CLINICAL SKILLS

AN INTRODUCTION FOR NURSING AND HEALTHCARE

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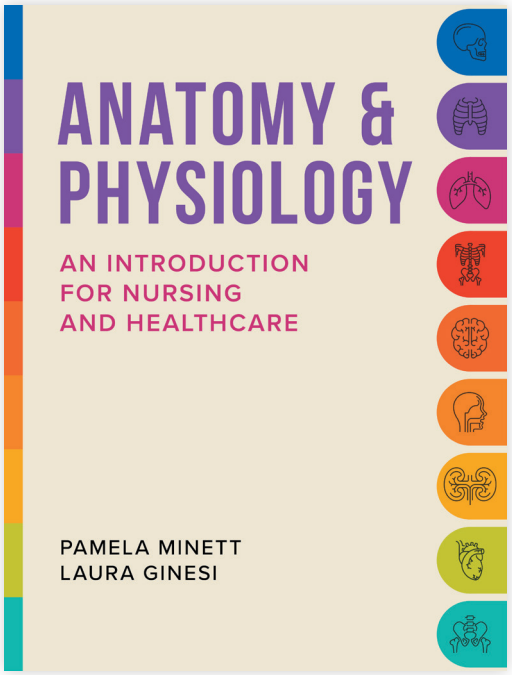

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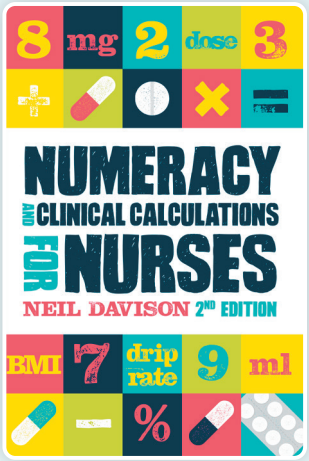

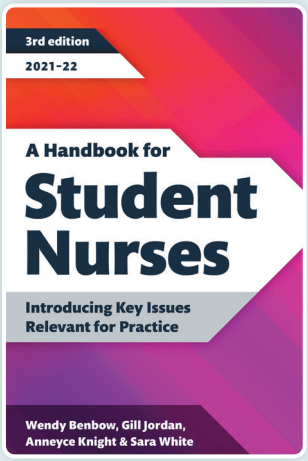

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CLINICAL SKILLS

AN INTRODUCTION FOR NURSING AND HEALTHCARE

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AN INTRODUCTION FOR NURSING AND HEALTHCARE

Robin Richardson
Executive Dean of the Faculty of Allied Health and Wellbeing,
University of Central Lancashire

Joanne Keeling
Associate Head (PGT) of the School of Health Sciences,
University of Liverpool

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Preface

This book is primarily aimed at students of nursing, to help them as they develop the ability to safely perform nursing procedures using the communication and relationship management skills as set out in Annexe A and B of the *Future Nurse: standards of proficiency for registered nurses*, published by the Nursing and Midwifery Council in 2018.

The book may also be useful to students of other healthcare professions who are required to carry out procedures when caring for people in a clinical environment. We were anxious that this book should not merely be a manual or set of instructions for performance, but be more comprehensive in enabling students to reflect upon their own values and beliefs whilst developing proficiency in a range of caring activities.

Consequently, the book incorporates the use of scenarios and activities to allow students to consider and develop their knowledge, values and experiences in order to care for people in a person-centred and compassionate way.

You are likely to encounter some unfamiliar words and phrases as you work your way through the individual chapters. Words that appear in **bold** type will be found, along with their definitions, in the Glossary near the end of the book.

We are grateful to the many healthcare professionals who contributed to this book, all of whom are experienced educators and clinicians. We hope that this book will be used as a supportive text and will act as a guide to students as they seek to achieve and demonstrate proficiency and professionalism in caring for and about others.

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About the authors

ROBIN RICHARDSON MA, BSc (Hons), RN (adult), RNT

Executive Dean, Faculty of Allied Health and Wellbeing, University of Central Lancashire

Originally from County Durham, Robin began his academic career at Royal Holloway College, University of London in 1984, graduating in 1987 with a Bachelor's degree in Human Physiology and Zoology. On graduation, Robin began his nursing career at the South Lothian College of Nursing and Midwifery in Edinburgh, eventually qualifying as a Registered General Nurse. On qualification Robin worked as a Staff Nurse at the Royal Free Hospital in London in several specialties including ENT, orthopaedic/trauma and general surgery before moving to St Mary's Hospital in Paddington in 1994 to specialise in vascular surgery. In 1997 Robin became a Nurse Practitioner within the St Mary's group of hospitals and commenced his teaching qualification at Thames Valley University – graduating with a master's degree in Learning and Teaching in Healthcare in 2002, by which time he was working as a full time lecturer at TVU. In 2003 Robin moved to the University of Central Lancashire, in Preston, where he is currently the Executive Dean of the Faculty of Allied Health and Wellbeing.

JOANNE KEELING MA, MA, PGCertEd., BSc (Hons), RN (mental health), RNT

Associate Head (PGT) of the School of Health Sciences, University of Liverpool

Joanne attended Bolton and Salford School of Nursing and qualified as a mental health nurse in 1995. Joanne worked in a range of mental health specialisms culminating in posts as a clinical leader and ward manager in acute services. Joanne continued her studies post qualification and gained a bachelor's degree in nursing studies and then master's degrees in Community and Healthcare Ethics and Healthcare Law along with a postgraduate certificate in teaching. Joanne began her academic career in 2002 lecturing at the University of Salford, then later joined the University of Central Lancashire working as Pre-registration nursing education manager and then Deputy Head of the School of Health Sciences. Joanne is currently the Associate Head of the School of Health Sciences (PGT) at the University of Liverpool.

Abbreviations

A&E	accident and emergency
ACE	angiotensin-converting enzyme
ACLS	advanced cardiac life support
ACVPU	Alert, Confusion (new onset), alert to Voice, alert to Pain, Unconscious
AED	automated external defibrillator
BAPEN	British Association for Parenteral and Enteral Nutrition
BBV	blood-borne viruses
BLS	basic life support
BMA	British Medical Association
BMI	body mass index
BNF	British National Formulary
bpm	beats per minute
BRASS	Blaylock Risk Assessment Screening Score
BUN	blood urea nitrogen
BVM	bag, valve and mask
CD	controlled drug
CHM	Commission on Human Medicines
COPD	chronic obstructive pulmonary disease
COSHH	Control of Substances Hazardous to Health Regulation
CPR	cardiopulmonary resuscitation
CRP	C-reactive protein
CVP	central venous pressure
DH	Department of Health
DIC	disseminated intravascular coagulation
DNAR	do not attempt resuscitation
DPI	dry-powder inhaler
ECG	electrocardiogram
FBC	full blood count
FFP	fresh frozen plasma
FiO_2	fraction of inspired oxygen
FOB	faecal occult blood
GCS	Glasgow Coma Scale
GI	gastrointestinal
GP	general practitioner
GSL	general sale list (medicine)
GTN	glyceryl trinitrate
HCAI	healthcare-associated infections
IDDM	insulin-dependent diabetes mellitus
IV	intravenous
LMA	laryngeal mask airway
LMP	last menstrual period
MDI	metered-dose inhaler
MDT	multidisciplinary team
MHRA	Medicines and Healthcare products Regulatory Agency
MRSA	methicillin-resistant *Staphylococcus aureus*
MUST	Malnutrition Universal Screening Tool
NEWS	National Early Warning Score
NEWS2	National Early Warning Score 2 (updated 2017)
NG	nasogastric
NICE	National Institute for Health and Care Excellence
NMC	Nursing and Midwifery Council
NSAID	non-steroidal anti-inflammatory drug
OP	oropharyngeal
PCA	patient-controlled analgesia
PCC	prothrombin complex concentrate
PDP	personal development plan
PEA	pulseless electrical activity
PEARL	pupils equal and reacting to light
PEG	percutaneous endoscopic gastrostomy
PGD	Patient Group Direction
POM	prescription-only medicine
PONV	post-operative nausea and vomiting

PPE	personal protective equipment
PSS	post-sepsis shock
RBCs	red blood cells
RCN	Royal College of Nursing
RCP	Royal College of Physicians
RPS	Royal Pharmaceutical Society of Great Britain
SAP	Single Assessment Process
SICP	standard infection control precautions
SLT	speech and language therapist
SOAD	second opinion approved doctor
TED	thromboembolus-deterrent
TENS	transcutaneous electrical nerve stimulation
TILE	task, individual capability, load, environment
TWOC	trial without catheter
U&Es	urea and electrolytes
UTI	urinary tract infection
VF	ventricular fibrillation
VT	ventricular tachycardia
WHO	World Health Organization

CHAPTER 1

01 Introduction

LEARNING OBJECTIVES

This book describes many clinical procedures that you will learn to carry out proficiently and with confidence. Several features are common to all procedures, and rather than repeating them for every procedure we will deal with them here. In this chapter you will learn about:

- introducing yourself and finding out a person's preferred form of address
- the principles of empathy, compassion and dignity
- different forms of consent and the importance of gaining consent before every nursing intervention or procedure
- the importance of hygiene and handwashing
- continuing professional development and the importance of research and keeping up to date with the latest evidence to inform your practice.

1.1 Introducing yourself

When you undertake your first practice placement as a student nurse, you will probably feel rather nervous, as it can be a daunting experience. You would probably like your new colleagues to introduce themselves to you and to learn your name and use it, rather than calling you 'the student'.

The same applies to the people you will be caring for, except that on top of their natural nervousness they are also anxious about their health. It's therefore very important to introduce yourself to them and to learn what their preferred form of address is. You also need to document their response in the nursing notes for your own benefit and the benefit of your colleagues.

A good way to do this is to adopt the practice advocated by the campaign *#Hello my name is*. This campaign was started in 2013 by Dr Kate Granger, a medical doctor who had terminal cancer and noted the failure of healthcare staff to introduce themselves to her. The practice is now widely recognised as the 'first rung on the ladder to providing truly person-centred compassionate care'. For more details see the website www.hellomynameis.org.uk.

You should tell the person and their families and carers your name, what your role is and how you would like to help them. You also need to ask them what they would like you to call them, for example 'Elsie', 'Mrs Smith'. This will also help you to avoid being overfamiliar or using generic (and potentially patronising or discriminatory) terms of address such as 'love' and 'mate'.

Be open and smile as you introduce yourself. You can practise this with your fellow students before you embark on your first practice placement.

Communication is covered in more detail in *Chapter 2*.

1.2 Empathy, compassion and dignity

Empathy simply means the ability to put yourself in the position of someone else. Even if you have not experienced what the other person is undergoing, it is important to imagine how they must feel. This is an essential part of being able to provide compassionate care: compassion is the combination of empathy for a person who is suffering and the desire to help alleviate that suffering.

Many routine activities become difficult for people in a clinical setting, and the nurse's role is to help them to carry out such activities while respecting their desire and need to be independent. Consider the following examples:

- Someone who cannot get out of bed might need to open their bowels. Simply closing the curtains around their bed and placing them on a bedpan does not preserve their dignity in the same way as taking the trouble to wheel their bed into a more private area such as an assisted bathroom.
- Over time you will develop confidence in practical skills such as giving bed baths. However, you also need to consider whether a person really needs a bed bath or whether they would prefer to wash themselves. This is an example of respecting their autonomy and promoting their independence.
- A person may receive bad news and be obviously upset. In that situation you may need to provide some privacy, hold their hand, and talk with them in a caring manner.

These are examples of situations in which you should show empathy and respect the person's dignity in order to provide person-centred compassionate care. This book focuses on clinical skills, but it is important to remember that care you provide with your clinical skills must always be delivered with empathy and compassion.

1.3 Consent

Hint for practice

If someone asks you a question about their care or treatment and you are unsure of the answer, seek advice from a registrant or your supervisor. You must never guess or give information you are unsure of. Even the most experienced professionals need to seek advice when unsure.

As well as always introducing yourself to someone in your care, another common feature is that you must obtain their consent to any procedure.

The Nursing and Midwifery Council (NMC) *Code* states that you must make sure that you get informed consent and document it before carrying out any action (NMC, 2018, Section 4.2), and that any information you give someone so that they can make an informed decision, should be accurate and truthful and presented in such a way as to be easily understood.

The basis of consent is that it must be:

- voluntary and given without pressure or coercion
- informed, so that the person understands what they are agreeing to, including potential benefits or risks associated with the procedure
- provided by a person with the capacity to consent, that is, the capability to make decisions for themselves (see *Section 13.5*).

Consent can be written, verbal (expressed) or implied ('by co-operation'). All are equally valid.

- When you tell someone you are going to take their blood pressure and ask if you can proceed, and they hold out their arm to enable you to perform the procedure, they have given implied consent.
- Verbal consent is simply spoken agreement.
- Written consent is generally required for surgical procedures and other procedures that carry identifiable risks.
- Both written and verbal consent are forms of 'expressed consent'.

Bear in mind that a person has the right to refuse treatment and therefore not to consent. If a person refuses the treatment or procedure you must not proceed. In that situation, you should tell your supervisor or the nurse in charge.

Consent is covered in more detail in *Chapter 13*.

1.4 Hygiene

Hygiene is covered in detail in *Chapter 3*. However, it is an important aspect of every procedure and demonstrates your commitment to the well-being and recovery of those to whom you provide care. You should ensure that you follow the hand-washing steps outlined in *Section 3.3* before every procedure and at appropriate points during the procedure.

Remember that hand contact is the most common way in which infection can be transmitted, and good hand hygiene is vitally important in the control of infection.

You must also wear the appropriate personal protective equipment such as gloves, apron, and so on, as specified for the procedure. You will find more information in the appropriate infection control policy of your organisation.

1.5 Developing and maintaining your proficiency

There are three identifiable aspects to being competent in a clinical skill:

- the psychomotor aspect, that is, the manual and technical ability to carry out the procedure (this is often referred to as the psychomotor domain) – **what** to do
- understanding the theory and evidence base that underpins the procedure (the cognitive domain) – **why** you do it
- the attitudinal aspects that you bring to the task in relation to explaining a procedure to a person, gaining their consent, carrying out the task in a compassionate way, and so on (the affective domain) – **how** you do it.

As a student nurse you should take every opportunity to observe and assist in nursing procedures until you are competent and confident enough to carry them out yourself.

Do not undertake any procedures that you are not comfortable carrying out or have not been taught. If your supervisor asks you to carry out a task which you do not feel confident or competent to do, you must have the courage to refuse politely and ask to be shown how the task should be performed.

The procedures included in this book are intended as a guide to clinical practice. Remember that you may need to adapt the procedures according to the individual needs and preferences of the people you are treating, whilst always maintaining safety. This level of proficiency will come with experience.

You will learn that nursing practice develops constantly, and you should make sure that you maintain your knowledge of the latest techniques and the developing evidence that underpins practice.

1.6 The 6 Cs

We have already referred to several concepts that form the 6 Cs. These are six fundamental values that underpin nursing care and were launched in a Department of Health (DH) document called *Compassion in Practice* (2016). As you practise and develop your proficiency in delivering care and performing the clinical skills outlined in this book, always remember the 6 Cs that must form the backbone of your practice.

1.6.1 Care

Care is our core business and that of our organisations, and the care we deliver helps the individual person and improves the health of the whole community. Caring defines us and our work. People receiving care expect it to be right for them, consistently, throughout every stage of their life.

1.6.2 Compassion

Compassion is how care is given through relationships based on empathy, respect and dignity. It can also be described as 'intelligent kindness', and is central to how people perceive their care.

1.6.3 Competence

Competence requires that all those in caring roles must be able to understand an individual's health and social needs and have the expertise and clinical and technical knowledge to deliver effective care and treatments on the basis of research and evidence.

1.6.4 Communication

Communication is central to successful caring relationships and to effective team working. Listening is as important as what we say and do, and essential for 'no decision about me without me'. Communication is the key to a good workplace with benefits for those in our care and staff alike.

1.6.5 Courage

Courage enables us to do the right thing for the people we care for, to speak up when we have concerns and to have the personal strength and vision to innovate and to embrace new ways of working.

1.6.6 Commitment

A commitment to our people and populations is a cornerstone of what we do. We need to build on our commitment to improve the care and experience of people, to take action to make this vision and strategy a reality for all and meet the health, care and support challenges ahead.

Activity

Considering the key points from this chapter and in discussion with your academic advisors/tutors and practice supervisor, think about your personal skills. You will need to develop a personal development plan (PDP) to identify and address any areas for your learning. You may wish to reflect on:

1. how confident you are at communicating with people and asking for help – you may need to practise your communication skills in a safe environment
2. your understanding of empathy and compassion and how you might show this to people in your care
3. your understanding of consent and what information you need to provide to ensure this is informed before you deliver care
4. your awareness of where to obtain guidance on best practice, to ensure you are providing evidence-based care at all times
5. how you might show that you are adhering to the 6 Cs and what they mean to you as a future nurse.

Summary

Key points from this chapter:

- Always introduce yourself to people in your care, and their families and carers.
- Try to put yourself in the person's position – be empathetic and compassionate and respect their dignity.
- Obtain consent before performing any nursing procedure or intervention.
- Follow good practice guidelines for hygiene and infection control.
- Only undertake procedures in which you are confident – don't be afraid to ask for help.
- Remember the 6 Cs in your practice.

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CHAPTER 2

02 Interpersonal skills

LEARNING OBJECTIVES

Good interpersonal skills are essential in all interactions with people. In this chapter you will develop the skills and knowledge required to:

- communicate effectively verbally and non-verbally
- apply interpersonal skills in relation to people living with dementia
- deal with aggression and violence.

Scenario: George Clarke

Mr George Clarke is 72 years old and lives at home with his wife Mary. George was diagnosed with Alzheimer's disease six months ago. This manifests itself in some minor memory difficulties around the home and disorientation when George is away from his home. He stopped driving three months ago following advice from his GP. Other than this, George has been relatively healthy with no hospital admissions in the last 10 years. However, he had to attend accident and emergency (A&E) last month when he accidentally walked into a door because he wasn't wearing his glasses. He takes four sorts of medication, one each for his Alzheimer's and arthritis and two for his blood pressure. His wife tends to all the household chores and finances, and she has to supervise George with his medication but, other than that, he is usually relatively independent.

Recently, George has started to experience some abdominal discomfort. He is becoming a little agitated and this is exacerbating his confusion. After a visit to his GP, George is admitted to the medical assessment unit at his local general hospital. Mary accompanies him.

2.1 Communication skills

2.1.1 Introduction

When you are communicating with people and their families and visitors in the clinical environment or providing information to colleagues about people in your care, what you say must be accurate and heard and understood by others. This section will raise your awareness of the skills needed when interacting with people, help you to communicate effectively and engage in, develop, maintain and disengage from therapeutic relationships.

2.1.2 Effective verbal skills

The way we speak can be influenced by many external triggers, such as fear or anxiety, for example. An awareness of these triggers can help us to control our speech and therefore make it more effective. As a nurse, what you say matters to

people in your care, their families and your colleagues. The way you communicate verbally also influences the response you get from those listening to you. The following tips will help you to communicate effectively.

The right words

Choosing the right words for the context aids understanding.

- Use clear language that people will understand. The use of medical jargon when talking to people (and their families and carers) about their illness can leave them confused.
- Give the right amount of information. Too much or too little information given at one time can also lead to confusion.
- Clarify important points and instructions.
- Repeat information if necessary, using different examples or in different words to aid understanding.
- Check that people have understood by asking them. You can also get them to repeat back to you in their own words what you have said to them.

The right speed

The speed at which we speak can be affected by emotions such as anxiety, fear, excitement or embarrassment. In these situations, speech speed tends to increase, and rapid speech can cause difficulties for the listener.

Slow speech too can be a response to an emotional state. It may indicate feeling low, shyness, lack of confidence, or defensiveness. Being positive and supportive rather than negative and defensive helps to make communication more effective.

You need to become aware of the ways in which your emotions can affect your speech as this will help you to control the speed at which you talk.

The right tone and pitch

The tone and pitch of our voices can also be influenced by our emotions, and we are often unaware of the tone of our own voice.

It is possible to adapt your tone deliberately for certain situations. For example, to engage empathetically with someone who is feeling anxious it helps to use a softer tone. Using a firm but controlled tone can help to calm a situation if we are faced with an aggressive person.

The pitch of our voice (high or low), too, can influence how people listen to us. Anxiety can tighten the voice box, making the pitch higher. One way of dealing with this is to drink some water to moisten the throat and relax the voice box.

Scenario: George Clarke

After his initial assessment, George appears confused and anxious. The nurse uses a calm tone of voice when speaking to him in order to reassure him. The nurse avoids showing any frustration with him and treats him with courtesy and respect by, for example:

- taking him and Mary to a quiet private area
- sitting down beside him to speak at the same level
- calling him by his preferred form of address
- smiling
- involving Mary in the conversation.

2.1.3 Effective non-verbal skills

Non-verbal skills, sometimes referred to as 'body language', are the ways we communicate to each other using our bodies. Non-verbal communication can be particularly useful in situations where communicating verbally is not easy; for example, if English is not the person's first language, or if the person has a sensory impairment such as blindness or deafness. In addition, a person who has a learning difficulty may find it hard to understand or respond to what you are saying and may respond better to non-verbal cues.

Non-verbal cues

Hint for practice

Practising communication skills in your everyday life will help to build your confidence in practice. Don't be afraid to ask others for feedback, as this will help you to identify and adapt your communication skills. Sometimes we may be unaware of how we are perceived or come across to others.

We use non-verbal cues, often unconsciously, in communicating with each other. Non-verbal cues include:

- Gestures – with our hands, arms and head. Gestures convey meaning; for example, crossing your arms and turning your head away is likely to give a negative message.
- Posture – sitting, standing, upright, slouched. Talking to someone while sitting slumped in a chair might indicate lack of interest, for example.
- Facial expressions. Our faces can show our feelings very clearly. For example, a smile will usually convey a very positive message.
- Eye contact. Maintaining appropriate eye contact helps effective communication. Avoiding eye contact may suggest that you are not really interested or that you may not be telling the truth, whereas staring or excessive eye contact may make a person feel uncomfortable. Be aware that the cultural background of the person you are caring for will influence their response; if you are unsure how much eye contact is appropriate you should seek advice from your supervisor.
- Proximity. Standing too close or too far away from someone might also make them feel uncomfortable and impede communication.

Adapting body language

It is possible with practise to control and adapt non-verbal cues consciously to reinforce what you are saying and to support positive and effective communication. For example, when you are assessing someone:

- Position yourself so that you are facing them and can make eye contact easily. The person then knows that you are interested and listening to them.
- Maintain a relaxed posture but avoid slouching in order to demonstrate that you are attentive to the person.
- Re-evaluate your position and body language constantly during communication and consider what your body language is communicating to the person from time to time during the assessment.
- If you find that you have started to turn away from the person, make a conscious effort to bring yourself back to face them again.

2.1.4 Effective listening skills

Listening is an important part of engaging with people. To be an effective listener you need not merely to receive the communication of the speaker but also to demonstrate that you are listening by responding verbally and using non-verbal cues. If a person believes that the nurse is not listening to them they may start to lose confidence in the service that the nurse provides.

As well as listening to what people are saying, remember to listen to the speed, pitch and tone of their speech. As we have seen, these can indicate emotional state. A flat tone or low pitch, for example, can indicate depression or a feeling of lowness; a high pitch or rapid speech might indicate anxiety.

Responding verbally

- Using phrases such as 'Yes, I see' and 'So what you mean is…' will indicate that you are listening and have understood.
- If you are not sure you have understood, check your understanding by repeating the speaker's words or by paraphrasing in your own words. Don't be afraid to say that you don't understand.
- Asking questions also indicates that you are listening. You should wait for the right moment to ask questions – let the speaker finish speaking and allow yourself to digest what they have said. Be careful not to interrupt.

Responding by using non-verbal cues

Just as when you are speaking to someone, you need to be aware of how you use body language when you are listening.

- Look at the person talking to you. Eye contact should be a gaze that occasionally moves away and then comes back to eye-to-eye contact. Maintaining direct eye contact for too long can become intimidating; be careful not to let it become a stare, so that the person you are listening to has to look away to break the contact. Be sensitive to their reactions; expectations in relation to eye contact may differ depending on cultural background.
- Face the person with your whole body. As with eye contact, be aware that facing someone with your whole body for too long can be intimidating for them; it is important that you have a relaxed posture to convey the message that you are listening in an interested and friendly manner.
- Your posture should also be open – make sure your arms are not folded and your legs are not crossed.
- Try to relax and lean forward slightly if you are sitting down, but not so much that you risk invading the personal space of the person talking to you and intimidating them.
- Gestures and facial expressions can also indicate that you are listening to someone. These can include smiling, nodding slowly to the person as they speak to you and tilting your head to one side to show that you are interested in what they are saying.
- Make time for the person speaking – you are not listening effectively if you look back over your shoulder as you are leaving the room and they are still speaking.

2.2 Dementia and interpersonal skills

2.2.1 Introduction

You are likely to care for people with dementia during your education; the reason for a person with dementia being admitted to hospital is often not their dementia, but it can have a significant impact on how they adjust to being in hospital and how they are cared for. This section aims to equip you with some relevant skills for communicating and engaging with people with dementia.

Scenario: George Clarke

George has been admitted so that his condition, pain level and general health may be assessed. His Alzheimer's disease is not the primary reason for his admission. However, his dementia makes him especially vulnerable to feelings of anxiety and fear. The healthcare staff adapt the way they communicate with him in order to ensure that he understands what is happening to him and can be involved in the decisions being made regarding his care.

2.2.2 Recognising dementia

Dementia is a broad term used to describe a range of signs and symptoms that result from progressive decline in mental abilities. This decline is the result of damage caused by specific brain diseases or by a trauma within the brain such as a stroke. Whatever the cause of a person's dementia the end result is the death of nerve cells (**neurones**). Neurones do not reproduce themselves; dementia therefore affects memory, thinking and reasoning. It is a progressive condition and the person's abilities deteriorate over time.

Dementia is usually associated with older age, but it also occurs in people of younger ages. There are different types – for example, Alzheimer's disease, vascular dementia and Lewy-body dementia. While no two people diagnosed with dementia will be the same, many types of dementia do follow a similar pattern. Some or all of the following signs and symptoms may be present:

- short-term memory loss
- disorientation
- loss of problem-solving skills
- loss of independence
- loss of the ability to care for own personal hygiene
- loss of control over bodily functions.

People who are confused can present similar symptoms to those of dementia. Something as simple as dehydration, malnutrition or a chest infection may cause someone to appear confused. The main difference between confusion and dementia is that in dementia, people continue to experience memory problems and thinking and communication difficulties over an extended period. Confusion is usually short-lived, perhaps present for two to three weeks, and you can expect to see the person make a good recovery. However, with dementia, the memory, thinking and communicating difficulties will have been present for at least six months.

People experiencing delirium or depression, too, may sometimes appear to be unconnected to what is going on around them. Symptoms of delirium include agitation, irritability and severe problems with understanding and processing information. These symptoms usually have a rapid onset and are a response to an underlying health condition; once the underlying condition resolves, the delirium too will get better. People experiencing an episode of depression may exhibit the same symptoms and additionally may appear preoccupied and unable to concentrate on their environment. Again, once treatment has taken effect people usually regain the ability to engage with those around them and to concentrate on and process information.

2.2.3 Communicating with people living with dementia

People with dementia can feel more afraid than other people because of their short-term memory difficulties. Being in new surroundings can be unsettling for someone with dementia, and sometimes this manifests itself in behaviours that are difficult to understand and manage. These behaviours can include:

- aggression (physical and verbal)
- wandering
- uninhibited behaviour
- repetitive questioning
- suspicion
- pacing
- lethargy.

Some of these behaviours can indicate that the person is trying to communicate something, and it is in the nurse's interest to try and understand what is upsetting the person in order to provide comfort and reassurance.

Communication can be problematic for people with dementia for a variety of reasons:

- **Receptive aphasia** – the person has difficulty interpreting the spoken word. Detailed information can become a jumble of sounds for them, but their understanding of non-verbal communication may be reasonable.
- **Expressive dysphasia** – the person may understand what you say to them but cannot find the words to reply.
- **Apraxia** – the person is unable to follow a command to carry out purposeful movement.

Dementia may impair a person's ability to assimilate new information regarding their surroundings or treatments for these reasons. Remembering the following points will help you to communicate with and care for them.

- You may have to repeat yourself when giving information; this may be frustrating for you, but the person with dementia may think that this is the first time you have told them.
- The person may ask the same questions repeatedly – be patient and answer them calmly.
- The person is likely to need frequent reassurance; using a calm tone of voice can help provide this.
- Try to make time and not appear too busy for them. If you are busy and promise to come back to the person 'in two minutes' then make sure you do go back to them. If you do not do this, it will exacerbate feelings of anxiety and fear and could lead to anger. Never give false hope to anybody.
- The person does not know the nursing staff on the ward and might not understand who they are and what they do. They might often ask for their partner or even their parents because they want to be with someone familiar. Try to reassure them by explaining that you are there to look after them at the moment.
- The person might benefit from having familiar things around them, so you could ask their partner or carer if there is anything that they could bring in such as, for example, family photographs. The ward will have to be able to safely accommodate whatever is brought in.
- Remember that the person is not deliberately behaving in a challenging way, so you must avoid showing any irritation.

It is important that you allow people to do things at their own pace and that you respect them as adults and do not infantilise them. Remember that an individual living with dementia is a person with all the components that each of us has: personality, past, present, social life, family or significant others, likes and dislikes, and a need for privacy and dignity.

Scenario: George Clarke

George begins to repeat questions that he has already asked, and he often asks for his wife. Eventually he gets out of bed and starts to show signs of anger. George needs frequent reassurance, and his condition causes him to forget that it is not long since he last asked a member of staff the same question. The nurse uses a calm tone of voice to soothe George and accompanies him back to his bed. She tells him when his wife is next due to visit and asks him if there is anything he would like his wife to bring with her. He asks for some photographs, and the nurse phones George's wife to ask her to bring some in when she next visits.

While taking George's observations, the nurse adapts her body language and uses non-verbal cues to assure him that he has her full attention and that she is interested in and values his input. He appears to be less anxious and confused, but he avoids eye contact and turns away slightly from her. The nurse will read these non-verbal cues that George uses to communicate his needs and what his body language is telling her about the way he feels. She might ask him if there is anything wrong, or if he is worried about something. She might also reassure him using touch and warm facial gestures.

George was only diagnosed with dementia six months ago, but being in hospital in new surroundings could still cause him anxiety.

2.3 Dealing with aggression and violence

2.3.1 Factors causing aggression and violence

Many things can trigger violent or aggressive acts, some of which are out of your control. You may come across some people who have a tendency towards aggression due to a combination of genetic factors and childhood environmental factors. Other factors, if you are aware of them, can be managed in order to reduce the possibility of a situation escalating and to avert violence.

Factors contributing to aggression include:

- environmental factors such as noise, lighting, heat, and so on
- invasion of someone's personal space
- boredom or lack of structured activity
- feelings of being ignored or treated disrespectfully
- fear of pain or the effects of the illness, or of the treatment
- alcohol and substance misuse.

2.3.2 Identifying anger, aggression and violence

People tend to display anger quite quickly, so knowing what to look for can help you to stop anger growing into aggression and violence. Reactions to be aware of are:

Physical reactions

- dipping head
- turning sideways
- defensive posture
- leaning forward
- rising to full height
- puffing out chest
- shifting body weight
- standing too close
- pacing
- stamping
- staring, or refusal of eye contact
- grimacing
- weeping
- grinding teeth
- twitching
- tremor
- rocking
- rapid or jerky movements
- exaggerated gestures
- poking
- clenched fists
- hitting self
- banging furniture
- nonchalance
- refusal to listen.

Verbal reactions

- refusal to speak
- wavering voice
- stammering
- rapid speech
- increased vocal pitch
- increased vocal volume
- screaming
- speech marred by spitting
- insults
- excessive sarcasm
- provocative speech
- excessive swearing
- inciting violence
- inappropriate laughter.

Any of the above reactions could indicate that someone is angry and has the potential to become aggressive or violent.

Scenario: George Clarke

George doesn't know the staff and they always appear busy to him. They don't know much about him and communication is difficult. The nurse notices him clenching his fists and becoming tearful, and she recognises these as signs of potential aggression. She takes the initiative and makes time to speak to George in a soothing voice, remaining calm and pleasant and reminding him who she is and why he is in hospital. She encourages him to talk about his feelings and reassures him that his wife will be visiting soon. George becomes calmer and relaxes his fists and appears less tearful. The nurse tells his wife about the episode and his wife too is able to reassure George.

2.3.3 Core interpersonal skills required to prevent and manage aggression

According to Leadbetter and Paterson (1995) there are four core skills required to prevent and manage aggression.

1. *Empathy* – By being empathetic you show that you understand another person's point of view, their feelings and their situation. It does not mean that you have to agree with everything they say or do.
2. *Respect* – This means respecting the person's individuality, not classing them as one of an undifferentiated group, but showing an interest in them. It is

easy to dismiss people in your care by considering them as a group with no individual ideas or needs.

3. *Genuineness* – To display genuineness you need to be yourself. Sometimes nurses hide behind a mask of professionalism, which can limit their responses so that they produce only stereotypical phrases that do not mean much. Try to respond in an open, spontaneous and personal manner, which will show warmth and understanding.
4. *Integrity* – This means that you need to be aware of your own competence, responsibility and fairness. Be mindful of any biases that you may hold and try to assess the situation fairly.

2.3.4 De-escalation

If a situation involving aggression does arise it must be addressed immediately. The term 'de-escalation' covers many aspects of the process of calming someone down and maintaining a safe environment, but the focus throughout is on communication. If you are confronted with someone who is being aggressive your body language and verbal communication are both extremely important.

- Be aware of your posture and eye contact.
- Avoid adopting an aggressive stance and shouting or talking over the other person. This will look more like an argument than a negotiation and would be likely to aggravate the situation.
- Try to appear calm, self-controlled and confident, while also showing respect for the other person's point of view.
- Display empathy and respect by asking open questions and showing concern and attentiveness through your verbal and non-verbal responses.
- Listen carefully and take care not to come across in a patronising or dismissive way.
- If there are patients, visitors and/or other staff around, you must also be mindful of their safety and enlist the help of other staff to make the environment safe. Clear communication and confidence in delivering brief, assertive instructions are essential skills.
- If you are unable to de-escalate the situation and you feel your safety or the safety of others is at risk, then call security for assistance.

Following an aggressive or violent incident it is good practice to take some time out to give those involved the chance to express their feelings about the situation. This is also an opportunity to reflect on and discuss how the matter was handled, and helps to identify both good practice and areas needing development.

The most important aspects of managing violence and aggression are communication with and observing the person in your care. If you use your basic interpersonal skills well in everyday nursing situations and are approachable and understanding, then you will also be able to develop your skills in prevention of violent incidents and in de-escalation and aggression management.

Activity

Think about people you know or have cared for with dementia, and reflect on the following issues:

- How did you adapt your communication style in relation to individual need?
- What were the best strategies for dealing with anxiety related to dementia?
- Would your approach to dealing with someone with dementia be different in the future, having considered the scenario in this chapter?

Summary

Key points from this chapter:

- You need to be aware at all times of how your verbal and non-verbal communication is perceived and interpreted by people.
- Listening is a key communication skill, the importance of which should not be underestimated.
- People with dementia have an altered capacity to understand. Therefore getting to know a person and being able to tailor your communication accordingly is paramount.
- Recognising and understanding the factors that may cause aggression and violence can help to prevent volatile situations deteriorating.
- The core interpersonal skills that you need to develop to help manage aggression are empathy, respect, genuineness and integrity.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

Hoe, J., and Thompson, R. (2010) Promoting positive approaches to dementia care in nursing. *Nurs Stand* 25(4):47–56.

Lowry, M., Lingard, G., and Neal, M. (2016) De-escalating anger: a new model for practice. *Nurs Times* 112(4):4–7. www.nursingtimes.net/roles/mental-health-nurses/de-escalating-anger-a-new-model-for-practice/7009471.article

Norman, K. (ed) (2019) *Essentials: Communication Skills*. Banbury: Lantern Publishing.

Pavord, E., and Donnelly, E. (2015) *Communication and Interpersonal Skills* (2nd ed). Banbury: Lantern Publishing.

Reference

Leadbetter, D., and Paterson, B. (1995) 'De-escalating aggressive behaviour', in Kidd, B., and Stark, C. (eds) *Management of Violence and Aggression in Healthcare*. London: Gaskell/Royal College of Psychiatrists.

CHAPTER 3

03 Infection control

LEARNING OBJECTIVES

Infection prevention and control is an essential part of caring for people. In this chapter you will develop the skills and knowledge required to:

- recognise when a person is at risk of developing an infection
- wash your hands effectively in preparation for tending to people
- use a non-touch technique to dress a surgical wound.

Scenario: Judith Kennedy

Miss Judith Kennedy is a 76-year-old lady who has been admitted to hospital with a venous ulcer on her left lower leg that will not heal. On admission, the ulcer is suspected to be infected, and a wound swab is sent to the laboratory for microscopy, culture and antibiotic sensitivity. She is started on intravenous (IV) antibiotics and requires daily dressing of her ulcer.

3.1 Introduction

Healthcare-associated infections (HCAIs) such as methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* can hinder a person's recovery, unnecessarily prolong their stay in hospital or their treatment, and even cause death. These infections also cost the health services significant amounts of money.

Nurses play a key role in preventing the spread of infection, starting with their own personal hygiene. This involves:

- wearing a clean uniform daily
- avoiding wearing a uniform outside the clinical area
- not wearing jewellery and wrist watches
- keeping nails short and free of polish
- wearing hair neat, tidy and off the collar.

3.2 Identifying the risk of infection

For an infection to occur a set of conditions must be present, commonly known as the chain of infection (*Figure 3.1*). There must be:

1. an organism which causes the infection
2. an area which provides nourishment for organisms and enables them to disperse further, the reservoir
3. a way for the organisms to exit, e.g. via the respiratory tract, urinary tract, gastrointestinal tract or blood
4. a route of transmission to the new host, such as skin to skin, by air, sexual contact or by injection (different organisms are transmitted in different ways)

5. a susceptible host (see below)
6. an area of entry, which will depend on the organism.

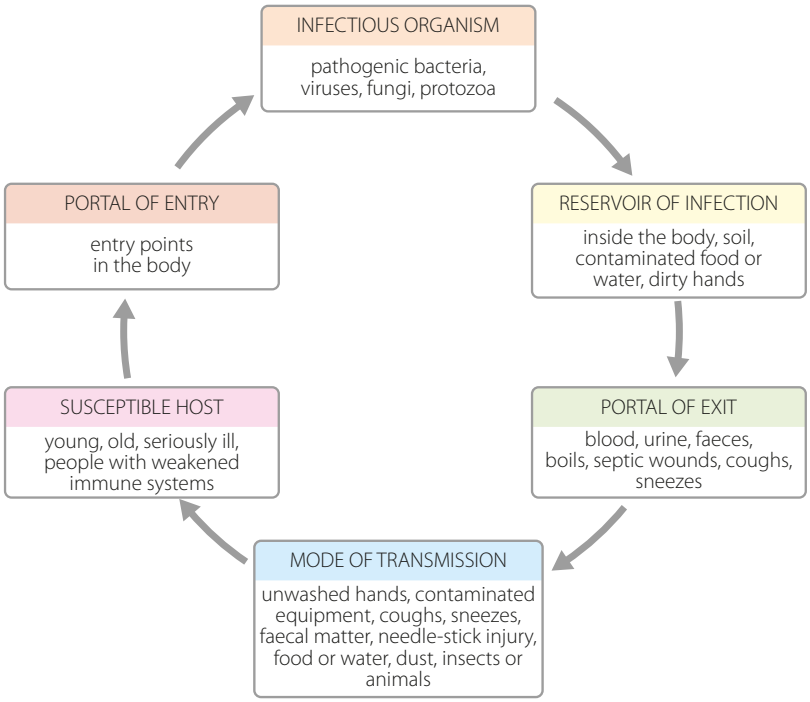

Figure 3.1 The chain of infection. Adapted from Minett, P. and Ginesi, L. *Anatomy & Physiology: an introduction for nursing and healthcare* (2020), Lantern Publishing.

Identifying the risk of infection enables us to plan the care required. An individual may be a susceptible host and at risk of infection for a variety of reasons:

- age – the immune system becomes less efficient with old age
- underlying diseases
- nutritional status
- immobility
- inability to attend to their own hygiene
- breaks in the skin, surgical procedures and invasive medical devices – these can provide bacteria with an entry portal
- poor blood supply – this can lead to a lack of nutrients in underlying body tissues
- certain medication – for example, chemotherapy, steroids and immuno-suppressants may affect a person's immune system and reduce their ability to fight infection.

3.3 Standard infection control precautions

All NHS bodies must have policies in place for standard infection control precautions (SICP). It is therefore important that you check your own organisation's infection control policy.

Standard infection control precautions are designed to prevent cross-transmission from sources of infection. These sources of potential infection include blood and other body fluids, which are treated as a risk regardless of whether an infection is known to exist. Body fluids include:

- cerebrospinal fluid
- amniotic fluid
- synovial fluid
- peritoneal fluids
- vaginal fluids
- semen

- breast milk
- pleural fluid
- saliva
- any other body fluid visibly contaminated with blood
- unfixed tissues and organs.

Any equipment or items in the care environment that are likely to become contaminated must also be considered to be a possible source of infection.

SICPs include guidance on:

- hand hygiene
- respiratory hygiene
- personal protective equipment
- safe use of sharps
- management of care equipment
- care of linen, including uniforms
- control of environment
- safe disposal of waste.

3.3.1 Hand hygiene

Hand contact is the most common way in which infection can be transmitted, and good hand hygiene is vitally important in the control of infection.

Many organisations state that a plain wedding band is the only jewellery allowed. In addition, it is important to ensure that the wrists are clean, so wrist watches or wrist jewellery should not be worn. Cuts and abrasions should be covered with a waterproof dressing. Fingernails should be kept clean, short and free from nail polish. False nails should not be worn because bacteria can be harboured in the nail bed.

Hands must be decontaminated immediately:

- before each episode of direct contact and care
- before any clean or aseptic procedure
- after any risk of exposure to body fluids
- after any physical contact
- after any contact with the person's immediate surroundings, such as the bed, furniture or other objects, even if you have not touched the person.

Before hand decontamination, all hand jewellery should be removed.

You may see these referred to as the 'five moments for hand hygiene' (Sax 2007).

The hand-washing procedure should take at least 15 seconds, depending on the level of cleansing required. Take care not to miss areas when washing your hands – the base of the thumbs and the back of the hands in particular are easily missed.

Procedure 3.1: Hand-washing

STEP 1 Wet the hands under running water.

STEP 2 Apply hand-wash solution (see *Figure 3.2*):

- using hand-wash solution, clean the hands palm to palm
- right palm over left dorsum and left palm over right dorsum
- interlace fingers palm to palm
- interlock backs of fingers to opposing palms
- rotationally rub the left thumb, clasped in the right palm and vice versa.

STEP 3 Rinse thoroughly.

STEP 4 Turn off the taps using the wrist or the elbow, not the clean hands.

STEP 5 Dry hands thoroughly with disposable paper towels.

STEP 6 Dispose of paper towels, taking care not to recontaminate the hands.

ALERT

Alcohol-based hand-rubs are not effective against spore-forming organisms, such as *Clostridium difficile*, or against norovirus. If someone has this type of infection, hands should be washed with soap and water before and after contact.

Hand-rubs

Alcohol-based hand-rubs are useful for performing hand hygiene when sinks are not readily available for hand-washing or when hands may be contaminated but are socially clean (i.e. not visibly soiled), such as when entering or leaving a hospital ward. Hand-rubs can also be used following hand-washing to provide further cleansing, for example, when performing aseptic techniques. Most organisations supply staff with their own hand-rubs that they can carry around with them. Hand-rubs may also be placed on beds or lockers.

Hand-rubs may not be effective against all organisms, and you should find out which microbes the hand-rub supplied to your organisation is effective against.

An emollient cream should be applied regularly to prevent the skin suffering from the drying effects of hand-washing. If a product causes irritation, you should contact occupational health.

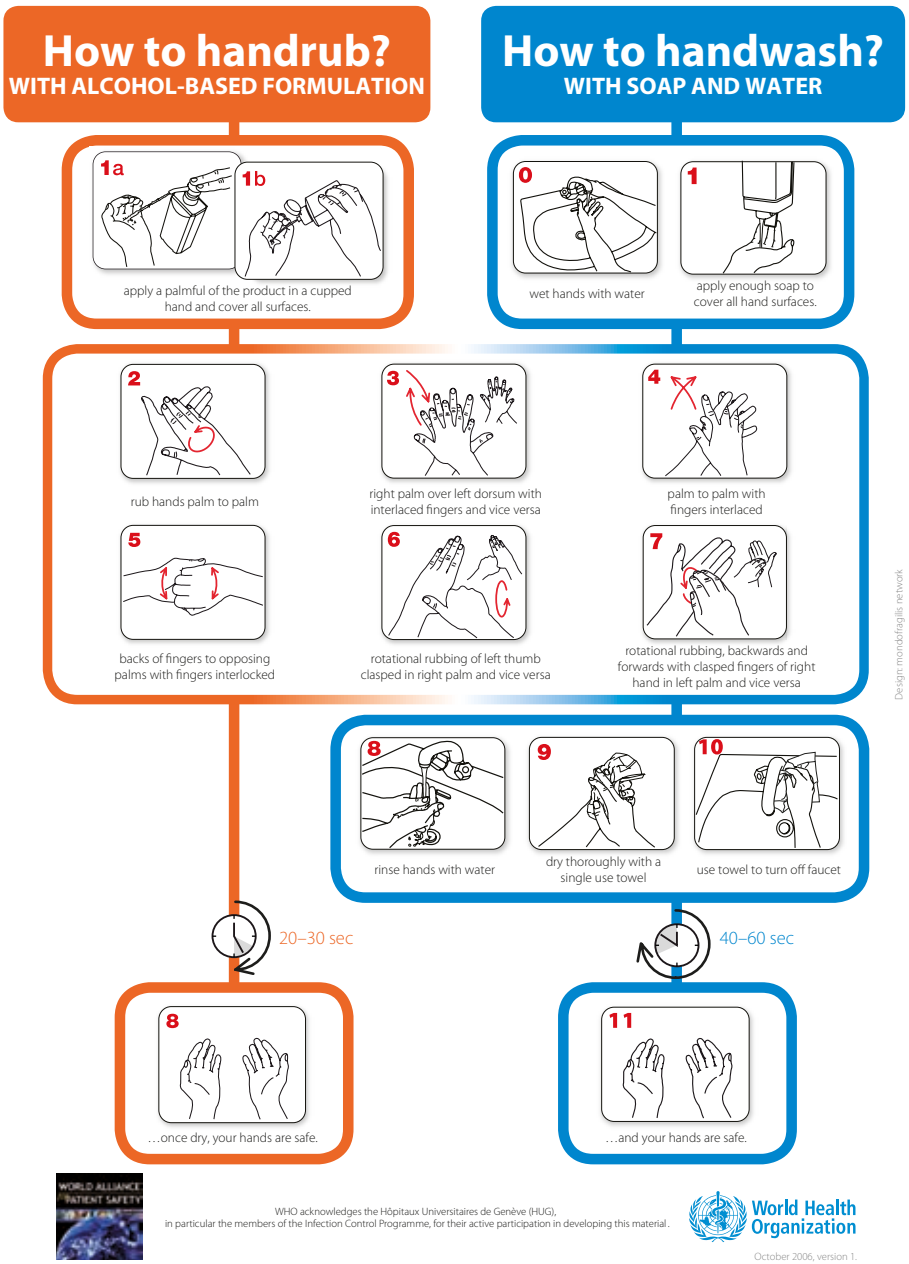

Figure 3.2 Hand-washing and using hand-rubs (reproduced with permission from the World Health Organization).

3.3.2 Respiratory hygiene/cough etiquette

Respiratory hygiene and cough etiquette should be applied as a standard infection control precaution at all times. The measures include:

- covering the nose and mouth with disposable single-use tissues when sneezing, coughing, wiping and blowing noses
- disposing of used tissues into a waste bin
- washing hands with soap and water after coughing, sneezing, using tissues, or after contact with respiratory secretions or objects contaminated by these secretions
- keeping contaminated hands away from the mucous membranes of the eyes and nose.

3.3.3 Personal protective equipment (PPE)

ALERT

Disposable gloves and apron should always be worn when handling body fluids.

If you are at risk of exposure to blood or body fluids it is important that you wear personal protective equipment. This includes gloves, aprons, masks and goggles or visors. Gloves and aprons are single-use items as this reduces the risk of cross-infection. They must be properly disposed of after use. You will need to find out about the correct way to dispose of contaminated PPE in your clinical area.

Gloves

Gloves must be worn for invasive procedures and contact with sterile sites, non-intact skin or mucous membranes, and for all activities that carry a risk of exposure to blood, body fluids, secretions or excretions or sharp or contaminated instruments. Gloves are worn to protect the healthcare worker not only from blood or body fluids but also from chemicals and hazardous substances. They are also worn to prevent cross-infection from person to person. Sterile gloves are often used for dressings and invasive procedures.

Gloves are single-use items and must be put on immediately before contact and removed afterwards. They should be changed between caring for each person and also between different treatments on the same person. Do not wear gloves longer than is necessary. Wearing gloves for too long occludes air and excess moisture in the glove, leading to skin breakdown and an ideal environment for some microorganisms to survive.

ALERT

Wearing gloves is not a substitute for effective hand-washing.

When you have been wearing gloves you must wash your hands after you take them off. Bacteria can contaminate the hands through small defects in the gloves or during glove removal.

Aprons

Plastic aprons must be worn to prevent contact transfer of bacteria from uniforms when assisting people with toileting, bathing or with any activities that may result in the dispersal of pathogens. Plastic aprons should also be worn with procedures causing the splashing of blood or bodily fluids. Plastic aprons should be worn for one single procedure or episode of person-centred care, and then disposed of as clinical waste. Many organisations have a specific procedure for taking off aprons. It is important that you check with your organisation which technique they require.

Long-sleeved gowns may be worn when there is risk of extensive contamination to clothing and for certain procedures on people who are in isolation. Long-sleeved gowns must be fluid-repellent, and like aprons are single-use and disposed of as clinical waste after each episode.

Face masks and eye protection

These should be worn if there is a risk of blood, body fluids, excretions or secretions splashing onto the face or the eyes.

3.3.4 Safe use and disposal of sharps

Sharps injuries, also called needlestick injuries, are one of the most common types of injury reported by healthcare staff, so care must be taken when handling sharps. Nurses who perform venepuncture and cannulation (see *Chapter 19*) are professionally accountable for the safe disposal of the sharps that are used during these procedures. This is also a legal requirement. Should any other individual suffer harm as a result of sharps not being disposed of appropriately, a nurse risks a civil charge of negligence.

In order to use and dispose of sharps safely and to avoid needlestick injuries, observe the following rules.

- Needles must not be bent or broken prior to use or disposal.
- Needles should never be recapped or resheathed.
- Sharps should never be passed from hand to hand, and handling should be kept to a minimum.
- A sharps container (conforming to UN 3291 and BS 7320 standards) should be available at the point of use, and used sharps must be discarded into this container.
- Whoever uses the sharps must dispose of the sharps themselves.
- Staff should not remove the needle from the syringe before disposing of them in the sharps container.
- Sharps containers must not be overfilled above the mark indicating that they are full.
- Sharps bins should be located in a safe position and placed out of reach of children at a height that enables safe disposal by all members of staff. They should be secured to avoid spillage.
- Items should never be removed from sharps containers.

3.3.5 Management of care equipment

Hint for practice

Keep your uniform as clean as possible by using a good detergent. It is also useful to take a spare uniform with you in your bag to work or keep one in a locker so you can change if needed.

Care equipment such as stethoscopes, infusion pumps, drip stands, and thermometers can become contaminated during the delivery of care and must be managed appropriately in order to limit the risk of contamination with micro-organisms.

Care equipment must be stored clean and dry after use, and covers should be used where appropriate.

There should be a local policy for cleaning equipment, and you will need to find out about the policy in your organisation. Some equipment may need to be cleaned outside the clinical area, such as in a sterilisation department.

3.3.6 Linen and uniforms

Used linen can harbour potentially pathogenic organisms and thus be a source of infection. A disposable plastic apron should always be worn when handling used

linen, for example during bed-making; and disposable gloves should be worn where linen is soiled. In some areas this may be a colour-coded apron specifically for linen handling. You should refer to the local policy in your organisation.

Always hold used linen away from yourself to avoid contamination of clothing from linen, and wash your hands after handling linen and removing your apron.

Uniforms are not considered a serious source of infection, but precautions should still be taken to ensure that remains the case.

3.3.7 Control of the environment

Surfaces of items in the clinical setting can harbour microorganisms, so in addition to good hand-washing routines, it is important that surfaces are kept clean and objects intact and undamaged. A cleaning schedule should be available in your organisation that will identify the cleaning responsibilities of clinical and non-clinical staff.

Whatever your specific responsibilities, you should always maintain a tidy and clutter-free environment. You should also report items and equipment that are damaged and any areas or items that are found to be consistently unclean.

3.3.8 Safe disposal of waste

Safe and appropriate management and disposal of waste are important in preventing infection. You should familiarise yourself with the local waste disposal policy, but the following general guidelines hold.

- Dispose of waste as close to the point of use as possible immediately after use.
- Use identified waste holders as appropriate. These should be hands-free so that your hands do not become contaminated as you are disposing of waste.
- Dispose of sharps only in approved sharps containers.
- Never dispose of waste into a receptacle that is already full.
- Always wear personal protective equipment.
- Never touch the waste receptacle while disposing of an item.
- Wash your hands after disposing of waste.

3.4 A clean and safe technique when dressing wounds

Aseptic technique, or aseptic non-touch technique, should always be used when dressing a surgical wound. A dressing pack should always be used, which will include a **sterile field**, a **gallipot** for wound-cleansing solution and either a pair of disposable forceps or a pair of sterile gloves. Non-touch technique involves the identification of key parts of the equipment that must remain uncontaminated – in this case that applies to anything that was contained in the dressing pack or added to the sterile field from a separate sterile source (swabs, for example). It is essential that items that come into contact with the wound do not contaminate the sterile area. Check your organisation's policy in relation to this technique as practices do vary – though the principles remain the same.

Procedure 3.2: Applying an aseptic dressing

STEP 1 Review the person's care plan. This allows for assessment of the wound when exposed and ensures you are treating the correct person.

STEP 2 Identify the person by checking the wrist band and ensure the right person will receive the correct nursing intervention.

STEP 3 Explain to the person what you are going to do and obtain verbal consent. This helps to reduce anxiety and encourages person-centred co-operation. It also prepares the person for the dressing change.

STEP 4 The person may experience pain when the dressing is changed, so assess for the need for analgesia before you change the wound dressing. With a qualified practitioner, administer any analgesic medication required. Allow enough time for the analgesia to work.

STEP 5 Prepare the necessary equipment. Preparation is effective time management and allows for an organised approach to the change of dressing. Check the integrity of sterile packaging and the expiry dates on all equipment to be used, as out-of-date equipment is a danger. Clean the dressing trolley according to your organisation's policy.

STEP 6 Wash hands using the procedure described in *Section 3.3.1*.

STEP 7 Close any curtains/doors to protect privacy and dignity.

STEP 8 Ensure the bed is at an appropriate height. This will help to reduce your risk of back strain when you are carrying out the procedure.

STEP 9 Set the person in a comfortable position that provides easy access to the wound area.

STEP 10 Cover any exposed area on the person, other than the wound area, to maintain dignity. Loosen the existing dressing to reduce discomfort during dressing removal.

STEP 11 Wash hands again. In case of direct contact with bodily fluids or blood put on a clean plastic apron to prevent contamination of your uniform and transfer of microorganisms.

STEP 12 Open the necessary equipment and prepare a sterile field. Make sure equipment is within easy reach and that the sterile field is maintained.

STEP 13 Remove the soiled dressing carefully. If any part of the skin is stuck to the dressing, use a small amount of sterile saline solution to help loosen and remove the dressing. The use of saline allows for easier removal while minimising tissue damage and pain. Do not reach over the wound.

STEP 14 Assess the soiled dressing for the colour, type or odour of any exudates on the dressing. If any exudate is present it should be documented. Place the soiled dressing in the correct waste receptacle and wash your hands.

STEP 15 Open cleaning solution and pour into a sterile container.

STEP 16 Put on sterile gloves.

STEP 17 Clean the wound from top to bottom, or from the centre to the outside of wound. Cleaning should be from the least to most contaminated area. Use a clean gauze square for each wipe, placing the used gauze in waste receptacle. The clean gauze square for each wipe ensures a previously cleaned area is not contaminated again. Ensure no surfaces are touched with the gloves.

STEP 18 After the wound is clean, dry the area using clean gauze swabs. Drying the area is important because microorganisms grow in a moist environment. Apply any treatment if prescribed.

STEP 19 Apply a dry sterile dressing over the wound. Dressings may reduce the growth of microorganisms and promote the healing process. They also allow for any exudate to be absorbed.

STEP 20 Place a second sterile dressing over the wound site. A second layer allows for exudate to be absorbed and also allows for additional protection of the wound against microorganisms.

STEP 21 Remove and dispose of gloves. Apply tape to secure the dressing. Tape is easier to apply after gloves have been removed.

STEP 22 Label dressing with date and time. This provides information for colleagues and demonstrates that the care plan has been followed.

STEP 23 Remove all equipment. Ensure the correct disposal of any sharps and waste materials. Ensure the person is comfortable with the bed lowered to lowest position for safety.

STEP 24 Clean the work surface, remove protective clothing and wash hands.

STEP 25 Complete all relevant documentation and make sure the individualised care plan is updated and that any changes observed in the wound have been documented.

3.5 Isolation precautions

Scenario: Judith Kennedy

The results of Judith's swab have come back from the lab. It has been determined that her ulcer is infected with MRSA. Judith's IV antibiotic prescription is changed from a broad-spectrum antibiotic to a more specific antibiotic to which MRSA is sensitive. Judith must also be isolated to prevent cross-infection to other people.

Standard precautions do not prevent the spread of airborne infections. Isolation precautions have become more common following epidemics such as SARS, swine flu and the COVID-19 pandemic. Isolation precautions may be taken:

- with people who may spread a disease
- with people who are at greater risk of infection themselves due to having a severely suppressed immune system, such as those undergoing chemotherapy or who have had a transplant.

Enforced isolation can cause fear, loneliness or embarrassment and must be done in as sensitive a manner as possible. Make sure that a person understands why they are being isolated, and that any carers and visitors are also aware of the precautions they should take. People in isolation are likely to feel more vulnerable and anxious than they would on the open ward, so it is especially important to use the full range of your communication skills in order to care for their psychological well-being.

ALERT

People in isolation are not in plain view, so remember to check on them regularly.

Remember that standard precautions should be adhered to with people in isolation. The two fundamentals of isolation precautions are described in the next sections.

3.5.1 Where the person is placed

Isolation normally requires a separate single room. If someone is placed in isolation because of an airborne infection the room may require a separate ventilation system from the rest of the ward so that contaminated air is not dispersed back through the ward.

3.5.2 Appropriate signage

It is important that staff and visitors are aware of the requirements for isolation. To this end, signage must be placed in a prominent position outside the room instructing staff and visitors of specific requirements, for example 'Gloves and aprons must be worn inside this room.'

3.6 Sepsis

Scenario: Judith Kennedy

If Judith's MRSA infection spreads from a localised wound to a more systemic infection, she may be in danger of developing septicaemia, or sepsis.

Sepsis is a life-threatening illness caused by the body overreacting to an infection.

The immune system sets off a series of reactions that can lead to widespread inflammation and blood clotting. It is a common problem that is often not recognised until too late, as it can look like other infections such as flu, gastroenteritis or chest infection. Symptoms usually develop quickly.

Although anybody can develop sepsis from a minor infection, some people are more vulnerable, such as those:

- with a medical condition or receiving medical treatment that weakens their immune system
- who are already in hospital with a serious illness
- who are very young or very old
- who have just had surgery or other invasive procedure
- who have wounds or injuries as a result of an accident.

3.6.1 Stages of sepsis

Sepsis develops in three stages.

- *Uncomplicated sepsis* is caused by infections, such as flu or dental abscesses. It is very common and does not usually require hospital treatment.
- *Severe sepsis* occurs when the body's response to infection has started to interfere with the function of vital organs, such as the heart, kidneys, lungs or liver.
- *Septic shock* occurs in the most severe cases of sepsis, when blood pressure drops to a dangerously low level, preventing vital organs from receiving enough oxygenated blood.
- *Post-sepsis shock* (PSS) may occur during recovery from sepsis. A range of symptoms can affect people emotionally, physically and psychologically. These symptoms usually last between 6 and 18 months and can be very distressing. It is important that people experiencing PSS symptoms seek help and advice from their after-care team. The symptoms usually disappear in time with appropriate care and management.

3.6.2 Sepsis screening tools

The updated National Early Warning Score (NEWS2; see *Chapter 6*) is the recommended tool to aid detection of acute clinical illness or deterioration due to sepsis in people with an infection or at risk of infection. The UK Sepsis Trust has developed several sepsis screening and action tools for use in various clinical settings with the NEWS2 (www.sepsistrust.org).

A person may be suspected of having severe sepsis if their NEWS2 is 3 or higher or they appear sick and have a known or suspected infection. In that case, if any one of the following 'sepsis red flags' is present, then the Sepsis Six pathway should be commenced immediately:

- responds only to voice or pain or is unresponsive
- acute state of confusion
- systolic blood pressure 90 mmHg or lower, or blood pressure has fallen more than 40 mmHg from normal
- heart rate more than 130 beats per minute
- respiratory rate 25 per minute or more
- requires oxygen to keep blood oxygen saturation (SpO_2) at 92% or higher
- non-blanching rash, mottled/ashen/cyanotic skin

- not passed urine in last 18 hours
- urine output less than 0.5 mL/kg/hour
- serum lactate 2 mmol/litre or higher (required blood test)
- recent chemotherapy.

See *Chapter 5* for more detail on taking observations. If you see these symptoms, report your observations immediately to the nurse in charge or a doctor.

3.6.3 The Sepsis Six

The Sepsis Six is a set of interventions that can significantly increase the chance of survival if delivered early.

The Sepsis Six

1. Ensure senior clinician attends.
2. Give oxygen if required. Start if O_2 saturations are less than 92% – aim for O_2 saturations of 94–98%. If at risk of hypercarbia aim for saturations of 88–92%.
3. Obtain IV access, take bloods: blood cultures, blood glucose, lactate, full blood count (FBC), urea and electrolytes (U&Es), C-reactive protein (CRP) and clotting; lumbar puncture if indicated.
4. Give IV antibiotics: maximum-dose broad spectrum therapy; consider local policy, allergy status, using antiviral.
5. Give IV fluids: fluid bolus of 20 mL/kg if aged under 16, 500 mL if 16 or over. The National Institute for Health and Care Excellence (NICE) recommends using lactate to guide further fluid therapy.
6. Monitor: use NEWS2; measure urinary output (may require a urinary catheter); repeat lactate at least once per hour if initial lactate is elevated or if clinical condition changes.

For more details, see https://sepsistrust.org/education/.

Activity

Look at the area you are currently working in and consider the ways in which you might contaminate a person with bacteria from another person, or from yourself. Then consider how you can prevent this from happening.

Summary

Key points from this chapter:

- Standard infection control precautions should be followed to prevent cross-transmission from sources of infection.
- Aseptic non-touch technique should always be used when dressing a wound.
- Making sure that someone understands why they are being isolated and checking on them regularly will help to reduce the anxiety they may be feeling.
- Sepsis is life-threatening and you must report immediately any suspicion that someone is at risk of developing sepsis.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

Hamm, R.L. (2019) *Text and Atlas of Wound Diagnosis and Treatment* (2nd ed). New York: McGraw–Hill Education.

NICE (2012, 2017) *Healthcare-Associated infections: Prevention and control in primary and community care. Clinical Guideline 139*. www.nice.org.uk/Guidance/CG139

Royal College of Nursing, Infection Prevention Society (2016) *Infection Prevention and Control Commissioning Toolkit*. www.rcn.org.uk/professional-development/publications/pub-005375

Royal College of Emergency Medicine, UK Sepsis Trust (2016) *Toolkit: Emergency Department Management of Sepsis in Adults and Young People over 12 Years*. https://sepsistrust.org/wp-content/uploads/2018/06/ED-toolkit-2016-Final-1.pdf

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Nutbeam, T., and Daniels, R., on behalf of the UK Sepsis Trust (2019) *Screening tools*. https://sepsistrust.org/professional-resources/clinical-tools/

Royal College of Physicians (2017) *National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS*. London: RCP. www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2

Sax, H. *et al*. (2007) 'My five moments for hand hygiene': a user-centred design approach to understand, train, monitor and report hand hygiene. *J Hosp Infect* 67(1):9–21.

World Health Organization (2009) *WHO Guidelines on Hand Hygiene in Healthcare*. Geneva: WHO. http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf

CHAPTER 4

04 Nursing assessment

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the nursing process
- assess the individual needs of the people you care for.

Scenario: Rita Johnson

Mrs Rita Johnson is an 81-year-old lady who lives in sheltered housing with her 83-year-old husband, Reg. They have no children and rely on each other for support. Recently, Rita has been having episodes of confusion and Reg has been struggling to care for her, as she has developed pain on micturition and slight urinary incontinence. Their GP has referred Rita to hospital for admission and assessment, suspecting that she might have a urinary tract infection (UTI). Her previous medical history includes osteoarthritis and hypertension (for which she takes daily medication).

Rita has been admitted to the medical ward, and you have been asked to assess her nursing needs.

4.1 The nursing process

Nursing is a four-stage cyclical process (*Figure 4.1*).

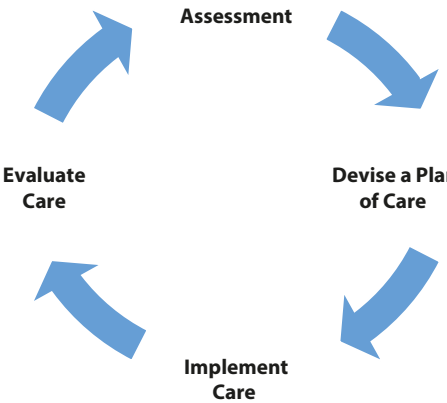

Figure 4.1 The nursing process.

The first stage in the nursing process is assessment. The nursing assessment aims to capture an accurate picture of the current condition of the person requiring nursing care. Everyone is different – age, sex, physical form, ethnicity, religion,

the job they do, their home life and background, etc. The purpose of the nursing assessment is to identify their holistic needs:

- physical needs
- psychological needs
- spiritual needs
- social needs.

By asking questions in relation to these needs, usually on admission, the nurse can also identify what the person sees as healthcare needs. These problems can be divided into:

- actual problems – needs that the person currently has
- potential problems – needs that may arise as a result of the person's condition or predicament.

4.1.1 Roper, Logan and Tierney's Model of Living

Roper, Logan and Tierney's Model of Living (2000) is the most widely used nursing model to assist the nurse in the practice of assessment.

The Model of Living identifies five concepts (*Figure 4.2*), though they are interrelated:

1. the activities of living
2. lifespan
3. dependence/independence
4. factors influencing the activities of living
5. individuality in living.

These concepts are explained in more detail below.

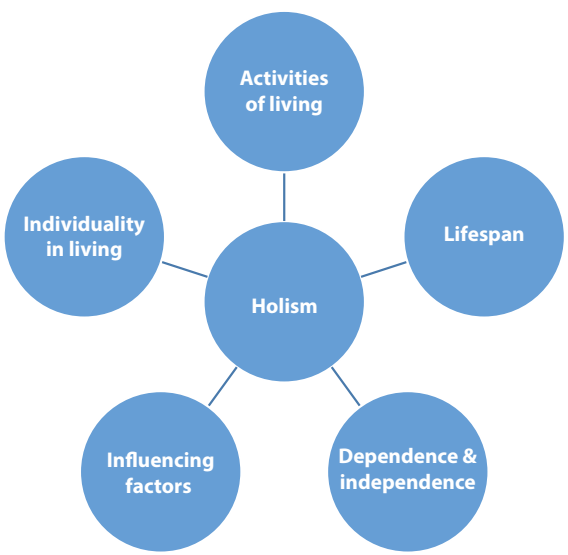

Figure 4.2 The Roper, Logan and Tierney Model of Living (Roper 2000). This figure was published in *The Roper Logan Tierney Model of Nursing* © Elsevier 2000.

Activities of living

The activities of living include:

- breathing
- controlling body temperature
- eating and drinking
- elimination

- sleeping
- communication
- personal cleansing and dressing
- mobilisation
- expressing sexuality
- work and play
- maintaining a safe environment
- dying.

As healthy individuals we take these activities for granted. However, because many of them interrelate, when someone becomes ill several of these activities may be affected. Here is an example of some of the interrelationships between the activities of living.

Scenario: Rita Johnson

Rita's confusion is worse at night, and she is sometimes too frightened to go to sleep as she is afraid of wetting the bed. Her personal cleansing is affected as occasional memory lapses mean that she sometimes needs help with washing and dressing. Reg already takes care of most of the household chores, as well as the finances. Rita certainly needs help in maintaining a safe environment.

Lifespan and dependence/independence

From birth we generally become increasingly independent. As adults our dependence upon others is usually minimal. As we become older, our independence may progressively diminish and we may once more develop a reliance on others in order to achieve the activities of living.

When a person develops an illness, their independence may be threatened for a short period or in the longer term. Effective nursing assessment will inform a care plan, which should promote as much independence as possible for the individual. The care plan should make clear a person's limitations and highlight which activities the person needs assistance or support with and at what level.

Scenario: Rita Johnson

Rita's current state of health has resulted in some minor memory difficulties and disorientation when she is away from the familiar environment of her home. Other than this Rita has been relatively healthy with no hospital admissions in the last 10 years. However, she is becoming increasingly dependent on Reg to carry out the household chores, manage their finances and remind her to take her daily medication.

Factors influencing the activities of living

In order to achieve excellent personalised care, practitioners must consider people holistically, taking into account all the factors that influence the activities of living.

The five main factors influencing the activities of living are biological, psychological, socio-cultural, environmental and politico-economic factors (Roper 2000). They often interrelate (*Figure 4.3*).

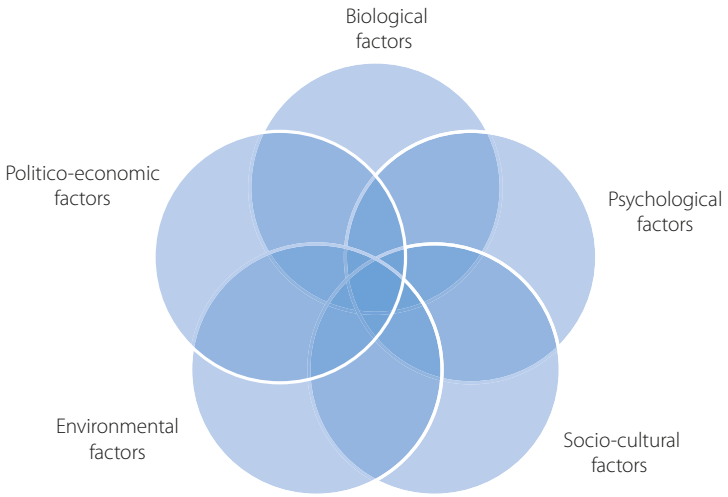

Figure 4.3 Factors that influence the activities of living (Roper 2000). This figure was published in *The Roper Logan Tierney Model of Nursing* © Elsevier 2000.

Scenario: Rita Johnson

Rita has been admitted to hospital for assessment because of her decreasing ability to self-care. The biological factor is the potential UTI that she has developed, and the confusion that may be related to the UTI. A psychological factor to consider may be how she responds to her decreasing ability to self-care and her urinary incontinence. There may be related psychological and socio-cultural factors arising from her increasing dependence on Reg, her husband. The environmental factors may include modifications to her lifestyle in order to manage her increasing frailty. The politico-economic factors are to do with her rights to treatment and care, and the likelihood that she will require increasing levels of care, perhaps in a care home, if her overall condition deteriorates.

Individuality in living

Individuality in living is the final concept of Roper *et al.*'s model and it concerns treating people as individuals and planning their care appropriately, according to their own specific needs. Individualised nursing should be planned with the person to meet the needs of that individual, as opposed to a routine applied to all people suffering from the same disease.

4.2 Person-centred assessment

Assessment of a person when they are admitted to a service is the first stage in the nursing process. The admission procedure, if performed comprehensively, will inform care planning. The nurse's interviewing skills must include many therapeutic communication techniques. Asking the right type of questions at the right time is very important. In some instances, basic 'yes' or 'no' questions will suffice, but often open questions are required in order to perform an in-depth assessment.

4.2.1 Documentation and record-keeping

Nurses document an individual's journey in continually updated nursing records. Effective documentation results in accurate, complete and up-to-date information,

which is vital for high-quality care. Records must be clear and logical and not be open to interpretation. They should also be free from error. If errors are found subsequently, they should be highlighted appropriately.

All hospitals have an admission procedure with specific documents that need to be completed to collect information relevant to the person being cared for.

4.2.2 The electronic individual care summary/nursing kardex

Generally, the most important document to be completed on admission is known as the electronic individual care summary, electronic patient care summary or 'nursing kardex'. Many of the sections in this document relate to the activities of living, giving the nurse the opportunity to ask questions that will provide valuable information. This information helps to identify problems and needs, leading to a set of attainable goals and a care plan that is holistic and appropriate to the individual.

Not all organisations use the same electronic care summary or system, but generally they will be quite similar. There may also be variations between wards and departments within the same hospital. For example, in surgical day case units where the person is likely to be discharged on the same day following a very minor procedure, performing an in-depth admission assessment would be a waste of resources. However, for people who are likely to have a lengthy hospital stay, the individual record is likely to include the following sections. Relevant questions are suggested for each section, but remember that these questions are not exhaustive. They provide a good basic guideline and introduction to the assessment process.

Name, address, telephone number, hospital number and date of birth

All the information in this section should ensure that the correct medical records are easily located.

In addition to knowing a person's given name, we also need to ask them how they would like to be addressed, as this may not be the same as their given name – William Morris, for example, might prefer to be addressed as Bill, Will, William or Mr Morris.

We need to know the person's address in order to arrange their discharge and any follow-up care, such as a visit from the district nurse or care provided by social services. There may also be environmental aspects that need to be considered such as:

- access to their accommodation
- the overall condition of the accommodation
- whether the person can access all the rooms he or she needs to
- the location of the accommodation for arranging transport for any subsequent appointments.

Next of kin

This is important for various reasons:

- The next of kin may be an additional source of information, especially if they live with the person and have witnessed events prior to admission.
- They may be the only source of information if the person is incapable of providing the necessary information themselves.
- They may know of any previous illnesses and how someone has coped in general with the activities of living.

- They may know of the person's prior wishes regarding refusal of treatment and any living wills, should the need arise. Remember that the decision about consenting to treatment rests with the person being cared for if they are capable of making it.
- In times of stress the next of kin may also be a source of help with the situation.

The person to contact in an emergency

Often this is the next of kin, but it may be someone different. For example, in situations where the person's next of kin has communication problems, is also suffering from an illness, finds it difficult to cope with an emergency situation, or does not have transport, the person to contact in an emergency may be another close relative or friend. It is important to ask for this information on admission.

Scenario: Rita Johnson

On admission, your nursing assessment will ideally include communication with Reg, as he knows about Rita's usual needs and abilities as well as the medication she is taking. However, you must check that this is fine with Rita, if she is able to understand the nature and purpose of what you are asking.

Any known allergies?

Hint for practice

In some instances, people have an illness or problem but they do not realise that this is actually an allergy. When asking about this issue, it is important not just to ask 'Do you have any allergies?' You need to expand on the question by giving some examples of allergies.

You must document any known allergies, as an allergic reaction could have fatal consequences regardless of an existing illness. Even if the person is unsure of allergies, it is better to document it just in case.

Scenario: Rita Johnson

Rita's memory difficulties mean that you might need additional sources of information about any allergies she may have. Allergies should be documented in her previous notes and GP record, and her husband may be able to give some information too.

Medical history

Previous illnesses may have implications for someone's present admission and/or treatment. Ascertaining their medical history may help with reaching a diagnosis and with the formulation of the care plan, as certain illnesses may be long-term or still be apparent, and these need to be considered when planning the person's care.

Scenario: Rita Johnson

Rita has:

- confusion and memory difficulties – this has implications for communicating with her and for her ability to manage her activities of daily living effectively
- arthritis – this has implications for her mobility, potential pain issues and long-term care
- high blood pressure (hypertension) – this has implications for Rita's cardiovascular health and increases her risk of stroke and heart attacks.

Present medications

- Knowledge of medications may help with diagnosis and treatment. For example, if someone is admitted with **haematemesis** (vomiting blood), then it may be that a medication is causing this.
- If someone is on one form of medication, then certain other medications that would treat their present illness might be contraindicated. People should be able to continue their current medication regime to prevent any exacerbation of the condition for which those medications were prescribed. Current medications should be added to the person's prescription chart and stored in the appropriate place.

Scenario: Rita Johnson

Rita takes three types of medication:

- two non-steroidal anti-inflammatory drugs (NSAIDs), diclofenac and indomethacin, for her arthritis
- enalapril, an angiotensin-converting enzyme (ACE) inhibitor, for her high blood pressure.

Rita's husband has to remind her to take her medication.

You need to establish what the medications are, how they are to be stored and whether Rita will need help to take them while she is in hospital.

Observations on admission

Chapter 5 outlines the procedures for the most common observations that are recorded on admission:

- temperature
- pulse
- respirations
- oxygen saturations
- blood pressure.

Assessment of pain is also carried out and recorded on admission – see *Chapter 15* for more information on pain assessment and management.

The person's weight should also be recorded, as it will form part of any ongoing nutritional assessment.

Other observations may be made and samples taken depending upon the person's condition or symptoms. For example:

- blood sugar levels in diabetic people
- urine sample (see *Section 8.2*)
- stool sample
- wound swab
- swabs for MRSA.

Blood samples for laboratory tests are usually collected by the phlebotomist, though healthcare practitioners educated in venepuncture may also be able to take blood. The most common blood tests are for U&Es and an FBC.

Observations on admission can provide a baseline for that individual's normal range of observations. However, this is not always the case – for example, a person

who is admitted as an emergency may be in pain or shock and these conditions are likely to produce observations that are outside their normal range. In these instances, the observations are likely to help with the diagnosis of a condition. Having knowledge of the normal ranges for observations and the potential causes of any deviations is therefore imperative for the nurse (see *Chapters 5* and *6*).

Scenario: Rita Johnson

Following admission, Rita is examined by a doctor and assessed by her named nurse. In addition to the routine observations, bloods are taken and investigations (including a urine specimen) are ordered to try to ascertain the cause of Rita's confusion and incontinence.

Communication needs

Communication is essential to all nursing care and procedures. Identifying any problems with a person's communication abilities will enable the nurse to adapt the communication style and/or find aids to try to improve the situation. Issues to consider include:

- Does the person have any hearing difficulties?
- Do they have a hearing aid? Have they brought it with them?
- Do they have problems with their eyesight?
- Do they wear glasses? Have they brought them with them?
- Do they speak and understand English?
- If not, what are the reasons for this? For example, English might not be their first language; they may have a learning disability; they may be semi-conscious; they may have a medical condition that is preventing them from speaking or understanding. Each of these reasons has a different implication for communication with and care of an individual.
- Do they understand another language, and if so, which?

Even basic things like filling in a menu can cause problems if the person filling it in cannot read because they do not have their glasses or do not understand English. Personal items like glasses and hearing aids sometimes go missing or can be misplaced, so documenting these items in the electronic individual care summary can help to ascertain whether they were in the person's possession on admission.

Scenario: Rita Johnson

In addition to asking about Rita's medical history, you also need to know about any potential barriers to communication, such as visual and hearing problems. Does Rita need glasses? Does she use a hearing aid?

Valuables

For legal reasons it is important to document the valuables the person has with them upon admission. Organisations often have a policy that any money or valuables that people have brought with them be checked, documented and locked away by the nurse for safe-keeping. Alternatively, the nurse may ask the person to send certain items home with their next of kin; again, it is important to document this.

Religious practices

Documenting a person's religion helps to ensure that some of their socio-cultural needs are addressed. Offering someone the option of prayer can help meet their psychological and/or spiritual needs. This may even be the case for those who do not normally practise their religion, as many people turn to religion in times of need. For those who practise regularly, not offering them the facility to maintain their practice may be detrimental to their well-being.

Religion can have a bearing on treatment and care in several other ways:

- Some treatments (including, in some cases, life-saving treatments) may be refused on religious grounds. The legal rules of consent mean that an individual's wishes and autonomy must be adhered to (see *Chapter 13*).
- Dietary needs must be considered.
- Hygiene needs must be considered.
- Religious beliefs and customs have a bearing on how last offices are carried out (see *Chapter 22*).

Admission notes

This section of the individual care summary allows the nurse to record a history of the symptoms and events that have led to admission. This can help with diagnosis and with identifying present needs. Questions to consider include:

- What specific symptoms has the person been suffering from? How often have the symptoms occurred, when have they occurred, where have they occurred, and has anything brought the symptoms on?
- Has the person been in pain? If so, a pain assessment should be carried out (see *Chapter 15*).
- Have they had any similar problems in the past?
- What have they done to address their problems prior to admission?

Scenario: Rita Johnson

Recently, Rita has started to experience some discomfort on micturition (passing urine). This is exacerbating her confusion and she is becoming a little agitated.

Consequently, Rita is examined by a doctor and re-assessed by her named nurse. The questions you would ask her and her husband would include:

- How long have you had the pain?
- How bad is the pain? (Use pain scoring methods – see *Chapter 15*)
- What does the pain feel like (pain quality)?
- What makes the pain better?
- What makes it worse?

Sleep

When someone comes into hospital it is important that they can get rest and that their sleeping pattern is kept as normal as possible. Different people use different methods to aid their sleep, and people admitted to hospital should be enabled to use these methods during their hospital stay. Questions to consider include:

- What time do they normally go to bed?
- How many pillows do they normally use?
- How many hours do they normally sleep?
- Is their sleep normally interrupted? If so, why?

- Are they a light sleeper? If so, you may consider putting them in a bed in a quieter spot of the ward or in a side room.
- Do they take any night sedation? If so, what? This can be important, as a withdrawal of certain medications can cause confusion in some people. If a person normally takes night sedation and wishes to continue, ask the prescriber to prescribe it on the medicine chart to avoid omission.
- Has their present illness affected their sleep and, if so, how?

Personal cleansing and dressing

Replicating as far as possible someone's normal cleansing and dressing regime in hospital is important for well-being. Questions to consider include:

- How often do they have a wash, bath or shower?
- How often do they wash their hair?
- Do they have any problems or difficulties in performing these tasks independently?
- Do they use any particular toiletries?
- Do they have any problems with their skin, feet, hands, nails or teeth?
- Do they have any medications or treatment routines for these problems?

Maintaining a high standard of hygiene while in hospital is imperative. However, a person's autonomy will also need to be considered. People do not all have the same hygiene standards, and some may have specific reasons for not wanting to wash. These reasons should be ascertained and addressed if possible. For example, if a person is embarrassed about being washed or helped by the healthcare team, an option may be to involve a relative or friend in that aspect of their care.

You may gain co-operation by tactfully explaining the issues and discussing your concerns. However, if this is not possible and the person refuses to wash, the nurse must abide by that person's wishes, provided that they have the capacity to consent and are aware of any potential consequences such as infection.

Elimination

Elimination is urinary and bowel function. Ascertaining normal and continual functions is important for any individual, although questions on this aspect need to be more detailed when the person's condition relates to the process of elimination. Questions to consider include:

- How often do they urinate and open their bowels?
- Has this changed since they became ill?
- Do their urine and faeces look or smell any different? For example, are they constipated, have they had diarrhoea, is there any blood in their urine or faeces, is their urine or faeces a different colour?
- Have they had or do they presently have any bladder or bowel problems? Asking a question like this helps to avoid being too direct about issues that may be embarrassing and something that they do not particularly want to disclose, such as stress incontinence, for example.
- If there is a problem highlighted, how is it managed and has anything been done about it? This may then enable the person to disclose whether they have a colostomy or urostomy.
- Do they have any pain when urinating or defecating?
- Do they have any urinary urgency, frequency or retention?
- Do they have any mobility problems or difficulties when going to the toilet?

Elimination may be affected by a person's condition or illness or by the fact that they have been admitted to hospital and are in unfamiliar surroundings, so continual assessment of this activity is imperative. A professional attitude is

required when asking questions, and maintaining a person's privacy and dignity when providing care during this activity is essential to avoid embarrassment as far as possible.

Scenario: Rita Johnson

Rita's assessment will include:

- whether her urinary and bowel functions have altered recently and whether this current condition presents her with elimination problems
- whether there is any elimination problem associated with the medication she takes for her arthritis.

Eating and drinking

People need a well-balanced diet. Some people are either admitted with or develop malnutrition following an admission to hospital (see *Chapter 10*). In some instances, a person may lack knowledge about nutrition, and asking the right questions in this section can help to educate them and prevent malnutrition. Questions to consider include:

- How good is their appetite? This only needs to be in general terms, e.g. good, poor, reasonable, etc.
- Has their appetite changed since they became ill?
- Have they suffered from any nausea or vomiting recently?
- Do they have any problems eating and drinking such as, for example, problems with swallowing?
- If they wear dentures, do they fit properly?
- How many meals do they eat each day?
- What kind of diet do they eat? Is it well balanced?
- Are they diabetic?
- Do they follow any other type of diet through choice or illness such as, for example, a gluten-free, low-sodium, low-fat or low-protein diet?
- Are they allergic to any food?
- Are there any foods that make their present illness worse, or that they dislike or that don't agree with them?
- Do they have any religious dietary requirements that we need to cater for?
- Do they have any difficulties at home in preparing their food?
- Do they have any financial difficulties that prevent them from buying nutritious food?
- Do they have any problems getting to the shops to buy their food?
- Have they lost or gained any weight recently?
- Are they likely to need any help with filling in the diet sheet? If so, what kind of help do they need?
- Are they able to feed themselves? If not, why not?

Mobilisation

Ascertaining someone's normal mobility is extremely important. It affects other activities, such as their ability to feed themselves, to wash and dress themselves and to tend to their own toileting needs. A reduction or impairment in the ability to mobilise can be the root cause of many other problems.

Many problems in mobility are transient and caused by the person's present state of health or injury. In other cases, the problems may be long-term and relate to the ageing process, such as arthritis, or they may be caused by previous illness or surgery, for example following amputation of a limb. Mobility problems may also

be due to the person's social or economic status. For example, problems may be caused by where they live or their inability to afford mobility aids such as installing a stair lift.

Questions to consider include:

- Do they have any problems with any of their limbs? If so, what problems do they have?
- Do they suffer from any illnesses that affect their mobility such as, for example, osteoporosis or multiple sclerosis?
- Do they have any mobility aids and, if so, what are they?
- How far can they walk independently?
- Do they have any pain when mobilising?
- Do they take any medications to ease the pain and, if so, what medication do they take?
- Are there any aspects at home that affect their mobility such as, for example, steps or stairs?
- Could modifications at home improve the issue?

Questions about mobility can also be asked when considering other activities of living, such as:

- How far do they have to mobilise to get to the toilet? (Elimination)
- How many stairs do they climb to get to the bedroom? (Sleeping)
- Do they suffer from breathlessness when mobilising? (Breathing)

It is important that a person's normal abilities are ascertained, as the care planned will aim to return them to as close to their normal abilities as possible. It may also be possible to improve their abilities using aids or adaptations. Other members of the multidisciplinary team (MDT), such as physiotherapists and occupational therapists, may also help to improve a person's mobility.

Scenario: Rita Johnson

Rita's assessment will include:

- whether her arthritis impairs her mobility and whether any impairment affects her other activities of living
- whether her current mobility is normal or whether her recent deterioration in health has caused any impairment.

Breathing

Breathing is usually performed effortlessly so any difficulty (**dyspnoea**) can be very frightening for the individual concerned. The demands on our breathing fluctuate for various reasons, such as:

- breathing demands increasing during exercise
- breathing demands increasing when adrenaline level rises
- illness and disease affecting breathing demands, especially when the lungs are directly affected as with asthma, chronic obstructive pulmonary disease (COPD), pneumonia and lung cancer, for example.

When communicating with someone who is suffering from dyspnoea you need to phrase questions that allow for straightforward answers and minimise the breathing demands for that individual. In some instances, and with consent, involving relatives or carers can assist the process. Questions to consider include:

- Have they had any difficulties with their breathing such as, for example, dyspnoea, coughing or wheezing?
- If they have a cough, is it productive? If so, what colour is the sputum? Is there any blood in the sputum (**haemoptysis**)?
- Has this changed since becoming ill?
- Do they have any long-standing problems with their breathing such as asthma or COPD?
- Do they take any medication to help with their breathing?
- Does their ability to breathe affect any other activities?
- Do they smoke? If so, how many a day?
- Would they consider smoking cessation?

Social circumstances

A person's social circumstances will inform the plan for discharge. Many people are readmitted to hospital due to problems with their previous discharge (see *Chapter 21*), and ensuring adequate support on discharge helps to prevent this. People who have been diagnosed as terminally ill may wish to return home to die, and again adequate support is essential.

Other issues that may need to be addressed include aspects of work and play. For example:

- Admission to hospital may affect someone's finances as they may not receive their normal income while absent from work, and this may add to their anxieties.
- People may be concerned about the care of a relative or pet while they are in hospital.
- Issues around expressing sexuality may be a problem depending on the cause of admission. For example, their illness may affect their ability to perform sexual intercourse after discharge, or their treatment may influence their body image or sense of self.

These concerns may also be addressed in other areas of the care-planning process or alongside the health education needs before or upon discharge. Questions to consider include:

- Do they live alone?
- Do they have any family who live locally?
- How do they generally manage at home?
- Is there anyone who helps them with shopping, cleaning or general care?
- What type of house do they live in?
- Does the place they live have any features that may cause mobility problems such as, for example, steps or stairs?
- Is their bathroom/bedroom upstairs?
- Do they have any mobility aids at home? If so, what are they?
- Do they have any emotional or financial concerns about their hospital admission?
- Do they envisage any problems on discharge?

The needs and coping abilities of relatives and carers should also be taken into consideration.

Scenario: Rita Johnson

Following diagnosis of a UTI, Rita is started on antibiotics to combat the infection. Over the next few days, her confusion and incontinence improve, and plans are initiated to discharge her home.

4.3 Care planning

Performing the admission nursing assessment is the first step towards formulating a person's care plan. Care plans are established by:

1. Identifying the person's needs as they see them.
   The process must involve the person being cared for (and their carers and family members, with consent) as we cannot make assumptions about what the problems or needs are. We also need to use our knowledge of illness and treatment to identify issues for further exploration.
2. Setting goals to address and meet each need.
   Goals must be realistic and attainable, and you must describe exactly what needs to be done in order to achieve them by all parties involved in care.
3. Incorporating a local, regional or national care pathway.
   In some cases a care pathway may already be in existence for a specific condition, describing standardised care as advocated by professional bodies or guidelines. This can be incorporated into an individualised care plan if required and relevant.
4. Establishing the frequency of evaluation.
   This measure of effectiveness of care will determine progress and whether the plan needs to be amended.

Hint for practice

Wherever possible discuss and involve the person in your care with care planning. This will help you to maintain a therapeutic relationship and help ensure you are placing the people at the centre of their own care and decisions.

4.3.1 Evidence-based practice and care planning

Research is continually being carried out to improve people's health outcomes and to inform nursing care. It is a professional requirement for registered nurses to undertake continuous development of their knowledge and skills to maintain proficiency. The best available evidence should be used in care planning to ensure that the care planned is effective, collaborative and up to date (NMC 2018).

4.4 Implementation

Once the assessment and care planning have been completed, the interventions highlighted in the care plan for each need must be implemented. The timing of implementation will vary according to:

- the intervention
- its priority – the extremely important skill of prioritising effectively comes with experience and using the evidence base (a simple example of priority of intervention is treating someone's pain before attending to their hygiene needs)
- the availability of the necessary resources for each intervention (for example, an ultrasound scan may be necessary but this will have to be ordered and there may be some specific preparation that needs to be done beforehand)
- whether the intervention is to be performed in isolation (as in the ultrasound scan) and or done repeatedly (as in the recording of observations).

Following the care plan, documenting the care given and communicating it to all the members of the MDT ensures continuity of care. In this way, all the team members are aware of what care has been given, what their contribution is and which aspects of care are still outstanding.

The care implemented must be evidence-based in the same way as the care plan.

4.5 Evaluation

As people's conditions improve or deteriorate, their needs change, and this has to be highlighted in their care plan. Nursing care is evaluated on a regular or, in some cases, continual basis. This is the last phase in the nursing process before the cycle starts again with assessment.

Activity

When you are next in clinical practice, observe your supervisor or another colleague performing an admission assessment. Ask your supervisor for a copy of the individual care summary or kardex used in your placement setting. Familiarise yourself with the care summary and complete the admission form for the person in our scenario, Rita. Think about the questions you might ask her or her husband in order to assess her.

Then use the Roper, Logan and Tierney Model of Living to begin to plan Rita's care, addressing each of the 12 activities of living and identifying what care could be implemented to improve these activities.

Summary

Key points from this chapter:

- The nursing process is a cycle that consists of assessment, care planning, implementation and evaluation.
- Roper, Logan and Tierney's Model of Living identifies five concepts – activities of living, lifespan, dependence/independence, factors influencing the activities of living, individuality in living.
- These five concepts can be used to assess people's problems and needs and to develop a holistic care plan for each individual.
- If performed comprehensively, the admission process can inform the process of care planning.
- Care plans are made up of problems and needs, with goals established to address those problems and needs.

Further reading

Holland, K., and Jenkins, J. (2019) *Applying the Roper, Logan, Tierney Model in Practice* (3rd ed). Edinburgh: Elsevier.

Newton, M., Llewellyn, A., and Hayes, S. (2019) *Essentials: The Care Process*. Banbury: Lantern Publishing.

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NMC (2018) *The Code: Professional Standards of Practice and Behaviour for Nurses, Midwives and Nursing Associates*. London: NMC. www.nmc.org.uk/standards/code/

Roper, N., Logan, W., and Tierney, A.J. (2000) *The Roper Logan Tierney Model of Nursing based on the Activities of Living.* Edinburgh: Churchill Livingstone.

CHAPTER 5

05 Observations

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- record someone's temperature, pulse, respirations and blood pressure accurately and efficiently
- obtain an oxygen saturation measurement
- understand the principles and practice of neurological observations
- monitor a person's blood glucose.

Scenario: Teresa White

Ms Teresa White is a 45-year-old woman who enjoys a healthy, active lifestyle. She has had no significant medical problems.

While driving to the local golf club Teresa is involved in a minor road traffic collision. She is admitted to the emergency department of her local hospital. She is alert and orientated and can remember the details of the accident. She is aware that she hit her head on the windscreen and reports no other injuries apart from a developing headache and a degree of blurred vision.

Teresa is admitted to the assessment unit for observation overnight.

5.1 Introduction

ALERT

All observations must be recorded accurately. Any observations outside the normal range should be reported to the nurse in charge immediately who will then consider the appropriate course of action.

Recording someone's temperature, pulse, respiratory rate and blood pressure is commonly referred to as 'taking observations'. They are a key part of nursing assessment on admission, and regular measurements are made of these functions so that any changes are noted quickly – this is vital for the early detection of any deterioration in a person's condition.

Taking observations also provides a good opportunity to communicate with the person and to determine their condition. Interpretation of the data is crucial, but it is also important to look at the person's needs holistically. Taking observations enables you to talk to the person, to see whether they are in pain, if they are worried or if they are uncomfortable. Verbal informed consent should always be obtained from the person before starting observation procedures.

Interpretation of the temperature, pulse, respiratory rate and blood pressure data helps to determine the level of care a person requires and is a basis for providing treatment or other intervention and preventing someone's condition deteriorating.

Scenario: Teresa White

While in the assessment unit overnight, the nurse assigned to Teresa's care starts by measuring her temperature, pulse, respiration rate and blood pressure. The results are noted on her chart:

- temperature – 37.5°C
- pulse – 62 bpm
- respiration rate – 12 resps per minute
- blood pressure – 135/85 mmHg.

The observations are repeated every thirty minutes to check for any deterioration. After four hours Teresa is beginning to show signs of becoming confused, and after six hours, Teresa becomes bradycardic and hypertensive, and it quickly becomes clear that Teresa is developing signs of raised intracranial pressure.

5.2 Temperature

Body temperature represents the balance between heat gain and heat loss and can be measured at various sites on the body using a variety of methods.

5.2.1 Places to measure temperature

Temperature can be measured at any of the following sites:

- *Axilla*: under the arm in the armpit – the thermometer is positioned next to the skin and well underneath the arm. Generally this gives a reading up to 1°C lower than oral, tympanic or forehead readings.
- *Oral*: under the tongue – if you are worried that the person (such as a confused person) may try to bite the thermometer, then use another method.
- *Tympanic membrane*: in the outer ear (external auditory canal) – this requires a special type of digital thermometer (see *Section 5.2.2*); do not be tempted to insert an ordinary thermometer into someone's ear.
- *Rectal*: in the rectum (rarely used nowadays).
- *Forehead*: some thermometers are simply heat-responsive strips that are placed on the forehead. You may also encounter electronic devices that measure body temperature on the skin surface.

5.2.2 Types of thermometer

There are many different types of thermometer available, with different operating techniques (*Figure 5.1*). It is not possible to give a description of every type of thermometer here, but the principal ones are:

- oral digital (*Figure 5.2*)
- tympanic membrane
- thermoresponsive strips (forehead or sublingual).

You should ensure that you are familiar with the main types of thermometer used in your clinical placement.

Figure 5.1 Examples of thermometers.

5.2.3 Methods of measuring temperature

There are several ways to measure temperature; the major methods are described in this section.

Procedure 5.1: Measuring oral temperature

STEP 1 Confirm the person's identity, explain the procedure and gain their consent.

STEP 2 Wash hands.

STEP 3 Place thermometer sleeve over the thermometer.

STEP 4 Place the thermometer under the person's tongue and leave for the required time (the time required varies from 15 to 60 seconds, depending on brand of thermometer, so make sure you check the instructions before carrying out this step).

STEP 5 Remove the thermometer, check the reading and write it down in the person's notes.

STEP 6 Remove the protective sleeve and dispose of it.

STEP 7 Wash hands.

STEP 8 Inform senior staff of any abnormal readings.

Procedure 5.2: Measuring temperature using a tympanic membrane thermometer

STEP 1 Confirm the person's identity, explain the procedure and gain their consent.

STEP 2 Wash hands.

STEP 3 Remove the thermometer from the base/charging unit.

STEP 4 Place a disposable cover over the probe.

STEP 5 Gently place the probe in the ear canal (remember to use the same ear as before if you have taken the person's temperature before). The probe must fit snugly in the ear canal; this can be achieved by pulling the pinna back slightly.

STEP 6 Point the thermometer slightly towards the nose, with the pinna gently pulled back to help position the probe so that it focuses on the tympanic membrane.

STEP 7 Press and release the scan button.

STEP 8 Wait for the thermometer to confirm the reading and remove the probe from the ear.

STEP 9 Record the temperature in the person's notes.

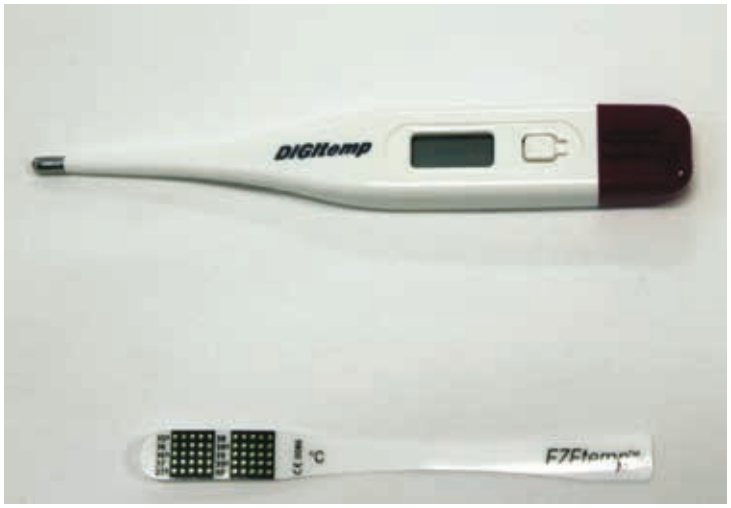
STEP 10 Eject the probe cover into the bin.

STEP 11 Clean the thermometer per local guidelines and replace the thermometer in the base unit.

STEP 12 Wash hands.

STEP 13 Inform senior staff of any abnormal readings.

Figure 5.2 Oral thermometers.



5.2.4 Normal range for temperature

The normal range of temperature is 36.0–37.5°C.

A temperature *below* 36.0°C is called **hypothermia**. A low body temperature is usually a physiological response to the person's local environment (hypothermia is common in the very young and older people who are less able to control their temperature, especially when exposed to cold external environments), rather than a response to illness.

A temperature *above* 37.5°C is a condition called **hyperthermia** or **pyrexia**. A high body temperature can be due to the environment (e.g. heatstroke), but is more likely to indicate the body's response to illness, which might be to raise an immune response to fight off infection, for example in meningitis.

ALERT

An inaccurate low body temperature reading can be caused by:

- the person taking a cold drink 15 minutes or less before their temperature is measured
- the temperature being taken under the arm (remember that temperatures taken here can be as much as 1°C lower than an oral temperature in the same person)
- excess sweating.

An inaccurate high body temperature reading can be caused by:

- the person taking a hot drink 15 minutes or less before their temperature is measured
- the person having smoked a cigarette 15 minutes or less before their temperature is measured
- ovulation – women who are ovulating have a temperature that is typically 0.6°C higher than normal.

Remember to observe and assess the person and not just rely on the thermometer. You may need to check their temperature again, possibly using a different method, or seek advice from a senior colleague. If the temperature measurement is still outside the normal range, report this to the nurse in charge.

5.3 Pulse

The pulse is a pressure wave caused by the contraction of the ventricles of the heart. It is sometimes felt by **palpation** at a point where an artery crosses a bony prominence.

5.3.1 Places to measure pulse

Sites of possible pulse palpation (*Figure 5.3*) include:

- *Radial*: on the inside of the wrist on the same side as the thumb. This is the most common place to take the pulse for a routine reading because it is usually easily accessible (see *Figure 5.4*).
- *Brachial*: on the inside of the elbow and on the opposite side from the radial pulse (the inner aspect of the arm). This is where the pulse is felt prior to taking a blood pressure.
- *Carotid*: beside the trachea; an important site to remember because this is used to feel for a pulse during a cardiac arrest. Take unilaterally, i.e. just on one side, not both sides at once since the carotid arteries supply a lot of blood to the brain.
- *Temporal*: on the temple.
- *Femoral*: the inner thigh, at the mid-inguinal point. The pulse is often taken here if a pulse from the wrist cannot be obtained.
- *Popliteal*: just behind the knee. This is not often used as a site for taking the pulse but it can be useful if you are trying to assess the extent of the blood supply to the lower leg, after a leg injury, for example.
- *Posterior tibial*: just behind the ankle. This is often used if poor circulation to the feet is suspected.
- *Dorsal pedis*: on the top of the foot. Often checked post-operatively in people who had injuries to the foot or when there is a problem with circulation.

ALERT

Do not use your thumb to take a pulse, as you are more likely to record your own pulse than that of your patient!

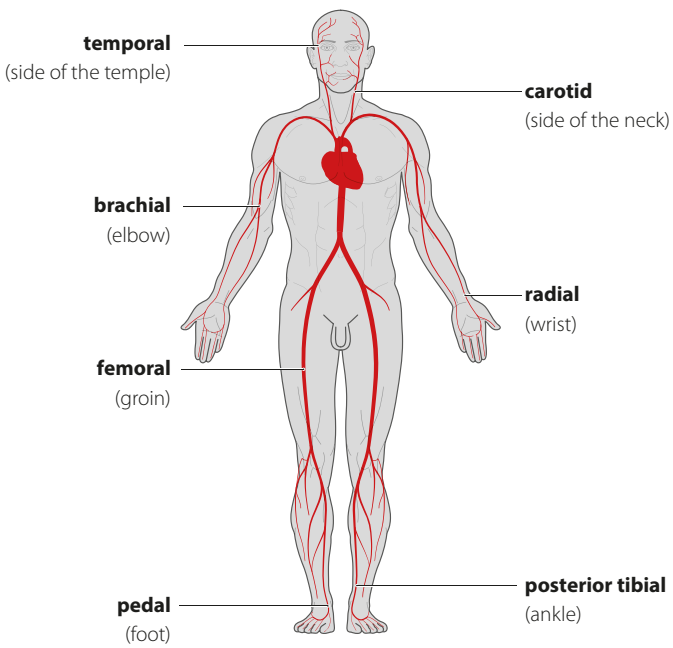


Figure 5.3 Sites of possible pulse palpation. Adapted from Minett, P. and Ginesi, L. *Anatomy & Physiology: an introduction for nursing and healthcare* (2020), Lantern Publishing.

Procedure 5.3: Taking a pulse by palpation

STEP 1 Obtain consent from the person.

STEP 2 Wash hands.

STEP 3 Place the fingers over the site of the artery; you may need to move your fingers around until you find the pulse.

STEP 4 Using a watch that shows seconds, count the number of beats felt within a 60 second period.

STEP 5 Record the pulse rate (in beats per minute) on the person's notes.

When taking the pulse it is important not only to measure the beats per minute (bpm) but also to assess the rhythm (regular or irregular) and the quality (weak or bounding) of the pulse.

5.3.2 Normal range for pulse rate

The normal range of pulse in adults is from 60 to 100 beats per minute (bpm).

A pulse rate of less than 60 bpm is referred to as **bradycardia** and can be caused by:

- raised intracranial pressure
- certain drugs, such as beta-blockers
- higher than average physical fitness (for example, some athletes have a resting pulse rate of just 40–50 bpm).

A pulse rate of more than 100 bpm is called **tachycardia** and can be caused by:

- low circulating blood volume (the heart beats faster to keep up the blood pressure), which can be the result of dehydration
- stress, shock or pain, all of which cause the release of adrenaline, which raises the heart rate.

An irregular pulse (i.e. the pulse is not beating in consistent time intervals, or the pressure is changing between beats) is a sign of irregular heart contractions (known as an **arrhythmia**).

A weak pulse may indicate decreased cardiac function, dehydration or shock.

Any irregularities in a person's pulse must be documented and reported to a qualified nurse.

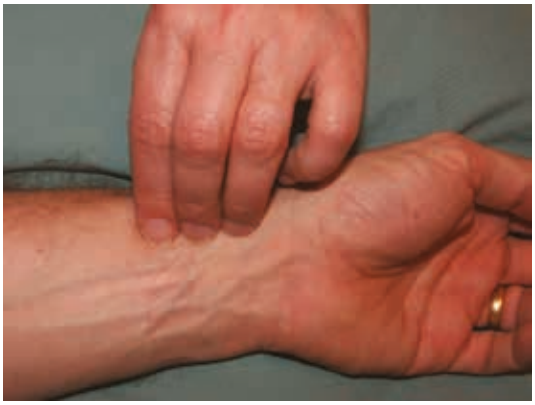


Figure 5.4 Taking a radial pulse.

5.4 Respiration rate

Hint for practice

Practise assessing someone's respiration while appearing to take the radial pulse. This subterfuge will help you to gain an accurate respiratory rate.

The function of the respiratory system is to supply the body with oxygen and to remove carbon dioxide. One respiration consists of a breath in and a breath out, that is, an inspiration and an expiration. When observing respirations, you are not only assessing the rate and the rhythm, but also the effort that is required by the person.

Respiratory distress (increased effort required to breathe) is often an early sign of other problems. People often report shortness of breath in the 24 hours before a respiratory or cardiac arrest.

Procedure 5.4: Assessing respirations

When measuring respiration rate it is important to ensure that the person is not aware of what you are doing, because the rate can increase if the person is aware that they are being observed.

STEP 1 While the person is unaware that you are monitoring them, count the number of times their chest rises in 60 seconds; remember that one respiration is the time taken for the chest to rise (inspiration) and fall (expiration).

STEP 2 Record in the person's notes the respiration rate as the number per minute.

STEP 3 Assess how much effort is required for the person to breathe, i.e. are they short of breath, is there any audible noise or are they using abdominal muscles to assist with air intake?

STEP 4 Next, assess whether each side of the chest is moving equally.

STEP 5 Listen for extra noises such as wheezing, grunting, **stridor** (a harsh vibrating noise), snoring, sighing or gasping.

STEP 6 Factors such as flaring of the nostrils and blueness (**cyanosis**) around the lips and extremities should also be observed. In the case of a dark-skinned person cyanosis can more easily be observed on the gums and fingertips.

STEP 7 Record in the person's notes all findings of significance.

STEP 8 Report any abnormalities to senior staff.

5.4.1 Normal range for respiration

The normal range for respiration in a healthy adult is 12 to 20 respirations per minute. Report observations outside this range to the nurse in charge.

Reduced respiration rate is called **bradypnoea** and can be caused by:

- opiate analgesia
- head injuries.

Increased respiration rate is called **tachypnoea** and can be caused by:

- stress
- fever
- cardiac failure
- respiratory diseases
- airway obstruction.

5.5 Blood pressure

Blood pressure is the force blood exerts on the wall of an artery. It is measured in millimetres of mercury (mmHg). Two measurements are recorded, written in the form 120/80 mmHg:

- systolic pressure (the top number in the reading) is the maximum pressure the blood exerts against the wall of the artery during ventricular contractions
- diastolic pressure (the bottom number in the reading) is the minimum pressure of blood against the wall of the artery following closure of the aortic valve.

Blood pressure determination is one of the most important measurements in clinical practice, and is still one of the most inaccurately performed. Healthcare professionals must be aware that devices for measuring blood pressure must be properly validated and maintained and regularly recalibrated according to the manufacturer's instructions (NICE 2011).

Blood pressure can be taken manually using a device called a **sphygmomanometer**; it is important to develop an expert manual technique. Electronic devices are also used and, if you come across these in your clinical placements, ask your supervisor exactly how they work; the basic procedure is provided below, but different models may require slight modifications to this.

Procedure 5.5: Measuring blood pressure manually

Before commencing you must ensure (NICE 2011):

- that the environment is relaxed and temperate
- that the person is quiet and seated, with their arm supported outstretched in line with the mid-sternum.

It is important to remember to estimate the systolic pressure first. Doing this allows you to avoid over-inflation of the cuff, which can cause unnecessary pain. The systolic beat can be estimated as follows (see also *Figure 5.5*):

STEP 1 Ensure that the upper arm is not covered with any clothing or, if this is not possible, that any clothing underneath the cuff is a thin single layer and not creased.

STEP 2 Place the blood pressure cuff over the middle third of the upper arm.

STEP 3 While watching the sphygmomanometer dial, feel for the radial pulse.

STEP 4 Pump the cuff up slowly until the radial pulse disappears; the reading at which the radial pulse disappears is the approximate systolic blood pressure.

Then take the blood pressure measurements:

STEP 5 Check that the cuff is still around the middle third of the upper arm.

STEP 6 Place the diaphragm (flat) side of the stethoscope on the radial pulse point (above the brachial artery).

STEP 7 Close the valve on the pump – doing this while keeping the stethoscope in place involves a lot of dexterity and requires practice! One of the keys to taking a reliable reading is to learn to control the valve when pumping the cuff up and letting it down.

STEP 8 Place the stethoscope in your ears (with the ear attachments facing slightly forwards as this follows the line of the ear canal) and use the flat side of the stethoscope to listen for sounds.

STEP 9 Pump the cuff up 10–20 mmHg above the level of the systolic reading that you estimated earlier. Then let the air out of the cuff slowly. If the cuff is let down too fast, you may not hear the sounds at the correct time, resulting in an inaccurate reading; if it is let down too slowly, then the high pressure in the cuff can cause a lot of discomfort to the person.

STEP 10 With the stethoscope still over the brachial artery, listen for the brachial pulse. When you hear the first clear pulse sound, the reading on the sphygmomanometer corresponds to the systolic pressure. As you continue to release air from the cuff, you will be able to hear the pulse. The level at which you can no longer hear the pulse through the stethoscope corresponds to the diastolic pressure.

STEP 11 Document accurately the readings when the pulse sound appears (systolic) and then disappears (diastolic).

STEP 12 Remove the cuff from the person's arm.

STEP 13 If the reading is higher than expected, you may wish to allow the person to relax and then repeat the measurement.

STEP 14 Report any abnormalities to senior staff.

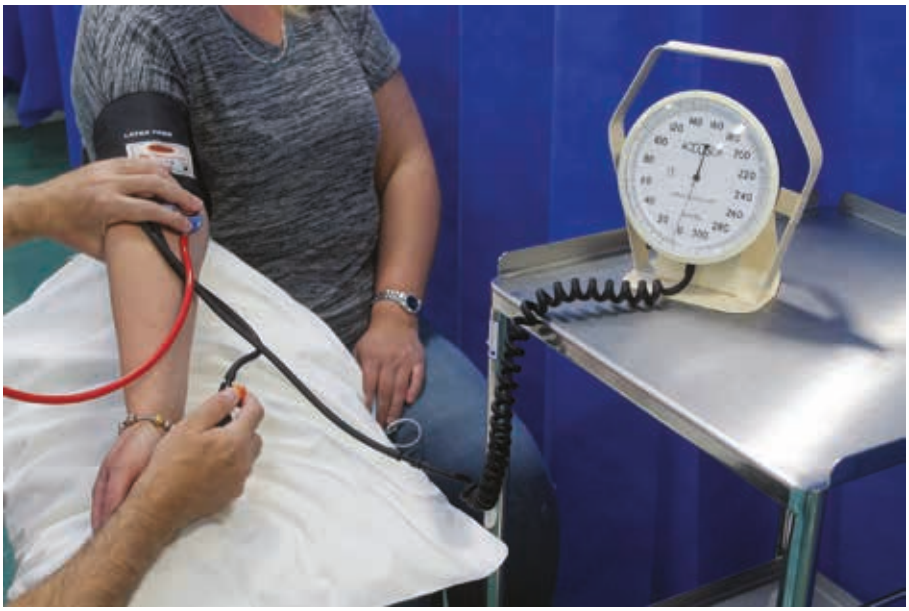


Figure 5.5 Taking a blood pressure reading manually.

Hint for practice

Keep the stethoscope away from the sphygmomanometer tubes because this will create excessive noise. Ensure that the head of the stethoscope is aligned in the correct way (flat side down) in order to hear properly.

As described in the procedure, the cuff must be over the middle third of the upper arm. If the cuff is too small or too large this is not possible. Using a cuff that is too small gives a falsely high reading in people with large upper arms (Vidt 2010). Most hospitals will keep cuffs in a range of different sizes. The ideal cuff should have a bladder length that is 80% of the arm's circumference and a width of at least 40% (Pickering 2005):

Arm circumference (cm)	Cuff description	Cuff size (cm)
22–26	Small adult	12 × 22
27–34	Adult	16 × 30
35–44	Large adult	16 × 36
45–52	Adult thigh	16 × 42

5.5.1 Normal range for blood pressure

Normal blood pressure generally ranges from 100/60 to 140/90 mmHg. Measurements outside this range should be reported to the nurse in charge.

A low blood pressure (i.e. below 100/60 mmHg) is referred to as **hypotension** and can be caused by:

- low circulating blood volume (**hypovolaemia**)
- decreased cardiac output
- dehydration
- shock (see *Section 5.5.2*).

A high blood pressure (i.e. above 140/90 mmHg) is known as **hypertension** and can be caused by:

- raised intracranial pressure
- cardiovascular disease
- stress
- pain.

ALERT

1. The use of electronic devices is often a major part of taking observations. The reliance on a machine for taking observations may be detrimental to nursing care if other obvious cues to the person's condition are not picked up, and may contribute to a superficial assessment.
2. Do not take a blood pressure on the arm of a person who has an A–V shunt for kidney dialysis, or on the affected side of a person who has had their lymph nodes removed for diseases such as breast cancer. Lymphoedema can affect readings after mastectomy.
3. Several factors can cause deviations in measured blood pressure, including room temperature, exercise, alcohol or nicotine consumption, positioning of the arm, muscle tension, bladder distension, talking and background noise (Pickering 2005). People should be enabled to sit quietly for at least five minutes before their blood pressure is measured (Vidt 2010).

5.5.2 Shock

Shock means that the circulatory system is not able to work effectively to provide the required circulation to the tissue, and can also cause the blood pressure to drop. Types of shock (see *Section 6.4.1*) include:

- **cardiogenic** shock (may be caused by a heart attack, also known as a myocardial infarction)
- hypovolaemic shock (caused by massive blood loss or severe dehydration)
- septic shock (due to a severe systemic infection)
- **anaphylactic** shock (caused by a severe allergic reaction)
- **neurogenic** shock (possibly caused by meningitis).

Shock-induced hypotension (low blood pressure) is usually accompanied by a rapid pulse (tachycardia). However, if the hypotension is accompanied by a reduced pulse (bradycardia), then this can indicate neurogenic shock, which could indicate meningitis.

5.6 Oxygen saturation

Oxygen saturation in peripheral blood (SpO_2) is a measure of the amount of oxygen being carried round the body by haemoglobin in the blood expressed as a percentage of the total oxygen-carrying capacity. A person with 100% saturation has oxygen molecules on all the haemoglobin. Oxygen saturations fall when a reduced amount of oxygen is circulating through the body. 'O_2 sats' are routinely measured in most people.

5.6.1 Normal range for oxygen saturation

The normal range for oxygen saturation in a healthy adult is between 95% and 98%.

A low oxygen saturation (i.e. below 95%) is referred to as **hypoxaemia** and is caused by:

- depressed respiratory effort
- low circulating blood volume
- shock.

People with COPD have a lower oxygen saturation than healthy people. A range of 88–92% would be considered normal for a person with COPD.

Measurements below the expected range should be reported to the nurse in charge.

5.6.2 Oxygen saturation monitoring

Oxygen saturation is monitored by pulse oximetry, which detects hypoxaemia before clinical signs become apparent. The monitor is an electronic device that clips onto a finger or ear lobe, or foot in the case of a small child, and gives a reading of the percentage of circulating haemoglobin that has oxygen molecules attached to it (*Figure 5.6*).

How saturation monitoring works

- When haemoglobin is well saturated with oxygen it is red and absorbs more light from the infrared probe on a saturation monitor.
- When haemoglobin has a lower oxygen concentration, the blood changes to a bluer colour and the amount of light absorbed from the red and infrared light that passes through the skin is reduced.
- The amount of light absorbed enables the pulse oximeter to detect changes in blood oxygen concentration.
- The light-emitting part of the probe is placed on the top of one part of the body, for example the finger, and a photodetector is placed directly opposite the light source on the underside of the finger. The red and infrared light passes through the skin, is picked up by the photodetector and interpreted.

Figure 5.6 (a) Saturation monitor, and **(b)** fingertip monitor in use.

Scenario: Teresa White

Following Teresa's deterioration, further radiological investigation is carried out and a diagnosis reached of a subdural haematoma. Teresa is transferred to the operating department for surgery. After successful removal of the haematoma, Teresa is monitored closely, and supplemental oxygen administered at a concentration of 40% via a simple face mask. To record her oxygen saturation, a probe is attached to her finger and her oxygen saturation levels monitored.

Procedure 5.6: Measuring oxygen saturation

STEP 1 Explain the procedure to the person and obtain their consent.

STEP 2 Make sure the area where you are going to place the probe is clean; remove any nail polish from the fingernail to minimise potential interference.

STEP 3 Place the probe on the index finger, ensuring it is positioned the right way up, and plug the cable into the oximeter.

STEP 4 The probe and lead can be secured with tape if necessary.

STEP 5 Position the person to minimise the effect of movement or slight tremors.

STEP 6 Check that the oximeter is displaying a normal waveform or graph (machines vary in whether they produce a waveform or bar graph).

STEP 7 Check that the oximeter alarm settings are correct for the person – a senior colleague will normally have advised these levels.

STEP 8 Note on the person's chart the time the reading was started and the location of the probe.

STEP 9 Report any abnormalities to senior staff.

STEP 10 Change the location of the probe at least every two hours to avoid inaccurate readings and reduce the effects of constant pressure on the digit.

Considerations for monitoring oxygen therapy

When monitoring and recording a pulse oximetry reading, you should ensure an appropriate amount of light and that the person is not moving. Misinterpretation of readings may occur for the following non-medical reasons:

Cause of misinterpretation	Reason	Effect on reading
Too much light	Surrounding environment is too bright Spotlight placed directly over the person	Sensor would be unable to detect blood flow
Too little light	Surrounding environment is too dim Probe not in the correct position Probe the wrong size for the person	Sensor unable to detect blood flow
Motion artefact	Person moving hand around	Increased blood flow causes incorrect reading
Venous pulsation	Sensor fitted too tightly Non-invasive blood pressure monitoring device on same limb as sensor	Increased blood flow causes incorrect reading
Change in light absorbency of blood	IV dyes for investigations, e.g. methylene blue, isosulfan blue and indocyanine green	Difficulty in detecting blood flow
Sensor function impaired	Nail varnish, false nails, dirty skin or nails	Difficulty in detecting blood flow
Note that the monitor will give an abnormally high reading in people who have suffered carbon monoxide poisoning as it cannot differentiate between carbon monoxide and oxygen molecules attached to haemoglobin.		

Professional responsibilities

Although the oxygen saturation monitor can detect hypoxaemia more quickly than the nurse caring for the person, it is crucial the nurse uses previous experience and observation skills to detect any changes in the person's condition. Saturation monitors should be used in conjunction with nursing skills and should not replace them.

ALERT

Damage to the skin is a potential problem when using an oxygen saturation probe with children and neonates, who have sensitive skin.

ALERT

An oxygen saturation probe should never be used to take the pulse rate because it cannot assess the rhythm and quality. It also does not replace the respiratory rate observation because it measures blood oxygenation, not ventilatory function.

5.7 Neurological observations

Scenario: Teresa White

Teresa has a head injury so it is important that her neurological status is assessed, and this requires a set of neurological observations to be undertaken.

In Teresa's case the observations indicate that she is now bradycardic and hypertensive. Her respiratory rate has also decreased.

Neurological observations consist of the Glasgow Coma Scale (GCS), pupil size and reactions, limb movements, temperature, pulse, blood pressure, respirations and blood oxygen saturation. This section focuses on the GCS, pupil size and reactions, and limb movements; the other observations have been covered earlier in the chapter.

Any person who is at risk of deteriorating neurologically should have neurological observations carried out. Such people include:

- people who have had (or are suspected of having) a head injury, especially if they have lost consciousness
- people who have had a stroke
- those with known or suspected brain tumours
- those at risk of cerebral infection such as meningitis.

5.7.1 Glasgow Coma Scale

The GCS evaluates three categories that most closely reflect activity in the higher centres of the brain. These are:

- eye-opening response
- verbal response
- motor response.

The individual components of the GCS should be described in all communications and should always accompany the total score (NICE 2014). A GCS of 15 indicates that the person is functioning cerebrally. A deterioration of one point in the motor response or two points overall is clinically significant and must be reported to a senior member of staff. The GCS responses are as follows:

Eye-opening response (E):

- spontaneously – without the need for speech or touch (4 points)
- to speech – eyes open when spoken to (3 points)
- to pain – eyes open when pain evoked (2 points)
- none – no eye opening (unless closed due to injury) (1 point)

Verbal response (V):

- orientation – able to say the current year and month, where they are and why, and who they are (5 points)
- confusion – does not answer the above correctly (4 points)
- inappropriate words – random words (3 points)
- incomprehensible sounds – for example grunting, moaning or crying (2 points)
- none – not even following verbal or painful stimuli (1 point)

Motor response (M):

- obeys commands – does what they are asked to do (6 points)
- localises – moves limb towards where pain is coming from (5 points)
- withdraws from pain – bends arm at the elbow but does not locate the pain (4 points)
- flexion to pain – flexes the upper arm and rotates the wrist (3 points)
- extension – characterised by straightening of the elbow and internal rotation of the shoulder and wrist (2 points)
- none – no response to pain (1 point)

Pain should only be applied if the person does not respond to firm and clear commands (Lister 2020). A trapezium squeeze is recommended – using your thumb and two fingers, hold 5 cm of the trapezium muscle where the neck meets the shoulder.

The three responses of the GCS should be reported separately: for example, E4, V4, M5. If a total score is recorded or communicated it should be based on a total out of 15, and to avoid confusion this denominator should be specified, so for example E4, V4, M5 gives a total score of 13/15 (NICE 2014).

5.7.2 Pupil size and reactions

Pupils are assessed to see if they are equal and if they react to light; if they are equal and both react, you might sometimes hear the acronym 'PEARL' (pupils equal and reacting to light) used. Alterations in reaction, shape or size are a late sign of raised intracranial pressure.

5.7.3 Limb movement

Also called motor response, this part of the set of observations assesses whether there has been any damage of the nervous system between the brain and the spinal cord. Each limb must be tested separately.

5.7.4 Head injury

Hint for practice

Neurological observations are extremely important and are essential in monitoring a person's health status. Take every opportunity to work with a range of professionals in assessing and documenting observations as you work towards obtaining proficiency.

Head injury refers to any trauma to the head other than superficial injuries to the face. Because the skull is a very hard retaining structure there is little room within the skull to accommodate additional material, such as blood clots, tumours or **oedema**. It is important to detect any neurological problems early so that the appropriate treatment can be performed, and possible brain damage prevented or minimised.

The National Collaborating Centre for Acute Care guidelines for the management of people with head injuries, updated as NICE Clinical Guideline 176 (NICE 2014), state that neurological observations should be carried out:

- half-hourly until the GCS is 15
- for people with GCS of 15, half-hourly for two hours
- hourly thereafter for four hours
- two-hourly thereafter.

Should a person with GCS 15 deteriorate at any time after the initial two-hour period, observations should revert to half-hourly and follow the original schedule (NICE 2014). These are minimum requirements: if you are worried about someone's condition, you should increase the regularity of the observations.

In-hospital observations of a person with a head injury should only be conducted by professionals competent in the assessment of head injury. However, as a student, you should take the opportunity to watch neurological observations being carried out while you are in practice, and this section will help you to understand the procedure.

Procedure 5.7: Neurological observations

STEP 1 Introduce yourself, explain the procedure to the person and obtain consent.

STEP 2 Assess the GCS.

- Assess eye opening to check level of consciousness.
- Assess verbal response by asking the person to tell you where they are.
- Assess motor response by asking the person to do something and assess their ability to carry out your instructions.

STEP 3 Check pupils using a pen torch, looking specifically for size and reaction to light – ensuring that both pupils react equally.

STEP 4 Assess limb movement starting with the arms, by asking the person to push against your hands with theirs. Lower limb movement should be assessed in a similar manner.

STEP 5 Record the results on the neurological observations chart (see *Figure 5.7*) and report any deterioration.

A doctor should urgently review the person if any of the following occurs:

- the development of agitation or abnormal behaviour
- a drop in GCS of one point for over 30 minutes (greater weight should be given to a drop of one point in the motor score)

- any drop in GCS of three or more points in the eye-opening or verbal response or two or more points in the motor response score
- the development of severe or increasing headache or persistent vomiting
- new or evolving neurological signs such as unequal pupils, asymmetry of limb or facial movements (NICE 2014).

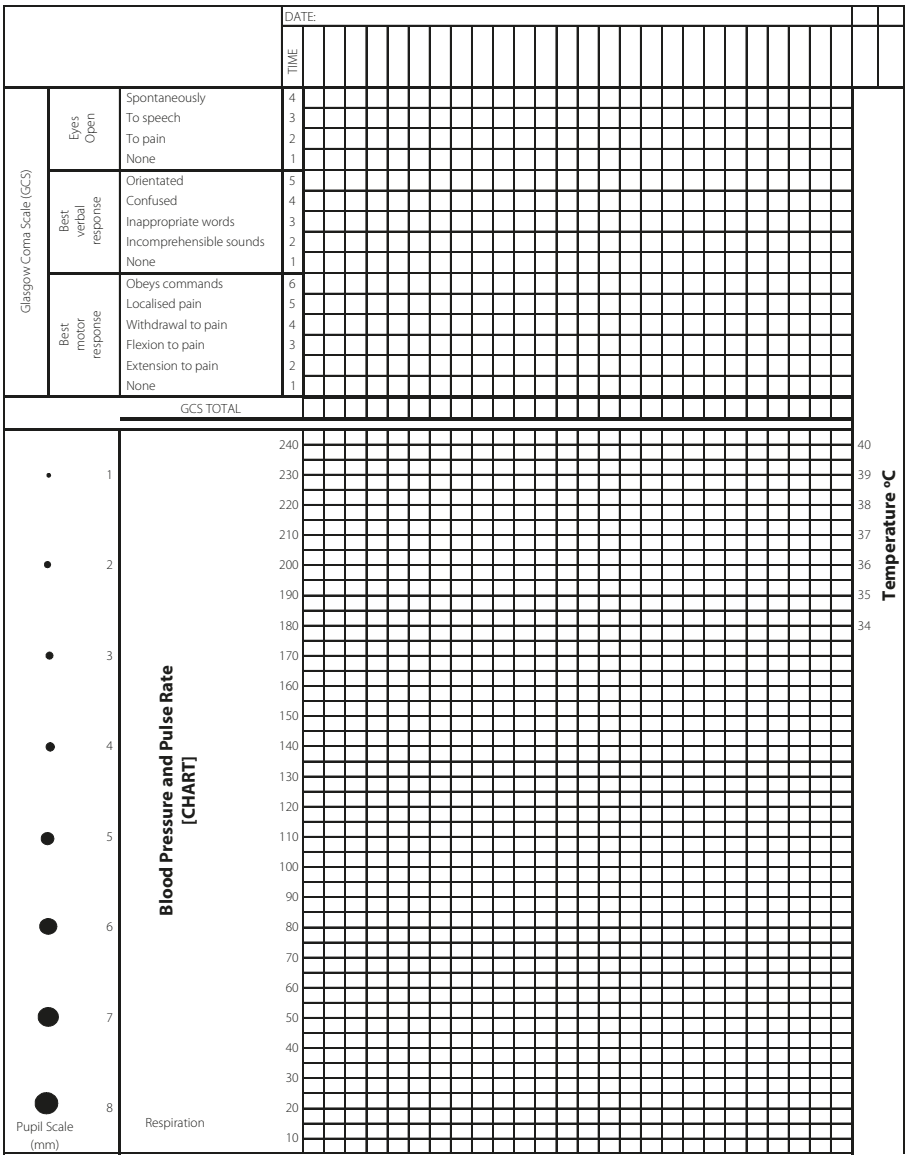


Figure 5.7 An example of a neurological observation chart.

ALERT

Neurological bleeds are unlike other bleeds in the body. The bleeding does not cause a lowered blood volume and tachycardia but, instead, causes a raised blood pressure. Often the systolic blood pressure increases while diastolic stays the same and the heart rate drops. The respiratory rate becomes irregular. The combination of these three factors is called Cushing's triad.

5.8 Blood glucose monitoring

Blood glucose level is the amount of sugar (needed for cell metabolism) in the bloodstream.

Procedure 5.8: Monitoring blood glucose

STEP 1 Introduce yourself, check the person's identity, explain the procedure and obtain consent.

STEP 2 Wash hands and put on gloves.

STEP 3 Take a small prick of blood from the person, from the side of a clean finger, using a lancet.

STEP 4 Place the drop of blood on to a blood glucose testing strip (checking manufacturer's instructions first); you may need to gently squeeze the finger above the puncture site if the drop of blood is not immediately forthcoming.

STEP 5 Insert this into the glucometer (an electronic device which 'reads' the testing strip), which will then give a measurement.

STEP 6 Ensure that the person is not left bleeding afterwards by applying pressure directly over the puncture site with cotton wool or gauze.

STEP 7 Dispose of the lancet in a sharps bin.

STEP 8 Dispose of gloves and wash hands.

STEP 9 Record the measurement in the person's notes.

STEP 10 Report any abnormalities to senior staff.

As with thermometers, there are so many different glucometers on the market that it would be impossible to describe each one in this book. However, they all work in a similar way and so you should familiarise yourself with the type of blood glucose monitor that is used in your clinical area so that you are confident of taking accurate measurements.

5.8.1 Normal range for blood glucose

The normal range for blood glucose level in a non-diabetic adult is between 4.0 mmol/L (pre-prandial) and 7.8 mmol/L (two hours post-prandial). Report measurements outside this range to the nurse in charge.

A low blood glucose level (i.e. less than 4 mmol/L) is called **hypoglycaemia** and occurs when the blood glucose level is insufficient to meet the metabolic demands of the body. It can be caused by factors such as:

- starvation
- renal insufficiency, which can cause infection
- liver failure
- insulin-secreting tumours
- salicylate (aspirin) poisoning
- excess insulin in a diabetic person.

A high blood glucose level (i.e. higher than 7 mmol/L) is called **hyperglycaemia** and occurs when the body is unable to produce insulin, such as in people with diabetes mellitus. During illness, surgery, infection or stress, the blood sugar levels may rise in people with diabetes. Some people may be diabetic and be unaware of it.

Scenario: Teresa White

Teresa's head injury had caused a subdural haematoma (bleeding on the brain) and this resulted in an increased intracranial pressure – this clinical diagnosis was made following the confusion, raised blood pressure and bradycardia and irregular respirations noted by the nurse looking after Teresa.

Teresa required surgery to relieve the intracranial pressure and was then monitored on a neurosurgical unit (see *Chapter 18* for more about pre- and post-operative care) until her discharge 10 days later. In the first 48 hours after her operation, observations (including neurological observations) were taken every two hours; once it was clear that there was no deterioration in any of the observations, the measurements were reduced.

Activity

Practise the skills of observation as often as you can to improve and maintain your proficiency. For example:

- Using a thermometer, record your own temperature and that of a friend. Assess the difference, after two minutes, between a temperature taken under the arm and a temperature taken orally.
- With a friend, practise locating the different places used to take a pulse, particularly the brachial, radial and carotid (remember to ask for permission before beginning). Count each other's pulse for a minute assessing rate, rhythm and quality.
- Using a manual sphygmomanometer, practise taking a manual blood pressure whenever possible.
- When you are in clinical practice, look at the blood pressure, pulse, respirations and temperature of the people under your care. Note how the observations relate to each other and to their medical history.

Summary

Key points from this chapter:

- Accurate observations are vital in determining the person's condition and the level of care the person requires.
- Taking observations provides a good opportunity to get to know someone.
- You must obtain consent from people before conducting observations.
- Document your measurements accurately.
- Talk to your supervisor immediately if you have a concern about a person's condition.

Further reading

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CHAPTER 6

06 Early warning scores – the detection of deterioration

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand what can happen to someone's condition
- document observations accurately
- calculate and use the National Early Warning Score to identify deterioration in someone's condition
- respond appropriately to deterioration in a person's condition.

Scenario: Teresa White

Teresa White is a 45-year-old female who enjoys a healthy, active lifestyle. She has had no significant medical problems.

While driving to the local golf club Teresa is involved in a minor road traffic accident. She is admitted to the A&E department of her local hospital. She is alert and orientated and can remember the details of the accident. She is aware that she hit her head on the windscreen and reports no other injuries apart from a developing headache and a degree of blurred vision.

Teresa is admitted to the assessment unit for observation overnight. While she is there she starts to deteriorate.

Surgery is performed on Teresa to relieve the intracranial pressure caused by a subdural haematoma.

6.1 The need for an early warning score

It is vital that you can detect deterioration or potential deterioration in a person's condition early and that you can respond appropriately. Simple physiological observations can be used to identify high risk in people in hospital.

An early warning score (EWS) consists of a simple calculation made when the person's temperature, pulse, respirations, systolic blood pressure, oxygen saturation and level of consciousness are recorded. This calculation results in a score that indicates whether the person requires urgent treatment, is an imminent emergency or an emergency.

The NICE guidelines state that a physiological track and trigger system should be used to monitor all adults in an acute hospital setting. All people in the acute ward environment should have at least one set of vital sign observations and an EWS recorded every 12 hours. The frequency of these observations should increase when abnormal physiology is detected (NICE 2007).

A National Early Warning Score (NEWS) was developed by the Royal College of Physicians (RCP) in 2012 and updated in 2017 (NEWS2) to create a standardised approach. It provides an unambiguous way of communicating deterioration and commonly agreed criteria against which deterioration can be measured (RCP 2017). NEWS2 is more sensitive than many other existing systems and has been proven to identify deterioration in people earlier, thus allowing earlier intervention that can prevent serious complications, admissions to intensive care and deaths (RCP 2017). NEWS2 is in widespread use in many NHS Trusts and is approved by NHS England for national implementation. However, some places use modified versions of NEWS2 or different early warning scores, and you should find out what your organisation uses.

Remember that many observations are obtained by the healthcare assistant. However, this increases the nurse's responsibility through the added dimension of personnel management, and the responsibility for detecting deterioration in people remains with the qualified staff.

6.2 Using the National Early Warning Score

ALERT

Some people will regularly have observation measurements that may be normal for them but may trigger a score on the set parameters. People in this situation may be placed on a Modified Early Warning Score (MEWS). If parameters are to be changed it is important that this decision is made with a doctor and the new values documented in the appropriate places.

The NEWS2 is a simple system calculated using six main parameters, listed below, plus a weighting for any person requiring supplemental oxygen to maintain their prescribed oxygen saturation range.

- *Respiration rate*: This is well documented as being one of the best indicators of high risk.
- *Oxygen saturation*: According to NICE guidelines this is an important early predictor of deterioration (NICE 2007).
- *Supplemental oxygen*: A score of 2 should be added if oxygen is being given when using the NEWS2 (RCP 2017).
- *Systolic blood pressure*: Blood pressure may decline only later in shock. Hypotension occurs after tachycardia and should be treated urgently.
- *Pulse*: In shock, the pulse rate may rise rapidly. The person's sympathetic nervous system compensates and may increase the heart rate and the respiratory rate long before the blood pressure starts to fall. In neurogenic shock bradycardia may be present.
- *Temperature*: Hypothermia or hyperthermia may be an indication of an infection and sepsis.
- *Level of consciousness and new confusion.* ACVPU is a simple, decreasing assessment of the conscious level of the person. The letters stand for:

Alert
Confusion (new onset)
alert to **V**oice
alert to **P**ain
Unconscious

Decreasing consciousness

A score of **P** or **U** will be backed up with a low GCS score (see *Chapter 5*).

There are many possible reasons for a decreased level of consciousness. It may be a result of direct intracranial pressure, or of other causes such as altered blood chemistry levels.

New confusion includes newly observed disorientation, delirium and any acute reduction in GCS score. If it is not clear whether any confusion is new or the person's usual mental state, it should be assumed to be new until confirmed otherwise.

A score is allocated to each of these parameters, and the sum of these scores creates the NEWS2 and is used as part of the person's observation chart (*Figure 6.1*).

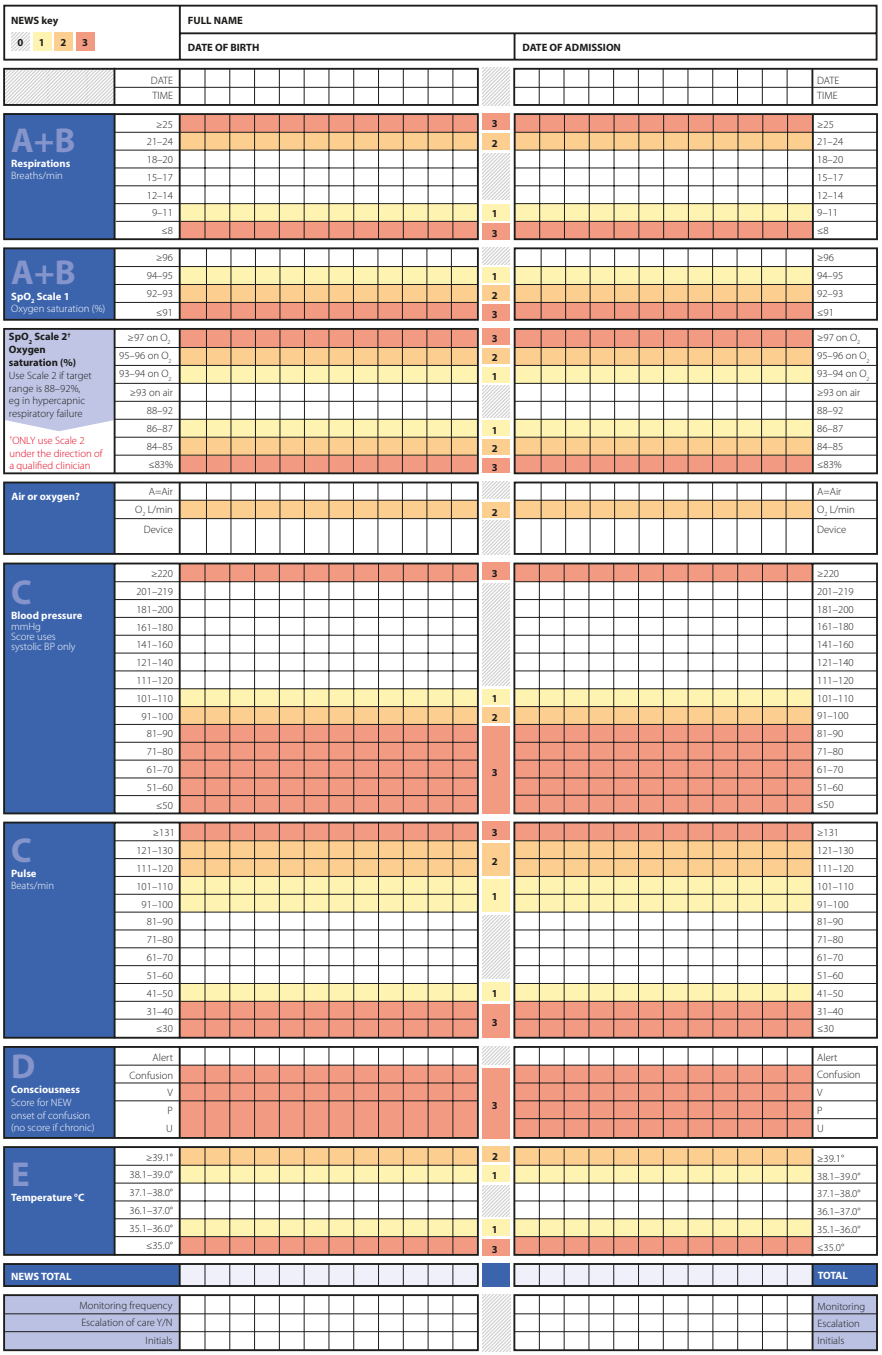

Figure 6.1 The NEWS2 observation chart (RCP 2017). Reproduced from: Royal College of Physicians. National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS. Updated report of a working party. London: RCP, 2017.

ALERT

Paediatric and midwifery EWS scores may be calculated in a completely different way. The National Early Warning Score should not be used for children or for women who are pregnant, because the physiology differs (RCP 2017). The latest guidance is available on the NICE website.

Small changes in each of these parameters when looked at together will show signs of deterioration earlier than a change in a single parameter. The person can therefore be treated sooner to prevent any further deterioration, with the aim of avoiding emergency action. The higher the NEWS2 score, the sicker the person and the more urgent the situation. The NEWS2 chart is also colour-coded to provide a visual prompt – as you record your observations in the coloured area you know that that parameter is triggering action.

In some early warning systems, urine output may also be used as an additional parameter.

- *Urine*: To function correctly the kidneys need to receive an adequate blood supply. Normal urine output should be 1.5–2.0 litres every 24 hours. To measure urine output accurately a person may be catheterised, and the urine measured hourly. Whenever the EWS is triggered, a fluid balance chart should be commenced immediately.

6.3 Documentation

ALERT

Remember to record the respiration rate. Respiration rate has been found to be often omitted. This is extremely poor practice.

Documentation of observations is vital to ensure that there is a record to refer to and the opportunity to review the person's history. If someone's vital signs have not been documented, then it is difficult to prove that they have been measured at all.

When documenting the NEWS2 it is important to record and report your concerns, as well as the numbers themselves. Any findings and any action taken should be reported. The person's response to treatment should also be documented, along with any further action to be taken. If no change has occurred, then this too should be documented.

Documentation should be clear and concise so that it efficiently communicates the person's condition to the reader. Observation charts are designed so that a clear trend can be seen visually. A clear and simple graph makes it easier to detect any deterioration.

Hint for practice

Figure 6.2 shows an easy and effective method of recording a person's blood pressure. Connecting the diastolic and systolic pressures with an arrow gives a quick indication of an improving, stable or deteriorating trend.

It is also useful if the pulse is recorded in red, if this is acceptable with your organisation.

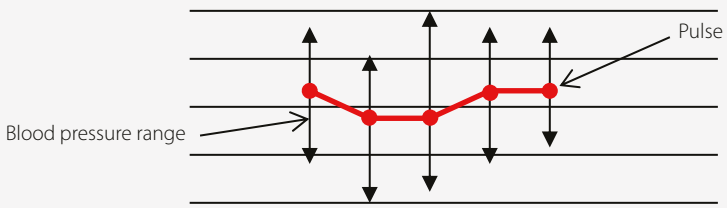

Figure 6.2 Documenting pulse and blood pressure.

6.4 NEWS2 – taking action

The monitoring of vital signs involves not just taking and recording a measurement but also the interpretation of the measurement you have recorded, and monitoring and interpreting the changing trends of vital signs over time.

NEWS2 is used not only for early detection of a critical illness but also to ensure that the correct intervention is made in a timely manner. The NEWS2 recommends the following interventions should result from early warning scores (*Table 6.1*):

ALERT

NEWS2 is an aid to assessment and not a substitute for a nurse's clinical judgement. Concern regarding any person should result in escalation, regardless of the EWS.

Table 6.1 National Early Warning Scores recommendations.

Score	Action
1–4 (low)	Prompt assessment by a competent registered nurse who should decide if the frequency of monitoring or care should be changed.
3 in any single parameter (medium)	Urgent review by a clinician skilled in the assessment of acute illness, usually a ward-based doctor.
5–6 (medium)	Urgent review by a clinician skilled in the assessment of acute illness, usually a ward-based doctor or acute team nurse.
7 or more (high)	Emergency assessment by a member of the critical care outreach team or equivalent, and usually transfer of the person to a high-dependency unit.

Scenario: Teresa White

In the assessment unit, Teresa's observations are repeated every thirty minutes to check for any deterioration. After four hours Teresa is beginning to show signs of becoming confused. After six hours, Teresa's observations are:

Respiration rate: 8 per minute	NEW score: 3
Oxygen saturations: 86% on air	NEW score: 3
Blood pressure: 170/90	NEW score: 0
Pulse: 38 beats per minute	NEW score: 3
Consciousness: new confusion	NEW score: 3
Temperature: 36.9	NEW score: 0

Teresa's total NEW score is 12, which indicates rapid and very severe deterioration, and an emergency assessment is carried out, resulting in surgery to relieve the intracranial pressure caused by a subdural haematoma.

6.4.1 Shock

Shock is an example of a condition that will trigger an early warning score. Knowledge of the different types of shock (*Table 6.2*) will help you predict what could happen to a person so you will be able to respond with the appropriate treatment.

Table 6.2 Different types of shock.

Hypovolaemic shock	Due to a lack of circulating blood volume; commonly caused by bleeding or dehydration
Cardiogenic shock	Caused by reduction of the heart's ability to function properly
Neurogenic shock	Disruption of sympathetic tone causing widespread vasodilation
Septic shock	Due to overwhelming infection that causes systemic vasodilation: eventually the cardiac output is insufficient to compensate for the vasodilation
Anaphylactic shock	Sensitivity to an antigen or allergen causing vasodilation

6.4.2 Sepsis

NEWS2 can be used to identify people likely to have sepsis who are at immediate risk of serious clinical deterioration and require urgent clinical intervention. Sepsis should be considered in any person with a known infection or signs or symptoms of infection, or in people at high risk of infection, and a NEW score of 5 or more.

People with a known or suspected infection and a NEW score of 5 or more need urgent assessment and intervention by a clinical team competent in the management of sepsis. (See *Chapter 2* for more details about sepsis.)

6.4.3 ABCDE assessment

An ABCDE assessment (*Table 6.3*) is a means of initially assessing the physical condition of acutely ill or injured people. It should be performed on any person who is triggering on the NEWS2. See also *Chapter 17* for more detail on airway management.

Table 6.3 The ABCDE assessment.

Airway	If the person can talk clearly and can cough or swallow then the airway is clear. If not, call for help.
Breathing	Assess the person's breathing. If the person is not breathing adequately, then call for help.
Circulation	Take the pulse and blood pressure. Assess the person's colour, capillary refill and urine output. Call for help if abnormal.
Disability	Assess the level of consciousness. Either use ACVPU or the Glasgow Coma Scale. A blood glucose level may also be taken.
Exposure	To complete the assessment, clothing will need to be removed in order to expose the person. Care should be taken to minimise heat loss, and to maintain the person's dignity.

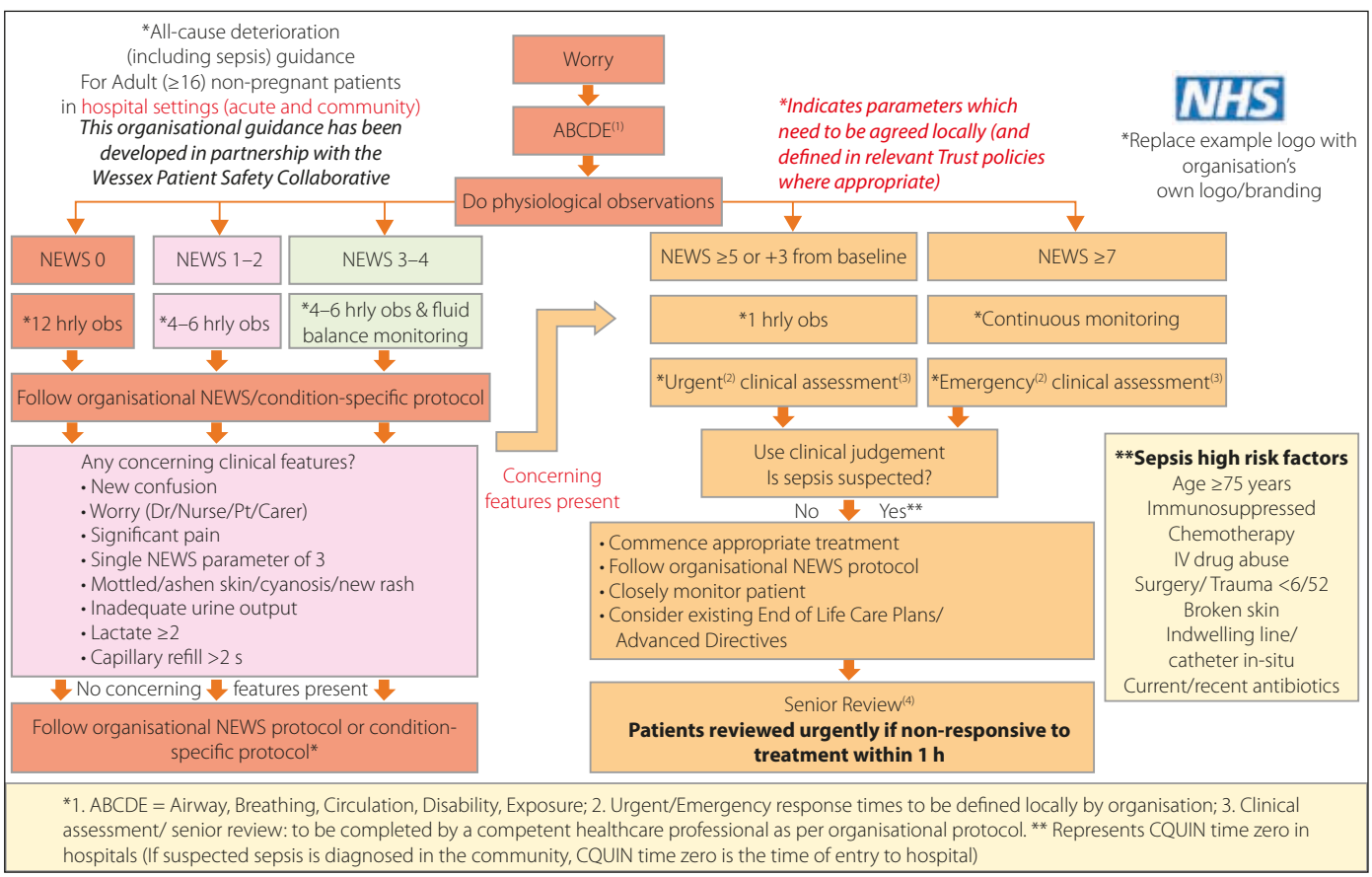

Figure 6.3 An example of an escalation pathway. Reproduced with permission from the Wessex All Cause Clinical & Organisational Response to Deterioration (ACCORD) Guidance (Wessex AHSN, 2018).

6.4.4 The outreach team

Outreach teams have been established in many hospitals to provide support for the care of people on general wards. Usually, they are called to see a person you are worried about in order to help with the care of that person. The outreach team has been developed to:

- identify people who are deteriorating and either help to prevent admission to ICU or ensure that admission to a critical care bed happens in a timely manner to ensure the best outcome
- enable discharges from critical care, by supporting the continued recovery of discharged people on wards
- share critical care skills with staff on the wards and in the community, ensuring the enhancement of training opportunities and skills practice and to use information gathered from the ward and community to improve critical care services for people and carers.

6.5 Other signs of deterioration

It is important that nurses use their experience and judgement as well as taking observations. Someone's colour, coldness or clamminess might indicate a change in their condition, and it is therefore necessary to report not only what is written on the observation chart but any other signs and symptoms noted.

As a student you should report any changes to a person's condition immediately. For example:

- Respiration – report not only the physiological parameters recorded, but also changes in rhythm, changes in breathing patterns, use of accessory muscles, and changes in the person's colour.
- Pulse – report if the pulse is weak or thready (where a pulse is hardly perceptible and feels like a fine moving thread under a palpating finger), as this may be an early indication of shock.
- Level of consciousness – 'alert to pain' in the ACVPU assessment is not the same as a pain score, which may be calculated separately from the EWS (see *Chapter 15*); however, pain is an important indicator that there is a problem, and any person complaining of severe or worsening pain should be assessed and reported even if the EWS is not triggering a response.

People may also be on a nausea or sedation score. Again, these must also be assessed and reported if changes are observed. There may also be occasions when a nurse feels someone's condition has changed but cannot express exactly how. If you are worried you should communicate this to a senior staff member and the person's condition should be reassessed.

Activity

Early Warning Score charts may differ from one healthcare organisation to another, and information may be recorded digitally in some areas. When you are next in clinical practice, compare the EWS charts used in your placement setting with the example provided in this chapter.

Review and research the types of shock outlined in *Table 6.2* in this chapter. Consider how the different types and signs of shock may appear on the NEWS2 chart in *Figure 6.1*.

Summary

Key points from this chapter:

- Early detection of deterioration can save lives.
- Use of early warning scores such as NEWS2 can help to identify deterioration early.
- Accuracy and attention to detail are critical in assessing someone's condition.
- Always document what you have measured and report any concerns you have about a person's condition immediately.

Further reading

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CHAPTER 7

07 Personal care

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- help people with their personal hygiene needs
- maintain the dignity of people as individuals.

Scenario: Abdullah Akhtar

Mr Abdullah Akhtar is a 50-year-old man who has been admitted to an acute medical ward, from A&E, having suffered a stroke. On admission to the ward, Mr Akhtar is unconscious and has a marked right-sided weakness. Though he can maintain his own airway, he is currently dependent on nursing staff to meet his complete care needs.

Mr Akhtar is married to Shamina, and they have three children. He works as an accountant for a local Primary Care Trust. He smokes twenty cigarettes per day but drinks no alcohol.

Information about Mr Akhtar:

Previous medical history

- insulin-dependent diabetes mellitus (IDDM) since the age of 12
- hypertension (high blood pressure)
- **hypercholesterolaemia** (high levels of cholesterol in the blood)

Observations on admission

- blood pressure: 170/110
- pulse: 101
- respiration rate: 14/min (laboured)
- oxygen saturations (SaO_2): 88% on air
- weight: 108 kg
- height: 1.6 m
- blood sugar: 15.5 mmol/L
- Glasgow coma scale: 10/15
- right-sided flaccidity

Drug history

- atenolol 100 mg daily
- bendroflumethiazide 2.5 mg daily
- simvastatin 20 mg at night

7.1 Importance of good hygiene

Hint for practice

Some people feel that needing the help of a nurse to carry out any personal care and hygiene activities is inherently undignified. Therefore, it is good practice to encourage a person to be as independent as possible with personal cleansing and dressing.

During illness people are sometimes unable to wash and dress themselves; they may feel embarrassed about this, especially if a nurse must do it for them. A sudden reduction in independence and liberty can also result in a loss of self-esteem. Enabling people to feel fresh and clean and to look their best can enhance their comfort and physical and emotional well-being and boost their morale.

The daily washing routine is a good opportunity to talk to a person and to develop an effective therapeutic relationship. Try to create a two-way communication and respond to a person's changing needs in order to maintain a bond of trust.

While caring for someone, imagine yourself in their position and consider how you would wish to be treated in similar circumstances. Empathy will help you to maintain communication and trust and in turn facilitate individuality and dignity.

7.1.1 Moral and ethical issues

There are important moral and ethical issues that you need to consider before assisting someone with their personal hygiene needs.

- Make sure that the person is fully aware of the procedure he or she is to take part in.
- Obtain the person's consent.
- If the person is unable to consent, involve their family or carers.
- Remember that a person who cannot speak or has limited speech may still be aware of what you are saying (to the person or to their family) and may be able to communicate by means of facial expressions and body language. Observe people carefully when explaining your actions to make sure they understand and consent.
- Learn about the person's illness, injury or condition and treatment options. This will assist you in planning their care and will help you to show empathy.
- Take the person's personal preferences into account when planning their care and reach agreement with them, or their family or carers, on how the nursing staff will assist them with their hygiene needs.
- Involve the person in any procedure and encourage independence as much as possible.
- Washing is usually a private process, so be aware of this when helping. Be discreet and maintain the person's dignity at all times.

Scenario: Abdullah Akhtar

When Mr Akhtar is admitted he is unconscious. The female nurse assigned to his care assesses his hygiene needs and explains to Shamina, his wife, what these may be. The nurse asks if it would be appropriate for her to undress and wash Mr Akhtar, and Mrs Akhtar says that she would prefer a male nurse to attend to him.

7.1.2 Your personal hygiene

Microorganisms are carried on hair, skin and clothes, and you must take responsibility for your own hygiene in order to limit cross-contamination between people (see also *Chapter 3*).

Modes of infection transmission include:

- airborne particles carrying microorganisms
- direct contact

- indirect contact via:
  - clothing
  - sharing items
  - inadequate cleaning
  - transfer from host, usually inadequate hand-washing.

7.2 Performing a bed bath

Scenario: Abdullah Akhtar

Mr Akhtar has had a left-sided stroke, which has resulted in a weakness on his right side. This is an abnormal condition of the brain characterised by occlusion of a blood vessel by an embolus, thrombus or cerebrovascular haemorrhage, resulting in ischaemia of the brain tissue that would normally be perfused by the damaged vessels. The result of the damage can be absence of or difficulty in speech because the speech domain is found in the inferior frontal gyrus; loss of speech is a characteristic of a left-sided bleed.

When Mr Akhtar recovers consciousness, he is unable to speak clearly, but the nurse can ascertain that he can hear and understand what she is saying. She observes Mr Akhtar when explaining her actions and he can give his consent to having a bed bath by nodding his head. The nurse then arranges for a male colleague to perform the procedure.

7.2.1 General principles

Allow reasonable time to perform the procedure and make proper preparations to avoid any delay during the bed bath and thus limit the time that someone is undressed.

If this is the person's first bed bath, he or she will be anxious and feel vulnerable. You need to be aware of this, show kindness and sympathy and be gentle. Avoid actions such as talking over the person to a colleague as this will increase anxiety and is likely to annoy them. Always maintain dignity and never allow this to be compromised. If a person can experience their first bed bath without any concerns, then they will be less anxious about future baths.

During the procedure, be soothing and supportive throughout. Use the whole process to communicate with the person, answer any questions and develop a therapeutic relationship. This is also an opportunity to do a full assessment of the person's skin integrity and observe for signs of any developing skin lesions, pressure ulcers and so on (see *Chapter 9* for more details about pressure ulcers).

Consider the environment in which the bed bath is to take place. Close curtains and windows to eliminate draughts and protect the person's dignity and privacy. Choose a good time of day – visiting time or ward rounds are not appropriate times for giving a bed bath.

Set the bed at an appropriate height to eliminate any need for over-reaching or stretching. Remember infection control procedures and make sure that you and your colleagues wash your hands and wear protective aprons to cover your uniforms before you start the bed bath.

Procedure 7.1: Giving a bed bath

STEP 1 Gather all equipment that is to be used. If there is a checklist of the necessary requirements, then use this to make sure you have collected the right equipment.

- Towels – use the person's own if available. People feel more comfortable using their own personal belongings, and the smell of a familiar fabric conditioner can add to feelings of comfort.
- Separate washcloths for face, torso and genital regions.
- Soap and toiletries. If these are from the ward check that the person is not allergic to these products. Check the person's notes to determine beliefs and cultural practices. Some soaps are unacceptable to vegans and vegetarians because they may contain animal products.
- Light sheets to cover the person as you bathe them.
- The water should be delivered just prior to beginning. Use warm water at approximately 40°C. The water should be replaced as it cools or gets dirty. The same water should not be used for the facial area and genitals.

STEP 2 During the bed bath encourage the person to be as independent as possible. For example, in our scenario Mr Akhtar may be able to assist by using his non-affected side. This not only allows the person to be part of the procedure, but also enhances his motor skills and his own sense of independence.

STEP 3 Wash the face first. Put a towel under the face to catch any water. Do not use soap unless the person has directed you to do so. Work away from the mid-line and avoid getting water into the eyes by asking the person to tilt their face towards the pillow. Wash in a gentle action up to the hairline and dry as you go using a soft face towel. Take care not to allow water to get into the ears.

STEP 4 Once the face is clean begin on the torso. Start with the arm furthest away from you (to avoid dripping dirty water on areas that have already been cleaned) and soap it. Rinse the arm and then dry it thoroughly. Then do the same with the chest and abdomen, followed by the arm closest to you. Uncover only the area you are washing and take care to wash thoroughly under the arms (axilla) and in any skin folds.

STEP 5 Once the upper torso is dry, gently turn the person onto their side and, with a colleague supporting, wash the back and buttocks. This is an opportunity to check for any developing pressure ulcers or reddening of the skin. If these are present this should be documented, and action taken if necessary. If the person has provided skin conditioner rub this in before repeating the action on the opposite side.

STEP 6 Change the water before washing the genitals. If possible, encourage the person to assist with this sensitive area. Then dry thoroughly and cover with the sheet as soon as possible.

STEP 7 After washing the genitals, change the water again and move down the body to the legs. While you are washing the feet, observe their colour and feel their temperature. Report and document any changes or delayed capillary refill.

STEP 8 Dress the person in their own clothes that are appropriate for the time of day. If they do not have their own clothes, use a hospital nightdress or pyjamas, but take care to choose the right size. Wearing clothes that are too tight or too big diminishes the person's own individuality and dignity.

7.3 Immersion bathing

Many people will be well enough to be assisted in an immersion bath. A full immersion bath allows all parts of the body to be cleansed thoroughly and should be offered in preference to a bed bath if possible.

Lying in warm water is a form of relaxation therapy and people should be encouraged to have a bath as soon as they are able. As with the bed bath, people must be informed about the procedure and the intervention that may be required, and their consent must be sought.

Some people prefer a shower to a bath, either for personal or cultural reasons. Such preferences should always be considered and noted on the person's care plan.

Procedure 7.2: Assisting with an immersion bath

STEP 1 Prepare the bath. The water temperature should not exceed 38°C.

STEP 2 Escort the person to the bathroom and offer assistance to undress.

STEP 3 The person should test the water to confirm the temperature. This helps to give them a sense of control.

STEP 4 Help the person into the bath. A hoist or seating aid may be needed, and staff and the person being assisted should have a full understanding of its use before the person is undressed (see *Chapter 9*).

STEP 5 Encourage the person to wash themselves with soap and give any help as required.

STEP 6 Maintain the person's dignity by using small washcloths to cover the genital region.

STEP 7 Offer help with back washing and hair care, particularly with people with limb deficits.

STEP 8 Once the person is bathed, towels should be placed around them while they step from the bath onto a non-slip mat (or are hoisted out).

STEP 9 Give full assistance with drying while the person is seated in a chair.

STEP 10 Offer toiletries if the person has their own – remember that if someone feels clean and smells pleasant, this will help to boost their self-esteem and aid their recovery.

7.4 Shaving

Make sure that people are given the opportunity to shave, either using shaving soap and a razor, or using an electric shaver. If a person is unable to shave themselves, you can offer to do it for them. A clean-shaven person may feel uncomfortable with stubble, and an unshaven appearance might give the impression that they are not being cared for, even if that is not the case.

7.5 Hair care

Dirty hair can feel uncomfortable, especially if the person is confined to bed. During the bed bath, the nurse may be able to decide with the person if their hair requires washing. Washing someone's hair in bed can be very difficult, as their confinement, disability or loss of movement can create problems with water containment. The procedure below is for washing someone's hair in bed, but you should wash hair in a shower, at a wash-basin or during an immersion bath if possible as this will be much easier.

Procedure 7.3: Washing someone's hair

STEP 1 Place absorbent towels and waterproof sheets around the person's head.

STEP 2 A second staff member must take control of the person's head so that they do not feel insecure. This nurse can then communicate and keep eye contact with the person.

STEP 3 Remove the head of the bed and store it safely. Placing a basin on the floor below the person's head, keep the shoulders and head at the edge of the bed.

STEP 4 Use jugs of warm water to wet the hair and then gently massage the shampoo into the hair. As with bed bathing, you need to consider which hair care products you are going to use before you wash the person's hair to ensure they are suitable, and the person is not allergic to them.

STEP 5 After shampooing, rinse the hair thoroughly and dry.

STEP 6 Try to comb or brush the hair into the style the person normally prefers. Hair should be brushed from roots to tips, and care should be taken not to irritate the scalp.

People who have been in hospital care for a long time may require a haircut. Do not do this yourself as it is not within the remit of any nurse. Instead, with the person's permission, find out if there is a hair-dressing service in the hospital and make an appointment if the person wants one.

7.6 Nail care

ALERT

Cutting the toenails of people with diabetes can be hazardous. This is because the circulation to the feet may be impaired in people with diabetes. If the skin is inadvertently nicked and becomes infected, gangrene may develop and ultimately lead to amputation.

Nail care is important to ensure that bacteria do not enter the nail bed and cause infection. If nails are allowed to grow, they can dry out and people may be tempted to bite their fingernails. Biting nails can result in the transmission of microorganisms that are buried in the surface of the nail into the mouth. Biting can also result in abnormal wearing of tooth enamel.

It is the responsibility of the nurse to identify when a person's nails need cutting, but the cutting itself should be undertaken by a professional manicurist or podiatrist, using sterile equipment. This prevents infection being transferred to other people. It is helpful to soak nails for five minutes to loosen dirt and germs and soften them before cutting.

7.7 Oral care

Hint for practice

Find a willing volunteer, such as a member of your family or a colleague and, using a clean toothbrush, practise cleaning their teeth. It is not easy!

The care of the mouth is very important. A build-up of plaque causes decay and produces substances that irritate the gums, making them red and tender or causing them to bleed easily. In time, gums may pull away from the teeth and pockets will form and fill with bacteria. If the gums are left untreated the bone around the teeth can be destroyed, and the teeth will become loose and may have to be removed. Periodontal disease is the main cause of tooth loss in adults. The best way to remove decay-causing plaque is by brushing and cleaning between the teeth every day.

Oxygen therapy and many drugs cause the mouth to dry, and this can also lead to infections such as oral thrush and ulceration.

It is the responsibility of the nurse to offer people oral care as a routine part of their personal care, and to meet oral care needs for people who cannot meet their own needs.

Procedure 7.4: Assisting with oral hygiene

STEP 1 Don the necessary protective equipment, such as gloves and an apron, as per the infection control policy in your organisation.

STEP 2 Support the person's head and place a bowl under their chin, with an absorbent towel under the bowl.

STEP 3 Use a soft-bristled brush of a size that fits easily into the person's mouth.

STEP 4 Put toothpaste onto the brush and place the brush at a 45° angle against the gum.

STEP 5 Move the brush back and forth in short strokes.

STEP 6 Brush the outer, inner and chewing surfaces of the teeth.

STEP 7 Gently brush the tongue to remove bacteria and freshen breath, taking care not to induce the gag reflex.

STEP 8 Look out for bloodstains on the toothbrush, and for any signs that the person is experiencing discomfort.

STEP 9 Assist the person to rinse their mouth and hold a towel against their chin as they do so.

Procedure 7.5: Assisting with dentures

STEP 1 Wearing gloves, remove the upper plate. Hold the inner and outer surface on both sides of the plate. Insert forefingers over the upper edge of the palate and press until the seal breaks between the dentures and the gums. Pull the plate forward to remove.

STEP 2 Remove the lower plate. Hold the inner and outer surface with the thumb and forefinger. Turn slightly and pull the denture up and out.

STEP 3 Clean the dentures using a toothbrush and denture paste, and rinse well.

STEP 4 Reinsert the dentures, upper plate first. Wet dentures with cool water. Apply even, gentle pressure on both sides of the upper palate and gently place into position. Insert lower dentures next.

STEP 5 Make sure there is no food trapped between the plate and gums. This can be extremely uncomfortable and may lead to ulceration.

STEP 6 Report ill-fitting dentures to senior staff, as these may cause ulceration within the oral cavity.

7.8 Bed-making

Making beds is part of the caring role and should not be underestimated. You should check on the condition of the linen on people's beds throughout the day to keep them tidy and/or to replace soiled linen. A tidy bed with clean bedlinen will:

- promote and enhance well-being
- reduce the risk of pressure ulcers
- assist in the control of infection
- contribute to the overall tidiness of the clinical area.

Procedure 7.6: Bed-making

STEP 1 Put on a protective apron over your uniform (dependent on local policy).

STEP 2 Bring a linen-skip to the bedside in preparation for stripping the bed.

STEP 3 Remove all linen, holding it away from your body. Soiled linen should be placed in a red linen bag and labelled accordingly.

STEP 4 Wash the bed with detergent and rinse. Dry off and allow to dry completely. This need not be done daily, but should be a priority if the bed frame or mattress becomes soiled. The whole bed should be cleaned thoroughly between different people using it. This will not necessarily be the nurse's job (check your local policy), but it will be the nurse's responsibility to make sure it is done.

STEP 5 Change your apron and wash your hands. Disposable aprons should be changed after each bed is made to avoid cross-contamination.

STEP 6 Organise clean sheets, a duvet, pillowcases and a draw sheet.

STEP 7 Put the clean bottom sheet on the bed and put the centre fold of the bottom sheet in the middle of the mattress.

STEP 8 If the bottom sheet is fitted, fix the corners of the sheet on the side of the mattress nearest to you. Walk round to the other side of the bed and fix the other two corners.

STEP 9 If the bottom sheet is not fitted, lift the top two corners and hold them away from the mattress to make mitred corners (*Figures 7.1* and *7.2*). Do not flap the sheet, as this encourages the movement of air and thus fomites.

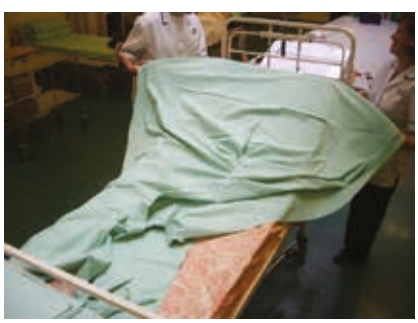


Figure 7.1 Arranging the bottom sheet.

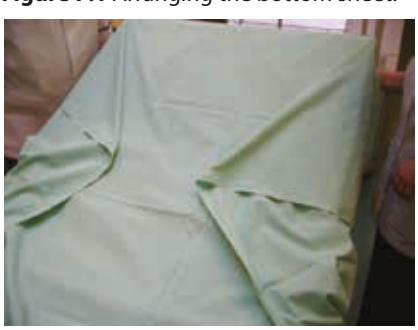


Figure 7.2 Mitred corners on bottom sheet.

STEP 10 Place the bottom of the sheet under the mattress. It is important to avoid excess folds of sheet as this will be uncomfortable for the bed's occupant and will favour formation of bed sores. Create tension and tuck in the corners (*Figures 7.3* and *7.4*).

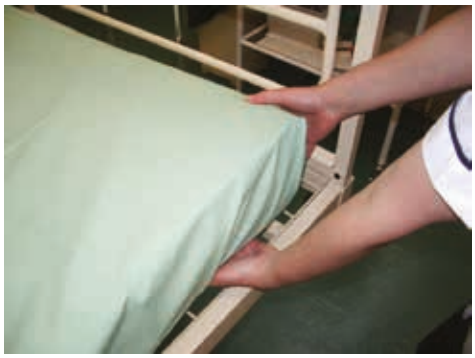


Figure 7.3 Tucking in the 'hospital corners'.

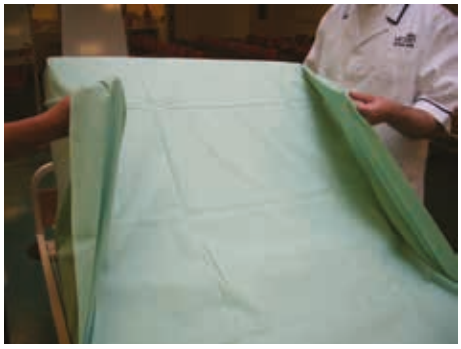


Figure 7.4 Repeating the procedure at the foot of the bed.

STEP 11 Put the top sheet with the centre fold along the middle of the bed. Line up the top part of the sheet with the top part of the mattress. Then put the bedspread or duvet over the top sheet with the central fold along the middle of the bed. Mitre the corners of the top sheet and the bedspread at the foot of the mattress, pulling the top linens up at the end of the bed to make a pleat (*Figure 7.5*). This allows room for the person's feet to move. It may also help to avoid skin sores or foot drop.

Figure 7.5 Pleating the top sheet at the foot of the bed.

Figure 7.6 Arranging the blanket.

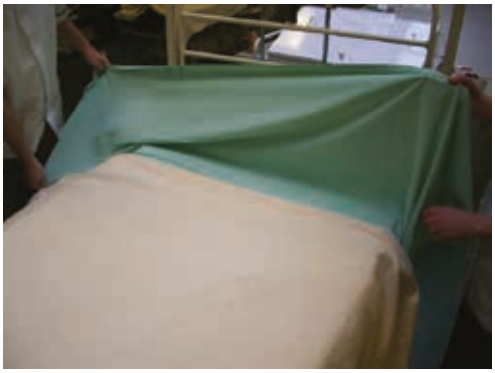


Figure 7.7 Arranging the bedspread and top sheet.

STEP 12 Fold the sheet over the bedspread or duvet at the head of the bed (*Figure 7.7*).

STEP 13 Put on fresh pillowcases and place the pillows against the back rest (*Figure 7.8*).

Figure 7.8 Putting on fresh pillowcases.

STEP 14 After changing the bed, remove the bed locks, place the bed in its original position and lower the bed to allow a person to enter safely. The newly made bed is shown in *Figure 7.9*.

Figure 7.9 A newly made bed.

If a person is unable to get out of their bed then it must be made while they are still in it. Changing bedlinen while the bed is occupied by someone usually follows the completion of a bed bath.

Advise the person about the task that will be undertaken. Allow them to ask questions and receive reassurance, and obtain their consent, before you start.

Procedure 7.7: Bed-making – making an occupied bed

This procedure requires two people.

STEP 1 Bring a linen-skip to the bedside, in preparation for stripping the bed.

STEP 2 Change your apron and wash your hands. Disposable aprons should be changed after each bed is made to avoid cross-contamination.

STEP 3 Raise the bed to an appropriate height so there is no risk of over-stretching.

STEP 4 Remove the pillow while supporting the person's back.

STEP 5 Release the corners gently; prevent elastic fitted sheets from snapping back; do not tug or jerk the sheets.

STEP 6 Remove the bedspread and blanket into the dirty linen bag; the top sheet may be left as a cover for the person to maintain dignity and warmth.

STEP 7 Assist the person to turn toward you, keeping their body covered with the sheet.

STEP 8 While the person is being turned your assistant should be at the opposite side of the bed.

STEP 9 The assistant should roll all bedding in layers close to the person's back.

STEP 10 The exposed bed may be quickly cleaned and dried.

STEP 11 A clean sheet should then be placed up to, but not touching, the rolled dirty bedding.

STEP 12 Assist the person to roll onto the fresh sheet, gather dirty bedding and place in the dirty linen bag.

STEP 13 While the assistant supports the person as necessary secure the bottom sheet using the elastic corners.

STEP 14 Remove the pillowcase; clean and dry the pillow and place a clean pillowcase onto it.

STEP 15 Place the pillow back on the bed and assist the person into a comfortable position.

STEP 16 Remove the sheet covering the person down to their umbilicus region, place the clean sheet by their shoulders and as you bring the clean sheet down remove the dirty sheet – avoid any contamination by not allowing the sheets to touch.

STEP 17 Place the dirty sheet in the dirty linen bag.

STEP 18 Place necessary blankets onto the bed depending on the weather and the person's preference.

STEP 19 Adjust the person's final position and consider requests such as additional pillows.

STEP 20 Remove the dirty linen bag.

STEP 21 Remove apron and any other protective clothing and wash hands correctly.

Activity

Put yourself in the position of a dependent person and consider the following questions:

- How would you feel if a stranger was helping you with your hygiene needs?
- How would you want to be treated in that situation?

As the nurse in this situation, consider the following:

- How would you incorporate a person's choice into your practice?
- Would any changes in their condition alter your plan of care?

Summary

Key points from this chapter:

- A person's individual hygiene needs should be assessed on admission and reviewed at regular intervals.
- A high standard of personal hygiene is necessary to minimise the risk of infections and to enhance the comfort and self-esteem of people.
- Independence should be encouraged, and assistance given only when required.
- Be discreet and always maintain people's dignity.
- The daily washing routine is a good opportunity to talk to people and to build up an effective therapeutic relationship.
- Work with people and their carers to plan hygiene care. Do not underestimate the value and importance of talking to people.

Further reading

Lister, S., Hofland, J., and Grafton, H. (2020) *The Royal Marsden Hospital Manual of Clinical Nursing Procedures* (10th ed). Chichester: Wiley–Blackwell.

CHAPTER 8

08 Specimen collection

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- take urine, stool and sputum specimens
- understand the importance of correct documentation
- understand the importance of following infection control procedures.

Scenario: Rita Johnson

Mrs Rita Johnson is an 81-year-old lady who lives in sheltered housing with her 83-year-old husband, Reg. They have no children and rely on each other for support. Recently, Rita has been having episodes of confusion and Reg has been struggling to cope with her, as she has developed pain on micturition and slight urinary incontinence. Their GP has referred Rita to hospital for admission and assessment, suspecting that she might have a UTI. Her previous medical history includes osteoarthritis and hypertension (for which she takes daily medication).

8.1 The basics

When taking specimens it is important to remember a few basics.

8.1.1 Labels and forms

Any specimen must be labelled correctly. This usually means:

- person's name
- date of birth
- hospital number
- ward and/or doctor
- date of collection
- the time of collection, especially if it is a repeated specimen.

The specimen needs to be sent to the laboratory with the original request form that has been completed by the requesting practitioner and contains the following information:

- person's name
- date of birth
- hospital number
- ward and/or doctor
- diagnosis or list of symptoms
- date and time of collection.

All writing on the form should be legible, and it should be signed by the person who requested the test.

8.1.2 Infection control

The principles of infection control must be followed (see *Chapter 3*). This means ensuring that:

- the outside of the container and the request forms are uncontaminated
- specimens are sent to the laboratory as quickly as possible
- gloves and aprons are worn as appropriate and discarded in the appropriate bins
- hands are washed before and after each specimen collection
- any sharps used are disposed of immediately at the point of contact into the correct container.

ALERT

Failure to label specimens means it is impossible to identify them and they must be thrown away. Labelling a specimen with the wrong person's details can be extremely dangerous.

Once specimens have been taken and tested it is important that the nurse documents any results. Any abnormalities must be noted and, if necessary, reported to the doctor.

8.1.3 Consent

As with any procedure, the person's consent should be sought before taking any specimens. Information about what is being taken, the reasons why and the way it will be done should be given to the person clearly, accurately and in a way that the person can understand. Many people find it embarrassing to have someone handle specimens taken from them, so it is also important to respect privacy and dignity throughout the process of specimen collection.

8.2 Urinalysis

Urine is the waste product produced by the kidneys. Urinalysis results give an indication of the physical status of the person: it is possible to detect conditions such as diabetes, liver disease, kidney disease, biliary disease, bleeding from the urinary tract, infections, malignant tumours, and high protein levels caused by problems such as heart failure and hypertension. Testing the urine can give a baseline observation and can also be used as a monitoring tool.

Urinalysis is the testing of the physical characteristics and composition of freshly voided urine. Obtaining a urinalysis is a good time to assess the urine to see if it is cloudy or clear, to test whether it has an offensive smell and to see what colour it is. Reagent strips are used to test for:

Abnormal urine constituent	Condition	Indicative of
Leukocytes (white blood cells)	Pyuria	Pus formation/inflammation/infection
Nitrites	Nitrituria	Bacterial infection
Protein	Albuminuria	Oedema/hypertension/nephrotic syndrome
Glucose	Glycosuria	Diabetes mellitus
Ketones	Ketosis	Anorexia/starvation/hyperglycaemia
Urobilinogen	Urobilinogenuria	Altered liver function
Bilirubin	Bilirubinuria	Altered liver function
Blood (red blood cells)	Haematuria	Trauma/inflammation/infection

Procedure 8.1: Obtaining a midstream specimen of urine

A midstream specimen of urine is collected to send to the laboratory for testing for microorganisms. If microorganisms are detected the laboratory will also determine which antibiotics the organisms are sensitive to. This collection can be carried out by people in privacy, if they are able to understand the instructions given by the nurse. Otherwise, they may require assistance from the nurse.

STEP 1 The person is asked to go to the toilet with a specimen container and some clean wipes, and to follow these instructions.

STEP 2 Women should be asked to clean the urethral meatus using soap and water. Men should clean the end of the penis with soap and water.

STEP 3 After cleaning, the person should pass a small amount of urine into the toilet, before interrupting the flow.

STEP 4 The sterile specimen container is then held underneath the flow of urine and the specimen collected.

STEP 5 The flow should be interrupted a second time and the specimen container removed and capped.

STEP 6 The person can then continue to finish passing urine into the toilet.

8.2.1 Catheter specimen of urine

Urinary catheterisation is the insertion of a special tube into the bladder. Catheterisation should only be done by trained and competent staff using strictly aseptic techniques (see *Chapter 16*). Any washing out, urine sampling and catheter removal are also performed as aseptic procedures to ensure that there is no potential for infection to reach the bladder.

Specimens of urine may be taken from the catheter tubing and sent to the laboratory for testing. It is important to ensure that there is no risk of contamination to the tubing that may then enter the bladder. The specimen must be taken from a fresh sample of urine coming down the tube, not from the clamp at the bottom of the bag where it may have been sitting for a while. Remember that many people will find having a catheter embarrassing, and it is important to maintain dignity and privacy.

Procedure 8.2: Obtaining a catheter specimen of urine

STEP 1 Wash hands and put on gloves and an apron.

STEP 2 Ensure that there is enough urine in the catheter tubing. If there is not enough urine in the tube, clamp the tubing below the access port until there is enough urine.

STEP 3 Clean the access point to the catheter with a 70% isopropyl alcohol swab or other appropriate cleaning material.

STEP 4 Take a sterile needle and syringe. Use aseptic non-touch technique to connect the needle onto the end of the syringe.

STEP 5 Insert the needle into the access point at a 45° angle to prevent the needle going straight through the tubing, and withdraw the required amount of urine. (Some tubing may provide an access point that does not require a needle.)

STEP 6 Dispose of any sharps used immediately in the sharps container.

STEP 7 Re-clean the access point with a 70% isopropyl alcohol swab or other appropriate cleaning material.

STEP 8 Place the urine into a sterile container. Avoid splashing or spillage.

STEP 9 Remove gloves and apron. Wash hands.

STEP 10 Send to the laboratory with the appropriate documentation.

STEP 11 Document the action taken in the person's notes and record any abnormalities.

Procedure 8.3: Urinalysis

STEP 1 Once the urine specimen has been collected, wash your hands, put on gloves and an apron.

STEP 2 Perform urinalysis using fresh urine. All urine specimens should be tested within two hours.

STEP 3 Dip a reagent strip into the urine for about one second so that all the areas are moistened.

STEP 4 Tap the edge of the strip on the container to remove excess urine.

STEP 5 Take care to avoid urine running from one square to the next, by holding the strip at an angle, rather than vertically.

STEP 6 Wait 60 seconds and compare the reaction colours with the colours on the test label (*Figure 8.1*). After 120 seconds, test the colour against the leukocyte label. (Note that the timings may differ depending on the brand of strip – always follow the instructions for each strip.)

STEP 7 Dispose of reagent strip, gloves and apron, and wash your hands.

STEP 8 Document and report findings.

Figure 8.1 Using a reagent strip.

Hint for practice

To prevent urine running from one square to another, which may give a false result, hold the reagent strip at an angle.

Scenario: Rita Johnson

The nurse takes a midstream urine specimen from Rita and performs urinalysis using a reagent strip. The results were:

- nitrites positive
- leukocytes positive
- red blood cells positive.

These results are all indicative of a UTI, so the nurse sends a sample of the urine to the laboratory for microscopy, culture and sensitivity in order to determine the nature of the infection and the appropriate antibiotic treatment.

8.3 Stool specimen

ALERT

If you are using a bedpan it is important not to contaminate the stool with urine, menstrual fluid or toilet paper.

Analysis of a stool specimen can give a good indication of the health of the person. It can show things such as blood, fats, bacteria, viruses and even parasites living in the gut.

Remember that it is important to be sensitive to people's needs at this time.

Procedure 8.4: Obtaining a stool specimen

STEP 1 Hands should be washed and gloves and an apron worn before handling any faecal specimens.

STEP 2 The person will need to defecate in a clean container. This may be a bedpan or a disposable receiver.

STEP 3 The specimen may be tested for faecal occult blood (FOB) on the ward using occult blood testing packs. Follow the manufacturer's instructions.

STEP 4 Otherwise, a small sample of the stool (collected using the spoon/spatula that is incorporated into the specimen container) is sent to the laboratory for testing with the appropriate documentation.

STEP 5 Observe the specimen for colour, consistency and odour and record in the person's documentation.

STEP 6 Gloves and apron should be removed and disposed of correctly. Hands should be washed afterwards.

8.4 Sputum sample

Sputum is produced by the lungs, usually in response to infection, and it should not be confused with saliva, which is secreted by the salivary glands. Testing sputum can reveal infection and help to identify which antibiotics can be given to someone.

Procedure 8.5: Obtaining a sputum sample

STEP 1 Put on gloves.

STEP 2 Encourage the person to sit up, if possible, and to breathe deeply.

STEP 3 Encourage them to cough up any secretions. If you find it difficult to obtain a sputum sample, a physiotherapist will be able to assist you.

STEP 4 Ensure that the person coughs directly into the sputum container.

STEP 5 Cover the container immediately to prevent the spread of infection.

STEP 6 Note the colour and amount of sputum. Be sure that it is sputum, and not saliva.

STEP 7 Wash hands.

STEP 8 Send the sample to the laboratory immediately with the appropriate documentation.

Activity

Think about how you will ensure that you maintain a person's privacy and dignity when obtaining a stool sample.

1. What things might you consider that someone would want to know before you obtain a stool sample from them?
2. What may they be embarrassed about asking you and how would you anticipate this?
3. How would you ensure that if you were obtaining the sample you would adhere to correct hygiene procedures to avoid contamination of the sample and to keep yourself and others safe?

Summary

Key points from this chapter:

- Urine, stool and sputum specimens can give a good indication of a person's health.
- Specimens must be taken without contamination.
- Specimens must be labelled correctly and accompanied by the correct documentation.
- Infection prevention and control procedures must be followed.
- The person's privacy and dignity must be maintained.

Further reading

Lister, S., Hofland, J., and Grafton, H. (2020) *The Royal Marsden Hospital Manual of Clinical Nursing Procedures* (10th ed). Chichester: Wiley–Blackwell.

CHAPTER 9

09 Skin integrity assessment and pressure area care

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand how pressure ulcers develop
- understand the classification of the severity of pressure ulcers
- assess the risk of people developing pressure ulcers using appropriate tools and scales
- prevent the development of pressure ulcers.

Scenario: Abdullah Akhtar

Mr Abdullah Akhtar is a 50-year-old man who has been admitted to an acute medical ward, from A&E, having had a stroke. On admission to the ward, Mr Akhtar is unconscious and has a marked right-sided weakness. Although he can maintain his own airway, he is currently dependent on nursing staff to meet his complete care needs.

Mr Akhtar is married to Shamina, and they have three children. He works as an accountant for a local Primary Care Trust. He smokes 20 cigarettes per day but drinks no alcohol.

9.1 Introduction

A pressure ulcer is:

> *'Localised damage to the skin and/or underlying tissue, usually over a bony prominence (or related to a medical or other device), resulting from sustained pressure (including pressure associated with shear). The damage can be present as intact skin or an open ulcer and may be painful.'*

(NHS Improvement 2018)

Pressure ulcers have a profoundly negative effect on a person's well-being and their ability to return to their optimal level of health. The role of the nurse is to undertake an appropriate assessment of a person's skin integrity and maintain appropriate pressure area care so as to minimise the risk of pressure ulcer development. It is essential that the nurse understands how pressure ulcers develop, how they are assessed and how they may be prevented. In the case of Abdullah Akhtar, in our scenario, his lack of mobility may make him especially vulnerable to developing pressure ulcers.

9.2 How and why pressure ulcers develop

9.2.1 The structure and functions of the skin

Structure

The skin is made up of three distinct layers (*Figure 9.1*):

- epidermis
- dermis
- subcutaneous (fatty) layer.

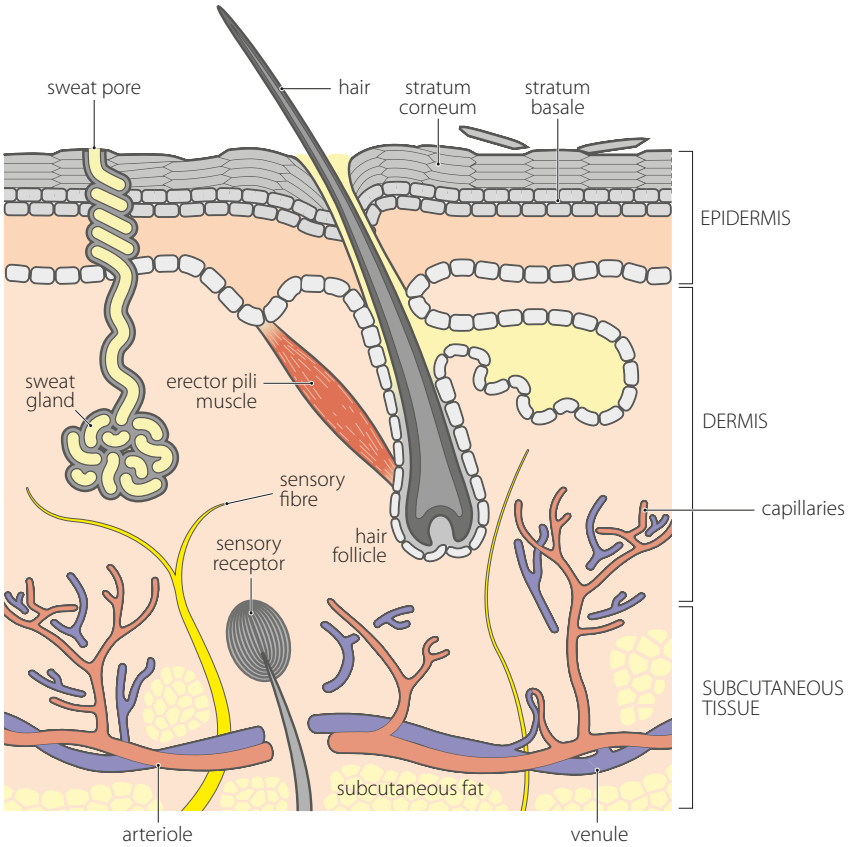


Figure 9.1 The structure of skin.

Functions

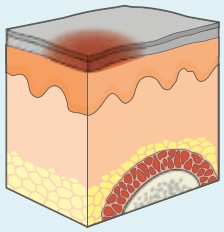
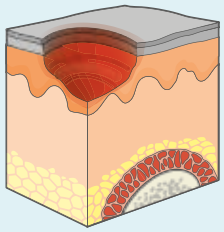
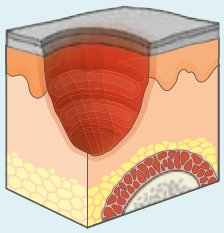
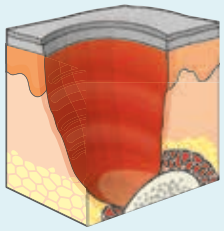
The functions of the skin are:

- protection of underlying tissues from the immediate environment and surroundings, including some protection against ultraviolet light
- waterproof/water-retaining barrier
- thermoregulation – through peripheral **vasodilation** (blood flows to the surface of the skin in order to shed heat through radiation and convection, and the increased blood flow stimulates the sweat glands so heat is lost through evaporation) and **vasoconstriction** (when the body attempts to retain heat, with a reduced blood flow to the dermis)
- sensation – nerve endings within the skin alert the brain to the presence of pressure, pain or injury to a particular area of the body, enabling the person to consciously or unconsciously withdraw from an unpleasant or dangerous sensation.

9.2.2 Pressure ulcers: classification

The purpose of pressure ulcer classification is to standardise record-keeping and provide a common description of the ulcer severity. The method of classification supported by NHS Improvement (2018) is shown in *Table 9.1*.

Table 9.1 Pressure ulcer classification (NPUAP/EPUAP/PPPIA 2014).

Category 1	**Non-blanchable erythema** of intact skin. Discolouration of the skin, warmth, oedema, induration or hardness are additional indicators, particularly on individuals with darker skin.	
Category 2	**Partial-thickness skin loss** involving epidermis, dermis or both. The ulcer is superficial and presents clinically as an abrasion or blister.	
Category 3	**Full-thickness skin loss** involving damage to or necrosis of subcutaneous tissue that may extend down to but not through underlying fascia.	
Category 4	**Full-thickness tissue loss** with exposed bone, tendon or muscle.	

Nursing staff must be accurate and consistent in their classification of pressure ulcers. Co-assessors or expert assessors are often used when undertaking the assessment of pressure ulcers, and most NHS Trusts employ specialist tissue viability nurses whose role is to provide advice on:

- pressure ulcer and wound assessment
- management of pressure ulcers, including specialist dressings
- pressure-relieving devices, such as special beds and mattresses.

9.2.3 Common sites for pressure ulcers

Pressure ulcers can occur in any body position or surface. Reporting of pressure ulcers over time suggests that the majority arise on the lower half of the body as follows:

- on the **sacrum** – 40%
- on the heels – 24%
- on the buttocks – 22%.

The body's bony prominences (see *Figure 9.2* and *Table 9.2*) are areas of particular focus; positioning on a bony prominence should be avoided. These areas may be more pronounced in someone suffering significant weight and/or tissue loss, and this increases the risk of pressure ulcer development.

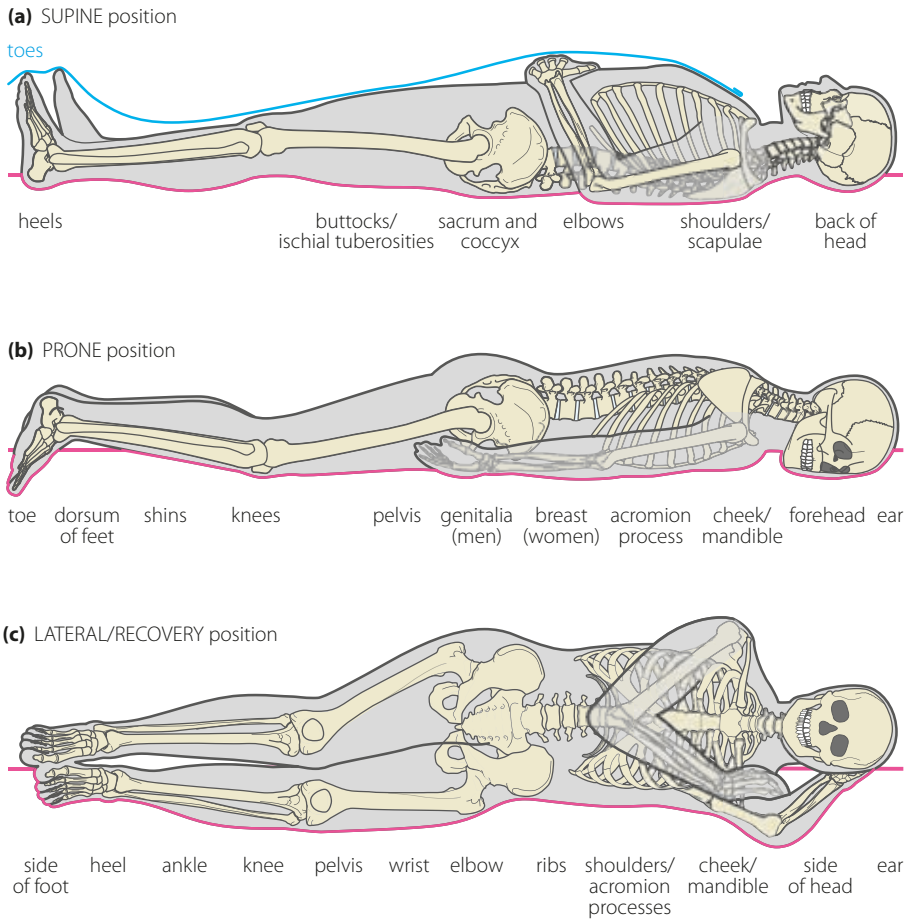


Figure 9.2 The body's bony prominences.

Pressure ulcers can also develop from the use of invasive or constricting equipment. For example:

- nasogastric (NG) tube
- thromboembolus-deterrent (TED) stockings
- endotracheal tube
- indwelling urinary catheters.

Table 9.2 Areas of direct pressure that may be susceptible to pressure ulcer formation.

Supine position	Prone position	Lateral/recovery position
Back of head Shoulder/scapulae Elbows Sacrum Buttocks Heels	Ear Face – cheek/mandible Breast (women) Shoulders – anterior Genitalia (men) Pelvis Knees Dorsum of feet Toes Lateral malleolus – if ankles are inverted	Ear Face – cheek/mandible Shoulder Ribs Elbow Wrist Pelvis Superior leg Inner thigh Medial/lateral aspect of knee Inferior leg Medial/lateral malleolus Medial/lateral aspect of foot

9.3 Pressure ulcer risk assessment

Hint for practice

Pressure ulcer risk assessment can often involve quite intimate observations, examinations or questions. Remember to always maintain the privacy and dignity of the person in your care by providing a sheet or covering if the person is required to undress, and by ensuring the assessment is undertaken sensitively.

An initial risk assessment for pressure ulcers should be undertaken within the first six hours of a person's first care episode by a registered healthcare professional. It is advisable to undertake this initial assessment as soon as possible after admission to any given care setting. As a student nurse you should observe and assist in this procedure until you are competent and confident enough to carry it out yourself.

This baseline assessment will provide a set of values, establishing the standard from which improvement or deterioration will be measured and further care interventions planned. The initial assessment must therefore be comprehensive, detailed and easy to interpret. It may be undertaken on admission to hospital or on a change of care setting, for example from a ward area to an intensive therapy unit or vice versa.

9.3.1 Factors influencing pressure ulcer development

The initial assessment will consider the following risk factors that influence pressure ulcer development.

- Pressure: When prolonged pressure is applied to a particular area of skin, blood flow is restricted, resulting in tissue damage (necrosis).
- Friction: When one surface opposes the movement of another, blisters form within the epidermis and can become skin lesions, accelerating pressure ulcer formation.
- Shear forces: When bone and subcutaneous tissue move while the skin remains immobile or moves at a reduced rate in comparison, blood vessels are more easily occluded, thus increasing the risk of pressure ulcer development.
- Level of mobility
- Motor and sensory impairment
- Continence
- Level of consciousness
- Acute, chronic and terminal illness
- Comorbidity (e.g. systemic signs of infection, blood supply, pain, medication)
- Posture
- Previous pressure damage
- Extremes of age
- Nutrition and hydration status
- Moisture on the skin.

9.3.2 Risk assessment tools

NICE *Clinical Guideline 179* (2014) suggests using one of three validated risk assessment tools to support clinical judgement – the Norton scale, the Waterlow scale and the Braden scale. Each of these tools identifies key areas that enable the user to judge whether someone is at risk of developing a pressure ulcer.

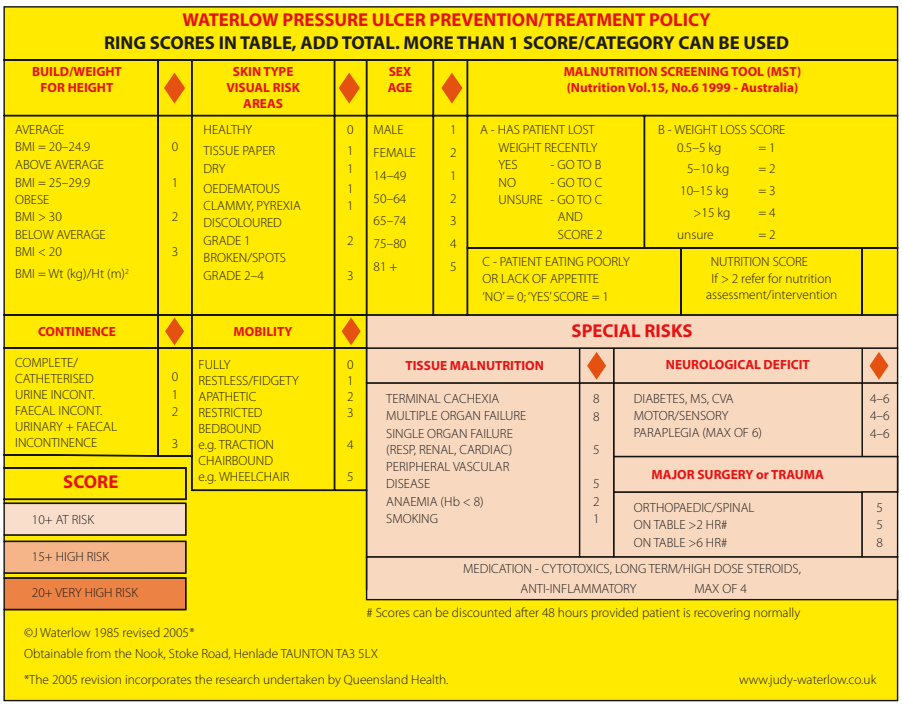
All three scales offer a numerical assessment from which a level of risk may be identified (*Table 9.3*).

Table 9.3 Comparison of Norton, Waterlow and Braden scales.

Norton scale	Waterlow scale	Braden scale
Physical condition	Build/weight	Sensory perception
Mental condition	Gender	Moisture
Activity	Appetite	Activity
Mobility	Visual assessment of at-risk skin area	Mobility
Continence	Mobility	Nutrition
	Continence	Friction and shear
	Tissue malnutrition	
	Neurological deficit	
	Major surgery/trauma	
	Medication	

The three scales differ in their choice of the key clinical areas on which the assessment is based. Although collectively they capture the risk factors which contribute to pressure ulcer development, a holistic assessment is not possible using only one of them. Risk assessment tools are a useful aid to the assessment process, but they should not replace the individual clinical judgement of the nurse.

Training is required to use these scales and any other assessment tools that are used in clinical practice. The nurse must also have a level of technical knowledge in order to interpret the meaning of the terms effectively and choose the most appropriate numerical score within each section.



WATERLOW PRESSURE ULCER PREVENTION/TREATMENT POLICY
RING SCORES IN TABLE, ADD TOTAL. MORE THAN 1 SCORE/CATEGORY CAN BE USED

BUILD/WEIGHT FOR HEIGHT

AVERAGE BMI = 20–24.9	0
ABOVE AVERAGE BMI = 25–29.9	1
OBESE BMI > 30	2
BELOW AVERAGE BMI < 20	3

BMI = Wt (kg)/Ht (m)²

SKIN TYPE VISUAL RISK AREAS

HEALTHY	0
TISSUE PAPER	1
DRY	1
OEDEMATOUS	1
CLAMMY, PYREXIA	1
DISCOLOURED	
GRADE 1	2
BROKEN/SPOTS	
GRADE 2–4	3

SEX AGE

MALE	1
FEMALE	2
14–49	1
50–64	2
65–74	3
75–80	4
81 +	5

MALNUTRITION SCREENING TOOL (MST) (Nutrition Vol.15, No.6 1999 - Australia)

A - HAS PATIENT LOST WEIGHT RECENTLY
YES - GO TO B
NO - GO TO C
UNSURE - GO TO C AND SCORE 2

B - WEIGHT LOSS SCORE
0.5–5 kg = 1
5–10 kg = 2
10–15 kg = 3
>15 kg = 4
unsure = 2

C - PATIENT EATING POORLY OR LACK OF APPETITE
'NO' = 0; 'YES' SCORE = 1

NUTRITION SCORE
If > 2 refer for nutrition assessment/intervention

CONTINENCE

COMPLETE/ CATHETERISED	0
URINE INCONT.	1
FAECAL INCONT.	2
URINARY + FAECAL INCONTINENCE	3

MOBILITY

FULLY	0
RESTLESS/FIDGETY	1
APATHETIC	2
RESTRICTED	3
BEDBOUND e.g. TRACTION	4
CHAIRBOUND e.g. WHEELCHAIR	5

SPECIAL RISKS

TISSUE MALNUTRITION

TERMINAL CACHEXIA	8
MULTIPLE ORGAN FAILURE	8
SINGLE ORGAN FAILURE (RESP, RENAL, CARDIAC)	5
PERIPHERAL VASCULAR DISEASE	5
ANAEMIA (Hb < 8)	2
SMOKING	1

NEUROLOGICAL DEFICIT

DIABETES, MS, CVA	4–6
MOTOR/SENSORY PARAPLEGIA (MAX OF 6)	4–6

MAJOR SURGERY or TRAUMA

ORTHOPAEDIC/SPINAL	5
ON TABLE >2 HR#	5
ON TABLE >6 HR#	8

MEDICATION - CYTOTOXICS, LONG TERM/HIGH DOSE STEROIDS, ANTI-INFLAMMATORY MAX OF 4

SCORE

10+ AT RISK
15+ HIGH RISK
20+ VERY HIGH RISK

Scores can be discounted after 48 hours provided patient is recovering normally

Figure 9.3 The Waterlow score card (Waterlow 2005). Reproduced with kind permission of Judy Waterlow MBE, SRN, RCNT.

Scenario: Abdullah Akhtar

Information about Mr Akhtar:

Previous medical history
- insulin-dependent diabetes mellitus (IDDM) since the age of 12
- hypertension (high blood pressure)
- hypercholesterolaemia (high levels of cholesterol in the blood)

Observations on admission
- blood pressure: 170/110
- pulse: 101
- respiration rate: 14/min (laboured)
- oxygen saturations (SaO_2): 88% on air
- weight: 108 kg
- height: 1.6 m
- blood sugar: 15.5 mmol/L
- Glasgow Coma Scale: 10/15
- right-sided flaccidity

Drug history
- atenolol 100 mg daily
- bendroflumethiazide 2.5 mg daily
- simvastatin 20 mg at night

You can use this information to assess Mr Akhtar's risk of developing a pressure ulcer according to the Waterlow score (*Figure 9.3*):

BMI (weight in kg divided by height squared in m): 108/(1.6 × 1.6) = 42 – Waterlow score of 2
Skin type: healthy – score 0
Sex: male – score 1
Age: 50 – score 2
Recent weight loss, lack of appetite: none – score 0
Continence: no incontinence – score 0
Mobility: right-sided weakness indicates restricted mobility – score 3
Tissue malnutrition: Mr Akhtar smokes – score 1
Neurological deficit: Mr Akhtar is unconscious on admission – score 6
Diabetes – score 5

Mr Akhtar's Waterlow score is therefore 20, which indicates that he is at very high risk of developing a pressure ulcer.

9.4 Preventing the development of pressure ulcers

A focus of nursing care is to prevent the development of pressure ulcers. This involves the avoidance of friction, pressure and shear forces, and consideration of associated contributory factors. The following key areas should underpin the prevention of pressure ulcers:
- structured risk assessment
- structured skin assessment
- skin care
- nutrition for pressure ulcer prevention (see *Chapter 11* on nutrition)
- repositioning and early mobilisation
- repositioning frequency
- repositioning technique (see *Chapter 10* on moving and handling people)
- support surfaces.

People undergoing surgery may require special attention, depending on how the surgery has affected their physical condition.

9.4.1 Skin assessment and care

The washing routine can be used as an opportunity to inspect and care for skin (see *Chapter 7*). Skin assessment should include regular inspection for redness, localised heat, oedema and **induration** (hardness), especially on individuals with darkly pigmented skin; skin should also be observed for signs of pressure damage caused by medical devices.

Dry skin is a risk factor, and emollients may be used to hydrate skin; massage and rubbing should be avoided.

9.4.2 Mobilising

Mobilising reduces the need for repositioning the person, and where possible, people should be encouraged to mobilise independently. This is determined by:

- general health status
- general skin assessment
- acceptability (comfort) to person and carer.

9.4.3 Repositioning

Hint for practice

Encouraging and maintaining as much independence as possible is essential to person-centred care. Spend some time with other professionals such as occupational therapists and physiotherapists to appreciate how this is reflected in the role of allied health professionals.

The person's position should be altered regularly and frequently, depending on individual risk factors and clinical need. Positioning the person should take into account factors which may influence the range of positional changes and interventions, including for example:

- pre-existing breathing/respiratory problems
- pre-existing pressure ulcers/wounds
- skeletal injuries – spinal injury, upper/lower limb fractures
- prolonged surgical procedures.

Reposition the person so that pressure is relieved or redistributed. Avoid subjecting the skin to pressure, friction and shear – lift the person rather than dragging them, and use transfer aids if necessary. Avoid positioning someone on bony prominences and onto medical devices such as tubes.

The frequency with which a person's position is changed should be driven by:

- their tissue tolerance (the ability of both the skin and its underlying supporting structures to endure pressure without adverse effects)
- their level of activity
- their general medical condition
- their treatment
- the results of their risk assessment
- their skin condition
- the support surface used.

Remember that a person seated in a chair may also be susceptible to developing pressure ulcers. You should limit the time someone spends sitting in a chair without pressure relief by means of independent mobilising or repositioning.

9.4.4 Pressure-relieving aids

Pressure-relieving devices can be used to support nursing intervention in minimising the risk of pressure ulcers developing.

Every healthcare organisation will have its own policy governing the use of pressure-relieving devices. This will be related to the result of the pressure ulcer risk assessment, which will determine the most appropriate type of device. The tissue viability specialist will also be available to advise on this.

Pressure-relieving devices may simply be support surfaces intended to distribute body weight over a large area, or more 'high-tech' dynamic systems (*Table 9.4*).

Table 9.4 Pressure-relieving devices.

Support surfaces	Dynamic systems
Standard foam mattress Alternative foam mattress/overlay Gel-filled mattress/overlay Fluid-filled mattress/overlay Fibre-filled mattress/overlay Air-filled mattress/overlay	Alternating pressure devices (air-filled sacs that sequentially inflate and deflate under the person, relieving pressure for short periods) Air-fluidised devices Low-air-loss devices Turning beds/frames

9.5 Ongoing assessment

Assessment should be conducted on an ongoing, individualised basis. Should a deterioration in any aspect of the person's assessed condition be suspected or detected, a further assessment should be undertaken (NICE 2014).

Should a pressure ulcer be present, a baseline assessment should aim to:

- grade the severity of the pressure ulcer(s)
- generate a personal ulcer profile to develop a plan of care from which treatment interventions will be initiated: anyone assessed as having a grade 1–2 pressure ulcer should, as a minimum provision, be placed on a high-specification foam mattress or cushion with pressure-reducing properties and should be very closely observed for skin changes, and have a documented positioning and repositioning regime
- evaluate treatment interventions
- assess for complications
- communicate information about the pressure ulcer to those involved within care management.

Ongoing assessment should include:

- causes of ulcer – pressure, friction or shear; the cause may inform the treatment required to prevent deterioration
- site/location – this will inform choices regarding repositioning of the person
- dimensions of ulcer – changes in size indicate whether the ulcer is improving or deteriorating
- stage or grade – a change in grade indicates whether the ulcer is improving or deteriorating
- exudates – amount and type (clear tissue fluid, pus, blood, dry/no exudate)
- local signs of infection – redness (pale skin tones)/darkening (dark skin tones), warmth, swelling of surrounding tissue
- pain – severity of pain and changes in severity, response to analgesia
- surrounding skin – signs of infection, colour
- possible sinus or fistula formation
- odour – this can indicate infection.

The assessment should be supported where indicated by photography/tracings, calibrated with a ruler. This would be undertaken by a specialist medical photographer.

The findings should be documented carefully and accurately in the nursing notes.

Scenario: Abdullah Akhtar

Mr Akhtar has been assessed as being at very high risk of developing a pressure ulcer. Despite efforts at prevention, he has developed a pressure ulcer and this has been dressed. The dressing now needs to be changed. The aim in undertaking an aseptic dressing is to reduce the risk of introducing pathogenic organisms into a wound or susceptible site, as well as to prevent the transfer of these organisms from the wound to other people or staff.

See *Chapter 3*, Procedure 3.2, for how to change an aseptic dressing.

Activity

Review what you know about Mr Akhtar. Using what you have learned about the development and prevention of pressure ulcers, answer the following questions.

1. What are Mr Akhtar's risk factors for developing a pressure ulcer?
2. Which areas of his body are most susceptible to pressure ulcer formation?
3. How would you plan Mr Akhtar's care from the point of view of preventing pressure ulcers?

When you are next in clinical practice, ask your supervisor if you can carry out a pressure ulcer risk assessment with a person who may be susceptible to developing a pressure ulcer.

Summary

Key points from this chapter:

- A pressure ulcer is a localised injury to the skin and/or underlying tissue.
- Pressure ulcers arise as a result of pressure, friction or shear.
- Pressure ulcers most often occur on bony prominences.
- Consistency is important in assessing and classifying pressure ulcers.
- Risk assessment tools exist to assist practitioners, but must be used consistently and in conjunction with the practitioner's own clinical judgement.
- Person-centred care should focus on the prevention of pressure ulcers by means of risk assessment, skin assessment, mobilising and repositioning, and pressure-relieving aids.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

Fletcher, J. (2019) Pressure ulcer education 1: introducing a new core curriculum. *Nurs Times* 115:11, 18–19. www.nursingtimes.net/clinical-archive/tissue-viability/pressure-ulcer-education-1-introducing-a-new-core-curriculum-28-10-2019/

NICE (2014) *Pressure Ulcers: Prevention and Management. Clinical Guideline 179* www.nice.org.uk/guidance/cg179/

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CHAPTER 10

10 Moving and handling

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- apply the theoretical principles of moving and handling to clinical practice situations
- assist with and undertake moving and handling risk assessments
- apply principles of risk assessment in context to a variety of moving and handling procedures.

Scenario: Elsie Smith

Mrs Elsie Smith is a 76-year-old lady who has been living independently in supported accommodation with her husband Walter. She also has a large extended family who see her on a regular basis.

Elsie is admitted to the medical ward via the emergency department, having collapsed at home. She is diagnosed as having had a left-sided stroke. This has left her with a profound right-sided weakness and no gag reflex.

10.1 Introduction

In the caring professions, musculoskeletal conditions are the main cause of sickness absence, and staff involved in the moving and handling of people have the greatest risk of musculoskeletal injury. Physical lifting should be undertaken only in exceptional circumstances. Safe and effective moving and handling procedures and techniques must always be employed, and ongoing training in manual handling should take place annually. This not only improves caring practice, but also reduces injury to both people being cared for and practitioners.

Remember that:

- If you injure your back, you may find it difficult to work as a nurse.
- If you injure yourself, or a person, while using correct techniques, as stipulated in your organisation's policies and procedures manual, you will be covered by the organisation's insurers through vicarious liability. If you work outside these guidelines, however, by cutting corners to save time, you may find yourself accused of the civil offence of negligence.
- As a student you are not yet accountable to your profession. However, you do have responsibilities to work within the scope of your own capabilities, using the methods you have been taught.

10.2 Legislation

Key pieces of legislation governing manual handling are described below.

10.2.1 Health and Safety at Work Act (HASAWA) (1974)

This Act aims to ensure, as far as is reasonably practicable, the health, safety and welfare at work of all employees. It includes:

- provision and maintenance of safe systems of work
- ensuring health and safety in the use of these systems
- provision of information, instruction, training and supervision necessary to ensure health and safety.

Under the legislation, as an employee you are expected to:

- take reasonable care of your own and others' health and safety, where others may be affected by your own acts or omissions
- co-operate with the employer in performing your duties.

Hint for practice

It is important to maintain and ensure your own health and safety at work so that you can care for people effectively. If you are unsure of the mechanisms in place to support you to maintain your own health and safety whilst in practice, ask advice from the Occupational Health department or Human Resources department of the Trust/organisation in which you are placed.

10.2.2 Management of Health and Safety Workplace Regulations (1999)

The Regulations require the employer to make a suitable and sufficient assessment of the risks to the employee.

10.2.3 Manual Handling Operations Regulations (1992, as amended 2002)

The Regulations come into force if there is a possibility that the employee may be exposed to a risk of injury arising from manual handling, including lifting, lowering, pushing, pulling and carrying. The employer must ensure that as a handler you adopt the following approach:

- *avoid* manual handling so far as is reasonably practicable
- *assess* the use of resources (carers and equipment), the task, and the load
- *reduce* the risks of injury where reasonably practicable.

10.3 Person-centred assessment

Assessment is a means to minimise the risk of injury during manual handling manoeuvres. It should include:

- the physical characteristics of the person, for example, weight and height; communicative aspects such as hearing, sight; previous experience of handling, physical abilities and level of energy
- the psychological and behavioural aspects, for example cognitive ability, apathy or lack of interest.

10.3.1 Physical aspects

- Weight assessment – this is a fundamental element of manual handling guidance. You must be aware of the load and weight that you, as a carer, can comfortably manage.
- Physical fitness – this includes the person's general fitness as well as any specific conditions.
- Physical capabilities – where appropriate, people should be encouraged to move as independently as possible by means of verbal prompting and assistance.

- Preparing the person physically – for example, with the appropriate clothing and footwear.
- Communication – are glasses and/or a hearing aid required?

10.3.2 Psychological aspects

- Engagement – the person may be distressed, uninterested, tired or lethargic.
- Privacy and dignity – nurses must integrate this key element into their practice.
- Fear – the person may be apprehensive about their future.
- Comprehension – understanding may be impaired for a variety of reasons such as the person's level of consciousness, the effects of hospitalisation, or news of a diagnosis.
- Communication – you must consider how you are going to instruct and assist the person in a manoeuvre.

Scenario: Elsie Smith

As she has no gag reflex, Elsie has had a nasogastric (NG) tube inserted, and she now requires an X-ray examination to check the position of the tube. For the X-ray to take place, Elsie requires assistance to transfer from her bed to the wheelchair.

The nurse assesses the physical aspects of the manoeuvre. As Elsie is dehydrated and malnourished, maintaining skin integrity is vital during manual handling manoeuvres. Her physical capabilities and her ability to assist with manoeuvres are reduced by the right-sided weakness caused by her stroke, and they are also affected by her nasogastric tube and IV infusion.

The nurse considers the psychological aspects too. Communication with Elsie must be clear and authoritative yet respectful. The nurse also establishes that Elsie prefers to be called Mrs Smith.

10.4 Risk assessment and reduction

In addition to the assessment, as a carer you must consider several risk factors in your planning and preparation in order to minimise risk both to the person and to yourself. These considerations will help you to decide whether you are able to carry out the task yourself, or if you need the help of another person or to utilise particular equipment. The acronym TILE covers the principal considerations, along with other factors:

- **T**ask
- **I**ndividual capability
- **L**oad
- **E**nvironment
- other factors.

10.4.1 Task

Safe principles of manual handling include:

- keeping the spine in a natural posture, not bent or twisted
- making sure the load is always kept close
- maintaining a stable base by ensuring that:
  - your feet are hip-width apart
  - your knees and hips are slightly flexed
  - one foot is slightly in front of the other in a walking position
  - your posture is natural and upright.

When establishing the risks under the task heading, we need to consider whether the task involves:

- holding or manipulating loads away from the body
- twisting, stooping or reaching upwards
- excessive lifting or lowering distances
- excessive carrying distances
- excessive pulling or pushing
- risk of sudden movement of loads
- frequent or prolonged physical effort
- insufficient rest or recovery periods
- a rate of work imposed by a process.

If any of these criteria apply, care should be taken to minimise the risk of injury to the handler. Remember that when caring for adults you are immediately exposed to handling loads which exceed the guidelines for lifting and lowering as suggested by manual handling guidelines (HSE 2020).

10.4.2 Individual capability

You must understand your capability as a handler and recognise your limitations. You may have learned some generic manual handling manoeuvres, which will be suitable for most of your practice. However, in specialist areas of healthcare, for example spinal injuries and specialist orthopaedic surgery, you may require specific manual handling training. This will include the use of any specialist handling equipment.

Assessing your own capability will help you to remain fit for your duties and to maintain the safety of people. Before you carry out any manual handling activity, ask yourself the following questions.

- Does the activity require unusual strength or height?
- Does it create a hazard to a nurse or carer who has a pre-existing health problem such as a back problem?
- Does it create a hazard to a nurse or carer who may be pregnant?
- Is it to be undertaken with someone who doesn't normally take part in the manual handling activities, for example, occasional visitors or allied health professionals such as a speech therapist?
- Does it require specialist information or training – do you have the necessary level of skill, knowledge and competence?

10.4.3 Load

While we do not view people as loads, we must consider their weight and handling characteristics before moving and handling them.

- How much help does the person need?
- What are the person's expectations/wishes?
- Is the person able to bear any weight?
- Is the person experiencing pain or on any medication?
- Are there tissue-viability or wound-care issues?
- Is the person able to communicate with others?
- What is the person's level of predictability?
- Is the person a vulnerable adult?
- Are there any behavioural issues?
- Are there any cultural issues?
- Does the person have any physical inabilities due to operations or investigations?
- How can you ensure the person's comfort?

- Are there any factors associated with the person's body shape?
- What are the height and weight of the person?
- Is there a history of falls?

10.4.4 Environment

Hint for practice

Never cut corners or take unnecessary risks. It is better to take a considered approach and take a little longer if necessary, than cause any injury to the person in your care or yourself. If you are in any doubt seek advice from your supervising clinician.

Consideration of the environment is a vital element of the manual handling risk assessment process. Each clinical area or working environment will be unique. Working in someone's home, for example, may pose problems during manual handling activities.

- Can you physically change the environment to promote safety? For example, is the bed height adjustable? Can the bed be moved to accommodate carers, equipment and the person?
- Are there space constraints on posture? For example, if you are in a client's home when undertaking a dressing to a foot, is there space for you to adopt the correct position to avoid stooping?
- Are there uneven, slippery or unstable floors? For example, is the floor wet, are you moving from carpeted to smooth flooring surfaces, or are you assisting with a manoeuvre outside, for example in a car park from a wheelchair into a car?
- Are there variations in working levels of floors or surfaces?
- Are there extremes of temperature or humidity? Consider the season and the time of day.
- Are there ventilation problems or environmental control measures, such as air-conditioning, which might be distracting or make the task uncomfortable?
- Is the light bright enough for safe completion of the manual handling task?

10.4.5 Equipment

Although equipment is not required in all moving and handling activities, the use of equipment may reduce the risk of injury to both the client and the carers. Drawbacks to use may include:

- the time to learn and become competent in its use
- increased numbers of caring staff required to operate the equipment.

10.4.6 Communication

Communication in manual handling activities is important for all. This is particularly true when assisting people who may be feeling distressed and apprehensive. You will need to use your communication skills to explain the procedure, obtain consent and reassure the person.

In addition, the lead carer should ensure that he or she provides clear and authoritative commands to the other carers involved. This ensures that everyone works in unison and thus reduces the risk of manual handling injury to carers. For example, 'on the count of three' needs to be clear – does it mean on the 'three' in 'one, two, three', or after the 'three' as in 'one, two, three, lift'?

10.4.7 Planning and organisation

Planning and organisation of the manual handling task considers all the factors involved in the risk assessment and results in making decisions based on those factors, including:

- the number of carers required to complete the manoeuvre safely
- who the lead carer will be and what the other carers will be required to do
- the working height necessary in order to eliminate or reduce the need for twisting, stooping and bending during the manoeuvre

- necessary changes to the physical environment
- planning the actual manoeuvre – positioning of the person, positioning of the carers
- instructional commands to be used where teamwork is required; for example, if you are using the commands 'ready, steady, roll', all carers should understand they will move on the 'roll' command, as should the person being moved, especially if they are assisting in the manoeuvre by moving independently
- selection of the appropriate equipment if required.

Scenario: Elsie Smith

The risk assessment for transferring Mrs Smith from the bed to her chair is as follows.

Task – as Mrs Smith has had a stroke, the task may require prolonged effort, and potentially the adoption of an abnormal posture on the part of the carer.

Individual capabilities – considering the task and the load, the manoeuvre should involve two carers; one to support the right side, while the other carer may assist with verbal commands and positive encouragement. As Mrs Smith's right leg may be weak, the second carer may be required to support this limb during the manoeuvre. The experience and training of both carers should be considered.

Load – Mrs Smith's ability to bear her own weight is impaired because of her condition, so the load will be unequally distributed. She will require additional assistance on her right side because of her right-sided weakness, although she can be encouraged to use her left arm to help support herself.

Environment – the bed should be adjusted to a comfortable height for the carers. Obstacles should be removed, and the floor checked to ensure it is not slippery. The brakes of the bed and chair should be on. Lighting and room temperature are also considered.

Equipment – having taken all the above factors into account, it is decided that a mechanical hoist will be used as this will minimise the risk of injury.

10.5 Using a hoist

ALERT

You must not use the hoist until you have received an appropriate amount of instruction, training and supervision in the use of the equipment.

This section looks at general principles of hoist usage (*Figure 10.1*). Each clinical area will have a differing range of manufacturers' hoists and each individual piece of equipment will have unique operating features. You will need to understand how to use each piece of manual handling equipment in each new clinical area in which you work.

The use of mechanical equipment is intended to facilitate the movement and transfer of people and maintain their safety and comfort. For staff, it also reduces the incidence of fatigue, improves comfort and safety, and reduces the risk of injury and back pain.

Procedure 10.1: Preparation for using a hoist

STEP 1 Explain the full manual handling procedure to the person and gain their consent and co-operation.

STEP 2 Decide on the number of carers required to complete the manoeuvre. While some hoists can be used by one carer it is safer practice to have two – one to support the person and the other to operate and manoeuvre the hoist.

STEP 3 Consider whether the moving and handling task to be performed is within your own scope of practice, and be sure that you have the knowledge, skills, experience and physical capabilities to undertake such a task.

STEP 4 Prepare yourself if necessary before starting the manoeuvre, for example by hand-washing.

STEP 5 Prepare the equipment – collect the hoist and ensure it is fit for purpose.

- Check that it is sufficiently stable to take the weight of the person. The maximum weight should be clearly labelled and visible on the hoist.
- Check that it has been maintained and serviced regularly in line with manufacturer's and legislative guidelines that demand regular servicing (*Lifting Operations and Lifting Equipment Regulations* 1998 and *Provision and Use of Work Equipment Regulations* 1998). The date of the last service should be clearly labelled and visible on the hoist.
- Even if the hoist has been serviced regularly, it is still good practice to ensure that it is in good working order before each use.
  - Are key parts in working order? For example, ensure the raising and lowering mechanisms and all four brakes are functional and easy to apply and release.
  - If electrical, has the hoist been fully charged?
  - Is the hoist clean?
  - Do the wheels and the hoist move freely in all directions?
  - Ensure none of the lubricating fluid is leaking.

STEP 6 Select the sling, taking into consideration the following general principles:

- Is it fit for purpose?
- Are there any rips, holes or tears in the fabric – does it have good integrity?
- Is it clean – no blood, urine, faeces?
- Is the label evident? This highlights maximum weight and care instructions.
- Is it suitable for the person's physical condition or do you need an adapted one, for example, for toileting, amputees, etc.?
- Are hooks, straps and clips all in good condition, with no cracks or breaks?

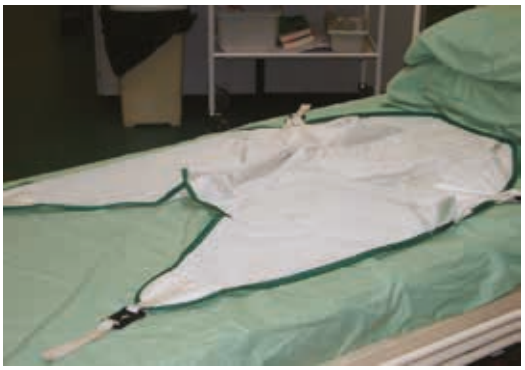

Figure 10.1 A typical hoist sling.

STEP 7 Prepare the environment.

- Ensure there is enough safe manoeuvring space around the bed for the person, you, your colleague(s) and the equipment that you intend to use.
- Ensure that there is enough clearance underneath the bed to accommodate the legs and base of the hoist.
- Move or reposition the bed, bed locker or table if necessary.
- If the person is to be transferred into a chair, position the chair appropriately.
- Ensure that you can manoeuvre the person without detriment to their privacy and dignity. For example, will the curtains close around the bed effectively when you are undertaking the manoeuvre in the hoist?
- Make sure the floor is safe to manoeuvre the hoist. For example, make sure that the floor is dry.
- Make sure there are no electrical cables in the way.

Once you have established that the equipment is in good order and the environment is safe you can proceed with manoeuvring the person into the sling and hoist. Throughout the procedure remember the following:

- Maintain comfort, privacy and dignity.
- Promote independence as much as possible. If the person can assist with this manoeuvre, then you are avoiding manual handling and reducing the risk of injury to yourself.
- Consider the risk factors for both the person and the carers.

ALERT

Be aware that all hoists are different in clinical practice. This procedure provides general principles of hoist and sling usage. Before using any mechanical equipment, you will need specific training in the use of that handling device.

- Moving someone may involve two or more carers. This should be based on your assessment of load – the size, shape and weight of the person and their ability to assist.
- Make sure your working base remains safe and stable:
  - Your feet are hip-width apart and flat on the floor.
  - Your knees and hips are slightly flexed
  - One foot is slightly in front of the other in a walking position.
  - Your posture is natural and upright.
  - Do not bend or twist unnecessarily.
  - Keep loads close to your centre of gravity – remember that weakened limbs are heavy.
  - If the bed has cot sides, do not work over the cot side as this will cause you undue musculoskeletal stress and strain.

Procedure 10.2: Manoeuvring a person

STEP 1 Decide which carer is to act as lead carer.

STEP 2 Decide on your instructional commands and make sure everyone involved is aware of them, including the individual being manoeuvred.

STEP 3 Plan with your colleagues how you intend to position the person in the sling, remembering the fundamental principles of manual handling practice.

STEP 4 Explain the manoeuvre to the person and check that you still have their consent.

STEP 5 If you need to roll the person onto one side, think about which side you are intending to roll them onto, considering the person's independence and ability to assist with the manoeuvre.

STEP 6 Before undertaking the manoeuvre ensure that there is no risk of the person falling from the bed during the procedure. If the bed has cot sides, ensure the opposite side of the bed has the cot side in place. If not, make sure that one carer is positioned in order to prevent a fall.

STEP 7 If the person can assist, provide clear and direct instructions before any manoeuvre that you want them to undertake. *Figures 10.2a–d* illustrate a person repositioning herself on her right side.

STEP 8 To roll the person onto their right side, reposition the left leg by crossing it over the right leg.

STEP 9 Reposition the left arm across the torso.

STEP 10 Position the head to look to the right.

STEP 11 Roll the person onto their right side.

STEP 12 Place the sling in position under the person's left side. When positioning the sling ensure, as far as possible, that it is evenly placed and uncreased, and that you have enough room to position the person safely, with the sling distributed across the mattress so that they are positioned centrally on the sling.

STEP 13 When the sling has been positioned, encourage or assist the person to roll onto their back.

STEP 14 Advise the person that this may be temporarily uncomfortable, depending on the thickness of the sling.

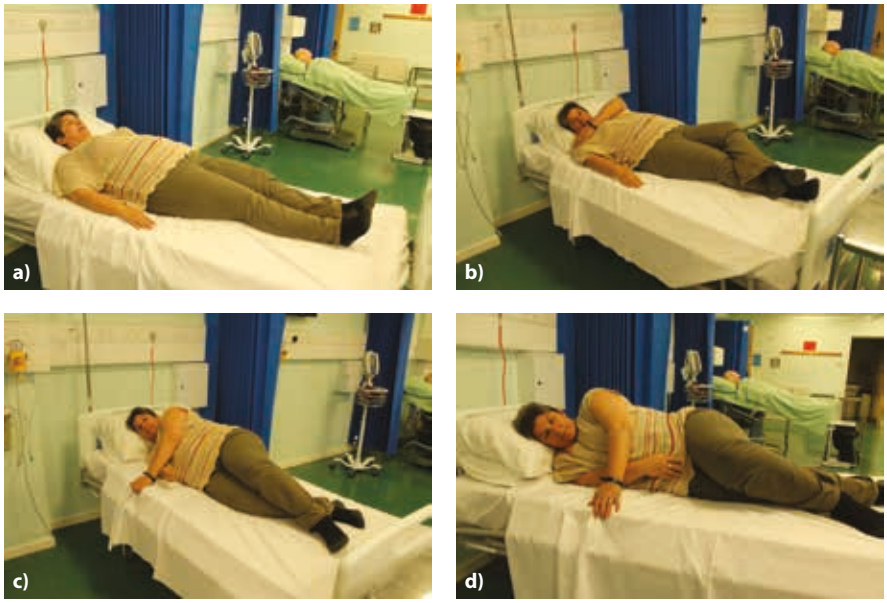

Figure 10.2 (**a–d**) A person repositioning herself onto her right side.

10.6 Bed manoeuvres

Manual handling equipment is available for moving people in bed, for example electric profiling beds. These beds can assist in the movement of people with decreased mobility, as they eliminate some of the handling tasks that the carer normally performs – for example, the profiling bed can move someone from a lying to a sitting position mechanically. The bed can be operated by the person in it, if they are able, and this promotes independence. The controller unit needs to be placed within easy reach of the person and with any weakness on one side or the other considered.

Other pieces of equipment can be used to help people move in bed. These include rope ladders, handgrips and transfer ('banana') boards (*Figure 10.3*). The handgrips and rope ladder can help some people alter their own position in bed, whilst the banana board can be used when assisting someone from bed to chair.

Figure 10.3 Moving and handling equipment: mat, rope ladder, handgrips, transfer board, sling.

Activity

Use the following headings to conduct a risk assessment in relation to moving someone you have worked with on your last clinical experience:

- task
- individual capability
- load
- environment
- other factors.

Summary

Key points from this chapter:

- Moving and handling activities in the workplace are covered by various pieces of legislation that place responsibilities on both employer and employee.
- When assessing someone before manual handling manoeuvres, you should consider physical and psychological aspects.
- Risk assessment should include consideration of the task, your individual capability, the load, the environment, and any other relevant factors such as the need to use equipment.
- There are various types and makes of moving equipment in clinical practice. You will need specific training before using any mechanical equipment.
- Always follow the latest guidance and regulations, and don't be tempted to cut corners.
- Always maintain people's dignity.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

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CHAPTER 11

11 Nutrition and fluid management

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- undertake a nutritional assessment
- provide nutritional support
- understand the principles and practice of **enteral nutrition**
- undertake a dehydration assessment
- maintain food-intake and fluid-balance charts.

Scenario: Elsie Smith

Mrs Elsie Smith is a 76-year-old lady who has been living independently in supported accommodation with her husband Walter. She also has a large extended family who see her on a regular basis.

Mrs Smith is admitted to the medical ward via A&E, having collapsed at home. She is diagnosed as having had a left-sided stroke. This has left her with a profound right-sided weakness and no gag reflex.

11.1 Nutritional assessment

Good nutritional care is an important factor in restoring health. A full nutritional assessment is carried out to find out what a person's nutritional needs are. The assessment gathers information about the person's previous and current diet and fluid intake, as well as their **anthropometrical measurements** – the measurements of the body including the weight and height.

A nutritional assessment tool often used in practice is the Malnutrition Universal Screening Tool (MUST; BAPEN 2011). The MUST is a simple five-step tool that allows health professionals across different care settings quickly to identify people already suffering or at risk of malnutrition. It requires the user to calculate a **body mass index** (BMI), the percentage of unintentional weight loss and an acute illness score in order to manage those people at risk of malnutrition most effectively.

Step 1: The body mass index (or the Quetelet index) is a weight-to-height ratio, calculated by dividing body mass (weight) in kilograms by the square of the person's height in metres. It is used to determine whether a person's weight is within the expected range for their height and as an indicator of obesity and underweight. The healthy range is 20–25 (although healthy but exceptionally muscular people may have higher BMIs). Most clinical areas contain a BMI chart

with the calculation done for you (*Figure 11.1*); all you need to do is plot where on the chart a person sits.

BMI calculations give MUST scores as follows:

Less than 18.5	(very underweight)	2
18.5–19.9	(underweight)	1
20–25 (normal range)		0
Over 25 (overweight or obesity)		0

Step 2: Ascertain whether the person has lost weight in the past 3–6 months and whether this was unintentional. This is done by asking the person and/or their carer or relatives (with consent) about the person's normal weight and comparing it with the weight documented on the individual care summary as part of their initial assessment. The unintentional weight loss is calculated as a percentage of the person's weight before the weight loss.

Unplanned weight loss in the previous 3–6 months gives the following MUST scores:

Less than 5%	0
5%–10%	1
More than 10%	2

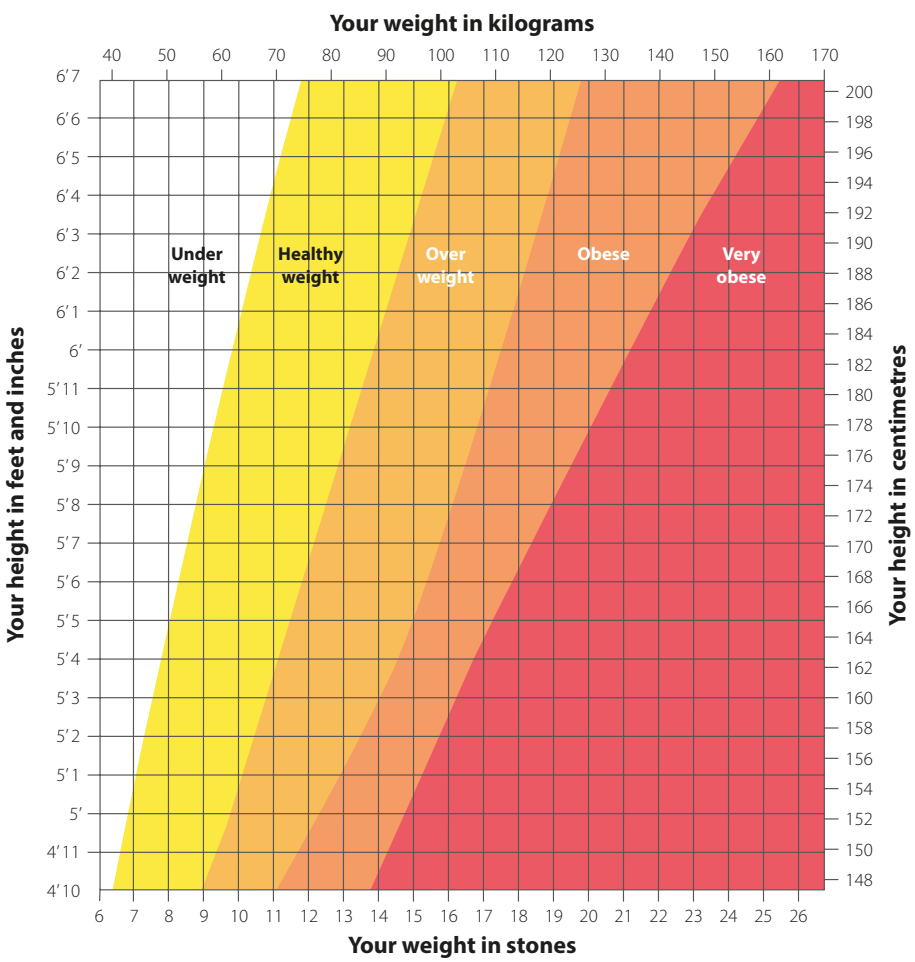

Figure 11.1 The BMI chart (public sector information licensed under the Open Government Licence v3.0).

Step 3: The acute illness score is 2 if the person is acutely ill and there has been or is likely to have been no nutritional intake for more than five days. Otherwise the score is 0.

Step 4: Add the three scores together.

Step 5: Manage the person following the British Association for Parenteral and Enteral Nutrition (BAPEN) guidelines (*Table 11.1*).

Table 11.1 BAPEN guidelines for management according to MUST score.

Total MUST score	Risk	Management guidelines
0	Low	Provide routine clinical care, including repeat screening at regular intervals depending on setting.
1	Medium	Observe – document dietary intake for three days: if adequate, repeat screening as for low-risk people; if inadequate, follow local policy, set goals, improve and increase overall nutritional intake, monitor and review care plan regularly.
2 or more	High	Treat – refer to dietician or nutritional support team or implement local policy; set goals, improve and increase overall nutritional intake; monitor and review care plan.

Scenario: Elsie Smith

On admission to the medical ward, Mrs Smith's weight is found to be 47 kg and her height 1.62 m. Her relatives are asked about weight loss, but they report that they have not noticed any weight loss in the last three months. However, her stroke has left her acutely ill with no gag reflex.

Mrs Smith's BMI is calculated to be 17.9, which gives a MUST score of 2. There is no weight loss to consider, but her acute illness score is 2. The total score is 4, which indicates that she is at high risk of malnutrition and requires treatment.

11.2 Encouraging and supporting dietary intake

Good nutritional care requires the nurse to provide the best dietary experience for each individual. It is not enough simply to refer someone who is at risk to a **dietician**. The key aim is to encourage dietary intake.

11.2.1 Food selection

If a person can eat and shows no signs of **dysphagia** (difficulty in swallowing) you must first find out what that person likes to eat. You can then help to pick out more favoured dishes from the menu, but you should not choose for them without their consent. You can also assess the availability of appropriate food for the person and where necessary communicate with catering services about an individual's needs. This may include special cultural or religious dietary requirements.

11.2.2 Environment

Ensure that the environment is conducive to eating.

Procedure 11.1: Ensuring a good eating environment

Before the meal arrives ensure that:

STEP 1 You have washed your hands according to the universal hand-washing guidelines (see *Chapter 3*) and changed your apron.

STEP 2 The person is sitting in a comfortable upright position.

STEP 3 The person can wash their hands if they request to do so.

STEP 4 They have a fresh cold or hot drink available to help wash down their food.

STEP 5 All bedpans, commodes and other offensive or unpleasant equipment, such as used vomit bowls, have been removed from the general area.

Once the meal has arrived:

STEP 1 Place it within the person's reach.

STEP 2 Remove any difficult covers and open any packages.

STEP 3 Assess whether the person needs assistance cutting the food up into manageable pieces.

STEP 4 Assess if they are able to feed themselves or whether they need assistance.

Hint for practice

- Fifteen minutes before the food arrives remind people that it is nearly mealtime and get them to talk about what they have ordered. This causes a physiological response where the body begins to prepare itself for eating.
- Play music quietly in the background. Research has shown that playing music whilst eating can have beneficial effects (Mamalaki 2017).
- Provide condiments for those who request them, unless they have been prescribed a low salt or renal diet. If people do not eat because the food tastes too bland, we are doing them a disservice.
- Some people can feel overwhelmed with large meal portions or with all their meal being served at once. If possible, serve one course at a time, leaving the remaining courses to one side until the person is ready for them. Remember to go back and serve them their next course.

11.2.3 Food intake charts

Food intake charts are a useful way of assessing exactly what a person has been eating while in your care. Each clinical area will have its own version of a food intake chart, but they all contain similar information. The chart will require you to document what the person has eaten, how much and when. Other information such as the position of the person, whether any assistance was required and any changes in their intake may also be requested.

The chart must be completed after each meal or snack (and not as you place the meal in front of the person) in order to record the actual dietary intake accurately.

11.2.4 Nutritional support

Some people may need assistance with feeding, either with all of their meal or to help them finish it. Helping someone else to eat may seem awkward, but once this skill is mastered it can be one of the most rewarding and the most important things you can do for a person.

Procedure 11.2: Helping someone to eat

STEP 1 Wash your hands.

STEP 2 Ensure the person is sitting in a comfortable semi-upright or upright position.

STEP 3 Sit beside the person, rather than in front of them, so that they can see their environment and do not feel they are being watched while they are eating (*Figure 11.2*). Do not stand while you are helping someone, as that will make them feel uncomfortable and hurried.

STEP 4 Bring the spoon or fork towards their mouth; don't expect them to strain towards the spoon or fork.

STEP 5 Give small amounts at a time.

STEP 6 Wait for the person to finish chewing and swallowing before offering the next mouthful.

STEP 7 Leave a small pause between mouthfuls so the person does not feel rushed.

STEP 8 Offer frequent sips of fluid to keep their mouth moist.

STEP 9 Tell the person what they are eating. If they are expecting peas and mash but find themselves eating rhubarb and custard they will receive an unwelcome surprise. This is especially important when helping someone on a puree diet, as they are then able to picture the flavour before they taste it.

STEP 10 Relax and talk to the person; if you are tense they will be too.

STEP 11 Make a mental note of any changes or difficulty with feeding. For instance, was there any difficulty with chewing or swallowing, was there excessive dribbling of saliva, did they become unusually drowsy during the meal? Document and report your comments.

Figure 11.2 Helping a person to eat.

11.2.5 Supplements and enriched diets

People's nutritional needs can also be supported through the use of supplements. These supplements come in many forms, such as:

- milk-based sip feeds such as Ensure Plus and Fortisip
- yoghurt style such as Fortifresh
- juice-based supplements such as Enlive and Provide Extra
- high-fat emulsions such as Calogen
- powders such as Scandishake, Calshake, Procal, Maxijul and Quickcal.

In addition, a person may be encouraged to consume a high-protein or a high-calorie diet. This would include selected fortified dishes such as fortified soups and milk puddings, full cream milk, extra butter and frequent meals and snacks

throughout the day. Small changes like this to the diet can be enough to prevent further weight loss and promote weight gain.

11.3 Enteral nutrition

Enteral nutrition delivers a liquid formula through a tube placed into a person's stomach (gastric feeding) or intestine (duodenal or jejunal feeding).

Gastric enteral nutrition is typically prescribed for:

- people who cannot eat normally due to dysphagia
- people who are unconscious or intubated
- people who are recovering from gastrointestinal (GI) surgery
- people in a hypermetabolic state (due to burns, sepsis, multiple trauma and cancer).

The location of the feeding tube and the type of tube used for enteral nutrition depend on the length of time the enteral feeding is expected to be administered, the condition of the person's GI tract, their aspiration risk and their overall condition. The different locations of feeding tubes are as follows:

- nasogastric (NG) (through the nose)
- orogastric (through the mouth)
- gastrostomy (through a surgical opening)
- percutaneous endoscopic gastrostomy (PEG) (through the abdomen)
- nasojejunal (through the nose).

Scenario: Elsie Smith

Mrs Smith's stroke has left her with no gag reflex, which means any food she swallows may go into her lungs, leading to **aspiration pneumonia** and possibly even death. Mrs Smith is referred to the dietician and the **speech and language therapist** (SLT). In addition, her diet will need to be administered through enteral nutrition, at least in the short term and possibly on a more permanent basis. It is decided that she will require the insertion of an NG tube.

11.3.1 Nasogastric tube insertion

NG tubes come in two different widths, wide bore and fine bore (*Figure 11.3*).

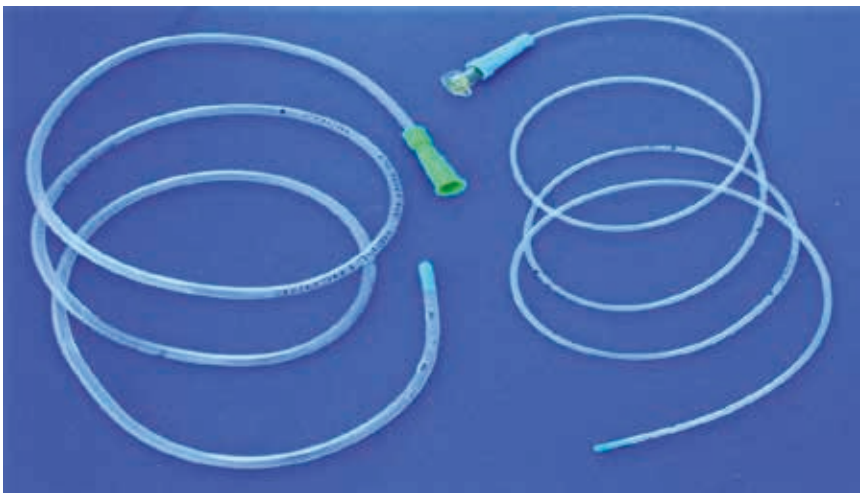

Figure 11.3 Wide-bore and fine-bore nasogastric tubing.

The choice of width is based on the condition of the person, the duration of the feeding programme and the type of feed to be administered. Prolonged NG feeding will usually necessitate the use of a fine-bore feeding tube in order to reduce the risk of the disadvantages more often associated with wide-bore tubes, outlined in *Table 11.2*).

Table 11.2 Advantages and disadvantages of wide- and narrow-bore nasogastric tubes.

	Advantages	Possible disadvantages
Wide-bore tube	Easier to insert and position Less likely to become blocked	Discomfort and intolerance Rhinitis Pharyngitis Oesophageal erosions/haemorrhage Oesophageal sphincter incompetence Aspiration and respiratory difficulties
Narrow-bore tube	Allow normal swallowing to continue while in place More comfortable Reduced chance of pharyngitis, rhinitis, lower oesophageal incompetence and mucosal erosions	Oesophageal or pulmonary perforation Abdominal distension Vomiting Tube blockage

Procedure 11.3: Passing a nasogastric tube

Equipment required:

- clinically clean tray/trolley
- NG tube of the appropriate size
- sterile receiver
- lubricating jelly/sterile water
- pH indicator strips
- hypoallergenic tape
- 50 mL syringe
- spigot
- glass of water and straw
- towel or protective pad.

Procedure:

STEP 1 Introduce yourself and ensure that you have the correct person for the procedure.

STEP 2 Tell the person what you are planning to do and the reason for the procedure. Gain the person's consent – make sure the person fully understands what is going to happen and is therefore able to give valid consent before the NG tube is passed.

STEP 3 Assist the person into a comfortable semi-upright position either in the bed or a chair, making sure their head is supported by a pillow. This position aids optimal neck/stomach alignment, making swallowing easier and ensuring the epiglottis is not obstructing the oesophagus.

STEP 4 Place a protective pad or towel across the person's chest to minimise contact with any gastric content.

STEP 5 Arrange a signal by which the person can communicate if they want the procedure to be stopped for any reason, for instance raising their hand or tapping the bed/chair. This can be a very frightening and uncomfortable process, so ensuring a person has some control over the procedure can reduce their anxiety.

STEP 6 Wash your hands according to the universal hand-washing guidelines, put on a clean apron and assemble the required equipment. Although this is not an aseptic procedure it is an invasive procedure, and the risk of cross-infection must be minimised.

STEP 7 Measure and mark the distance the tube is to be passed. To get the right length of tube, start at the person's earlobe and measure to the bridge of the nose and then to the xiphisternum – this ensures the correct length of tube enters the stomach.

STEP 8 Examine the person's nostrils for deformity or obstructions to determine the best side for insertion. You can check for the appropriate nostril by asking the person to sniff with one nostril closed then repeat with other nostril. Choose the clearer nostril for NG tube insertion.

STEP 9 Lubricate at least 15–20 cm of the tube with a thin coat of water-based lubricant or sterile water (check the protocol of the clinical area). This will reduce friction between the mucous membrane and the tube, making it easier and more comfortable to pass.

STEP 10 Insert the end of the tube into the clearer nostril and slide it backwards and inwards along the floor of the nose, past the pharynx and into the oesophagus. This will help the tube pass into the oesophagus by following the natural anatomy of the nose.

STEP 11 If there is some resistance you can try rotating the tube slowly and gently as you advance the tube or withdraw the tube and try again in a slightly different direction and, if necessary, use the other nostril.

STEP 12 As the tube passes down into the back of the throat ask the person to start swallowing or sipping water through a straw. The swallowing action both closes the glottis, enabling the tube to pass into the oesophagus, and focuses the person's attention on something other than the tube.

ALERT

Withdraw the tube immediately if the person's respiratory status changes significantly, if the person begins to cough or turns blue or if the tube coils in the person's mouth.

STEP 13 Advance the tube as the person swallows until the mark on the tube is reached. Again, if at this point the person shows signs of distress remove the tube immediately as this could mean the tube is in the bronchus.

STEP 14 Check the tube is in the correct position by aspirating (withdrawing) 0.5–1 mL of gastric content using a 50 mL syringe (20–50 mL for children) and testing the aspirate with pH testing paper. Gastric aspirate should be very acidic, and certainly pH 5.5 or less. However, if the aspirate is between pH5 and 6, nothing should be administered until the correct position of the tube is confirmed. An X-ray can also be used to check correct positioning. If you are in any doubt about the position of the tube do not commence feeding. Always refer to the organisation's protocol for your individual area. Confirming the correct position of NG feeding tubes in adults is essential prior to commencing each feed, before administering medication via the NG tube, following an episode of vomiting or coughing and if you suspect that the NG tube has been moved for any reason. Failure to do so could result in the feed entering the person's lungs.

STEP 15 Secure the tube to the nostril with hypoallergenic dressing tape. In addition, the tube can be secured to the cheek and behind the ear. This is to hold the tube securely in place and to ensure comfort.

STEP 16 Document:

- the date and time of procedure
- the type of tube used
- the length of the tube
- the pH and nature of the aspirate
- the reason for the NG tube insertion
- the condition of the person during and after the procedure.

11.3.2 Percutaneous endoscopic gastrostomy (PEG) feeding

Gastrostomy feeding may be recommended if the digestive system is still working well but nutritional support is likely to be needed for more than a few weeks. Gastrostomy feeding involves surgically creating an opening, known as a fistula, through the abdominal wall. A feeding tube is then passed through the opening and into the stomach. The feeding tube is held in place with either a stitch, a small inflated balloon around the tube just under the skin, or a flange around the tube just under the skin.

The nurse's responsibility in caring for a PEG involves cleaning the area around the tube daily with soap and water and making sure it is thoroughly dried. The tube must be flushed with 30 mL of water before and after each feed.

11.4 Hydration and fluid balance

All humans need a continuous supply of fluid to maintain healthy functioning of the body. Water intake must match water output to maintain fluid balance (**homeostasis**). Water is lost through insensible losses (those that are not obvious), such as through the skin (perspiration) and lungs (respiration), and sensible losses such as urine and stools (elimination). A healthy adult needs an average of 1–1.5 mL of water per calorie consumed. If 2000 calories are consumed in one day, 2000–3000 mL (2–3 litres) of fluid must also be consumed.

Daily urine output can vary from as little as 720 mL to as much as 2400 mL depending on fluid intake, activity level and even the climate we live in. Fluid balance is shown in *Table 11.3*.

Table 11.3 Fluid balance.

Approximate daily intake	Approximate daily output
1500 mL in liquid	1500 mL urine
700 mL in food	150 mL faeces
300 mL respiration	850 mL insensible losses

11.4.1 Dehydration

Dehydration will occur if more fluid is lost than is consumed. Early signs of mild dehydration include a dry mouth and feeling thirsty; when thirst becomes noticeable dehydration is already present. At this stage it is important to offer someone a fresh cold or warm drink immediately. If left untreated at the mild stage dehydration increases, with more signs and symptoms developing.

Signs of moderate to severe dehydration include:

- sunken eyes
- reduced skin turgor (skin loses its firmness)
- reduced urine output (due to the kidneys' attempt to conserve body fluids)
- rapid and deep breathing (due to electrolyte imbalance)
- tachycardia (increased heart rate)
- low blood pressure (due to reduced blood volume)
- fainting (due to reduced blood supply to vital organs such as the brain)
- convulsions.

Signs of severe dehydration are:

- cold extremities (hands and feet)
- peripheral cyanosis (bluish discolouration of the skin and gums caused by lack of oxygen in the blood)
- rapid pulse
- very low or even undetectable blood pressure.

If dehydration is left undetected and untreated it will eventually result in death.

Hint for practice

Always ensure that people in your care and their carers/relatives know where to obtain a drink or to ask for one when required. Just as you ensure your own hydration, it is important to maintain as much independence as possible and that people are not embarrassed or unsure of how to ask for a drink if they are thirsty.

11.4.2 Assessment of dehydration

If you suspect someone is becoming dehydrated it is important to complete a thorough nursing assessment and commence treatment immediately. This assessment includes obtaining a recent and accurate history of fluid and diet intake.

Thirst

Feeling thirsty is an important sign of fluid depletion. Those suffering fluid loss due to **pyrexia** (high temperature), diarrhoea, vomiting and hyperglycaemia experience this sensation of thirst most. Thirst is a natural response to fluid depletion and normally causes people to increase their fluid intake, thereby restoring fluid balance or homeostasis.

Nail-blanch reaction

The nail-blanch test (or the capillary nail refill test) is performed on the nail beds to test the amount of blood flow to tissues. The nurse briefly applies pressure to the person's nail bed using her/his thumb and finger. Once pressure is released the nurse checks how quickly colour returns to the person's nail bed. If colour returns quickly (in approximately 2 seconds) this would suggest the heart is pumping blood around the body sufficiently – the cardiac function is good. However,

a delayed capillary refill response of more than two seconds could be a sign of poor cardiac function and a reduced circulatory blood volume.

Skin turgor

The skin turgor test involves gently pinching the skin on the back of the hand and observing how quickly the skin recoils once released. When pinched up, the skin of a healthy person returns immediately to its normal position once released. However, when skin turgor is reduced it can take several seconds longer to recoil and in the severely dehydrated it will stay in the pinched position (*Figure 11.4*). This suggests the person has a fluid volume deficit, which may result in a person becoming more susceptible to developing pressure ulcers (see *Chapter 9*).

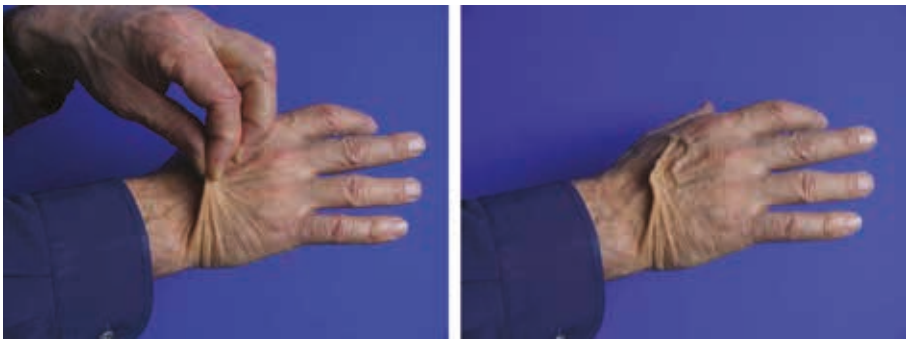

Figure 11.4 Skin turgor test.

Blood pressure

A low blood pressure often accompanies fluid volume dehydration, resulting in inadequate blood flow to the heart, brain and other vital organs. Symptoms such as dizziness and light-headedness will be experienced. **Postural hypotension** may occur. This can be assessed by the nurse firstly recording the person's blood pressure while they are lying down and then immediately rechecking the blood pressure while they are standing up: a sustained decrease when standing is known as postural hypotension. In more severe cases of dehydration, hypotension occurs even when the person is lying flat.

Pulse

A fast pulse, or tachycardia, indicates that the heart is beating more rapidly than is normal. The average heart beats at around 80 bpm; a heart rate above 100 bpm is considered tachycardic. There can be many causes of tachycardia, but when assessing for dehydration you should consider not only the rate per minute but also the strength and rhythm of the pulse (see *Chapter 5*). Tachycardia accompanied by a weak pulse can be a sign of decreased intravascular volume caused by dehydration.

Respiration

The respiratory rate should be recorded while the person is at rest, by counting the number of breaths taken in by the person in one minute (see *Chapter 5*). Abnormalities or change from someone's normal (baseline) respiratory rate may indicate an underlying disorder of fluid, electrolyte or acid–base balance. When someone is dehydrated, their respiratory rate will often increase, becoming more rapid and shallow. This is to compensate for the reduced oxygen supply to both the extremities and the organs, as a result of the decreased blood volume and blood pressure.

Neurological assessment

Reductions in physical, psychomotor, and cognitive performance can occur when 2% or more of body weight is lost due to dehydration. Neurological observations including an assessment of a person's consciousness level are therefore important when assessing the level and effects of severe dehydration.

Urine output

If you suspect someone is dehydrated, it is important to measure their urine output. Urine output of less than 400 mL daily is called **oliguria** and may result from reduced circulating fluid. The volume, colour and specific gravity of urine can also provide important information about abnormalities and therefore you may be required to do a urinalysis (see *Section 8.2*).

Blood tests

Other tests for dehydration include:

- blood chemistries (electrolytes)
- full blood count (FBC)
- creatinine
- blood urea nitrogen (BUN).

These blood tests will only be carried out by practitioners who are specifically trained and qualified to do so.

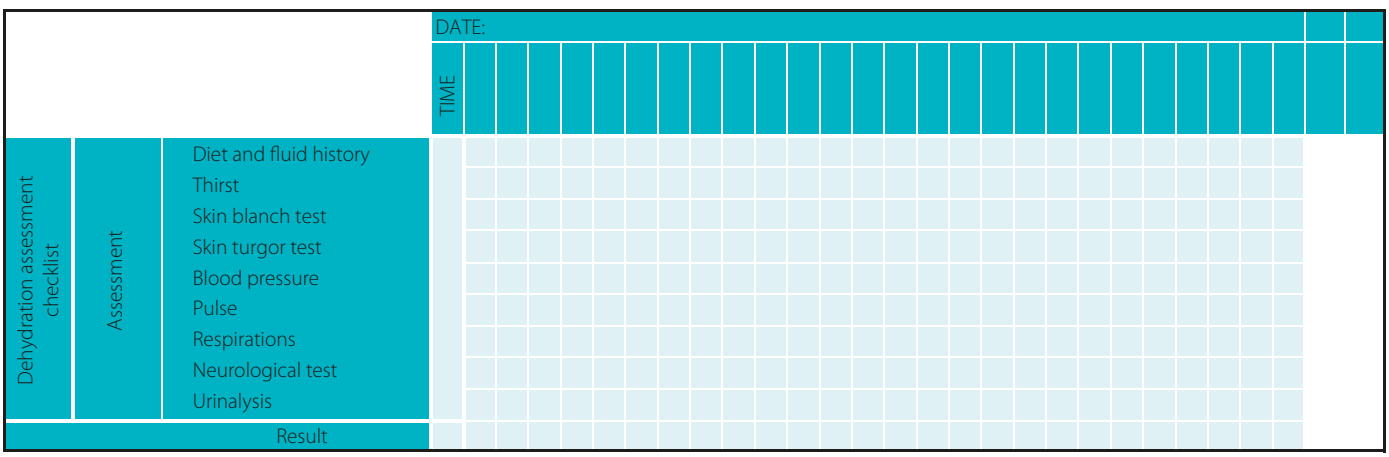

Figure 11.5 A dehydration checklist.

Scenario: Elsie Smith

Using this checklist, we discover that following her stroke Mrs Smith has:

- a reduced diet and fluid intake
- blood pressure of 80/50 mmHg
- pulse of 112 bpm
- respiration rate 28 breaths per minute
- revealed by urinalysis, an increase in specific gravity.

In addition, her extremities are cold with poor perfusion to her nail beds and she is complaining of dizziness, a headache and feeling thirsty. She is moderately to severely dehydrated, so IV fluid therapy is prescribed and commenced immediately. She is prescribed 2 litres of normal saline daily and her fluid intake and output is documented on a fluid balance chart. A positive balance is achieved.

11.4.3 Intravenous fluid therapy

IV fluid therapy is the administration of sterile liquids directly into a vein to provide volume replacement, to restore and maintain fluid and electrolyte balance, and in some instances for nutritional purposes (**parenteral nutrition**) and for the administration of drugs.

IV fluids are classed into two groups, **crystalloids** and **colloids**.

ALERT

Both crystalloids and colloids must be prescribed before they can be administered. As a student nurse, your role is to observe and report on the condition of the person receiving the IV infusion and ensure the IV site is free from infection or phlebitis. You may also discuss how you can develop your clinical skills regarding IV infusions with your supervisor.

Crystalloids

Crystalloids include normal saline, dextrose solutions and Hartmann's solution. They are so called because they are aqueous in nature, containing water-soluble molecules that are able to pass freely through a semi-permeable membrane.

Colloids

Colloids contain larger insoluble molecules that do not pass easily through a semi-permeable membrane and therefore remain in the intravascular compartment for longer. Colloids include Dextran, gelatin (Gelofusine, Haemaccel) and blood.

11.4.4 Maintaining fluid balance charts

Fluid balance charts provide a record of all fluid intake and output for a 24-hour period. Fluid balance charts must be an accurate record of a person's actual fluid intake and output, and maintaining an accurate chart is an important nursing responsibility. To record the intake you must include fluid gained from all sources, such as drinks or an IV infusion. Similarly when recording fluid output you must include all sources such as urine, vomit, gastric aspirate, losses from wound or drainage tubes and from diarrhoea.

It is important to inform the person and carers when a fluid balance chart is in place so they can also record their own fluid intake and output where possible. The intake and output are totalled together to give the balance. A negative balance arises when more fluid has been lost than taken in. If there is a negative balance, this must be reported and acted on. A positive balance means that more fluid has been taken in than lost and is the aim when managing dehydration and fluid volume deficit.

Activity

Using the body mass index chart illustrated in *Section 11.1*, work out your own BMI by weighing yourself and measuring your height, then plotting your score on the chart.

Summary

Key points from this chapter:

- A nutritional assessment is used to ascertain a person's nutritional needs.
- Serving food that people like in an environment conducive to eating is likely to reduce the risk of malnutrition.
- To maintain fluid balance and the healthy functioning of the body, fluid intake must match fluid output.
- A dehydration assessment should be carried out if you suspect that someone risks becoming dehydrated.
- Food intake charts and fluid balance charts must be maintained accurately to monitor a person's nutritional status and fluid status.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

Brotherton, A., Simmonds, N., and Stroud, M., British Association for Parenteral and Enteral Nutrition (BAPEN) Quality Group (2010) *Malnutrition Matters: Meeting Quality Standards in Nutritional Care*. Redditch: BAPEN. www.bapen.org.uk/pdfs/toolkit-for-commissioners.pdf

NHS England (2015) *10 Key Characteristics of 'Good Nutrition and Hydration Care'*. www.england.nhs.uk/commissioning/nut-hyd/10-key-characteristics/

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BAPEN (2011) *Malnutrition Universal Screening Tool 'MUST' Tool*. Redditch: BAPEN. www.bapen.org.uk/pdfs/must/must-full.pdf

Mamalaki, E., Zachari, K., Karfopoulou E., *et al.* (2017) Presence of music while eating: Effects on energy intake, eating rate and appetite sensations. *Physiol Behav* 168:31–3.

CHAPTER 12

12 Bowel care, suppositories and enemas

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the importance of good bowel function
- monitor someone's bowel function
- administer a suppository
- administer an enema
- maintain the dignity of people as individuals.

Scenario: Abdullah Akhtar

Mr Abdullah Akhtar is a 50-year-old man who has been admitted to an acute medical ward, from A&E, having suffered a stroke. On admission to the ward, Mr Akhtar is unconscious and has a marked right-sided weakness. Though he can maintain his own airway, he is currently dependent on nursing staff to meet his complete care needs.

Mr Akhtar is married to Shamina, and they have three children. He works as an accountant for a local Primary Care Trust. He smokes twenty cigarettes per day but drinks no alcohol.

12.1 Constipation

Normal daily exercise helps to stimulate peristalsis in the GI system. This natural gut motility is what helps us to 'move our bowels' or pass faeces. If our mobility is reduced, for whatever reason, we are more likely to become constipated. Although constipation is initially a minor inconvenience, it may impede a person's recovery, and if left untreated it can lead to much more serious complications such as intestinal obstruction.

12.2 Monitoring bowel function

Monitoring bowel function is an extremely important part of a nurse's role. You must ask 'Have you had your bowels opened today?' While this may be embarrassing for the novice student nurse, it will soon become second nature. However, don't forget that the question is likely to be embarrassing for the people you ask, too, so be discreet and maintain their dignity.

If you are assisting someone in the toilet, have a good look at the faeces they have passed and make a note of:

- the amount they have passed
- the consistency (is the stool hard, soft or diarrhoea?)

- the colour: pale stools may indicate a problem in the biliary tract; very dark stools may indicate the presence of **occult blood**; any fresh blood may indicate haemorrhoids (piles) or bleeding in the intestines and should be reported immediately.

12.2.1 Promoting good, regular bowel habits

Promoting good and regular bowel habits in people in our care will include:

- encouraging a good oral fluid intake of 2–3 litres per day
- promoting a diet that is high in fibre
- being aware of any constipating medications the person might be taking, particularly opiate analgesia (such as co-dydramol, co-codamol, dihydrocodeine and codeine phosphate)
- promoting regular exercise as far as possible
- use of oral aperients (laxatives) when constipation is noted, such as lactulose or senna (Senokot).

12.3 Administration of suppositories

Suppositories are small torpedo-shaped devices, used to deliver a measured amount of a drug into the rectum where it is absorbed. An example of a typical suppository is seen in *Figure 12.1*. The suppository has a tapered end and a blunt end.

Figure 12.1 Suppositories.

Suppositories may be used to deliver many types of systemic drugs, such as:

- antibiotics (e.g. metronidazole)
- anti-convulsive medication (e.g. carbamazepine)
- anti-inflammatory medication (e.g. diclofenac, aspirin)
- analgesics (e.g. paracetamol).

They can also be used to deliver topical preparations to the rectum, such as haemorrhoid preparations. They are also commonly used in hospitals to remedy constipation. Glycerol, when dissolved in the rectum, acts as a stimulant to the rectal wall, causing peristaltic waves and the passing of impacted faeces.

Scenario: Abdullah Akhtar

Mr Akhtar's bowel function has been monitored closely because of his impaired mobility, and it has been noted that he has not passed faeces for several days. The doctor has prescribed two glycerol suppositories, per rectum. The ward manager asks you as a student nurse to administer them under the supervision of your supervisor. You administer the suppositories following the procedure below.

Procedure 12.1: Administering a suppository

STEP 1 Before administering the suppositories, explain the procedure and obtain verbal consent.

STEP 2 Collect necessary equipment:

- suppositories as prescribed
- prescription chart
- receiver or disposable tray
- lubricating gel
- tissues.

STEP 3 Wash and dry your hands. Put on a disposable apron and gloves.

STEP 4 Make sure you maintain the person's dignity and privacy during this procedure. Do not expose the person to more than is required.

STEP 5 Position the person on their left side, with knees brought up toward their chest. This position is necessary due to the anatomical position of the rectum. If you are a left-handed person, you will have to get used to administering suppositories with your non-dominant hand.

STEP 6 Remove packaging from the suppository (*Figure 12.2*) and cover the suppository with lubricant.

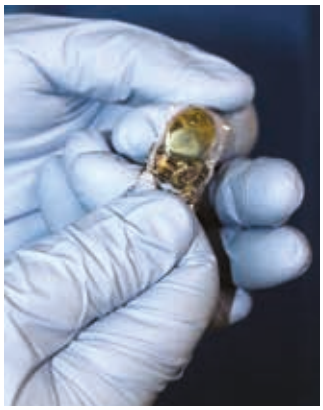

Figure 12.2 Removing a suppository from its packaging.

STEP 7 Using your left hand, part the person's buttocks, exposing the anus. Warn the person that you are about to insert the suppository – remember that they cannot see what you are doing.

Figure 12.3 Inserting the suppository.

STEP 8 Insert the suppository into the anus with your right index finger (*Figure 12.3*). See the manufacturer's instructions regarding which end of the suppository to insert first, as this is a source of much debate.

STEP 9 If more than one suppository is to be administered, repeat the process.

STEP 10 Using tissues, wipe away any lubricating gel from around the anus (*Figure 12.4*).

STEP 11 Dispose of equipment and wash hands.

Figure 12.4 Wiping any remaining lubricant from the anus.

12.3.1 Following suppository administration

If the suppositories are to stimulate a bowel movement, the person should be advised to retain the suppositories in the rectum for as long as possible. He or she should be warned, however, that the urge to defecate may become very powerful. Therefore, you must ensure that the person has access to a nurse call bell, and/or a toilet or commode.

If the suppositories are drugs, they need to be absorbed through the rectal wall. The person should, therefore, be warned not to pass faeces for at least half an hour. Ideally, people should be encouraged to empty their bowels before the suppository is administered.

12.4 Administration of enemas

An enema is a prescribed volume of fluid that is administered per rectum. It may be prescribed to someone who is still not passing faeces despite the administration of suppositories. Uses of enemas include:

- removal of severe faecal impaction (where oral aperients and/or suppositories have been ineffective)
- administration of drugs (retention enema)
- bowel cleansing.

Examples of enemas include:

- phosphate enema, a 128 mL enema, used as an osmotic laxative; these powerful enemas should not be used on people with inflammatory bowel conditions, or those who are sodium-restricted
- sodium citrate (Micralax) enema; these are only 5 mL in volume, so can be administered more easily
- arachis oil, a retention enema; this 130 mL enema is used as a faecal softener, but should **not** be used on people with a peanut allergy.

The administration of an enema, like the administration of suppositories, is undignified and embarrassing for the recipient. It is the role of the nurse to explain the procedure carefully, answer any questions the person might have and obtain verbal consent. During the procedure, it is vital that the nurse is careful to maintain the person's dignity and to provide reassurance.

Procedure 12.2: Administering an enema

STEP 1 Before administering the enema, explain the procedure and obtain verbal consent.

STEP 2 Collect necessary equipment:

- prescription chart – all enemas must be prescribed by a doctor or non-medical prescriber, before administration
- the correct enema, as required and prescribed; note that some enemas, such as arachis oil retention enemas, should be warmed before administration, by removing the enema from its packaging and placing it in a jug of warm water for a few minutes
- receiver
- lubricating gel
- tissues/toilet paper
- gloves and apron
- commode if there is no easy and near access to a toilet.

STEP 3 Ensure privacy for the person in your care.

STEP 4 Wash your hands and put on gloves and an apron.

STEP 5 Position the person on their left-hand side with knees brought up toward their chest.

STEP 6 Remove the enema from its packaging, including the cap on the end of the nozzle.

STEP 7 Lubricate the nozzle.

STEP 8 Encourage the person to relax, perhaps by asking them to take some deep breaths in and out.

STEP 9 Use your left hand to part the person's buttocks, exposing the anus. Inspect the anus for haemorrhoids.

STEP 10 Using your right hand, insert the nozzle of the enema carefully through the anus and into the rectum, avoiding any haemorrhoids.

STEP 11 Squeeze the enema reservoir until all the contents have been delivered into the rectum.

STEP 12 While maintaining pressure on the enema reservoir, withdraw the nozzle carefully. Maintaining pressure as you do this prevents the enema fluid from re-entering the reservoir bag.

STEP 13 Clean the person's anal area with tissues or toilet paper and cover the person with bedclothes.

STEP 14 Dispose of equipment and wash hands.

12.4.1 Following enema administration

If you have administered a retention enema, you should encourage the person to lie in the same position for half an hour to help absorption of the fluid in the rectum. You can help this process by elevating the end of the bed.

If you have administered a phosphate enema or something similar to aid evacuation of impacted faeces, the effect is likely to be fairly rapid. However, you must advise the person in your care to hold on to it for as long as possible. Make sure that the person has access to a commode or a toilet. If necessary, make yourself available to assist. Don't forget to offer the person hand-washing facilities and wash your own hands thoroughly following this procedure. Document the effectiveness of the enema in the nursing notes and on the observation chart.

Activity

Review what you know about Mr Akhtar and answer the following questions:

1. Why might Mr Akhtar become constipated following his stroke?
2. How would you know if he was constipated?
3. What might you do to:
   - treat his constipation?
   - prevent it recurring?

Summary

Key points from this chapter:

- Monitoring of bowel function is vital for everyone under your care, and bowel movements should be recorded on the observation chart daily.
- Constipation may impede recovery and can lead to serious complications if left untreated.
- Prevention of constipation is better than cure.
- Suppositories may be given to relieve constipation; they may also be used to administer certain drugs.
- The administration of suppositories and enemas is extremely embarrassing for many people. Make sure you perform these procedures with sensitivity.

CHAPTER 13

13 Legal, ethical and professional aspects of medicines management

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the legal, ethical and professional aspects of medicines management
- think through issues and apply your professional judgement
- work within the legal and ethical frameworks that underpin safe and effective medicines management
- understand the need for keeping and maintaining accurate records
- work within the guidelines of national and local policies
- understand consent and how it is achieved.

Scenario: James Roper

Dr James Roper, known as Jim, is an 85-year-old gentleman who, until quite recently, has been living at home with his wife. Over the past four years he has been becoming increasingly forgetful, with progressive memory loss and increasing periods of confusion. He has become increasingly irritable and loses his temper easily. He has been admitted to the older people's mental health unit under the relevant mental health legislation following a diagnosis of vascular dementia.

Jim has been prescribed medication but he refuses to take it.

13.1 Legal aspects of medicines management

Legislation exists in relation to the prescribing, supply, storage and administration of medication, and when working with medication you must understand the relevant legislation and comply with it. The Medicines Act 1968, as developed via various statutory instruments, provides the legal framework for the manufacture, licensing, prescription, supply and administration of medicines in the UK.

The Medicines Act 1968 classifies medicines into the following categories:

- prescription-only medicines (POMs) – supplied or administered to a person on the instruction of an appropriate practitioner, for example a doctor, dentist or one of a range of non-medical prescribers from other healthcare professions
- pharmacy-only medicines – these can be purchased from a registered primary care pharmacy, provided that the sale is supervised by a pharmacist; for example hydrocortisone cream, analgesia containing low-dose codeine phosphate

- general sale list medicines (GSLs) – these do not need a prescription or the supervision of a pharmacist and can be obtained from retail outlets; for example paracetamol, aspirin.

The Misuse of Drugs Act 1971 prohibits the possession, supply and manufacture of medicinal and other products, except where such possession, supply and manufacture has been made legal by the Misuse of Drugs Regulations 1985. This legislation deals with what are known as controlled drugs. It categorises these into five schedules. In healthcare it is mainly the Schedule 2 medicines that concern us – medicines such as morphine, diamorphine and pethidine – and Schedule 3 drugs such as barbiturates.

13.1.1 Patient Group Direction

A Patient Group Direction (PGD) is a written direction relating to the supply and administration of POMs to groups of people with known specified conditions. A PGD, signed by a doctor and agreed by a pharmacist, can act as a direction to a nurse or other designated healthcare professional to supply and/or administer POMs to people using their own assessment of need, without necessarily referring to a doctor for an individual prescription.

The law is clear that the majority of care should be provided on an individual, person-specific basis, and that the supply and administration of medicines under PGDs should be reserved for those situations where this offers an advantage for care without compromising safety, and where it is consistent with appropriate professional relationships and accountability. For example, a PGD may allow a paramedic to administer a prescription-only asthma medication in an emergency to a person known to have asthma.

13.2 Professional practice

Understanding 'the principles of safe and effective administration and optimisation of medicines' is a key feature of Platform 4 and Annexe B in *Future Nurse: Standards of Proficiency for Registered Nurses* (NMC 2018a). It involves working with people to ensure that their needs are being met and that they are involved in and consent to the treatments offered.

Exercising your professional judgement in administering medicines entails:

- knowing the person and what is in their care plan
- knowing the therapeutic uses of the medication, its normal dosage, side effects, precautions and contraindications
- considering the condition of the person before, at the time of, and following administration
- alerting the prescriber or another authorised prescriber if you have concerns about contraindications, allergic reactions or if, after assessment, you believe that the medication is no longer needed.

Following these guidelines will enable you to act in the best interests of the person in your care.

The British National Formulary (BNF) is published twice a year by the British Medical Association (BMA) and the Royal Pharmaceutical Society of Great Britain (RPS). It lists all the drugs available to the health service in Britain. There is also a version of the BNF for children. Both publications are available online at https://bnf.nice.org.uk. The BNF provides comprehensive information on the use, dosages, side effects and indications and contraindications of medications. It is provided to

pharmacists and doctors and is always available in the NHS wherever medication is administered. See *Chapter 14* for more detail about the practice of administering medicines.

13.2.1 Concordance

In administration of medicine, **compliance** is the extent to which an individual takes the medication as instructed. **Concordance** is a process that involves the person and aims to obtain their agreement to take the medication.

Sometimes people are reluctant to accept medication, or they stop taking it before completing the course. They may be worried about side effects or confused about dosages, or the regime may be complicated, especially if they have to take several different drugs in different dosages and at different times. Establishing a good relationship with a person and working with them to improve their knowledge about their medication will promote concordance and thus improve compliance.

13.2.2 Record-keeping

Hint for practice

Professional practice in medicines administration includes identifying how and when you make a mistake. Ensure you are aware of the local procedure regarding drug administration errors and discuss how these can be avoided with your supervisor. This will help you in working towards proficiency in this area.

Good record-keeping in relation to the administration of medication helps to deliver care of a consistently high standard. Accurate records mean that teams can offer continuity of care and all members of the team can be fully informed of progress and changes.

Healthcare records can be called in evidence, at a local level to investigate a complaint or even in a court of law. The courts adopt a very straightforward view to record-keeping – if something is not recorded, it has not been done.

The prescription chart

The prescription chart should contain at least the following information:

- person's name
- generic/brand name of substance to be administered
- form of the drug, e.g. tablet
- strength
- dosage
- timing
- frequency of administration
- route of administration
- start and finish dates
- authorised prescriber's signature with date
- any known allergies.

You must be able to read the entries on the chart. Many drugs have long complicated names which are often very similar to the names of other drugs, so it is vital to avoid mistakes. See *Section 14.5* for more information about medication errors and how to avoid them.

Medication administration records

Medication administration records must be clear. You must record the time of administration and the dosage. The drug administration chart should be signed by the person administering the drug; if, as a student nurse, you are being supervised in drug administration, then your signature should be countersigned by the registered nurse. If, for any reason, the drug is omitted then the reason for omission should be clearly recorded. It is just as important to know why something was not done.

13.2.3 Changes to a prescription

If changes to a prescription are necessary but have not been written on the chart, then a new prescription is required. Under exceptional circumstances, if the medication has been previously prescribed and changes to the dose are considered necessary, but the prescriber is unable to issue a new prescription immediately, then an instruction by email or text message may be used, depending on local policy. Therefore it is important that you have 'knowledge of how prescriptions can be generated, the role of generic, unlicensed, and off-label prescribing and an understanding of the potential risks' (NMC 2018a).

13.3 Storage of medication

ALERT

Remember that a hospital is a public place and, as such, the safe and secure storage of potentially dangerous substances, such as drugs, is paramount.

Once drugs arrive on the ward or in the department from the pharmacy, the nurse in charge will allocate an appropriately trained member of staff to check them and put them away in the correct cupboards or trolleys. The best way for you to learn how to do this is to get involved, under supervision, while you are on placement.

13.3.1 Safety checks

Before any medication can be stored there are two safety checks that need to take place.

1. A visual check is carried out on the packaging. If the packaging has been tampered with or damaged, the medication should be returned to the pharmacy.
2. A visual check is also carried out on the drug label. The label will show the expiry date of the medication; if the label has been altered in any way, or if the expiry date has passed, the drug should be returned to the pharmacy.

13.3.2 The storage of medication at an appropriate temperature

The clinical effectiveness of a drug may change if it is stored at the wrong temperature. The RPS (2018) sets out recommendations on how to store medications at appropriate temperatures. Local healthcare organisations will have their own variations on these recommendations, so you must familiarise yourself with the local policies. Local policy for drug storage should be based on product information and a summary of product characteristics, and you should familiarise yourself with this information.

Room-temperature storage

Most of the drugs that we see in clinical practice can be stored at room temperature. They are usually marked as 'Do not store above 25°C'. As long as the drug is stored within the recommended temperature range, variation should not alter the stability or shelf life of the drug concerned. Where and how drugs are stored at room temperature is therefore important. For example, they should not be stored in direct sunlight. During periods of extreme heat the drugs should be protected where possible by refrigeration.

Cold storage

Some drugs require cold storage. The information on temperature storage in relation to specific drugs can be found in the BNF and in manufacturer's guidelines. Any product requiring cold storage between 2°C and 8°C should be stored in a locked refrigerator designed for the storage of medication. Medications must

not be stored in a fridge that is used to store food because of the risk of cross-contamination of the foodstuff or the medication, and the possibility of error or misuse.

The basic requirement for temperature monitoring is a thermometer that measures maximum and minimum temperatures. This should be placed in the fridge with the drugs and positioned so that, as far as possible, it will not be affected by the opening and closing of the door. It is good practice to read and record the temperature daily and reset the thermometer, although your local hospital policy in this respect should be checked.

When storing medications in refrigerators avoid placing the medication in contact with the chiller plate or coil, as this may cool the drug to below the recommended temperature. This is particularly important with high-risk products such as vaccines. In the ideal position space around the drug allows for air circulation.

A very small number of specialist drugs require freezer storage. The same principles apply to their management and storage. The temperature range recommended for these is below –5°C.

13.3.3 The location of medication cupboards and trolleys

Medications should be stored in a convenient place for staff in order to allow access. Cupboards and trolleys for medication storage should be in sight for security reasons. They should be sited appropriately according to the nature and stability of the products they contain. Particular attention should be paid to:

- the height of cupboards, so that staff can reach the medication without excessive bending or stretching
- avoidance of direct sunlight and locations that are prone to extreme temperatures that could affect the effectiveness or shelf-life of the drugs
- prevention of surface contamination of medication containers.

Drug trolleys

These are lockable mobile storage units for medications and are used in a ward environment where drug rounds will occur regularly. The drugs they contain should be stored as described above and, when not in use, the trolley should be locked and secured to the wall for safety. During a drug round you should not leave the trolley open if it is unattended. If you have to leave the trolley then it should be locked. The keys for the drug trolley should be held by the person in charge of the ward.

Drug cupboards

A drug cupboard is a lockable, static unit, wall-mounted (heights vary), often in a clean utility room to which unauthorised personnel do not have access. There should be nominated cupboards for drugs that are taken internally and for lotions that are for external use only. The keys should be held by the nurse in charge of the ward or clinical area, as this nurse has overall responsibility for the activity on the ward or department. Regulations for the storage of substances hazardous to health are set out in the Control of Substances Hazardous to Health Regulation (COSHH) (HSE 2002).

Common IV fluids and emergency drugs are the only medications that are not stored in a locked cupboard. However, emergency drugs do have to be in a sealed container. IV fluids are usually stored in the ward's store cupboard, and emergency drugs are usually kept with the cardiac arrest trolley/defibrillator.

ALERT

Remember that ward or department medications are for use only with people under care and are not for the use of members of staff or anyone else.

People may have their own drug cupboards. This allows them to administer their own medication as prescribed with supervision. The use of this method is on the increase (and having individual cupboards that contain bespoke medication for a named person certainly reduces medication errors). Drugs are usually stored in a wall-mounted locked cabinet next to the person's bed. The person has the key and is responsible for it, but the policy on this may vary depending on local organisational procedures.

13.4 Controlled drugs

Controlled drugs (CDs) can be defined as drugs of addiction that produce dependence. Examples are diamorphine and pethidine. They are an essential part of modern clinical practice and are used in a wide variety of clinical conditions for acute and chronic pain management, anaesthesia, palliative care, and so on.

The Misuse of Drugs Act (1971) and the Misuse of Drugs Regulations (2001, as amended) regulate the use and distribution of CDs. Local policies and procedures will be in place and you must make yourself familiar with them.

Common CDs include:

- diamorphine
- morphine sulphate
- pethidine
- dihydrocodeine (injectable)
- fentanyl.

13.4.1 Administration of controlled drugs

CDs should always be checked by two registered nurses or midwives during the preparation and administration processes when two registered practitioners are available. However, at times, this might not be achievable, for example in community hospitals or during quieter night shifts. If it is detrimental to person-centred care not to give the drug, the registered nurse may use an appropriately trained healthcare worker as the second check. The person performing the check is verifying that the stock level of the particular drug corresponds to the drug register (see below). Any mistakes in the register should be crossed out with a single line, then signed and dated. If difficult drug calculations are required, then two registered members of staff must be involved in the preparation of the drug.

Procedure 13.1: Administering controlled drugs

STEP 1 Check the stock level with the controlled drug register.

STEP 2 Sign the register and the person's prescription chart (both staff members).

STEP 3 Perform an identity check of the person to receive the medication (nurse administering).

STEP 4 Record the dose administered.

STEP 5 Dispose of any leftover drug appropriately (see below).

STEP 6 Amend the controlled drug register (see below).

13.4.2 Storage of controlled drugs

CDs should only be stored in a clinical area if there is an appropriately qualified member of staff on the ward or in the department where the drugs are to be kept.

ALERT

1. Remember that if the controlled drugs cabinet can be easily observed by staff then other people can also see it. Make sure that it is always locked to prevent unauthorised access.
2. Controlled drugs cabinets are often in busy areas such as near the nurses' station. Follow the correct procedures for administering CDs in order to minimise risk and prevent mistakes occurring.

CDs must be stored in a locked cabinet reserved solely for this purpose that can be opened only by a unique key carried by the healthcare professional responsible for the drugs. It is common practice for these cabinets to be inside an additional locked cabinet, although this is not required. There is often a red indicator light on the cabinet to inform staff that it is open. These cabinets should be secured to a wall and somewhere that is easily observed by staff.

The keys for the controlled drugs cabinet should be held by the nurse in charge and kept separate from other keys associated with the clinical area. Local arrangements will be made for the storage of spare keys or keys for areas which are not staffed 24 hours a day. Lost or stolen keys should be reported immediately to senior staff, who will then follow local protocols.

If CDs need to be refrigerated, they should be stored in a separate locked fridge solely for that purpose. CDs should be kept in their original packaging and, unlike other drugs, should not be transferred to other containers for distribution.

13.4.3 The controlled drug register

Any area that stocks CDs must hold a register of the drugs held. The purpose of the register is to monitor and record the usage and current balance of the drug stock. The nurse in charge of the unit or department is responsible for ensuring that regular stock checks take place, and for maintaining accuracy of the current balance. The frequency of these checks will depend on local policy, but daily checks are a minimum. The checks should be carried out by two members of staff, one a registered nurse and a second nurse or responsible person, for example a student nurse or senior healthcare worker (again depending on local policy).

Any movement of CDs, whether for administration, disposal or return to pharmacy, should be recorded. Any discrepancies should be brought to the immediate attention of the nurse in charge. An untoward incident form must be completed for actual and near-miss incidents involving CDs.

13.4.4 Ordering and receiving controlled drugs

Any area with CDs should also hold a drug-ordering book or electronic means of ordering. The nurse in charge of that area is responsible for maintaining a list of the names, signatures and grades of nurses who are authorised to order such drugs. There will be an indication as to how much of a drug needs to be held in stock. Overstocking or understocking should be avoided. Staff within the relevant areas will have an idea of the amount of CDs that are used on a daily basis.

Each item requested should be ordered on a separate page, including the date, a signature and printed name of the person ordering the drugs. This order will then be forwarded to the pharmacy department where it will be checked and the drugs prepared for collection or delivery (depending on local policy).

The delivery or collection of the drugs will be carried out by a member of the hospital staff with a valid identification badge. When the drugs arrive at the clinical area, a registered nurse must check the delivery, referring to the original order. A signature will be required on the delivery record.

These drugs should then be recorded in the area's CD register, including the date received, quantity supplied and amended running balance. This recording should be carried out by two members of registered staff. Senior staff and pharmacy should be informed of any discrepancies. As a student nurse you will not be in

a position to order CDs, but refer to your local hospital policy regarding students undertaking the checking procedure.

If there is a requirement for CDs outside of pharmacy hours then your local hospital will have a policy and procedure to follow. There may be slight variations between organisations, so be sure to read up on this if you change your place of work.

13.4.5 Disposal of controlled drugs

CDs must be destroyed in accordance with the laws specified in the Misuse of Drugs Regulations (2001). Your local pharmacy will have identified persons who are responsible for the disposal of these drugs. If CDs are no longer required within your area then they must be sent back to the pharmacy department. The nurse in charge should inform the pharmacist of this. An entry must be made into the CD register of the return of the drug involved and this should be signed by the appropriate members of staff.

Individual doses of CDs that have been prepared but not administered may be destroyed at ward or department level. A second qualified nurse should witness the destruction of the drug and a record should be kept in the CD register, with both nurses signing the register. Destruction should take place in a safe and appropriate manner. Small amounts of CDs should be emptied into a sharps bin to render them irretrievable. The emptied vial or ampoule should then also be placed in the sharps bin. When the bin is sent for destruction it should be labelled 'Contains mixed pharmaceutical waste and sharps – for incineration' (DH 2007).

13.5 The capacity to consent

Every adult is presumed to have the mental capacity to consent to or refuse treatment, including medication, unless he or she:

- is unable to take in and retain the information provided about the medication by the treating staff, particularly as to the likely consequences of refusal, or
- is unable to understand that information, or
- is unable to weigh up the information as part of the process of arriving at a decision.

Although the responsibility for the assessment of capacity lies with the treating clinician, other practitioners have a responsibility to participate in discussions about the assessment.

If a person is capable of giving or withholding consent, no medication should be given without their agreement, even if refusal could adversely affect their health or shorten their life. The person should be provided with adequate information about the nature, purpose, risks and viable alternatives to the proposed medication.

Registered nurses, midwives and health visitors must respect a competent adult's refusal as much as they would his or her consent. The consequences of failing to do so can be severe, amounting to criminal battery or civil trespass and also a breach of a person's human rights. (There is an exception to this principle relating to treatment authorised under the relevant mental health legislation, which will be discussed later in this chapter.)

13.5.1 Who makes the decision?

If a person is deemed to be incapable of providing consent, or the wishes of a mentally incapacitated person appear to be contrary to the best interests of that person, then someone has to decide whether or not to administer medication.

It is the registered practitioner's responsibility to provide an objective assessment of the person's needs and the type of treatment that has been suggested. This should not, however, be done in isolation. There are many people involved in an individual's care and treatment, and the following people could be consulted:

- relatives
- carers
- members of the MDT.

A collaborative decision should be reached, taking into consideration the views, concerns and knowledge of all those involved in the decision-making process. The best interests of the person must always be paramount in reaching the decision.

In some cases, a person may have given previous instructions while still competent, perhaps in the form of a living will or advance statement. These wishes should be respected provided that they are clearly applicable to the present circumstances and there is no evidence to suggest that the person has changed their mind.

Hint for practice

The legal aspects of practice are very important and there are times when complex decisions need to be made. However, remember that you are never expected to make these decisions on your own. Your Trust/organisation will also have legal advisors to assist in these matters.

The views of people close to a person can be helpful in clarifying wishes and establishing their best interest. However, you should note that no one, not even a spouse, can consent for someone else.

People can be incapable of giving consent for many reasons, some of which may be only temporary. For example, they might be in a coma, unconscious, mentally ill or just suffering from the sedative effects of medication. Capacity to consent may change and therefore needs to be reviewed on a regular basis by the team involved with the person.

13.5.2 Consent and mental illness

If a person is detained under a section of the Mental Health Act (1983), the Mental Health (Northern Ireland) Order (1986) or the Mental Health (Care and Treatment) (Scotland) Act (2003), the principles of consent still apply to any medication that is not related to the mental disorder for which the person has been detained. It is essential to continue to assess their capacity to consent to or refuse such medication. The same principle applies to people with a learning disability who are not suffering from a mental illness.

The position is different, however, with regard to medication for the mental disorder for which the person has been detained. Medication can be given against the person's wishes for the first three months of the treatment order, or after this if sanctioned by a second opinion approved doctor (SOAD). A SOAD is appointed by the appropriate statutory mental health body to provide second opinions on treatment.

13.5.3 Children and consent

The principles governing consent apply equally to everyone, albeit with some restrictions in relation to children. If a child is under the age of 16 they are generally considered to lack the capacity to consent to or refuse treatment, including medication. The parents (or those with parental responsibility) retain this right unless the child is considered to have sufficient understanding and intelligence to make up their own mind. You can find out more about this by reading the Fraser Guidelines (DH 2004), which were the result of the court case *Gillick v. West Norfolk and Wisbech Area Health Authority* (1985), in which a mother argued that a doctor should not be able to provide contraceptive advice to her daughter, who was under the age of 16, without consulting the mother.

A child of 16 or 17 is presumed to be able to consent for themselves. The refusal of treatment by a child of any age can be a complex matter. If the refusal could lead to severe injury or death, the child's decision can be overruled by the Court of Protection. Parents may consent for a child in this circumstance, but this would only be acceptable in an emergency if it were not possible to obtain a court order. In Scotland the law is different: the parents' consent cannot override a refusal of consent by a competent child, regardless of age. In all situations the best interests of the child remain paramount.

13.5.4 Disguising medication

The act of disguising medication in someone's food or drink is referred to as covert administration. Although disguising medication in this way may be seen as a way of helping someone get the right medication and thus helping them get well, it is an act of deception. The NMC *Code* (2018b) requires each registrant always to act in such a manner as to justify public trust and confidence. They must also work co-operatively with people and families and respect their involvement in the planning and delivery of care. Covert administration of medication is generally not seen as good practice by the NMC.

If a decision is taken to administer medication covertly, then the best interests of the person are paramount. The best interests of the person relate to interventions that would save life or prevent deterioration or ensure an improvement in the person's physical or mental health. However, the right of the person to give or withhold consent should always be fully recognised. Any decision made regarding the administration of covert medication must be clearly documented in the care plan, and the healthcare professional or team making the decision will be accountable for it.

Scenario: James Roper

Jim has been admitted to the older people's mental health unit under the relevant mental health legislation following a diagnosis of vascular dementia.

Jim has been prescribed medication but he refuses to take it. The MDT in charge of Jim's care discuss the issues. They also involve Jim's wife in the discussion.

It is agreed by the MDT that Jim does not have the capacity to consent and that his refusal to take his medication is therefore not an informed decision taken with an understanding of the consequences. A further consideration is that the medication he is refusing has been prescribed for the treatment of the condition for which he has been admitted.

After much discussion, the members of the MDT agree that it is in Jim's best interest for the medication to be administered, and a decision is taken by the team and in agreement with his wife to disguise the medication in his morning porridge.

Activity

When you are next on clinical placement:

1. Find a copy of the BNF and look up and make notes on some of the drugs currently prescribed for people in your care.
2. Obtain the policies and procedures relating to the administration and storage of medicines in your placement setting and familiarise yourself with the requirements.

Summary

Key points from this chapter:

- You must always keep in mind the legal, ethical and professional aspects of medicines management when administering medicines.
- You need to be aware of and adhere to national and local policies.
- Working collaboratively with the people under your care helps to gain consent and concordance.
- Accurate and up-to-date records help practitioners to provide a high standard of care.
- Medications must be stored in an appropriate location and at an appropriate temperature.
- There are specific regulations and guidelines relating to the prescription, ordering and receipt, storage, administration and disposal of controlled drugs.
- You should be aware of the laws around capacity and consent.

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CHAPTER 14

14 Administration and optimisation of medicines

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the importance of administering medicines safely
- understand basic pharmacology
- identify the various routes for the administration of medications
- prepare selected drugs for injection
- identify sites used for intradermal, subcutaneous, intramuscular and intravenous injections
- administer medication via various routes using suitable and appropriate techniques
- correctly and safely calculate drug dosages using recognised formulas
- understand the risk factors associated with the administration of medication
- reduce the risk of medication errors
- understand the importance of reporting errors and near misses.

Scenario: Daniel Grant

Mr Daniel Grant is a 47-year-old man who has been admitted to the medical ward having sustained a severe dog-bite to his left arm. His arm is extremely swollen and has been elevated to reduce swelling. On admission, Daniel reports to the admitting nurse that he is allergic to penicillin.

Daniel is to be treated with IV antibiotics.

14.1 General safety issues

Safe administration of medicines involves the 5Rs or 5 Rights – Right person, Right drug, Right dose, Right route, Right time:

- *Right person* – check name bands, taking particular care with children if siblings are present
- *Right drug* – clarity of prescription
- *Right dose* – calculations: grams (g), milligrams (mg), micrograms (mcg), nanograms (ng)
- *Right route* – for example oral, rectal, intramuscular, intravenous
- *Right time* – for example once every four hours (4 h).

In addition:

- Check the expiry date of any medication that you administer.
- While administering drugs you should have access to appropriate reference sources to support safe administration (the BNF and BNF for Children).
- You should confirm the accuracy of complex dose calculations.

- Staff should be educated and assessed as proficient before administering drugs.
- People with allergies should wear readily distinguishable wrist bands.
- Serious administration errors and 'near misses' should be reported to the relevant reporting authority.

Follow these principles:

- Wash and dry hands before and after administration of medication.
- Use gloves where appropriate, and remember hand-washing is still just as important when wearing gloves.
- Explain and gain consent from the person in your care and ensure that they are comfortable following any procedure.
- Check the medicine against the prescription chart – ensure the right person, right medication, right dose, right time, right route and that the medicine is within date.
- Use a non-touch technique – do not handle medications directly.

14.2 Basic pharmacology

All pharmaceutical substances carry risks and may be toxic. Before administering any medication always familiarise yourself with the correct dose and the possible side effects of that medication.

To be effective, a drug must reach the desired concentration in the part of the body where it is required to act and this concentration must be maintained for the appropriate period of time. This aim depends on the key interactions that take place between the drug and the body after the drug has been administered.

Medical pharmacology is the science of drugs and how they interact with the body. These chemical interactions are referred to as:

- **pharmacokinetics** – the branch of pharmacology concerned with the movement of drugs in the body and the way in which the body handles a drug (*Table 14.1*)
- **pharmacodynamics** – the branch of pharmacology concerned with the action of drugs on the human body and the way in which a drug works.

14.2.1 Pharmacokinetics

Table 14.1 The key processes involved in pharmacokinetics.

Absorption	The process by which fluids, nutrients and drugs are taken up by the body tissues. The major site for absorption is the small intestine, which is lined with villi, small projections that increase the surface area of the intestine. The rate of absorption is determined by the route of administration and the solubility of the drug – that is, whether the drug is water- or fat-soluble.
Distribution	When a drug enters the bloodstream it is rapidly diluted and transported through the body. Drugs bind to plasma proteins in the blood in greater or smaller proportions. The unbound proportion is free to move from the bloodstream to its target to apply its pharmacological effect.
Metabolism	Metabolism is the first stage of drug clearance, the means by which a drug is chemically altered to aid elimination from the body. The primary site where metabolism occurs is the liver. Other organs and tissues where it occurs to a lesser extent include the lungs, kidneys, blood and intestine.
Excretion	The metabolites of a drug leave the body. The primary routes for this are through the GI system (in faeces) or the renal system (in urine). Other routes include evaporation, exhalation, saliva and breast milk.

14.2.2 Pharmacodynamics

ALERT

When administering medication to children two registered nurses must always check and administer.

Most drugs produce their effects by acting on proteins known as receptors in the following ways:

- They provide chemical compounds that are deficient in the body – for example, vitamins.
- They interfere with the function of receptor sites by enhancing the response – for example metformin, which increases receptor sensitivity to insulin in people with type 2 diabetes mellitus (this is known as an **agonist** drug).
- They interfere with the function of receptor sites by preventing usual responses – for example tamoxifen, which binds to the receptor site and blocks normal cell function and activity; this in turn prevents cell growth stimulation in oestrogen-dependent breast tumours (this is known as an **antagonist** drug).
- They act against invading cells in the body – for example antibiotics.
- They act against abnormal cells in the body – for example anti-cancer drugs.
- They interfere with cell functions and metabolic pathways by either stimulating or inhibiting normal levels of activity in, for example, hormone disorders.

The therapeutic effect of a drug is also referred to as the desired effect of the drug. A side effect is an effect that is unintended and may range from mild and harmless to severe and harmful. Allergic reactions may be either mild or severe. A mild reaction may include a variety of symptoms such as a skin rash or loose stools. It is important to ask a person about and observe them for side effects. Any signs of allergic reaction should be reported immediately to the nurse in charge.

A severe allergic reaction usually occurs immediately after the administration of the drug and this is referred to as an **anaphylactic reaction**. This requires immediate treatment of symptoms and can in some cases be fatal if not treated promptly.

ALERT

Children differ both anatomically and developmentally from adults and this must be taken into consideration when administering drugs. Here are some important points in relation to medication calculation and administration when treating children:

- From birth to adolescence the child is undergoing dramatic changes in physical growth, psychosocial development and sensitivity to drugs. As the body's composition changes with development so do the rate and extent of drug distribution.
- Plasma protein levels are lower in children. Variable plasma protein levels can increase drug toxicity or speed up the elimination process.
- Total body water is greater in children under two years of age, including the proportion that is extracellular fluid. As water-soluble drugs are distributed mainly in the extracellular fluid a greater mg-to-kg dose of water-soluble drugs is needed in young children. As a result, if the child is dehydrated, the response to drugs will change and the dose may become a toxic dose. If doses are repeated before the dehydration is corrected there is a greater risk of toxicity occurring.
- Drug-metabolising enzymes are limited in infants. However, as maturity progresses, the liver becomes able to metabolise most drugs. Immature organ systems are sensitive to toxic effects and have limited compensatory mechanisms.
- Changes in pharmacokinetics are likely to occur at times of change – for example at puberty.

14.3 Drug calculations

You will need a certain amount of mathematical skill to become a safe and efficient practitioner when administering medication. The most common type of medication error is administering the wrong dose.

Some drug administrations can require calculations to ensure that the correct volume or quantity of medication is administered. In these situations a second registrant should check the calculation in order to minimise the risk of error.

The use of calculators to determine the volume or quantity of medication should not act as a substitute for arithmetical knowledge and skill. You must be able to demonstrate proficiency and accuracy when calculating dosages, and continuously develop your numeracy skills, as a core requirement to meet proficiency in medicines administration (NMC 2018a).

In many instances dosage calculations can be carried out using mental arithmetic, but it is important to understand the principles involved and have a working knowledge of the formulas (based on proportions) for more complex calculations. On a drug administration chart you may be given the total dose a person is to receive. You will have to calculate the correct amount of medication, whether it is in tablet or liquid form, and required to make up the prescribed dosage.

14.3.1 Standard metric measurements

All drug calculations require an understanding of the metric system.

1 kilogram(1 kg)	= 1000 grams (1000 g)
1 gram (1 g)	= 1000 milligrams (1000 mg)
1 milligram (1 mg)	= 1000 micrograms (1000 mcg)
1 litre (1 L)	= 1000 millilitres (1000 mL)
1 millilitre (1 mL)	= 1000 microlitres (1000 mcL)

ALERT

Micrograms, mcg, are sometimes written as µg. Do not use this symbol as it is too easily mistaken for mg, milligrams.

14.3.2 Some standard medical abbreviations used in prescriptions

Latin abbreviation	Instruction
p.o.	by mouth
s.c.	subcutaneous
i.m.	intramuscular
i.v. (or IV)	intravenous
b.d.	twice a day
t.d.s.	three times a day
p.r.n.	given as necessary
q.d.s.	four times a day
a.c.	before food
p.c.	after food
stat	given immediately
e.c.	enteric coated
caps	capsules
elix	elixir
guttae	drops
neb	nebuliser
p.r.	rectal administration

14.3.3 Medication in tablet form

Example 1

A person is prescribed 120 mg of a drug but the tablets are available as 40 mg tablets only. You need to calculate how many 40 mg tablets to give in order to administer 120 mg of the drug. The formula is:

$$\textbf{Number of tablets} = \frac{\textbf{amount prescribed}}{\textbf{amount in each tablet}}$$

The prescription is the total amount of medication you are asked to administer – 'what you want'. The availability is the amount in each tablet – 'what you've got'.

$$\textbf{Number of tablets} = \frac{\textbf{what you want}}{\textbf{what you've got}}$$

In this case, what you want is 120 g (the amount prescribed) and what you've got is 40 g (the amount in each tablet). So:

$$\text{number of tablets} = \frac{120}{40}$$

Simplify the numbers by cancelling the zeros (that is, dividing top and bottom by 10):

$$\frac{12}{4} = 3$$

Three tablets should be given. If in doubt, check your answer by asking yourself how much medication is administered if you give three tablets:

$3 \times 40 \text{ mg} = 120 \text{ mg}$

14.3.4 Medication in liquid form

When drugs are in liquid form, the availability is given in terms of the concentration of the solution or suspension. As an example, pethidine hydrochloride is available in a concentration of 50 mg/mL. This means that 50 milligrams of pethidine hydrochloride are dissolved in every millilitre of liquid. If the quantity of drug to be given is known, and the concentration of the drug in solution is known, we can calculate the volume of liquid required. This is necessary for drugs in liquid form, as prescriptions are usually by weight, whereas the drugs are labelled by concentration.

Example 2

An adult is prescribed 400 mg of a drug formulated in syrup. The syrup contains 500 mg of the drug in 5 mL.

First estimate a sensible dose: if 5 mL of syrup contains 500 mg of the drug, then you will need less than 5 mL for a dose of 400 mg.

The formula is:

$$\textbf{Volume of liquid required (mL)} = \frac{\textbf{dose required (mg)} \times \textbf{volume of dose available (mL)}}{\textbf{dose available (mg)}}$$

In other words

$$\textbf{Volume of liquid required (mL)} = \frac{\textbf{what you want (mg)} \times \textbf{what it comes in (mL)}}{\textbf{what you've got (mg)}}$$

What you want is 400 mg. What you've got is 500 mg/5 mL of syrup

So the calculation is:

$$\frac{400}{500} \times 5 = 4 \text{mL}$$

The volume is given in millilitres as 4 mL. Check your answer by asking yourself how much medication is administered if you give 4 mL of syrup:

$$4 \text{mL} \times \frac{500 \text{mg}}{5 \text{mL}} = 400 \text{mg}$$

14.3.5 Calculation by body mass

Example 3

ALERT

Remember: if in doubt, consult experienced colleagues.

As children and infants metabolise drugs differently from adults, it is much more difficult to have definitive drug dosages for children. Therefore they are prescribed according to body mass, rather than for a specific age range.

Jon is five years old and he weighs 20 kg. He needs a dose of ibuprofen. The doctor has prescribed 400 mg four times daily. You suspect this dose is too high and decide to check a paediatric formulary. The formulary states that ibuprofen is prescribed at 20 mg/kg in four divided doses.

What the formulary means is that 20 mg of the drug should be given to the child for every 1 kg that they weigh. As Jon weighs 20 kg, he will need 20 mg × 20 = 400 mg of ibuprofen.

However, the formulary also states that this should be administered in four divided doses. So each dose should be 400 mg ÷ 4 = 100 mg.

14.4 Routes of drug administration

Drugs can be administered in many ways, and the doctor or non-medical prescriber will usually prescribe both the medication and the route of administration (*Table 14.2*). Not all drugs can be administered by all the possible routes; they are usually available in one or two formulations prepared for different routes. The most appropriate route will depend on several factors, for example a person's general condition, potential side effects of the drug, speed of onset and rate of absorption required.

Each route of administration has advantages and disadvantages. For example, a person with chronic asthmatic bronchitis who is having breathing difficulties may be prescribed the drug Ventolin (salbutamol) for symptom relief. Rather than being given the drug orally the prescriber would prescribe an inhalation to give rapid localised relief by introducing the drug directly into the respiratory tract.

Table 14.2 Routes of drug administration.

Oral	by mouth
Sublingual	under the tongue
Rectal	into the rectum
Vaginal	into the vagina
Inhalation	via the respiratory tract
Nasal	into the nose
Topical	onto the skin or mucous membranes
Optic	into the eye
Aural	into the ear
Injection	intramuscular, subcutaneous, intradermal and intravenous
Intraosseous	into the substance of the bone (in resuscitation situations)
Intra-articular	into the cavity of a joint
Intracardiac	into the heart
Intrathecal	into the spinal fluid
Epidural	into the epidural space

14.4.1 Oral administration of drugs

Oral administration of drugs is the most convenient and safest route.

Table 14.3 Advantages and disadvantages of oral administration.

Advantages	Disadvantages
The route is convenient and safe. There is more time to react if side effects occur. When liquid medicines or pre-dissolved tablets are used, the absorption process occurs more rapidly. Variety: oral medications may be formulated as tablets, capsules, lozenges/pastilles, linctus, elixir or syrup. There are also sublingual preparations – medications that are placed under the tongue (in spray form or tablets).	Medicines have a lower therapeutic effect if administered orally, and some medicines are destroyed by gastric juices. Efficacy depends on the rate and extent of absorption, how well the drug dissolves in physiological solutions (for example gastric juices) and the chemical properties of the drug. The appearance, smell and taste of the medicine may pose issues for some people, particularly children. Absorption of drugs can only take place when the drug has dissolved/disintegrated into the gastric juices.

All these points must be considered for every individual, as everyone has different requirements.

14.4.2 Rectal administration

Drugs that are given rectally are presented in the form of suppositories (solid torpedo-shaped formulation) or enemas (liquid form) (see also *Chapter 12*). Enemas are generally used as a treatment for constipation or to prepare the bowel for investigations or surgery. The absorptive surface area of the rectum is small but the good blood supply ensures rapid absorption. Note that faecal impaction will delay the absorption of the drug and would be a contraindication, as would recent colorectal surgery, due to potential **paralytic ileus**.

Table 14.4 Advantages and disadvantages of rectal administration.

Advantages	Disadvantages
Can be given if the person is nauseous or vomiting. Can be used for people with swallowing difficulties and unconscious people. Avoids destruction of the drug by gastric acid and irritation of the upper gastrointestinal (GI) tract.	Anal or rectal irritation can occur. Suppositories are made to melt at body temperature, so need to be kept refrigerated. Side effects can include inflammation and even perforation of the colonic mucosa. Undignified for the person (especially if self-administration is not practical).

Remember that many people may be unwilling to have drugs administered via this route and a careful assessment should be made of the appropriateness of this choice.

Examples of drugs administered via this route are:

- diclofenac (analgesia)
- paracetamol (antipyretic)
- diazepam (given to stop a seizure)
- aminophylline (bronchodilator)
- prochlorperazine (anti-emetic).

See *Chapter 12* for the administration procedure.

ALERT

As with any procedure performed you should remember the important issues of hand-washing and infection control. When handling creams and ointments you are advised to wear gloves to prevent absorption and cross-infection.

14.4.3 Topical administration

The topical route consists of drug administration via the epidermis (the outer layer of the skin) and external mucous membranes. It therefore includes administration into eyes and ears (optic and aural administration).

Epidermal administration

Table 14.5 Epidermal formulations.

Type	Characteristics and examples	Application
Creams	Oil-based preparations, for example hydrocortisone cream for inflammatory skin disorders such as non-specific dermatitis	It is advisable to apply creams to the skin with a gauze swab.
Ointments	Water or oil-based, semi-solid and usually dispensed in tubes Used for inflammatory skin disorders, providing an external layer of protection to the skin	It is advisable to apply ointments to the skin with a gauze swab.
Pastes	Thick in texture and therefore need to be 'spread', for example zinc and coal tar paste for psoriasis	A wooden or plastic spatula must be used to aid application.
Local anaesthetic	Examples: Ametop gel and EMLA cream used to block superficial pain from venepuncture and cannulation, particularly used with children	Follow the manufacturer's instructions for use.
Transdermal patches	Small patch that adheres to the skin Examples: patches containing hyoscine to prevent motion sickness or oestrogens for hormone replacement	Attach to the chest, abdomen or upper arm. The site should be changed each time.

Optic administration

Table 14.6 Optic formulations.

Type	Characteristics and examples	Application
Eye drops	Presented in solution in either single-use containers or in a larger bottle with a dropper Used for example in the treatment of glaucoma	Each container is for use only in one individual, and if both eyes are treated, use a separate bottle for each eye labelled 'left' and 'right'. Avoid touching the eye with the dropper to avoid contamination of the dropper. Drop vertically inside the lower lid and ask the person to blink between drops.
Eye ointments	Water or oil-based, semi-solid and usually dispensed in tubes Used for example in the treatment of conjunctivitis	Using your forefinger, gently pull the lower lid downwards to form a small pocket for the ointment. Squeeze the ointment tube until the ointment forms a ribbon and apply inside the lid margin. Usually applied at night.

Aural administration

Table 14.7 Aural formulations.

Type	Characteristics and examples	Application
Ear drops	Presented in solution in either single-use containers or in a larger bottle with a dropper Used for example in the treatment of otitis externa or impacted earwax	Each container is for use only in one individual, and if both ears are treated, use a separate bottle for each ear labelled 'left' and 'right'. Avoid touching the ear with the dropper end to avoid contamination of the dropper. Ask the person to sit upright with their head leaning slightly away from the affected ear. Pull the pinna of the ear upwards and backwards and instil drops as prescribed.

14.4.4 Drug administration via inhalation

Inhalation therapy is the most effective way to administer preventative and symptom-relieving drugs for respiratory conditions and diseases. The drug will reach the lungs directly, requiring a lower dose and minimising systemic side effects.

There are several different inhaler devices with different operating methods (*Figure 14.1*). These are usually operated by the individual, but it is important that nurses learn the correct technique for each type of inhaler in order to check and improve the person's technique. A regular review of technique improves treatment adherence and symptom control and reduces the incidence of acute episodes.

Figure 14.1 Various inhaler devices.

With all types of inhaler, the person inhales an aerosol (a mixture of air and medication), and the speed of inhalation (the inspiratory flow) will influence where the medication is deposited and absorbed. Inhaler devices are designed to deliver drug particles of a certain size to the small airways during inhalation.

Metered-dose inhalers (MDIs)

The most used inhaler, the MDI consists of a plastic housing and a metal aerosol canister (*Figure 14.2*). The canister contains a mixture of propellant and medication. When the canister is pressed, a precise quantity of the mixture is released. With most MDIs, the aerosol is delivered under pressure at high speed. The person should inhale as they actuate the device. Inhalation should be slow and steady; inhaling too fast may cause a greater proportion of the aerosol to land at the back of the throat and be swallowed, thus reducing the beneficial clinical effect and increasing the potential for local and systemic side effects.

Figure 14.2 A metered-dose inhaler (MDI). Reproduced under a Creative Commons Attribution-Share Alike 3.0 unported licence. Author: James Heilman, MD. Available at https://commons.wikimedia.org/wiki/File:Fluticasone.jpg

MDIs with holding chamber/spacer

A container that holds the aerosol cloud produced by an MDI is known as a spacer or chamber. There are different types of these MDI + spacer combinations. They remove the need to coordinate inhaling and pressing the canister (many people find this difficult), and they also help to reduce the number of large particles in the aerosol cloud (which are too big to reach the parts of the lung that would benefit).

Dry-powder inhalers (DPIs)

Drug delivery from DPIs (*Figure 14.3*) is triggered by inhaling through the device. While each design of DPI is different, the basic principle remains the same. A metered quantity of powdered medication is drawn into the airflow and follows a specific route within the inhaler towards the user's mouth.

Figure 14.3 Dry-powder inhalers. Reproduced under a Creative Commons Attribution-Share Alike 4.0 International licence. Author: Brett Montgomery. Available at https://commons.wikimedia.org/wiki/File:Dry_powder_inhalers.jpg

Nebulisers

A nebuliser is used to administer a solution of drug in the form of a fine mist for inhalation. Nebulised medication can be administered, carried by bottled or piped oxygen, to treat acute respiratory problems in the hospital setting. Alternatively a compressor can be used to supply air as a vehicle (*Figure 14.4*). Each method requires a nebuliser pot and mask or mouthpiece. The pump (compressor unit) forces air through the liquid (drug solution) in the drug chamber (nebuliser chamber). This converts the liquid into a fine mist, which can be breathed in through a mask or mouthpiece.

Figure 14.4 Compressor and nebuliser device. Reproduced under a Creative Commons Attribution-Share Alike 3.0 unported licence. Author: Trainer2a. Available at https://commons.wikimedia.org/wiki/File:Jet_nebulizer.jpg

14.4.5 The prescription and preparation of injectable medicines

Drawing up drugs for injection

The complexities associated with the prescription, preparation and administration of injectable medicines mean that this route poses greater potential risks for people than do other routes of administration.

Prescribing

Some nurses who have undergone further specialist training are able to prescribe medication. This is not part of every nurse's role, but thorough checking of the prescription certainly is.

STEP 1 All prescriptions for injectable medicines must specify the following:

- the person's name
- the prescriber's signature
- the approved medicine name
- the dose and frequency of administration
- the date and route of administration
- the allergy status of the person.

STEP 2 Where relevant, the prescription, or a readily available local protocol, must specify the following:

- the brand name and formulation of the medicine
- the concentration or total quantity of medicine in the final infusion container or syringe
- the name and volume of diluent and/or infusion fluid
- the rate and duration of administration
- stability information to determine the expiry date of the final product
- type of rate-control pump or device(s) to be used
- the age and weight of any person under 16 years of age
- the date on which treatment should be reviewed
- arrangements for fluid balance or clinical monitoring – these should be made on an individual basis and according to local protocol and clinical need.

Procedure 14.1: General preparation of injectable medicines

STEP 1 Read all prescription details carefully and confirm that they relate to the person to be treated (**right person**).

STEP 2 Ensure that the area in which the medicine is to be prepared is as clean, uncluttered and free from interruption and distraction as possible. Ideally, preparation should take place in an area dedicated to this process.

STEP 3 Assemble all materials and equipment: sharps bin for waste disposal, medicine ampoules/vials, diluent, syringes, needles, alcohol wipes, disposable protective gloves, clean reusable plastic tray.

STEP 4 Check that:

- the medication has not passed its expiry date
- containers, vials and packaging are undamaged
- medicines have been stored as recommended, for example, in the refrigerator
- you have the correct medication (**right drug**) – beware of the risk of confusion between similar-looking medicine packs, names and strengths; read all labels carefully
- the formulation, dose, diluent, infusion fluid and rate of administration correspond to the prescription and product information
- the person has no known allergy to the medicine
- you understand the method of preparation.

STEP 5 Calculate the volume of medicine solution needed to give the prescribed dose. Write the calculation down and obtain an independent check by another qualified healthcare professional (**right dose**).

STEP 6 If the medicine is to be added to a bag of IV fluid, a label that clearly identifies the drug and dose that has been added should be attached to the bag.

STEP 7 Clean your hands according to local policy. Put on a pair of disposable protective gloves.

STEP 8 Use a 70% alcohol wipe or spray to disinfect the surface of the plastic tray.

STEP 9 Assemble the syringes and needles. Peel open wrappers carefully and arrange all ampoules/vials, syringes and needles neatly in the tray.

STEP 10 Use a 'non-touch' technique: avoid touching areas where bacterial contamination may be introduced, for example syringe-tips, needles, vial tops. Never put down a syringe attached to an unsheathed needle.

STEP 11 Prepare the injection by following the manufacturer's product information or local guidelines.

Procedure 14.2: Preparation – withdrawing solution from an ampoule into a syringe

STEP 1 Tap the ampoule gently to dislodge any medicine in the neck.

STEP 2 Snap open the neck of glass ampoules, using an ampoule snapper if required, or twist off the top of plastic ampoules.

STEP 3 Attach a needle to a syringe and draw the required volume of solution into the syringe. Tilt the ampoule if necessary. Note that the necks of some plastic ampoules are designed to connect directly to a syringe without use of a needle, once the top of the ampoule has been twisted off.

STEP 4 If the ampoule contains a suspension rather than solution, it should be gently swirled to mix the contents immediately before they are drawn into the syringe.

STEP 5 Invert the syringe and tap lightly to aggregate the air bubbles at the needle end. Expel the air carefully.

STEP 6 Remove the needle from the syringe and fit a new needle or sterile blind hub.

STEP 7 Label the syringe.

STEP 8 Keep the ampoule and any unused medicine until administration to the individual is complete to enable further checking procedures to be undertaken.

Procedure 14.3: Preparation – withdrawing solution or suspension from a vial into a syringe

STEP 1 Remove the tamper-evident seal from the vial and wipe the rubber septum with an alcohol wipe. Allow to dry for at least 30 seconds.

STEP 2 With the needle sheathed, draw into the syringe a volume of air equivalent to the volume of solution you need to draw up. If a large volume is required, you may have to repeat thisstep (push–pull technique).

STEP 3 If the vial contains a suspension rather than solution, mix the contents by swirling gently immediately before they are drawn into the syringe.

STEP 4 Remove the needle cover and insert the needle into the vial through the rubber septum. Invert the vial. Keep the needle in the solution and slowly depress the plunger to push air into the vial.

STEP 5 Release the plunger so that solution flows back into the syringe.

STEP 6 Continue to inject small volumes of air and draw up an equal volume of solution until the required total is reached. This 'equilibrium method' helps to minimise the build-up of pressure in the vial.

STEP 7 Alternatively, the rubber septum may be pierced with a second needle to let air into the vial as solution is withdrawn. The tip of the vent needle must always be kept above the solution to prevent leakage.

STEP 8 With the vial still attached, invert the syringe. With the needle and vial uppermost, tap the syringe lightly to aggregate the air bubbles at the needle end. Push the air back into the vial.

STEP 9 Fill the syringe with the required volume of solution then draw in a small volume of air.

STEP 10 Expel excess air from the syringe. Remove the needle and exchange it for a new needle or a sterile blind hub.

STEP 11 The vial(s) and any unused medicine should be kept until administration to the person is complete.

Procedure 14.4: Preparation – reconstituting powder in a vial and drawing the resulting solution or suspension into a syringe

STEP 1 Remove the tamper-evident seal from the vial and wipe the rubber septum with an alcohol wipe. Allow to dry for at least 30 seconds.

STEP 2 Withdraw the required volume of diluent (for example, water for injections or sodium chloride 0.9%) from ampoule(s) into the syringe.

STEP 3 Inject the diluent into the vial. Keeping the tip of the needle above the level of the solution in the vial, release the plunger. The syringe will fill with the air which has been displaced by the solution (or if the contents of the vial were packed under vacuum, solution will be drawn into the vial and no air will be displaced). If a large volume of diluent is to be added, use a push–pull technique as described in Procedure 14.3 above.

STEP 4 With the syringe and needle still in place, gently swirl the vial(s) to dissolve all the powder, unless otherwise indicated by the product information. This may take several minutes.

STEP 5 Withdraw the required volume of solution from the vial into the syringe. Alternatively, the rubber septum may be pierced with a second needle to let air into the vial as solution is withdrawn. The tip of the vent needle must always be kept above the solution to prevent leakage.

STEP 6 If a purpose-designed reconstitution device is used, the manufacturer's instructions should be read carefully and followed closely.

Procedure 14.5: Preparation – labelling injection and infusion containers

STEP 1 All injections should be labelled immediately after preparation, except for syringes intended for immediate push (bolus) administration by the person who prepared them. Under no circumstances should an operator be in possession of more than one unlabelled syringe at any one time, nor must an unlabelled syringe be fitted to a syringe driver or similar device.

STEP 2 Labels used on injectable medicines prepared in clinical areas should contain the following information:

- the name of the medicine
- the concentration
- the route of administration
- the diluent and final volume
- the person's name
- the expiry date and time
- the name of the practitioner who prepared the medicine.

STEP 3 Place the final syringe or infusion and the empty ampoule(s)/vials(s) in a clean plastic tray with the prescription for taking to the person for administration.

14.4.6 Injection technique

A good injection technique is fundamental to nursing care, and it is essential that you possess the necessary knowledge and skill to undertake this safely.

Skin disinfection before an injection is routinely carried out in many hospitals; if skin disinfection is undertaken then skin should be cleaned with an alcohol swab for 30 seconds and then allowed to dry for 30 seconds. You may find different healthcare organisations have different practices.

Suggested needle size for different types of injection (not including IV) are shown in *Table 14.8*.

Table 14.8 Recommended needle gauges.

Type of injection	Needle gauge adult	Needle gauge child
Subcutaneous	25/26 G × 16 mm	26 G × 16 mm
Intramuscular	21 G × 40 mm	23 G × 30 mm

The depth and angle of introduction of the needle is shown in *Figure 14.5* for the different injection techniques.

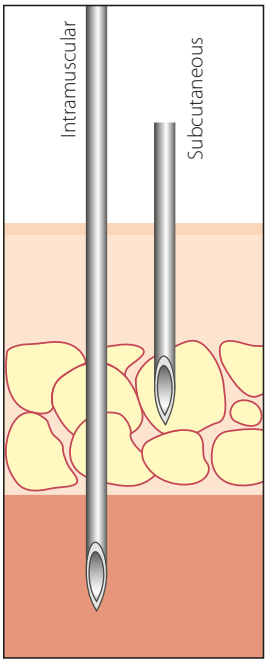


Figure 14.5 Needle insertion depths and angles for different injection techniques.

Subcutaneous injections

The subcutaneous route is used for slow, sustained absorption of medicine, such as insulin and heparin. The sites for subcutaneous administration are illustrated in *Figure 14.6*.

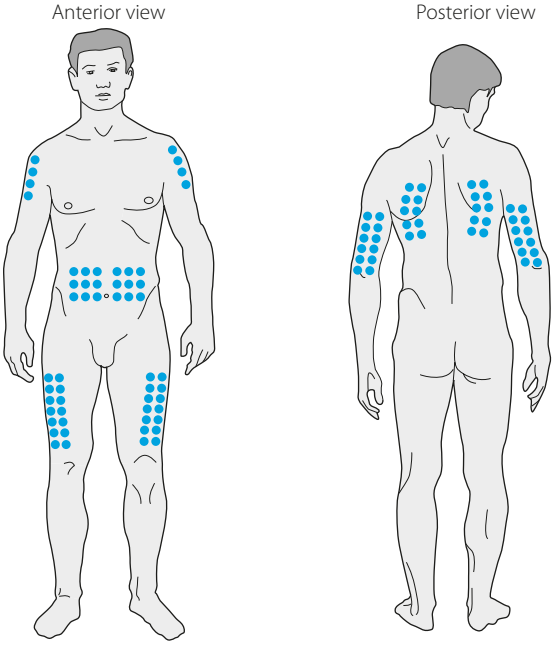


Figure 14.6 Recommended subcutaneous injection sites.

Subcutaneous injections should be given at a 90° angle into a raised skin fold. Regular injections such as insulin should have the site rotated. It is not necessary to aspirate after needle insertion and before injecting subcutaneously, as piercing a blood vessel with this type of injection is very rare.

ALERT

The intramuscular route is not recommended in children, unless there is no other alternative, because of the potential for pain and trauma. Also, children have less muscle mass and perfusion, which will therefore affect drug absorption.

Intramuscular injections

Intramuscular injections deliver medication into large muscles, providing rapid systemic action and absorbing relatively large volumes. There are several sites used for injection but, wherever is chosen, it is important to inspect the site for signs of inflammation, infection or skin lesions. The site should also be assessed for muscle mass, as thin emaciated people may not have enough muscle mass in certain areas.

The main sites available for intramuscular injection include:

Deltoid muscle of the upper arm – often used for vaccines such as hepatitis B and tetanus. The injection should be given at a 90° angle to the skin (*Figure 14.7*). This area is only suitable for the injection of small volumes of fluids.

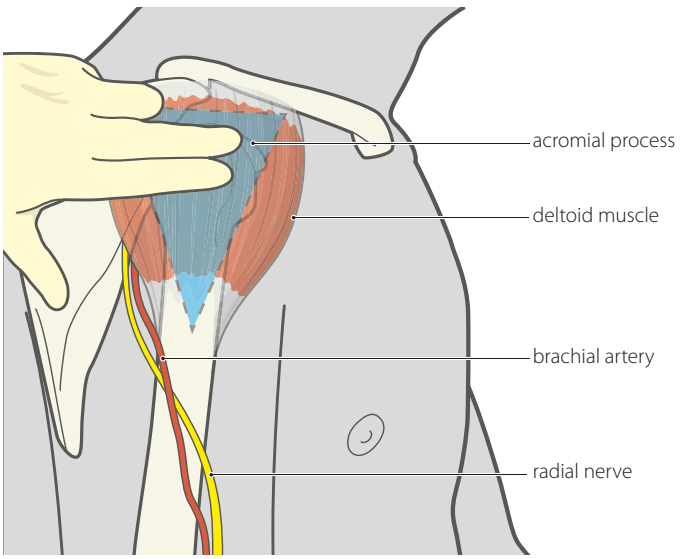


Figure 14.7 Deltoid intramuscular injection site.

Gluteus maximus muscle – often referred to as the 'upper outer quadrant of the buttock' (*Figure 14.8*). This site is commonly used, although there have been reports of damage to the sciatic nerve. In the case of infants and children (not yet walking) it is not recommended as a suitable site.

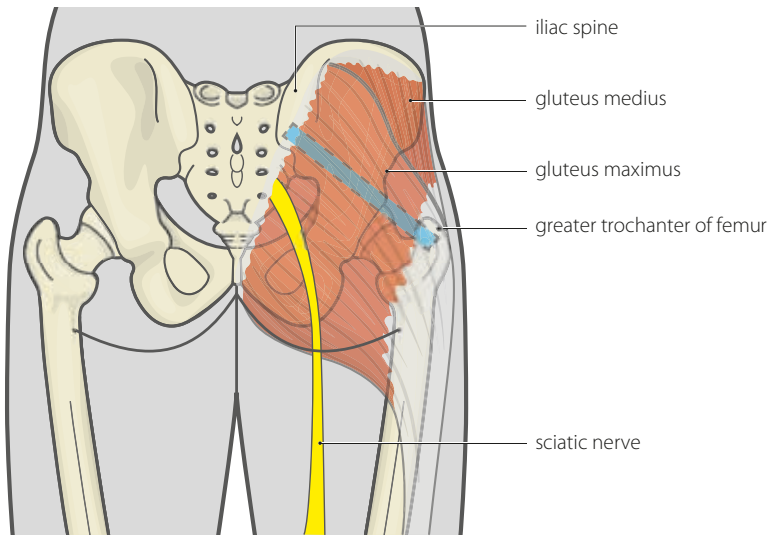


Figure 14.8 Gluteus maximus intramuscular injection site.

Quadriceps muscle on outer aspect of femur – this is the traditional site for intramuscular injections (*Figure 14.9*) and is a safe site for infants and young children.

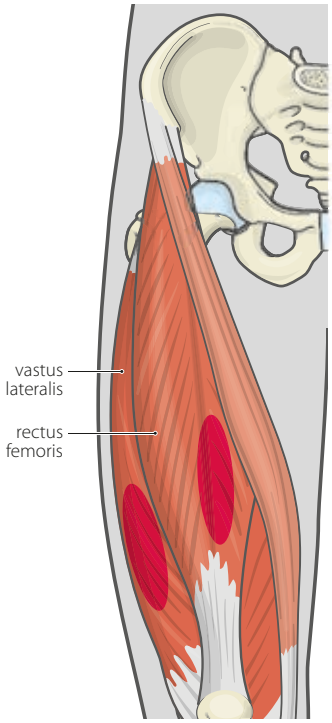


Figure 14.9 Quadriceps muscle on outer aspect of femur intramuscular injection site.

Procedure 14.6: Administering intramuscular injections

STEP 1 Prepare the medication following the appropriate procedure described above (Procedures 14.1–14.5).

STEP 2 Insert the needle to sufficient depth to enter the muscle, with a dart-like action at 90° to the skin.

STEP 3 Withdraw on the plunger to ensure that the needle has not entered a blood vessel.

STEP 4 Inject the medication by pressing on the plunger.

STEP 5 Withdraw the needle from the injection site.

STEP 6 Apply gentle pressure with a gauze swab for 10 seconds.

STEP 7 Dispose of sharps safely.

STEP 8 Wash hands.

STEP 9 Check the condition of the person.

STEP 10 Document the administration of the medicine on the prescription sheet.

The **Z-track technique** (*Figure 14.10*) was initially introduced for drugs that stained the skin such as iron for injection. It is now commonly used with the intramuscular injection technique as it is associated with less pain.

Procedure 14.7: Z-track injection technique

STEP 1 Prepare the medication following the appropriate procedure described above (Procedures 14.1–14.5).

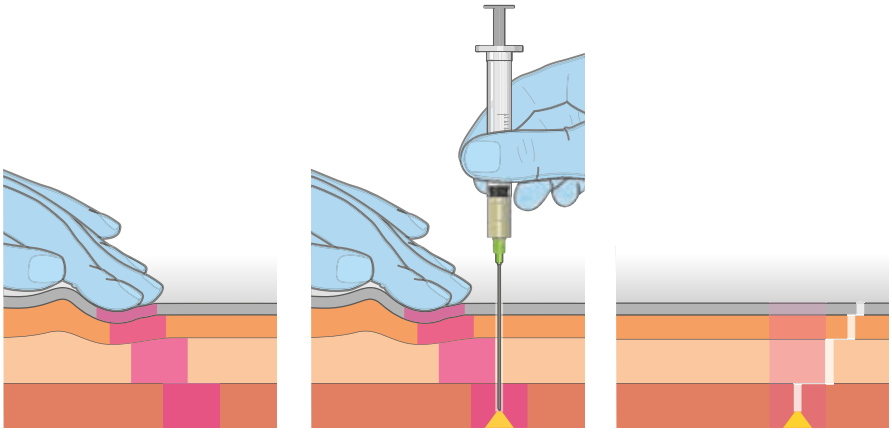
STEP 2 Pull the skin downwards or to one side at the intended site.

STEP 3 Insert the needle and administer the injection.

STEP 4 Allow 10 seconds before removing the needle to allow the medication to diffuse.

STEP 5 On removal of the needle release the retracted skin. This causes the tissues to close over the deposit of medication and prevent it from leaking.

Figure 14.10 Z-track technique.



14.4.7 Intravenous fluid therapy

IV fluid therapy will be explained briefly to help you to understand these procedures so that you can assist medical staff and qualified practitioners effectively when they are preparing to administer medication via this route. Venepuncture and cannulation are dealt with in more detail in *Chapter 19*.

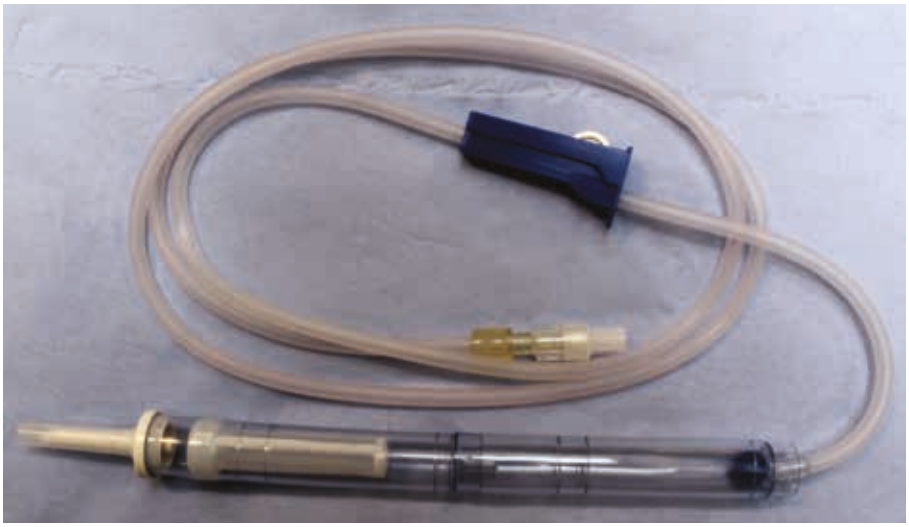
Equipment used for IV fluid therapy

Cannulas and needles are sized by their diameter, which is called the gauge. The smaller the diameter, the larger the gauge: a 22-gauge cannula is smaller than a 14-gauge cannula.

Administration sets are commercially prepared in sterile packs. In the set you will find (*Figure 14.11*) specialised sterile tubing with, at one end, a rigid trocar (bag spike) protected by a sterile sheath. At the other end is a protected Luer connector nozzle (needle end). At the trocar end the tubing widens into a drip chamber. An adjustable roller clamp surrounds the tubing below the drip chamber. This allows the flow of fluid to be regulated at the prescribed flow rate.

Intravenous pumps (volumetric infusion pumps) (*Figure 14.12*) are used to give a precise flow rate. They are available in many different types and makes. You must be familiar with the type of pump used in your area of practice. There is evidence that many drug errors occur due to unfamiliarity with equipment.

Figure 14.11 An administration set.



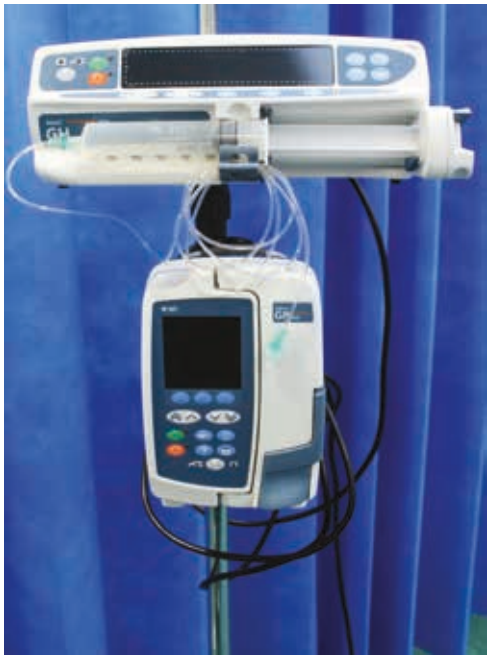


Figure 14.12 Volumetric infusion pumps.

ALERT

IV infusions to children should always be delivered using a volumetric infusion pump.

Burette sets are specialised administration sets for infusions when a volumetric infusion pump is not available and the person needs a more accurate flow rate than a standard gravity-controlled delivery set. The burette has a calibrated drip chamber with a roller clamp above and another roller clamp below the chamber. The chamber is filled with the amount of fluid prescribed and this fluid is infused at the rate (in millilitres per hour) prescribed. For the infusion to continue the drip chamber must be refilled as prescribed when empty.

Syringe drivers deliver small amounts of IV fluid containing drugs. Most of these drivers are designed for a specific size of syringe, so you must always ensure that you are using compatible equipment. They can be adjusted to deliver a specific volume (number of millilitres) per hour.

Intravenous infusions

For adults the prescriptions for IV fluids are usually written along the following lines: normal saline 0.9% 1 litre over 6 hours. The flow rate is written in units of millilitres per hour (mL/h) and the formula is:

$$\textbf{Flow rate} = \frac{\textbf{volume (in mL)}}{\textbf{time (in hours)}}$$

In this case:

$$\textbf{Flow rate} = \frac{\textbf{1000 (volume in mL)}}{\textbf{6 (time in hours)}} = \textbf{167 mL/h}$$

The calculation is rounded up to the nearest whole number. Check your answer by asking how many mL of medication are administered in 6 hours at 167 mL/h:

In 1 h you are administering 167 mL of fluid. So in 6 h you are administering 6 × 167 mL = 1002 mL.

In order to set up a manually controlled drip accurately by eye, you need to be able to calculate the number of drops per minute that will equate to the amount

prescribed. This is the drop rate, which is written in units of drops per minute (drop/min). The formula for this calculation is:

$$\textbf{Drop rate} = \frac{\textbf{volume (in drops)}}{\textbf{time (in minutes)}}$$

To calculate the volume in drops, you need to know how many drops of the fluid ordered are contained in 1 mL. You should find this information on the packaging of the administration set.

Volume in drops = volume in mL × number of drops per mL

With a clear fluid, 20 drops usually equals 1 mL. In this case, for one litre:

Volume in drops = 1000 (volume in mL) × 20 (number of drops per mL)
= 20,000 drops

To find the rate in minutes, you need to change the hours into minutes by multiplying by 60. In this case:

Time in minutes = 6 (time in hours) × 60 (minutes per hour) = 360 minutes

Using the formula for calculating the drop rate, in this case:

$$\textbf{Drop rate in drop/min} = \frac{\textbf{20,000 (volume in drops)}}{\textbf{360 (time in minutes)}} = \textbf{56 drops/minute}$$

Note that this is again rounded to the nearest whole number. Check your answer by asking how many mL of medication are administered in 6 hours at 56 drops/min:

20 drops make 1 mL of fluid, so 1 drop makes 1/20 mL, so 56 drops make 56/20 mL, which is 2.8 mL. So you are administering 2.8 mL of fluid every minute, and therefore 60 × 2.8 mL every hour, which is 168 mL. In 6 hours, you would administer 6 × 168 mL of fluid, which is 1008 mL.

ALERT

Blood is thicker than clear fluid and drops of blood are larger in volume than drops of clear fluid. Therefore, when transfusing blood, it takes fewer drops to constitute 1 mL (usually 15 drops = 1 mL of blood, 20 drops = 1 mL of clear fluid). Always remember to check on the packaging how many drops of fluid are in 1 mL.

Example

A person requires 500 mL IV infusion over 12 hours. 20 drops of the fluid make 1 mL. What is the flow rate and how many drops per minute should you administer?

$$\text{Flow rate} = \frac{500\,(\text{volume in mL})}{12\,(\text{time in hours})} = 42\,\text{mL/h}$$

$$\text{Drop rate} = \frac{500\,(\text{mL}) \times 20\,(\text{drops/mL})}{12 \times 60\,(\text{time in minutes})} = 14\,\text{drops/min}$$

Check these answers by asking how many mL of fluid are administered in 12 hours at a flow rate of 42 mL/h and at a drop rate of 14 drops/minute.

Reconstituting drugs

Many drugs require reconstitution and most pharmacy departments offer a centralised IV additives service where drugs are prepared under strict aseptic conditions using laminar flow chambers. However, there will still be times when drugs need to be reconstituted in the ward setting. This must be done in a clean environment, using aseptic technique and sterile equipment. The task should be undertaken only by a medical practitioner or a registered nurse who has undergone appropriate training.

Other ways of administering medication intravenously

Medication can be added to a volume of fluid for infusion via the bag or burette, or directly into the IV cannula through a bung near the entry site. Flush solutions, for example normal saline, should be used between bolus additions to ensure that incompatible drugs do not mix and, at the end of each administration, to ensure no drug remains in the line.

14.4.8 Oxygen therapy

Oxygen (O_2) is a colourless, odourless, tasteless gas that constitutes approximately 21% of atmospheric air. Oxygen, carried by the red blood cells, is essential for all tissues. However, some organs are more susceptible to the lack of oxygen (**hypoxia**) than others; for example adequate oxygenation at all times is vital to prevent tissue damage to the brain, heart and kidneys. Hypoxia can occur for several reasons:

- failure of oxygen transport, for example shock due to bleeding, cardiac problems or sepsis (in general terms, shock, whatever the cause, relates to the inability to deliver oxygen to the tissues)
- cardiac disease
- pulmonary disease
- poisoning, for example by carbon monoxide
- birth asphyxia.

Oxygen is the first drug given in an emergency/resuscitation situation. The use of oxygen can be life-saving, but its use must be appropriate. As with all drugs, oxygen can cause complications and involves risks. For example, oxygen must be administered with caution to people whose respiratory drives are maintained by hypoxia, such as adults with COPD. These people retain carbon dioxide because of the reduced ventilation through their diseased lungs. The main respiratory stimulus for these people is a falling pO_2 (pressure of oxygen) known as the **hypoxic drive**, and if high levels of oxygen are given then their respiratory drive will diminish, potentially resulting in respiratory arrest.

Insufficient delivery of oxygen will lead to cell damage, hypoxia and, ultimately, death; excessive oxygen use in some people may lead to respiratory failure. It is therefore important to provide the prescribed percentage of oxygen to the person, no more and no less.

Oxygen is a prescription drug

There are two principal indications for oxygen therapy:

- to counteract hypoxia and to increase oxygen saturation levels, which requires the use of medium to high concentrations of oxygen
- to supplement oxygen levels without increasing carbon dioxide levels, using low-flow oxygen.

Oxygen therapy is prescribed and titrated according to need and is monitored for effectiveness via pulse oximetry. As oxygen therapy is a prescribed treatment, the following parameters should be documented on the person's prescription chart:

- starting device
- percentage
- flow rate in litres per minute
- duration of therapy
- target saturations.

Oxygen is prescribed by flow rate or by percentage and titrated to achieve the prescribed target saturations. The target saturation percentage range when

titrating oxygen parameters is 94–98% for acutely ill people and those returning from surgery, and 88–92% for people who have COPD and **hypercapnia** (elevated blood CO_2). It is important to note that people are individuals and each person has their own therapeutic range against which oxygen is titrated.

Oxygen delivery

Oxygen is provided in hospitals either via a piped system with flow valves to connect to the oxygen masks or in bottles (black body, white collar). Oxygen administration is a potentially dangerous procedure, because oxygen supports combustion and can convert a spark into a flame. Safety precautions must be taken in the immediate area of its use.

Oxygen devices

Low-flow devices

Low-flow devices such as nasal cannulas and simple face masks draw in supplemental oxygen with room air to deliver an increased percentage of oxygen. This is measured as the fraction of inspired oxygen, or FiO_2. A 24% concentration of oxygen, for example, is equivalent to FiO_2 of 0.24.

Nasal cannulas and headboxes/hoods are commonly used in the child health setting because they are an effective way of administering oxygen to children and they are better tolerated than a mask. A headbox/hood should be used for infants to enable the oxygen percentage concentration to be measured more accurately.

Figure 14.13 A nasal cannula.

A nasal cannula (*Figure 14.13*):

- delivers FiO_2 of 0.24–0.40
- requires a flow rate for an adult of 0.5–6.0 L/min
- is less restrictive than a face mask for communication and feeding.

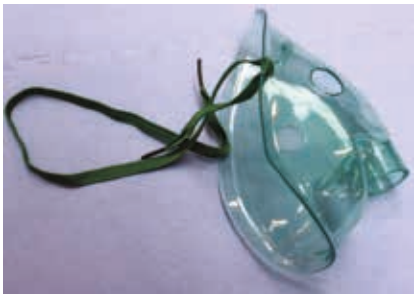


Figure 14.14 A simple face mask.

A simple face mask (*Figure 14.14*):

- delivers FiO_2 of 0.24–0.60
- requires a flow rate of 5–10 L/min
- must have a minimum flow rate of 5 L/min to prevent rebreathing of exhaled gas.

Fixed-concentration venturi masks (*Figure 14.15*) give a known concentration of oxygen. The oxygen masks are usually colour-coded and will indicate the percentage the person will receive and the flow rate in litres per minute. They are available in FiO_2 of 0.24/0.28/0.35/0.40/0.60. Medium-concentration masks will deliver FiO_2 of between 0.40 and 0.60. These are commonly used in post-operative recovery areas for short-term oxygen therapy following surgery.

Figure 14.15 A venturi face mask.

High-flow devices

High-flow partial rebreathing (*Figure 14.16*) or non-rebreathing (*Figure 14.17*) devices are used with people who are having difficulty maintaining their oxygen saturations, after trauma or cardiac arrest. The devices are generally for short-term use only. These devices deliver oxygen at rates above the person's normal inspiratory flow and supply a fixed percentage or FiO_2 generally between 0.60 and 0.90.

Figure 14.16 Using a partial rebreathing system.

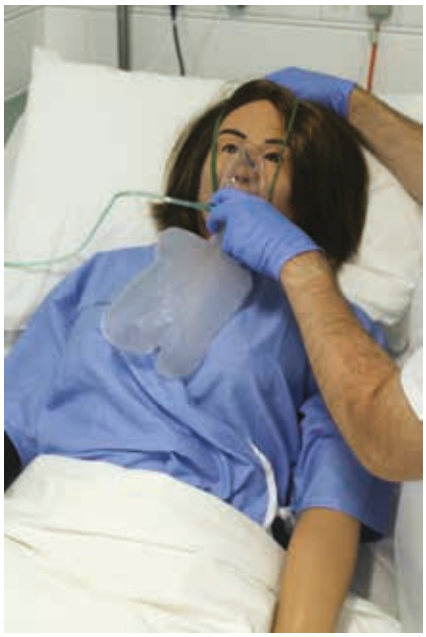
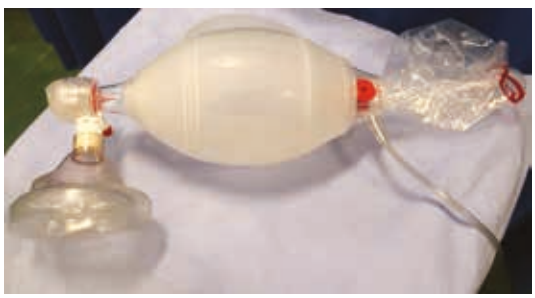


Figure 14.17 A non-rebreathing system.



Observations and complications

Regular observations of the person must be made while they are receiving oxygen therapy. If you are using a portable supply, check the cylinder regularly to ensure there is enough oxygen remaining in the cylinder.

Table 14.9 Potential problems associated with oxygen therapy.

Cause	Effect	Solution
Device fitted too tight	Pressure damage to ears, bridge of nose, nostrils Discomfort, claustrophobia leading to increased anxiety and non-concordance with treatment	Check device and loosen if necessary.
Device fitted too loose	Inadequate oxygen therapy	Check device and tighten if necessary.
Prolonged oxygen therapy	Dehydration of mucous membranes in upper respiratory tract	Provide regular oral care; use oxygen humidification.

Signs of inadequate oxygenation will present as:

- increased respiratory rate
- increased pulse rate
- confusion
- agitation or reduction in conscious levels
- **cyanosis** (blue or purple colouration of the skin or mucous membranes – in people with dark skins, easier to recognise from the gums).

People requiring long-term oxygen therapy will need humidified oxygen to prevent drying of the mucous membranes of the upper airway, as this can cause chest secretions to become sticky and difficult to expectorate. Humidifiers are a common source of bacteria and viruses associated with the respiratory system, so if humidification is being used the equipment must be used as per the manufacturer's instructions to prevent infection.

Pulse oximetry (oxygen saturation monitoring)

Pulse oximetry is used to monitor oxygen saturation and it will detect hypoxaemia before clinical signs become apparent. For more detail on pulse oximetry, see *Section 5.6*.

14.5 Medication errors

A medication error is any safety incident…

> *where there has been an error in the process of prescribing, preparing, dispensing, administering, monitoring or providing advice on medicines. These can be divided into two categories; errors of commission or errors of omission. The former include, for example, wrong medicine or wrong dose. The latter include, for example, omitted dose or a failure to monitor, such as international normalised ratio for anticoagulant therapy.*
> MHRA 2014

The most common errors are omitted medicines, wrong medicines, and wrong dose, strength or frequency of medicines.

Near misses

A 'near-miss' medication error is *an error that happened but did not reach the person*. For example, imagine that a doctor prescribes penicillin for someone who is allergic to penicillin. As long as this error is discovered before the penicillin is administered, it would be regarded as a near miss.

Scenario: Daniel Grant

During the 22:00 medication round, the night staff-nurse notices that Daniel is due 500 mg of IV flucloxacillin. This is to be his first dose.

The staff nurse recalls that Daniel is allergic to penicillin and notes that flucloxacillin is to be avoided in people who are allergic to penicillin.

Some questions to consider:
- Has a medication error occurred?
- What should the nurse's immediate response be?
- Who should be informed?

14.5.1 Risk factors

ALERT

As a student nurse you should not be administering medication without appropriate supervision by registered health and social care professionals (NMC 2018c).

As a student you will be working under the supervision of your practice supervisor, but it is still your responsibility to follow the general principles of medication administration. While you are on placement you also need to understand relevant local policies and procedures related to medication management and ask your supervisor to help you and support you with this process.

Some of the common risk factors involved in medicine administration include:

Human factors

- Inexperience in dealing with medication/drug delivery devices
- Unsupervised practice
- Inaccurate application of the 5Rs
- Distraction
- Carelessness
- Fatigue
- Complacency
- Communication
- Lack of knowledge about risk.

Workplace issues

- Busy environment
- Staffing shortage
- Poor reporting/auditing
- Vague policies/procedures related to medicine administration
- Transfer of medication/prescription charts from one clinical area to another.

Prescription issues

- Poor drug calculations
- Inaccurate prescription
- Illegible prescription
- Documentation.

Critical-care and child-care settings are particularly high-risk areas, as potent medicines are often prescribed and administered according to the weight of the

person. This makes the calculation of accurate dosage more complicated and increases the possibility of error.

14.5.2 Reducing the risks

The WHO's Patient Safety Curriculum Guide (2011) suggests ways to make medication use safer:

- Use generic names in preference to trade names.
- Learn and practise thorough medication history-taking.
- Know which medications are high risk and take precautions.
- Be very familiar with the medication you administer.
- Use memory aids.
- Remember the 5Rs when administering.
- Communicate clearly.
- Develop checking habits.
- Encourage people to be actively involved in the process.
- Report and learn from medication errors.

Here are some further simple guidelines that can help you to reduce errors and contribute to improvements:

- Follow the right protocols, policies and procedures.
- Do not allow yourself to be distracted.
- Remember the basic rules of drug administration.
- Think about yourself as a practitioner, know your limitations and seek help and support.
- Take some time to improve your knowledge about the medications that you are administering.

Hint for practice

There are some easy ways to avoid getting distracted while carrying out a drug round, such as using a 'Do not disturb' sign on the drug trolley or wearing a tabard which says 'Please do not disturb me!' You should also let other staff know that you are undertaking the drug round so that they can listen for and respond to the nurse call bells.

14.5.3 Review

In the event of a medication error the well-being of people in our care is paramount. Where the wrong drug or the wrong dose has been administered, or the drug has been administered incorrectly, the consultant responsible for the person and the nurse in charge must be informed as soon as possible. The MDT will decide whether any further action is needed in respect of care management. As a student nurse, you must do the appropriate baseline observations and document them alongside the plan of care.

People also have the right to be informed of a medication error or near miss, and the doctor or senior nurse is responsible for informing them.

14.5.4 Reporting

The reporting of medication errors and near misses is designed to protect both people receiving care and staff, and to identify areas where improvements in practice need to be made. It is not designed to apportion blame or to be part of the disciplinary process. Reporting all incidents of medication errors helps to improve the quality of care that we deliver to people. Reporting an incident may prevent it from happening again, and reporting is thus a key element in reducing risk.

As a student on placement you should familiarise yourself with your placement organisation's Untoward Incident Reporting System, as well as reading the current local and national policies and seeking support from your supervisor.

If you have made a medication error or witnessed others making an error, you must report it. Platform 1 of the NMC *Standards of Proficiency for Registered Nurses* requires you to 'apply the principles of courage, transparency and the professional

Hint for practice

Always remember the NMC *Code* – you are not expected to be perfect and mistakes may happen, especially as a student when you are learning to become proficient. However, you must be honest and uphold your duty of candour at all times.

duty of candour, recognising and reporting any situations, behaviours or errors that could result in poor care outcomes' (NMC 2018a, 1.3). If you need to report an error, whether your own or someone else's, there are people to help and support you both in the placement setting and at your education provider.

If a drug error has taken place, in addition to reporting the error, all medicine containers, syringes, infusions and administration equipment involved in the error must be retained safely for examination.

Reporting adverse reactions

People may experience reactions to the medications that they have been administered. Such reactions are not necessarily due to a medication error, but it is very important that these events are documented, the person examined and the event reported. You do not have to be certain that the drug caused the reaction; just be suspicious of a possible association and talk to your supervisor about it. Make sure you report all adverse reactions, even if the reaction is well recognised such as, for example, GI bleeding with anti-inflammatory drugs.

The Medicines and Healthcare products Regulatory Agency (MHRA) and the Commission on Human Medicines (CHM) run the 'Yellow Card' scheme. This scheme enables online reporting of adverse reactions by both health professionals and the public. It is used to collect information on suspected adverse reactions and to monitor the safety of medicines and vaccines. See the website http://yellowcard.mhra.gov.uk for more information.

The CHM particularly encourages the reporting of all suspected reactions in children.

Medicine defect reporting

Your organisation's policy will also require you to alert staff to a defect when a medical product, as supplied by the manufacturer, is not of the expected standard. Defects may involve, for example, inadequate or incorrect labelling, ineffective packaging, contamination or discolouration of the medicine. If you have any suspicion that there is a defect, do not use the drug and report it immediately to your supervisor and the nurse in charge, who will inform the duty pharmacist.

14.6 Complementary medicine

14.6.1 Important nursing principles

Registered nurses have a responsibility to 'safely use, share and apply research findings to promote and inform best nursing practice' (NMC 2018a, 1.7).

Many people seek treatment from a homeopath or buy over-the-counter treatments. Some treatments, particularly herbal remedies, may contain substances that are unsafe or affect the activity of prescribed medications. It is important to discuss this with the person being cared for if you think they may be using an alternative therapy. The person being cared for and the MDT should be involved in any discussion on what is acceptable, and the alternative therapy should be prescribed accordingly and administered in the same way as any other prescription. Any possible contraindications should be explained so that a person can make an informed choice. If there is a conflict and the person insists on continuing, the conflict should be documented in the care records. The *Code* states:

> make sure that the care or treatment you advise on, prescribe, supply, dispense or administer for each person is compatible with any other

> care or treatment they are receiving, including (where possible) over-the-counter medicines (NMC 2018b, 18.3)

Complementary medicine and traditional medicine include many different techniques and therapies for treating people, and feature increasingly in healthcare practice. The medical profession regards any technique or substance that has not undergone extensive research and clinical trialling with scepticism, and much complementary medicine remains scientifically unproven. However, certain complementary therapies may be effective, and they may be of psychological benefit, in as much as they make the person feel better.

Many complementary therapies are based on the following principles:

- a focus on the person not the disorder – find the cause, not the symptom
- the individual is a whole person who needs time, effort and understanding
- mind, spirit and emotions have an impact on the individual and their well-being.

Activity

On your next placement take some time with your practice supervisor(s) to discuss the commonly used medications within that clinical area. Learn about the medications and review the chapter learning outcomes. Obtain and learn the policy for reporting a drug error or near miss, and think about how you as a student nurse can limit the risks of making an error.

Summary

Key points from this chapter:

- All medicines must be administered to the right person, with the right drug, at the right dose, by the right route and at the right time – the 'five rights' or '5Rs'.
- The most common type of medication error is administering the wrong dose, so you must calculate dosages accurately and have them checked by a second practitioner if you are not sure.
- You must be trained and assessed as proficient before administering drugs.
- All incidents of medication errors must be reported in order to protect people receiving care and staff and to identify areas where improvements to the quality of care can be made.
- The risks of medication errors can be reduced by following recommended protocols, policies and procedures.
- Always follow the principles of hygiene and infection control.

Further reading

Davison, N. (2020) *Numeracy and Clinical Calculations for Nurses* (2nd ed). Banbury: Lantern Publishing.

References

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

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NMC (2018c) *Part 3: Standards for Pre-Registration Nursing Programmes*. London: NMC. www.nmc.org.uk/standards/standards-for-nurses/

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CHAPTER 15

15 Pain management

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the different types of pain
- recognise the symptoms of pain
- use appropriate tools and scales to assess pain
- understand the different types of analgesic drugs and their use in the treatment of pain
- understand non-pharmacological options for pain management.

Scenario: George Clarke

Mr George Clarke is 72 years old and lives at home with his wife Mary. George was diagnosed with Alzheimer's disease six months ago. This manifests itself in some minor memory difficulties around the home and disorientation when George is away from his home. He stopped driving three months ago following advice from his GP. Other than this, George has been relatively healthy with no hospital admissions in the last 10 years. However, he had to attend A&E last month when he accidentally walked into a door because he wasn't wearing his glasses. He takes four sorts of medication, one each for his Alzheimer's and arthritis and two for his blood pressure. His wife tends to all the household chores and finances, and she has to supervise George with his medication but, other than that, he is usually relatively independent.

Recently, George has started to experience some abdominal discomfort. He is becoming a little agitated and this is exacerbating his confusion. After a visit to his GP, George is admitted to the medical assessment unit at his local general hospital.

Following admission, George is examined by a doctor and assessed by his named nurse. Bloods are taken and investigations are ordered to try to ascertain the cause of George's pain. George is kept nil by mouth, and an IV infusion is commenced. Shortly after admission a pain assessment is performed, and it is clear that George's pain is increasing and that it is radiating into his back. In view of the findings following the doctor's examination, his blood results and the fact that he has been on long-term NSAIDs for his arthritis, the doctor decides that he needs an endoscopy for suspected gastric ulceration.

The procedure goes as planned, with the provisional diagnosis proving to be correct. He is transferred back to the medical ward for conservative treatment.

In view of his age and his complex needs he remains in hospital for a few days pending review of his home circumstances. He is then discharged home with a care package.

15.1 The aetiology of pain

Pain is an individual, unpleasant sensory and emotional experience. Our understanding of pain is that a stimulus, such as tissue damage to a finger (as in *Figure 15.1*), activates the pain receptor nerve endings in the skin. These receptors are known as **nociceptors**. Nociceptors convert the stimulus into nerve impulses; nerve fibres then transmit these impulses via the spinal cord to the brain, and the brain interprets these impulses as pain.

A break in the path of pain impulse may still result in an element of pain perception as, for example, with phantom limb pain. Stress and its physiological effects can also play a major part in the perception of pain, particularly where chronic pain is concerned.

Developments in the aetiology of pain have helped considerably with the management of pain, allowing selection of the most suitable drug or non-drug therapies for that individual.

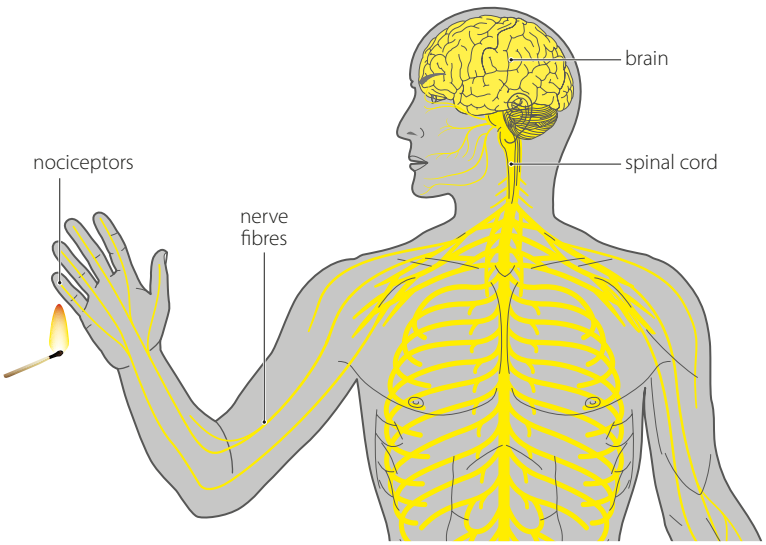


Figure 15.1 Pain transmission.

15.2 Types of pain

Pain can be described according to its duration and its source, and is usually separated into two categories: acute pain and chronic pain. In some instances, an individual may suffer from both – this is known as acute on chronic pain. Acute and chronic pain may be caused by a variety of stimuli:

- cutaneous (skin) pain
- visceral (abdominal) pain
- somatic (muscles, bones, etc.) pain
- neuropathic (damage to nerves) pain.

Cutaneous, visceral and somatic pain relate to the area of the body that has been injured. Neuropathic pain can be described as pain that arises as a result of damage to neural tissue, with the pain occurring in areas where there are sensory deficits.

15.2.1 Acute pain

Acute pain is pain that has started suddenly or recently, usually caused by a disease or injury. The pain generally has a limited duration (usually less than six months) and diminishes as that disease or injury heals. Examples of acute pain include:

- headache
- toothache
- pain following a physical injury (for example burns, sprains, fractures and lacerations)
- **dysmenorrhoea**
- abdominal pain.

Acute pain as protection from harm

Acute pain may sometimes help to protect the individual from further harm. For example, if a person is suffering from lower left-sided abdominal pain they are likely to have the pain investigated. The investigation may reveal an inflamed appendix, in which case the appendix will be surgically removed as an emergency before it perforates. Without the pain, there might have been no investigation and no surgery, and the person would be at serious risk of developing life-threatening complications such as peritonitis.

Behavioural psychology also plays a role in our response to pain. We learn to avoid potential causes of pain as, for example, when the pain is caused by touching a sharp object. The perception of the pain felt is transferred to our memory and we avoid touching the sharp object again.

15.2.2 Chronic pain

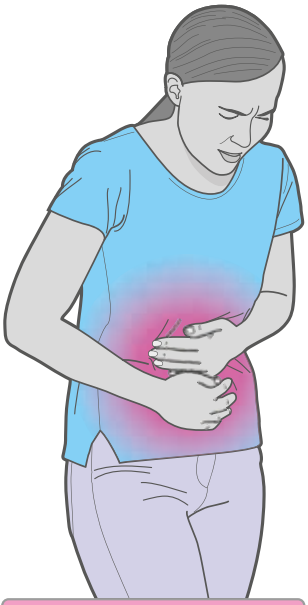
The British Pain Society (2013) defines chronic pain as 'continuous, long-term pain of more than 12 weeks or after the time that healing would have been thought to have occurred in pain after trauma or surgery'. Chronic pain occurs with many different types of illness, injury or disease. Examples of chronic pain include:

- back pain
- osteoarthritis
- rheumatoid arthritis
- cancer
- diabetic neuropathy
- post-herpetic neuralgia
- multiple sclerosis
- post-surgical pain.

If left untreated or not managed successfully, chronic pain can seriously affect the quality of life for sufferers and their carers. Feelings of helplessness, isolation or depression may arise and, in some instances, family breakdown may occur.

15.3 Symptoms of pain

Pain is frequently under-recognised, and it is imperative that healthcare professionals are aware of its symptoms. A person may express feelings of pain verbally, but non-verbal gestures or expressions too may indicate that they are



SYMPTOMS OF PAIN

fatigue
increased respirations
(raised pCO_2, decreased pO_2)
increased cardiac work
(tachycardia and hypertension)
drop in renal function
(urinary retention)
changes in intestinal motility
(constipation or paralytic ileus)

Figure 15.2 Symptoms of pain.

suffering from some form of pain. Examples of non-verbal expressions of pain include:

- grimacing or other facial expressions
- the person's overall posture
- guarding or holding the affected site
- inactivity or a reluctance to move the affected site.

15.3.1 Physiological symptoms

Figure 15.2 illustrates some examples of physiological symptoms of pain. Some of these can be observed and measured by the nurse:

- increased respiratory rate, measured by counting the person's respirations or by checking their blood gases for a rise in carbon dioxide and a reduction of oxygen levels
- increased cardiac function, ascertained by a blood-pressure check (elevated) and a pulse check (also elevated).

Elevated vital signs may occur for only a short time. The body will seek equilibrium, which could happen within an hour from the onset of the pain, and the vital signs will quite often return to the person's normal rate even if the pain is still persistent. Vital signs alone cannot therefore be relied upon to identify symptoms of pain.

15.4 Assessment of pain

Pain is subjective; we all have different pain thresholds. It is therefore generally recommended that pain should be assessed by the person experiencing it.

Pain management needs to be based upon the individual pain sufferer's perception, and not on our view of what the pain should be for that individual's injury or illness. If we have suffered an injury in the past and were able to cope with the resulting pain without analgesia, we should not assume that someone else with the same injury will also be able to cope without analgesia. Doing so results in an inconsistent assessment of the person's pain, inconsistent pain relief and an increased risk of under-treatment.

15.4.1 Initial pain assessment – PQRST method

This method is particularly useful for a quick pain assessment. For each episode of pain, the following five characteristics are discussed with the person:

P = provokes (What causes the pain? What makes it better/worse?)

Q = quality (What does it feel like? Can you describe the pain – is it sharp/dull/stabbing/cutting/burning/achy/crushing/tightness/…?)

R = radiates (Does the pain go anywhere else? Does it move around?)

S = severity (How bad is the pain?) There are various methods to evaluate severity, such as pain scoring.

T = time (When did the pain start? How long does it last? Is it constant or does it come and go?)

Scenario: George Clarke

Shortly after admission a pain assessment is performed using the PQRST method. In addition to chronic pain in his arthritic knee, which is managed by oral NSAIDs, it is clear that George also has gastric pain, which is increasing and radiating into his back. In view of the findings following the doctor's examination, his blood results and the fact that he has been on long-term NSAIDs for his arthritis, the doctor decides that he needs an endoscopy for suspected gastric ulceration.

15.4.2 Ongoing pain assessment

Hint for practice

Be aware that when someone is in pain they may not react to questions in the way you expect. They may be irritated, angry or dismissive. Always look for other signs of pain and use your observation skills to gain as comprehensive an assessment as possible.

There are several assessment tools designed to help healthcare professionals and pain sufferers to assess pain on a continual basis, such as when assessing the need for analgesia during medicine rounds. Examples of such tools include asking the person to rate their pain:

- on a visual scale with a line extending from 'no pain' to 'worst pain imaginable'
- verbally as 'none', 'mild', 'moderate' or 'severe'
- on a numerical scale of 1 to 10, with 10 being the worst pain possible.

Questions may also be asked to ascertain the effect of pain on the individual's quality of life or on their ability to carry out their activities of living. Questions are also used to help to identify the type of pain in order to enable the healthcare professional to treat the pain effectively. The assessment tool used depends upon the individual healthcare organisation's protocol and their pain-management services. However, some form of assessment tool will be used in most places to provide the basis for the pain management programme for the individual.

The British Pain Society recommend the following questions to ask people:

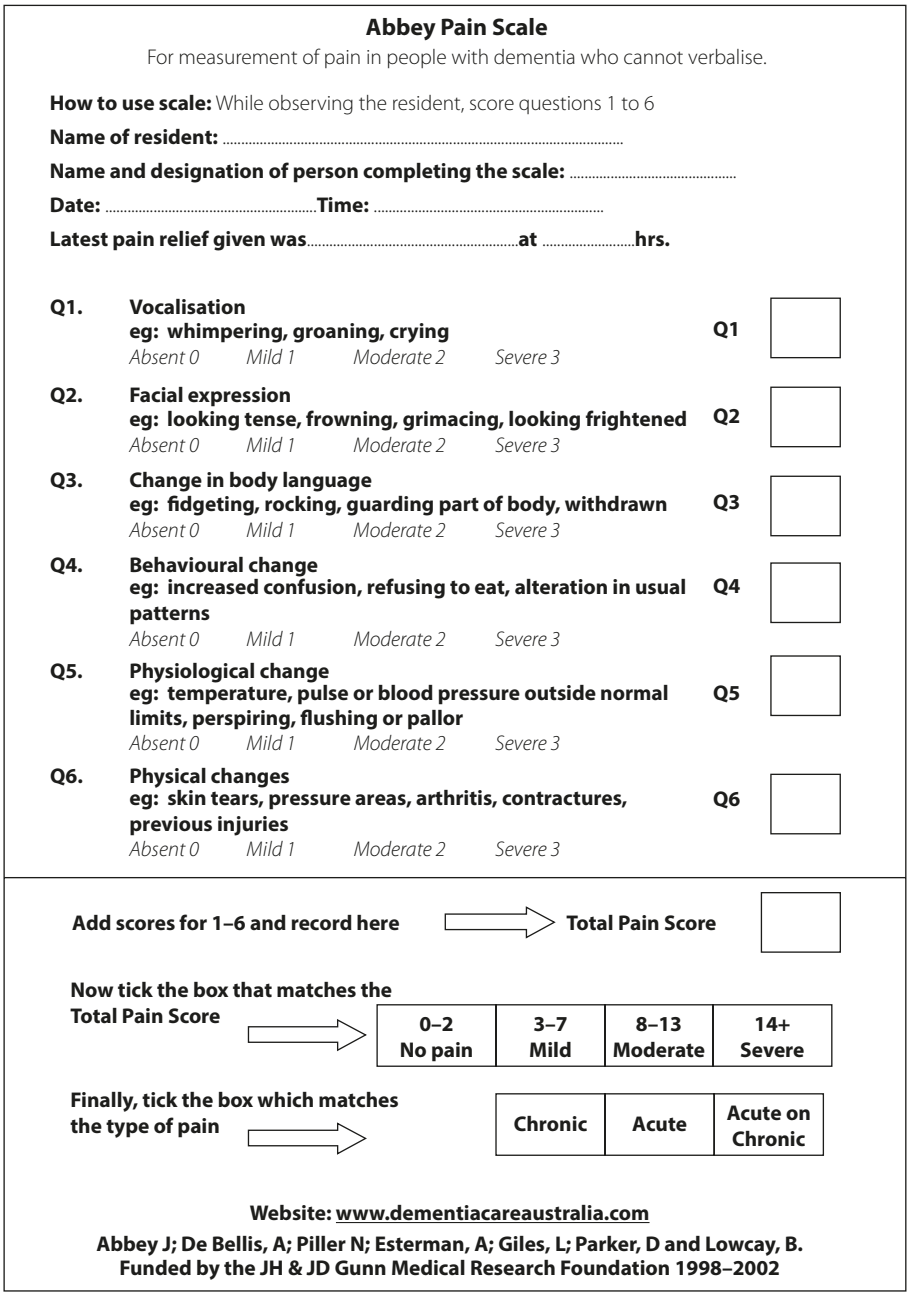
- How intense is your pain now?
- How intense was your pain on average last week?
- How distressing is your pain now?
- How distressing was your pain on average last week?
- How much does your pain interfere with your normal everyday activities?
- If you have had treatment for your pain, how much has this relieved the pain?

The first four questions are answered on a scale of 0 to 10, where 0 is no pain and 10 is extreme pain. The last question uses a percentage scale. These scales are also available in a variety of languages, which is useful if an interpreter is not at hand. The pain scale translations are available on The British Pain Society's website, www.britishpainsociety.org.

15.4.3 Specialised pain assessment scales

Specialised assessment tools have been developed for use with people who have some cognitive impairment, such as forms of dementia and some learning disabilities. Examples include:

- the Abbey Pain Scale (*Figure 15.3*) (Abbey 2004)
- ADD – the Assessment of Discomfort in Dementia Protocol (Kovach 1999)
- DS-DAT – the Discomfort Scale – Dementia of the Alzheimer's Type (Hurley 1992)
- PAINAD Pain Assessment in Advanced Dementia Scale (Warden 2003).



Abbey Pain Scale

For measurement of pain in people with dementia who cannot verbalise.

How to use scale: While observing the resident, score questions 1 to 6

Name of resident: .....

Name and designation of person completing the scale: .....

Date: .....**Time:** .....

Latest pain relief given was.....**at** .....**hrs.**

Q1.	**Vocalisation** **eg: whimpering, groaning, crying** *Absent 0 Mild 1 Moderate 2 Severe 3*	**Q1**	
Q2.	**Facial expression** **eg: looking tense, frowning, grimacing, looking frightened** *Absent 0 Mild 1 Moderate 2 Severe 3*	**Q2**	
Q3.	**Change in body language** **eg: fidgeting, rocking, guarding part of body, withdrawn** *Absent 0 Mild 1 Moderate 2 Severe 3*	**Q3**	
Q4.	**Behavioural change** **eg: increased confusion, refusing to eat, alteration in usual patterns** *Absent 0 Mild 1 Moderate 2 Severe 3*	**Q4**	
Q5.	**Physiological change** **eg: temperature, pulse or blood pressure outside normal limits, perspiring, flushing or pallor** *Absent 0 Mild 1 Moderate 2 Severe 3*	**Q5**	
Q6.	**Physical changes** **eg: skin tears, pressure areas, arthritis, contractures, previous injuries** *Absent 0 Mild 1 Moderate 2 Severe 3*	**Q6**	

Add scores for 1–6 and record here → **Total Pain Score**

Now tick the box that matches the Total Pain Score →

0–2 No pain	3–7 Mild	8–13 Moderate	14+ Severe

Finally, tick the box which matches the type of pain →

Chronic	Acute	Acute on Chronic

Website: www.dementiacareaustralia.com

Abbey J; De Bellis, A; Piller N; Esterman, A; Giles, L; Parker, D and Lowcay, B.
Funded by the JH & JD Gunn Medical Research Foundation 1998–2002

Figure 15.3 The Abbey Pain Scale (Abbey 2004). Republished with permission of MA Healthcare Ltd from The Abbey pain scale: a 1-minute numerical indicator for people with end-stage dementia. Abbey, J. *et al*. (1995) *International Journal of Palliative Nursing*, 10(1): 6–13; permission conveyed through Copyright Clearance Center, Inc.

15.4.4 Assessment of pain in children and older people

The ability to recognise and assess pain is particularly important when caring for children and older people.

Children

There are published guidelines on identifying the best method for recognising and assessing pain in children and on identifying reliable and valid measures of pain, by means of appropriate pain scales for use with children depending upon their age group and level of development. Effective pain assessment with children is crucial to good pain management (Twycross 2017).

The Wong–Baker FACES® Pain Rating Scale (*Figure 15.4*) is also commonly used with children (Wong–Baker FACES Foundation 2021).

Figure 15.4 The Wong–Baker FACES® Pain Rating Scale. Retrieved 7 April 2021 with permission from www.WongBakerFACES.org.

Older people

Many older people are stoic and may be reluctant to report pain. You should not assume that someone is comfortable just because they have not verbalised their pain. Guidelines on recognising and assessing pain in older people were developed by the British Geriatrics Society, the British Pain Society and the RCN in collaboration with researchers at Teesside University, Anglia Ruskin University, University of Bournemouth, the Centre for Ageing Better and the Centre for Positive Ageing (see Schofield 2018).

Table 15.1 Observable changes associated with pain.

Autonomic changes	Pallor, sweating, tachypnoea, altered breathing patterns, tachycardia, hypertension
Facial expressions	Grimacing, wincing, frowning, rapid blinking, brow raising, brow lowering, cheek raising, eyelid tightening, nose wrinkling, lip corner pulling, chin raising, lip puckering
Body movements	Altered gait, pacing, rocking, hand wringing, repetitive movements, increased tone, guarding (stiff, rigid, or interrupted movement while changing position), bracing (stationary position where fully extended limb maintains abnormal weight distribution)
Vocalisations	Sighing, grunting, groaning, moaning, screaming, calling out, aggressive/offensive speech
Interpersonal interactions	Aggression, withdrawal, resisting
Changes in activity patterns	Wandering, altered sleep, altered rest patterns
Mental status changes	Confusion, crying, distress, irritability

For older people with cognitive or communication impairment, a specialised pain scale such as the Abbey Pain Scale (see *Figure 15.3*) should be used. In addition, observations are important for older people. *Table 15.1* shows possible changes associated with pain that you can observe.

15.5 The treatment of pain

15.5.1 Drug therapy

Various analgesic drugs can be used to alleviate pain. The choice of analgesia depends upon the nature and severity of the pain and, in some instances, on the cause of the pain. This section highlights some commonly used drugs, the types of pain that they may be used for and the most prevalent side effects. Further

reading on these drugs is essential to develop your knowledge of the usual doses for each drug, other less common side effects and knowledge of issues like contraindications and drug interactions. An up-to-date edition of the British National Formulary will provide all this information.

The World Health Organization pain relief ladder (WHO 2019; *Figure 15.5*), initially developed for the treatment of cancer pain, is used widely for routine treatment of acute and chronic pain. WHO advocates the concurrent use of additional drugs (**adjuvants**); these will be covered later in this chapter.

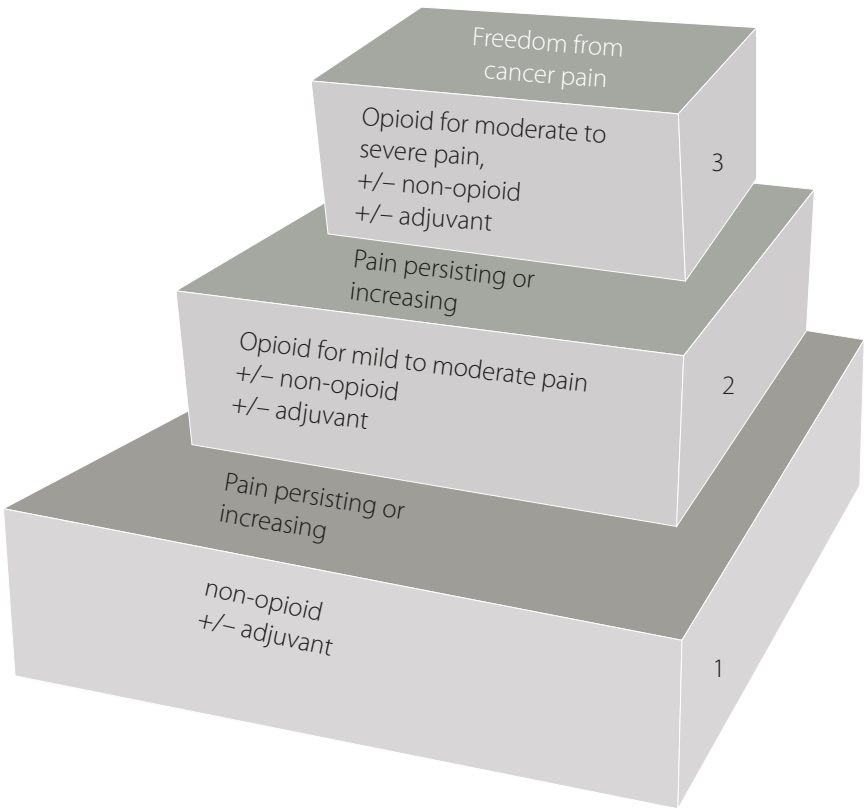


Figure 15.5 WHO Pain Relief Ladder. Reproduced with the permission of the World Health Organization. (www.who.int/cancer/palliative/painladder/en)

The WHO's recommended treatments for each step on the pain relief ladder are shown in *Table 15.2*.

Table 15.2 WHO-recommended treatments.

Step on pain relief ladder	Description of pain	Severity on a scale of 1 to 10	Treatment
1	Mild	1–3	Non-opioid drug such as paracetamol or aspirin, with or without adjuvant
2	Pain persists or increases or is moderate in the first instance	4–6	Mild opioid such as codeine, with or without non-opioid and/or adjuvant
3	Pain persists or increases to moderate to severe or is severe in the first instance	7–10	Strong opioid such as morphine, with or without non-opioid and/or adjuvant

The WHO (2019) also advocates that, in order to ensure total pain control, treatment should be given regularly at prescribed intervals, every 3–6 hours, and not on demand.

Non-opioid analgesics

Paracetamol

Paracetamol is given on its own for mild to moderate pain or with stronger analgesia for moderate to severe pain. It is given by mouth, intravenously or rectally in the form of a suppository. Side effects of paracetamol are rare but may include rashes or blood disorders. However, care should be taken not to exceed the stated dose, as this can lead to liver damage. This can sometimes happen by accident if other preparations are given or taken at the same time without awareness that they also include paracetamol.

Non-steroidal anti-inflammatory drugs (NSAIDs)

NSAIDs such as ibuprofen and diclofenac are given for mild to moderate pain including dysmenorrhoea, post-operative pain and migraine. If taken regularly they have both an analgesic and an anti-inflammatory effect, which makes them particularly useful for musculoskeletal and/or joint diseases, though the anti-inflammatory effect may take up to three weeks.

The most prevalent side effects are GI discomfort, nausea, diarrhoea and, occasionally, bleeding and ulceration. People should be advised to take the medication with food or a glass of milk.

The most commonly used NSAID is ibuprofen as it has fewer side effects than other drugs in this category. However, its anti-inflammatory properties are weaker than those of other drugs in this category.

Scenario: George Clarke

Following George's endoscopy, which confirmed the provisional diagnosis of gastric ulceration, omeprazole (a proton-pump inhibitor) is prescribed to reduce the acidity in his stomach.

As the oral NSAIDs were the likely cause of the ulceration, these medications are stopped and George is referred to a pain specialist. Following review by the pain specialist, a combination of paracetamol and amitriptyline is prescribed for George, together with a topical NSAID to apply to the affected knee.

Opioid analgesics

The most prevalent side effects of opiates include nausea and vomiting (particularly in the initial stages of treatment) so you must monitor for this. If necessary, an anti-emetic can be prescribed.

Constipation is another possible side effect. Again, you need to monitor people for this and provide laxatives as required.

Drowsiness may also occur. In that case, it is important that you ensure safety for people in your care by supervising them closely and monitoring their level of consciousness.

Larger doses of opiates may produce respiratory depression and hypotension, so the person's vital signs must be observed during their treatment. The antidote (naloxone, Narcan) must be readily available, especially when the treatment is first initiated.

The following examples of opioid analgesics are presented in order of potency, from lowest to highest. Some drugs have specific additional side effects associated with them, which are noted here.

Codeine phosphate

Codeine is given for mild to moderate pain by mouth (including as a syrup) or by intramuscular injection.

Tramadol hydrochloride

Tramadol is given for moderate to severe acute or chronic pain and for post-operative pain by mouth (including as an effervescent, lemon-flavoured, sugar-free powder), by intramuscular injection, by IV injection (over two to three minutes) or by IV infusion.

Additional side effects are the risk of abdominal discomfort, diarrhoea, hypo-/hypertension, **paraesthesia**, anaphylaxis and confusion. People taking this medication need to be observed closely for all these potential risks and either treated accordingly and/or reviewed for a more suitable analgesic. This is particularly important where anaphylaxis is concerned as the reaction is potentially fatal.

Hint for practice

Remember to use the British National Formulary to look up the purpose and specifics of any medications you are unsure of. One should be available in your area of practice.

Dihydrocodeine tartrate

Dihydrocodeine is given for moderate to severe pain by mouth (including modified release), or by deep subcutaneous or intramuscular injection.

Buprenorphine

Buprenorphine is given for moderate to severe acute or chronic pain by sublingual administration, by intramuscular injection or in the form of a self-adhesive patch (the dose adjustment for the patch has strict guidelines and can vary between preparations). It may also be given as a pre-medication by sublingual administration or by intramuscular injection or given intra-operatively by slow IV injection.

Pethidine hydrochloride

Pethidine is given for moderate to severe acute or post-operative pain by mouth, by subcutaneous injection, by intramuscular injection or by slow IV injection. In some instances, it may also be given as a pre-medication before surgery, though this use is now quite rare. It is more commonly used for pain control during labour.

In addition to the most prevalent side effects of opiates, convulsions have been reported in cases of overdose.

Morphine

Morphine is administered for severe acute and post-operative pain by subcutaneous or intramuscular injection, or via individual-controlled analgesia (patient-controlled analgesia, PCA). It is also given by slow IV injection for myocardial infarction and acute pulmonary oedema. For severe chronic pain sufferers, the ideal administration route is oral (this includes sublingually or by

oral modified release every 12 or 24 hours, according to the brand), but morphine may also be administered by subcutaneous injection (though this is not suitable for oedematous people), by intramuscular injection or via the rectum in the form of suppositories.

Diamorphine

Diamorphine is given for very severe acute and chronic pain by subcutaneous or intramuscular injection. It is also given for myocardial infarction and acute pulmonary oedema by slow IV injection (though the dose is usually lower than that for morphine).

Compound analgesics

Compound analgesics contain a weak analgesic, such as aspirin or paracetamol, and an opioid derivative such as codeine phosphate. There are numerous compound preparations available, including:

- co-codamol 8/500 (8 mg codeine phosphate and 500 mg paracetamol)
- co-codamol 15/500
- co-codamol 30/500
- co-dydramol 10/500 (10 mg dihydrocodeine and 500 mg paracetamol)
- co-dydramol 20/500
- co-dydramol 30/500.

The side effects of each depend upon the individual drugs that are in them.

Tricyclics and anticonvulsants for pain management

Tricyclic antidepressants (amitriptyline hydrochloride) and anticonvulsants (gabapentin and pregabalin) are given orally, usually as adjuvants to a licensed analgesic specifically for neuropathic pain.

15.5.2 Specific post-operative pain relief

Following an operation, all people should have a full pain assessment. In many instances, especially with major operations, the anaesthetist will discuss pain relief in depth with a person before the operation. This is especially important for people who are likely to have either PCA or an epidural. It is important to ensure that the person understands the treatment regime, first to promote concordance (see *Chapter 13*) and, secondly, to prevent any distress when they see an extra piece of equipment attached to them on their return from theatre.

People undergoing major operations will benefit from the use of PCA delivery systems for several reasons:

- They allow a continuous or almost continuous supply of analgesia and can thus prevent breakthrough pain occurring, which is very reassuring to the individual.
- They allow the individual and/or the healthcare professional to titrate the amount of analgesia required, while still ensuring an adequate level of pain control.
- They help to avoid the need for the individual to have repeated injections.
- Because the person's pain is controlled, they are likely to comply with any post-operative recovery regime, which will help to prevent many post-operative complications.

Post-operative pain relief is dealt with in greater detail in *Chapter 18*.

15.6 Non-pharmacological options for pain management

15.6.1 Physical therapies

In order to manage pain effectively referrals may be made to other healthcare professionals such as physiotherapists and occupational therapists. They will perform their own assessments and will use their knowledge to help the individual with their pain. For example, a physiotherapist may suggest exercises to increase mobility and educate someone to take control of the pain. An occupational therapist may offer someone specific aids to help with certain activities of living.

15.6.2 Cognitive behavioural pain management programmes

Cognitive behavioural pain management programmes can improve a person's pain experience, their mood, their ability to cope, their negative outlook on their pain and their activity levels. The British Pain Society Guidelines for Pain Management Programmes for Adults (2013) state that for people with persistent pain that adversely affects their quality of life and has a significant effect on physical, psychological and social function, a pain management programme is the treatment of choice to restore the sufferer's life to as near normal as possible. An interdisciplinary approach is advocated that includes the following:

- a medical specialist – to assess and manage medical needs, provide education and training
- a chartered clinical psychologist – to assess and implement psychological principles and provide cognitive behavioural therapy, education and training
- a registered physiotherapist with specialist experience of managing people with chronic pain – for physical reactivation
- an occupational therapist – for group work, goal setting, planning and pacing a return to activities, retraining and return to work
- a registered nurse – for medication review, rationalisation and reduction when agreed, health education and liaison with a person's carers and other agencies
- a pharmacist – for education and planning of medication adjustment
- clinical support workers (such as healthcare assistants, occupational therapy and physiotherapy technicians and assistant psychologists) – for data collection and analysis, working alongside specialist clinical staff in a supporting role
- administrative staff – for all administrative duties
- a past participant in a pain management programme – for health education and serving as a role model.

(British Pain Society 2013, pp. 27–8)

15.6.3 Transcutaneous electrical nerve stimulation (TENS)

TENS machines work by stimulating areas of the skin (via a pair of electrodes) with an electric current. They are most frequently used by people who have chronic pain.

15.6.4 Support groups

People with long-term chronic pain may find a support group beneficial as it will enable them to discuss and share their concerns and coping strategies with others. The support group may also help with the emotional aspects of chronic pain and may help to improve the person's overall mood and psychological state of mind.

15.6.5 Health information

Various information leaflets are available to help people who suffer from acute or chronic pain, including those from:

- Action on Pain (www.action-on-pain.co.uk)
- British Pain Society (www.britishpainsociety.org)
- Pain Concern (www.painconcern.org.uk)
- the Pain Relief Foundation (www.painrelieffoundation.org.uk).

Activity

When you are next in clinical practice, ask your supervisor about the pain assessment scale used in their setting and compare and contrast it with other scales that can be found on the British Pain Society's website (www.britishpainsociety.org). Ask your supervisor if you can spend some time with the organisation's pain management team.

Summary

Key points from this chapter:

- The best way to ascertain whether someone is in pain is to ask them directly.
- There are several assessment tools and scales, including specialist tools for use with people with cognitive impairment, that have been developed to help practitioners to assess level of pain.
- The choice of analgesic drug to manage pain depends on the nature and severity of the pain and in some instances on the cause of the pain.
- The British National Formulary provides information about drug doses, side effects, contraindications and drug interactions.
- The British National Formulary for Children should always be used when administering medication to children.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

Association of Paediatric Anaesthetists of Great Britain and Ireland (2012) Good practice in postoperative and procedural pain management. *Paediatr Anaesth* 22 Suppl 1:1–79.

RCN (2009) *The Recognition and Assessment of Acute Pain in Children: Update of Full Guideline.* London: RCN. www.euroespa.com/wp-content/uploads/2014/10/003542.pdf

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CHAPTER 16

16 Catheterisation

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the reasons for catheterisation
- understand the principles and procedures of male and female catheterisation.

Scenario: Joseph Hamilton

Mr Joseph Hamilton is a 28-year-old man who has been admitted to an acute general surgery ward, from the emergency department, via the operating theatre, having undergone repair of ruptured anterior cruciate ligaments in his right knee.

You notice that Joseph is not passing urine. Palpation of his lower abdomen reveals a distended bladder, which is then confirmed by an abdominal ultrasound scan.

Joseph is in urinary retention. This is a potential complication of general anaesthesia. The doctor requests that Joseph is catheterised with an indwelling Foley catheter.

16.1 Urinary catheterisation

Urinary catheterisation involves the insertion of a narrow tube into the urethra, which is then passed up into the urinary bladder. As a student nurse you are unlikely to perform this procedure yourself. However, you may be asked to assist, for example, by setting up a catheterisation trolley in preparation.

Reasons for catheterisation include:

- the retention of urine (acute or chronic)
- the administration of certain drugs
- preparation for and recovery from certain types of surgical operation such as abdominal surgery, certain gynaecological procedures and any surgery that necessitates keeping a very close eye on urine output in the post-operative period
- bladder irrigation following urological procedures.

An indwelling catheter has a balloon at the end that is inflated after insertion in order to anchor the catheter in the bladder (*Figure 16.1*). An intermittent catheter does not have a balloon, as it is required only for very short-term use, for example for those with bladder disorders who rely on intermittent catheterisation in order to void urine.

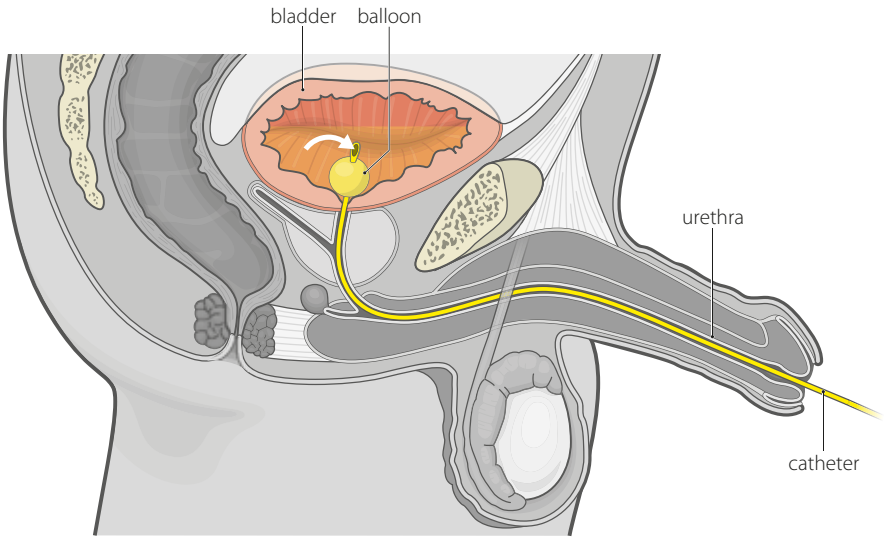


Figure 16.1 A catheter *in situ* in the male bladder. Adapted from Minett, P. and Ginesi, L. *Anatomy & Physiology: an introduction for nursing and healthcare* (2020), Lantern Publishing.

16.1.1 Male catheterisation

The equipment required for male catheterisation is:

- a stainless-steel trolley that has been cleaned according to local organisation policy
- a catheter pack that contains:
  - a sterile field
  - equipment required to clean the penis (disposable forceps, gallipot, cotton wool/sponge cubes/gauze swabs)
  - a receiver to contain the sterile catheter and for urine to drain into initially
- cleansing solution – this will vary according to local policy, but chlorhexidine solution or normal saline is adequate; some clinical areas advocate the use of plain soap and water for washing the genitals
- a Foley catheter of an appropriate size and length (see the section on Catheter selection, below)
- Local anaesthetic lubricating gel to both lubricate the urethra and dull any sensation – this tends to be supplied in pre-filled syringes containing between 6 and 15 mL of gel
- Water for injection (usually 10 mL) to fill the catheter's retaining balloon (the balloon should not be filled with air, as it will cause the balloon to float in the bladder; normal saline should not be used, as it may crystallise; and tap water should not be used as it is not sterile) – note that some specialist catheters require more than 10 mL water, so check the catheter packaging for details
- 10 mL syringe to draw up the water for injection
- Drainage bag – this will be connected to the catheter following successful insertion.

Catheter selection

The external diameter of a urinary catheter is measured in Charrière units (Ch), with one Charrière being equivalent to 0.33 mm. Therefore, a 12 Ch catheter has an external diameter of slightly less than 4 mm. In general, the smallest diameter catheter that will do the job should be selected, as this will reduce trauma to the urethra. Catheter sizes 12 and 14 Ch should be adequate to drain clear urine. If the urine is cloudy or contains sediment, a larger size (16–18 Ch) may be required.

When catheterising an adult male, a long catheter must be selected, as men have longer urethras than women. Catheters for adult females are 250 mm in length, while catheters for adult males are 450 mm in length. The type of catheter selected will also depend on how long it will be required for and whether the person is allergic to latex. *Figure 16.2* shows some common types of urinary catheter, and *Table 16.1* lists some advantages and disadvantages of each type.

When selecting the most appropriate catheter for the person, it is important to consider:

- Is the person allergic to latex?
- How long will this catheter be required for?
- What is the most appropriate size?

Remember that:

- a larger diameter will provide better drainage
- a smaller diameter will cause less irritation to the urethral wall.

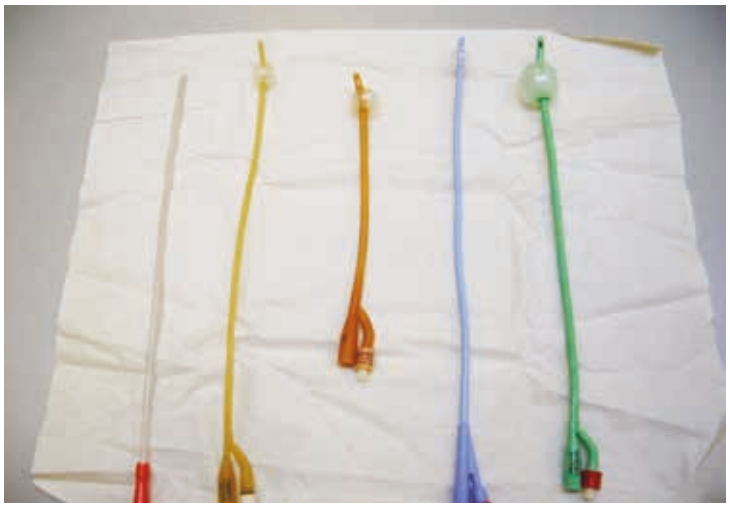


Figure 16.2 Types of catheter (with balloons inflated where appropriate). From left to right: **(a)** intermittent catheter; **(b)** silicone-coated Foley (12 Ch); **(c)** Teflon-coated latex Foley (female) (16 Ch); **(d)** silicone Foley (16 Ch); **(e)** Silastic Foley (18 Ch).

Table 16.1 Comparison of different types of catheter.

Catheter type	Length of use	Comments
PVC (polyvinyl chloride) (**a**)	Up to seven days	Rigidity may cause discomfort Inflexible May be used without a balloon for intermittent self-catheterisation
Latex (Teflon-coated) (**c**)	Up to four weeks	Not to be used with people with latex allergies Teflon coating reduces trauma on insertion, and helps reduce encrustation
Latex (hydrogel-coated)	Up to 12 weeks	Not to be used with people with latex allergies Hydrogel coating allows long-term use of this type of indwelling catheter
Silicone (hydrogel-coated)	Up to 12 weeks	Suitable for those with latex allergies Rigidity may cause discomfort
Silicone (**d**)	Up to 12 weeks	Suitable for those with latex allergies Wide lumen provides better drainage
Latex (coated with silicone elastomer, also known as Silastic) (**e**)	Up to 12 weeks	Not to be used with people with latex allergies Can help reduce encrustation

Procedure 16.1: Male catheterisation

STEP 1 Explain the procedure carefully to the person and make sure that he understands. This will enable you to gain informed consent before performing the catheterisation.

STEP 2 The procedure should be carried out in a private treatment room if one is available and it is large enough to accommodate a bed. If this facility is not available, ensure that privacy is maintained, and that the person is not unduly exposed.

STEP 3 Make the person comfortable, in a supine position, with his legs extended.

STEP 4 Put on a disposable apron.

STEP 5 Wash your hands using bactericidal solution, using an effective hand-washing technique (see *Chapter 3*).

STEP 6 Take your trolley to the person's bedside and prepare your equipment, opening any supplementary packs and dispensing any required solutions using an aseptic technique. The catheter should be removed from its outer wrapper, but not from its inner wrapper. A trolley for catheterisation is shown in *Figure 16.3*.

Figure 16.3 A catheterisation trolley.

STEP 7 Before cleaning the penis, place an absorbent pad between the person's legs, to protect the bedclothes. Put on a pair of gloves, take hold of the penis with your non-dominant hand and retract the foreskin (if present). With your dominant hand, clean the glans penis carefully (*Figure 16.4*).

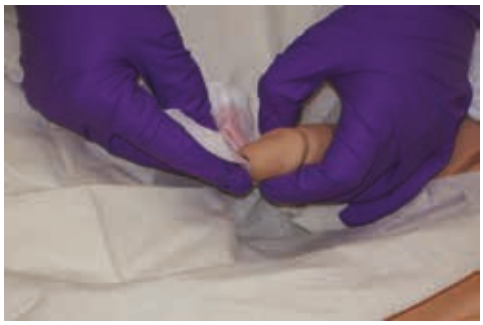


Figure 16.4 Cleaning the penis before catheterisation.

STEP 8 Take the syringe of lubricating anaesthetic gel and insert the nozzle into the urethral opening. Gently inject the gel into the urethra until the syringe is empty (*Figure 16.5*). Discard the syringe and use your non-dominant hand to prevent the gel escaping from the penis. The gel should be given about five minutes to take effect.

Figure 16.5 Administering the lubricating anaesthetic gel.

STEP 9 Discard the gloves you are using and re-wash your hands. Put on a pair of sterile gloves. Take your sterile field from your trolley, fold it twice and tear a hole at the folded corner. This will provide you with a hole through which to position the penis. Tear off the end of the inner wrapper enclosing the catheter, using the serrated edge. Place the catheter in the sterile receiver and bring it across to your sterile field. Hold the penis with your non-dominant hand and hold the catheter by the inner wrapper with your dominant hand. This ensures that the catheter itself is not touched. Having lubricated the tip, insert the catheter into the urethra, gradually withdrawing the inner wrapper, until urine flows into the receiver (*Figure 16.6*).

Figure 16.6 Inserting the catheter.

STEP 10 When you see urine flowing, insert the catheter further, almost to the bifurcation. This will ensure that the balloon portion of the catheter tip is inside the bladder.

STEP 11 Take your syringe of water for injection (amount dependent on manufacturer's instructions) and inject into the balloon port. This will inflate the balloon inside the bladder (*Figure 16.7*).

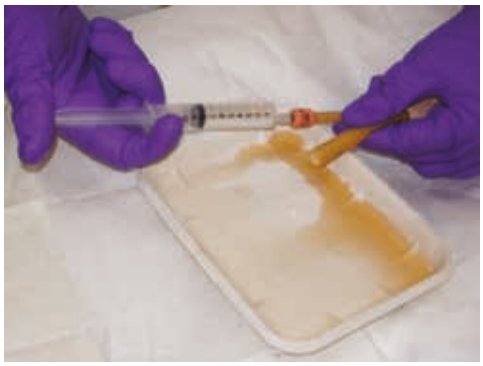


Figure 16.7 Inflating the balloon.

STEP 12 Once the balloon is inflated, gently withdraw the catheter until resistance is felt. This means that the balloon is correctly positioned in the neck of the bladder. Then connect the drainage bag to the outlet port of the catheter (*Figure 16.8*).

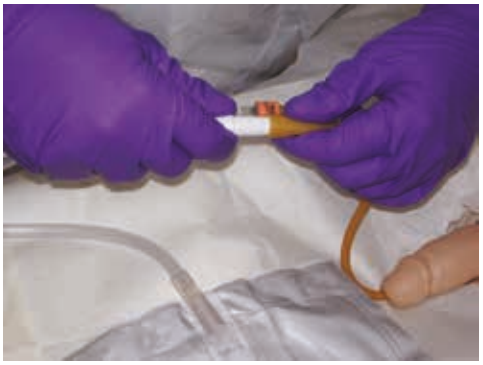


Figure 16.8 Connecting the drainage bag.

STEP 13 After catheterisation:

- position the catheter and drainage bag in a comfortable and secure position, ensuring that the drainage bag is below the level of the catheter
- if you have retracted the foreskin, make sure you replace it – failure to do this may result in paraphimosis (trapping and swelling of the foreskin)
- send a specimen of urine for microscopy and culture.

16.1.2 Female catheterisation

Procedure 16.2: Female catheterisation

Female catheterisation employs the same principles and procedures as for a male catheterisation, though there are some differences:

- The urethral meatus can sometimes be difficult to identify. If you are having problems locating the urethra and inadvertently insert the catheter into the vagina, leave it there and use a new catheter. This will prevent the same thing happening twice. Following successful catheterisation, remove the first catheter.
- Use a female-length catheter when catheterising women, because the urethra is shorter than that of men. However, if the person is obese, you may find that a male-length catheter is more comfortable for her.
- Anaesthetic gel is not always used before female catheterisation; sterile KY jelly may be used instead. If anaesthetic gel is used, 6 mL should be sufficient for the shorter urethra.

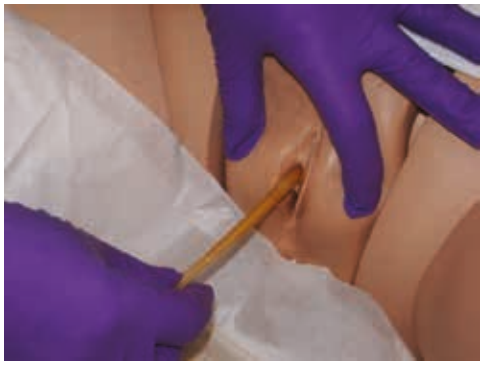


Figure 16.9 Inserting a urinary catheter into a female.

16.2 Catheter care

It is vital to maintain a high standard of personal hygiene for catheterised people in order to prevent UTIs. The cleansing of catheters should be carried out as part of the person's daily washing routine.

- Females:
  - The vulval area should be cleaned, using a disposable cloth, in a downward motion, using clean, warm soapy water.
  - The catheter itself should be cleaned with a separate cloth, wiping in one direction, away from the person.
  - Ensure that the vulval area is dried thoroughly.
- Males:
  - The foreskin (if present) should be retracted, and the glans can then be cleaned using a disposable cloth and clean, warm, soapy water.
  - The catheter can then be wiped with a clean disposable cloth in one direction, away from the person.
  - Ensure that the penis is dried thoroughly.

16.3 Removal of urinary catheters

The longer a catheter is in place, the greater the risk of complications and infection. The need for catheterisation should therefore be reviewed at regular intervals, and catheters should be removed as soon as possible to ensure that the risk of infection is reduced. A 'trial without catheter' (TWOC) should be attempted when an assessment indicates the possibility. It involves removing the catheter and seeing whether the individual can pass urine and empty their own bladder successfully. This procedure may also be used to measure any improvement or discover whether further management is required, for example through medication.

Before removing a urinary catheter, ensure that the person is passing faeces normally. This is because of the possibility of a distended colon or rectum putting pressure on the urethra and impeding the flow of urine during micturition. If the person is constipated, the catheter should remain *in situ* until the constipation is corrected. There is no agreed consensus as to when the best time of day is to remove a catheter, although a study has suggested midnight is better than 6 am (Kelleher 2002).

Explain the procedure of catheter removal to the person and obtain their consent to proceed. Some people may be extremely anxious about having their catheter removed. These anxieties may be related to:

- fear of the pain associated with a recurrence of previous urine retention
- fear of incontinence following catheter removal
- fear of discomfort during the actual procedure.

When a catheter is removed, the person may be concerned that they will be unable to pass urine. Reassurance should be given to the contrary, emphasising that a close eye will be kept on their bladder function.

The equipment required for catheter removal is:

- receiver
- syringe (size dependent on amount of water in catheter balloon)
- gloves and apron
- specimen pot (if a UTI is suspected).

Procedure 16.3: Urinary catheter removal

STEP 1 Explain the procedure to the person and obtain verbal consent.

STEP 2 Ensure that the person is lying on the bed in a supine position. Place an absorbent pad under the buttocks and place the receiver between the legs.

STEP 3 Wash and dry hands using an appropriate technique.

STEP 4 Put on the apron and gloves.

STEP 5 Having checked how much water should be in the balloon, connect the syringe to the balloon port and withdraw the water from the balloon.

STEP 6 While reassuring the person, pull out the catheter and place in the receiver.

STEP 7 Following the procedure:

- Make sure the person is comfortable and has access to a nurse call bell in case assistance is required to the toilet.
- Encourage the person to increase their oral fluid intake (if they are able to drink), or get the doctor to review their IV fluid regime.
- If a UTI is suspected, send the catheter tip for microscopy and culture.
- Dispose of equipment appropriately.

Activity

Many healthcare organisations' policies concerning urinary catheterisation state that only male nurses may catheterise men, and only female nurses may catheterise women. This does not, however, apply to doctors. What do you think about such policies in relation to:

- maintaining the dignity of people?
- hierarchies that exist within healthcare settings?

Summary

Key points from this chapter:

- The decision to catheterise should not be taken lightly and should be taken in consultation with the wider MDT, based on clinical need.
- Urinary catheterisation is an undignified and embarrassing procedure. Bear this in mind when communicating with someone during the process.
- The potential for the introduction of microorganisms into the bladder during this procedure is high. Therefore a strict aseptic technique must be adhered to.
- People should be monitored after the procedure for early signs of urinary tract infection. Care should also be taken to keep the catheter clean.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

RCN (2019). *Catheter Care: RCN Guidance for Health Care Professionals.* London: RCN. www.rcn.org.uk/-/media/royal-college-of-nursing/documents/publications/2019/february/007-313.pdf

Reference

Kelleher, M.M.B. (2002) Removal of urinary catheters: midnight vs 0600 hours. *Br J Nurs* 11(2):84–90

CHAPTER 17

17 Airway management and life support

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- safely manage the airway of a person whose condition is deteriorating
- carry out life-support procedures.

Scenario: Sarah Bennett

Ms Sarah Bennett is a 38-year-old female who enjoys a healthy, active life. She has had no significant medical problems before now.

While riding her horse, Sarah lost concentration and fell off. She is admitted to the emergency department of her local hospital. She is alert and orientated and can remember the details of the accident. She is aware that she hit her head on the ground and reports no injuries apart from a developing headache and a degree of blurred vision.

Sarah is admitted to the assessment unit for observation overnight. While she is there a healthcare assistant who has been attending to her calls for assistance from a nurse as Sarah appears to be in a collapsed condition. The nurse observes that Sarah's condition has suddenly deteriorated and that she has a reduced respiratory rate. Although her pulse rate has dropped, it is still present, so she has not suffered a cardiac arrest.

17.1 Airway management

17.1.1 First steps

Before you can consider a person's airway, breathing and circulation status, you must confirm that the area is safe. After ensuring it is safe to approach the person, check for responsiveness simply by speaking loudly and clearly, saying: 'Are you all right?' while shaking the person gently by the shoulders.

17.1.2 Recognition of airway obstruction

Airway obstruction can be easily missed by healthcare professionals. It is important when assessing anyone's airway to use both your hearing and your sight. A fully or partially occluded airway will render any attempt to assist an individual's ventilations ineffective and in fact detrimental to the person's condition.

Types of partially occluded airway noises

With a partially occluded airway, air entry to the lungs is reduced and is usually noisy.

- **Inspiratory stridor** is a harsh inspiratory noise created by an obstruction somewhere within the larynx or above. The obstruction can be caused by either a foreign body or a narrowing within the upper airway.
- **Snoring** is caused by an occlusion of the posterior portion of the pharynx; usually this is caused by the tongue. Poor basic airway management can also result in obstruction. Correct basic airway management techniques will rectify this.
- **Gurgling** is highly suggestive of fluid within the upper airways. This should be rectified as quickly as possible to prevent the fluid not only from blocking the airway but also from entering the lungs. It can be rectified by postural drainage (turning the person on their side to drain the fluid) or by using the appropriate suction equipment (see *Section 17.1.4*).

17.1.3 Checking for obstructions

ALERT

Never perform a 'blind finger sweep' as this can move the object further down the airway and make the airway obstruction significantly worse.

Be aware that if the person starts fitting while you are performing this manoeuvre, the clenching of the person's teeth could cause you severe injury.

You need to examine the airway to ensure there are no foreign bodies or obstructions visible. You can do this simply by opening the mouth and making a visual inspection.

If you can clearly see a foreign body within the oropharynx it may be possible to remove the object manually; ensure that you are wearing disposable gloves to do this. The obstruction must be clearly visible, easy to reach and easy to remove.

17.1.4 Opening the airway

The head tilt/chin lift (*Figure 17.1*) and the jaw thrust manoeuvre (*Figure 17.2*) are the two basic airway opening techniques used to ensure a person has a clear airway. Both are simple but effective methods for removing the tongue from the posterior wall of the pharynx, thus enabling free passage for ventilation, whether by the person's own breathing or by mechanical means.

Procedure 17.1: Airway opening – head tilt/chin lift

STEP 1 Place one hand on the person's forehead.

STEP 2 Place the fingers of the other hand on the bony prominence of the person's jaw.

STEP 3 Move the chin upwards and tilt the head backwards. This should be achieved with gentle pressure and done with care.

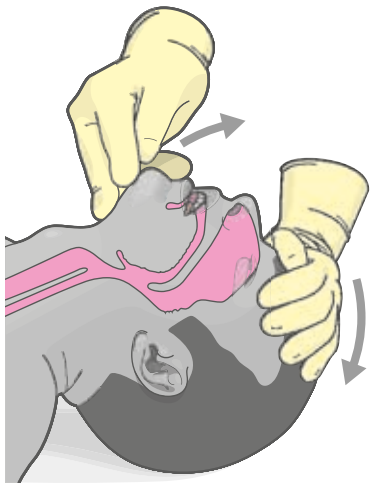


Figure 17.1 Head tilt/chin lift.

In the case of a suspected cervical spine trauma, a jaw thrust should be performed instead, as this method opens the airway but involves no backward displacement of the spine. Note that this requires a two-handed action and will be difficult to maintain over time.

Procedure 17.2: Airway opening – jaw thrust

STEP 1 Using both hands, apply pressure at the angle of the jaw.

STEP 2 Lift the jaw upwards. This will pull the tongue forwards while the head remains in the neutral position.

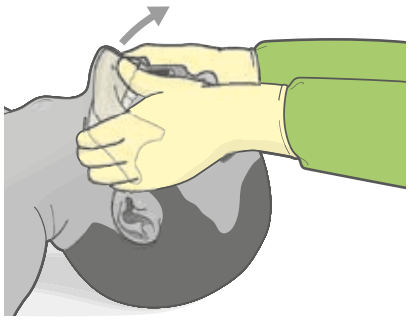


Figure 17.2 Jaw thrust.

Using suction

Suction should always be readily available in hospitals. Use a rigid wide-bore suction catheter (sometimes referred to as a 'Yankauer') to remove large volumes of liquid, such as blood, saliva and vomit, from the upper airway. To remove smaller volumes of fluid, such as airway secretions, it may be more appropriate to use a soft suction catheter.

ALERT

You must have formal training before using suction equipment. Never perform 'blind' suctioning when clearing someone's airway. Always ensure that you can see where you are aspirating, so that you can ensure you avoid direct trauma to the person's airway. Suctioning an airway with a rigid suction catheter can cause trauma to the delicate membrane linings so suctioning must be done with care. It also important to remember that while you are using suction equipment to clear someone's airway, the person is not receiving supplemental oxygen and, as a result, may start to become hypoxic.

17.1.5 Securing and maintaining the airway

The airway is secured and maintained with the use of an appropriately-sized oropharyngeal or nasopharyngeal airway.

Scenario: Sarah Bennett

Sarah has suddenly deteriorated, and her respiratory rate is observed to be 10 respirations per minute, well below the normal rate of 12 to 20 in a healthy adult. She is clearly **hypoventilating** and her consciousness level is falling. Therefore her airway needs to be secured and maintained. As Sarah's teeth are not clenched and it is possible to open her airway, it is decided that an oropharyngeal airway will be used.

Oropharyngeal airways

The oropharyngeal airway, sometimes referred to as an OP airway or a Guedel, is a curved plastic tube that consists of a flange, a lumen and an outer reinforced section. The airway is designed to fit neatly between the tongue and the hard palate of the mouth. There are many sizes available to fit individuals of different sizes (*Figure 17.3*). A correctly sized airway is one that sits neatly with the flange section resting just above the person's front incisors.

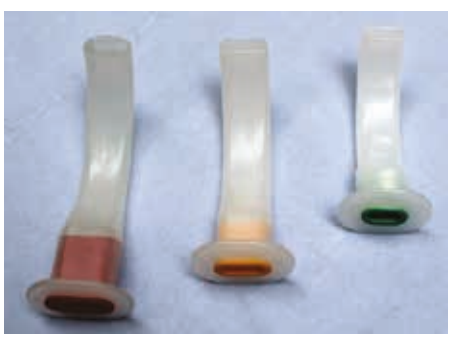


Figure 17.3 Oropharyngeal airways.

Procedure 17.3: Using an oropharyngeal airway

STEP 1 To size an oropharyngeal airway, measure from the angle of the jaw to the front incisor, as shown in *Figure 17.4*. If the airway rests at the teeth then it is the correct size.

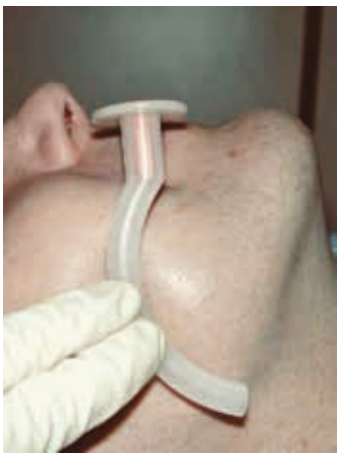


Figure 17.4 The correct method for pre-sizing an oropharyngeal airway.

STEP 2 Insert the airway by placing it upside down into the oral cavity (see *Figure 17.5a*).

STEP 3 Rotate the airway through 180° so it passes beyond the hard palate (*Figure 17.5b*).

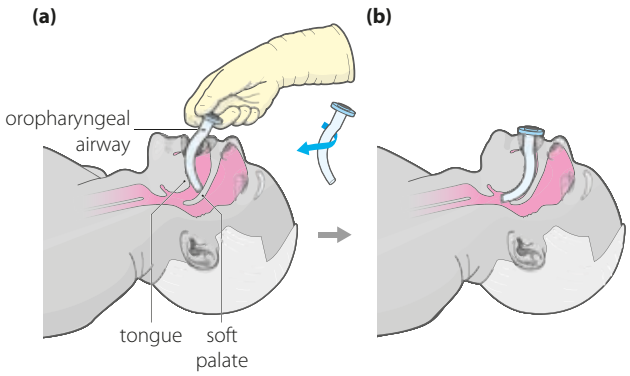


Figure 17.5 Inserting an oropharyngeal airway.

ALERT

1. Never guess the size of an oropharyngeal airway for someone. Use the measuring technique before insertion as all individuals have different anatomical proportions.
2. During insertion of the airway, if the person becomes intolerant or shows visible signs of rejecting the airway, then they do not need one. Indeed there is a strong possibility that the person will vomit, causing further resuscitation and airway problems.
3. Once the oropharyngeal airway is in place, this does not mean that the airway is now totally protected. The airway is still in danger from occlusions such as vomit and blood. If the person vomits with the airway in place, then this fluid will not only block the airway, it will also cause long-term pulmonary complications. Always keep checking the person's airway.

Nasopharyngeal airways

ALERT

Formal post-registration training is required before using a nasopharyngeal airway.

A nasopharyngeal airway (*Figure 17.6*) is a simple curved tube with a flange at one end and an atraumatic tip at the other end. The device is placed into the nostril of the person and advanced along the floor of the nose. It is useful when you are unable to open the airway, for example, when the teeth are clenched.

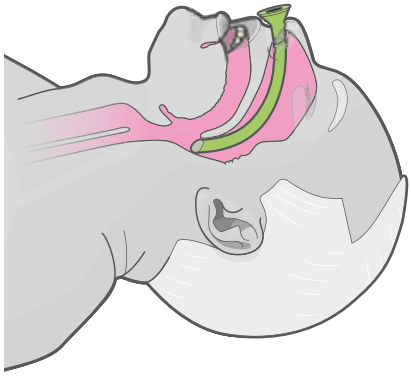


Figure 17.6 The nasopharyngeal airway.

17.1.6 Breathing

Scenario: Sarah Bennett

Having corrected and supported Sarah's airway, the nurse now assesses the respiratory status and effort being made by Sarah. This is simply achieved by adopting the 'look, listen and feel' method.

1. Look at Sarah's chest: is it moving?
2. Listen to the airway: can Sarah's breathing be heard?
3. Feel the breath against your face: can any breath be felt?

Once this has been done, the nurse observes that Sarah's respiratory rate is less than 10 respirations per minute, so she is clearly not breathing as she should be. As Sarah's ventilations are inadequate to perfuse her tissues with the necessary oxygen, her breathing needs to be supported with the use of mechanical means and with supplemental oxygen. This is done under the guidance of a suitably qualified practitioner.

Supporting ventilation

ALERT

While you are supporting Sarah's ventilations, you will have to keep re-checking her pulse every 10 breaths (every minute) to ensure that Sarah has not suffered a cardiac arrest.

Two medical devices are commonly used to support ventilation: the pocket mask and the bag, valve and mask device. Whichever device and method is used, each breath must be delivered over approximately one second and with a volume which corresponds to normal chest movement. Allow the person to expire between ventilations, and check that you can see the chest rise and fall with each ventilation.

Pocket mask ventilation

The pocket mask (*Figure 17.7*) is widely used in the hospital setting. It is very similar in construction to a face mask used during anaesthesia and has a one-direction valve to allow the person's expired air to flow away from the rescuer. Typically, the pocket mask is transparent to allow for blood or vomit to be seen within the airway.

To use the pocket mask, breathe into the mask for one second through the one-way valve, ensuring there is adequate chest rise (*Figure 17.8*). Supplemental oxygen can also be added to the mask by attaching the appropriate tubing to the oxygen port.

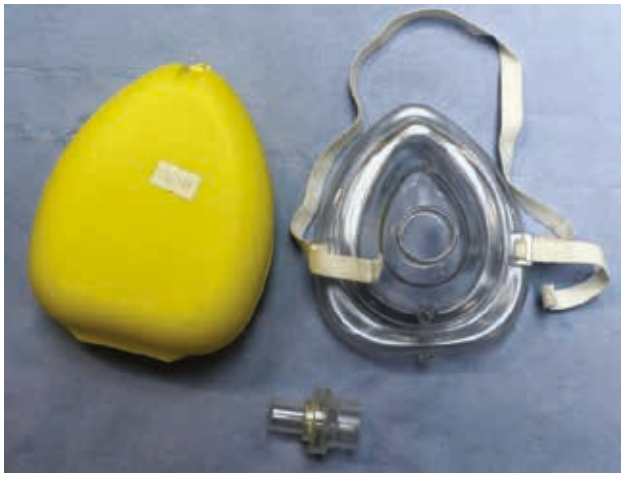


Figure 17.7 A pocket mask.

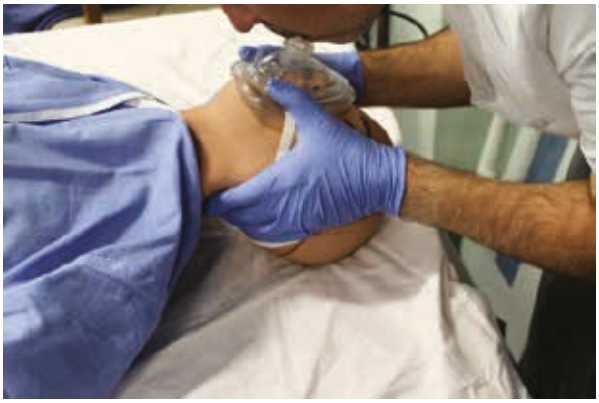


Figure 17.8 Use of a pocket mask.

Bag, valve and mask device (BVM)

ALERT

When using the BVM, squeeze the bag gently but firmly. Do not 'snatch' the bag, as you will ventilate the person too aggressively. This may force some of the air into the stomach, possibly inducing aspiration of the stomach contents.

The BVM (*Figure 17.9*) is used for ventilating people who are making inadequate or no respiratory effort. An effective seal at the mask is vital when using the BVM. This is achieved by using a C-grip method (sometimes referred to as the 'anaesthetist's grip'), with the thumb and forefinger around the mask and the remaining fingers around the angle of the jaw, pulling the jaw up to meet the mask (*Figure 17.10*). To provide ventilation in this manner it is necessary to extend the neck and perform a head tilt/chin lift manoeuvre. The alternative jaw thrust manoeuvre is required in suspected cases of cervical spine injury. Attached to the bag is an inflatable reservoir that is filled with oxygen. The bag is then squeezed to provide ventilations containing high-concentration oxygen.

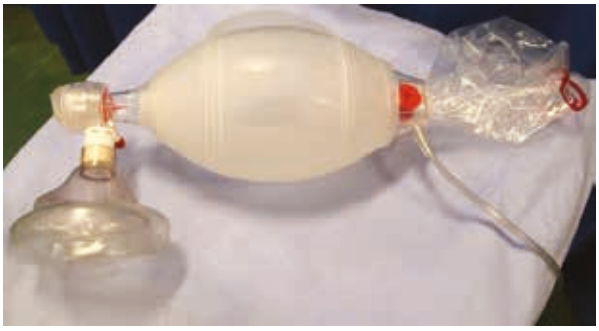


Figure 17.9 Bag, valve and mask.

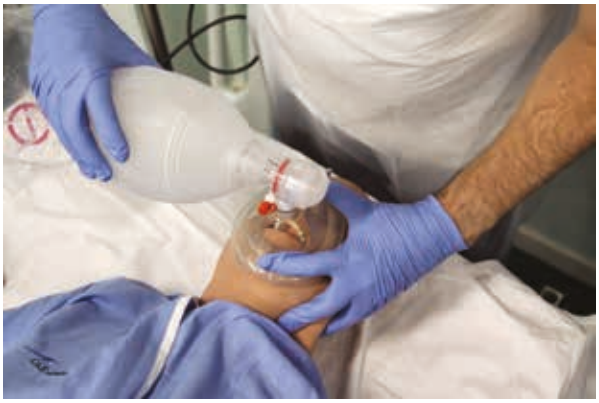


Figure 17.10 Ventilation with bag, valve and mask.

When using a BVM it is usually necessary to use an OP airway to keep the airway open. This also makes it easier for you to ventilate the person. An OP airway helps to prevent backward displacement of the tongue. It is also useful to give some

form to the mouths of people who have no teeth. However, if a person has good, close-fitting dentures, then these should be left in place.

Using a BVM with an appropriate airway opening manoeuvre requires skill, experience and practice. As a model of good practice, bag and mask ventilation is better with two people (*Figure 17.11*), with one person squeezing the bag and the second person applying an effective seal with the face mask.

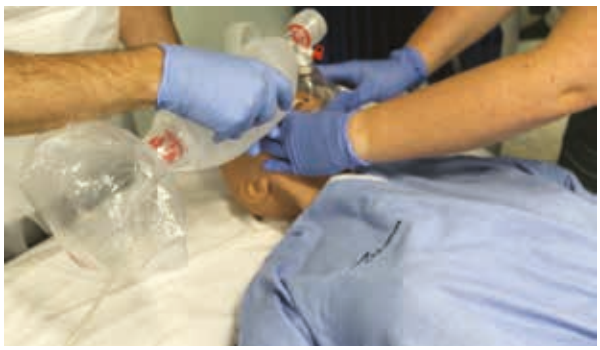


Figure 17.11 Two-person technique for bag, valve and mask ventilation.

With the oxygen reservoir in place and oxygen attached, high concentrations of oxygen can be delivered. This is of critical importance to the person's condition. When connecting oxygen to the device ensure it is set to 15 litres per minute on the flow meter – this will deliver an oxygen concentration of over 90%.

17.1.7 Airway management summary

The table below summarises the key aspects of airway management.

Table 17.1 Airway management and respiratory support summary.

Airway support	Respiratory support
Head tilt/chin lift Jaw thrust in case of suspected spinal injury Suction Oropharyngeal airway Nasopharyngeal airway if the oral airway cannot be opened	Pocket mask ventilation Bag, valve and mask ventilation Supplemental oxygen

17.2 Basic life support

Hint for practice

Knowledge of basic life support skills is essential even as a student. Ensure that you attend your regular updates as the skills you learn are not only essential as a future registrant, but could save someone's life in any environment.

Basic life support is given in cases of cardiac arrest in order to maintain adequate ventilation and circulation until means can be obtained to reverse the underlying cause of the cardiac arrest.

To maintain life and function effectively a constant supply of oxygen is required to all parts of the body. The brain will become severely damaged if deprived of oxygen for just a few minutes. To ensure that there is enough oxygen supplied to the brain there are three elements which must be maintained and supported:

- **A**irway – must be clear to enable oxygen to reach the lungs
- **B**reathing – to deliver the oxygen to the bloodstream
- **C**irculation – to carry the oxygen to the tissues of the body.

If any of these physiological responses are absent, then support and assistance will be required. Basic life support consists of the following elements:

- initial assessment
- airway maintenance

- ventilation support
- chest compression.

Basic life support implies that no equipment is employed other than a protective device for affording supportive ventilations to the person. In hospital a pocket mask is used (see *Section 17.1.6*).

17.2.1 Adult basic life support outside hospital

The following algorithms are taken from the Resuscitation Council UK (2015) guidelines. *Figure 17.12* shows the sequence of basic life support for the lay person or for out-of-hospital life support. This is a very simplistic approach, but as healthcare professionals we must be familiar with the principles. One of the standards in the 2018 updated NMC *Code* states that a nurse or midwife should 'always offer help if an emergency arises in your practice setting or anywhere else'.

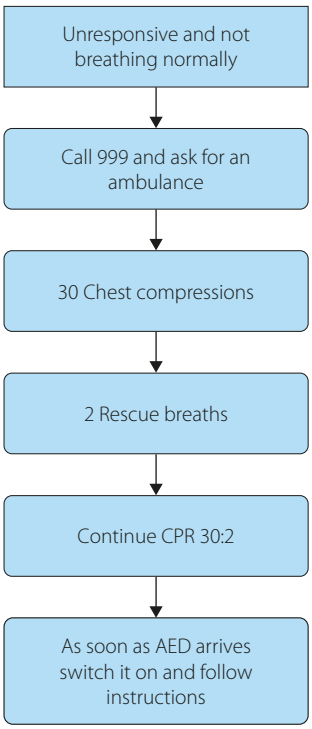


Figure 17.12 Out-of-hospital basic life-support sequence. Reproduced with the kind permission of the Resuscitation Council UK.

17.2.2 Adult basic life support (in-hospital resuscitation)

There is an expectation that the healthcare professionals attending to the person are skilled at recognising a collapsed person with no breathing or pulse. The focus is on the early identification of the cardiac arrest and calling for the necessary support from the in-hospital resuscitation team. This sequence includes advanced interventions; these will be carried out and performed by the appropriately trained personnel within the resuscitation team. Your priority is to ensure that effective basic life support is being performed (*Figure 17.13*). Advanced life support will be addressed in *Section 17.3*.

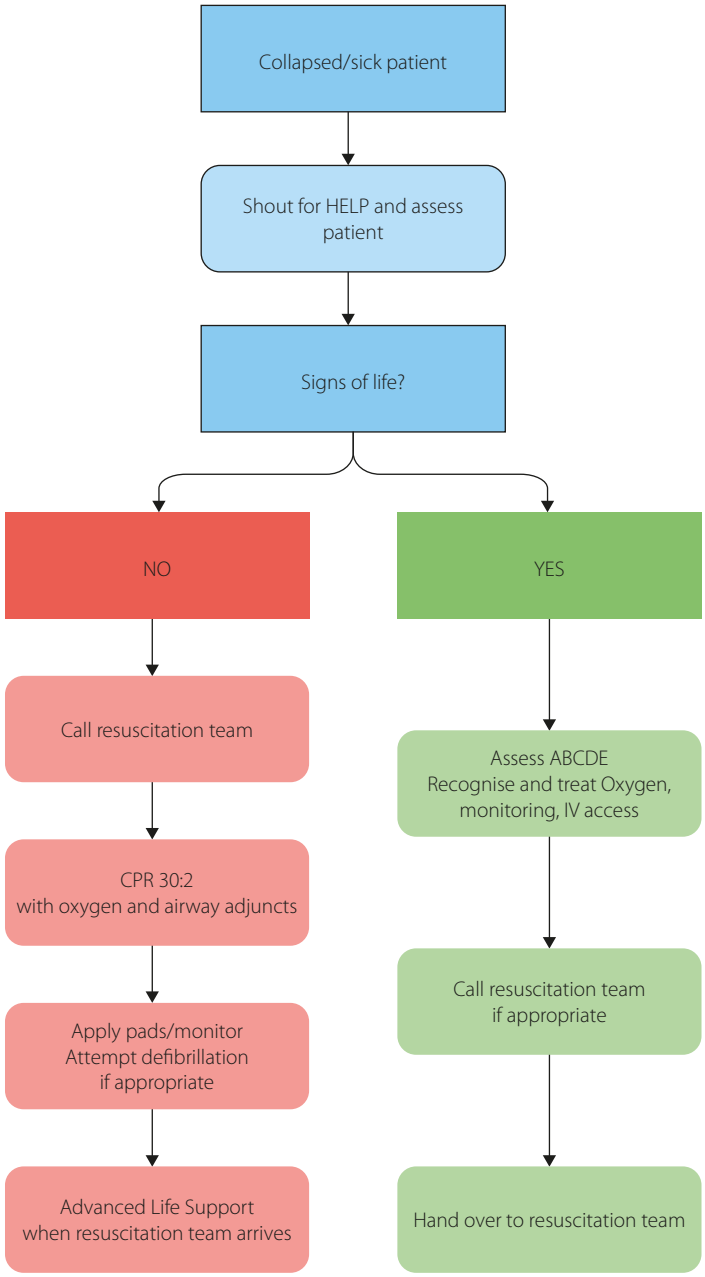


Figure 17.13 Adult basic life-support algorithm (in-hospital resuscitation). Reproduced with the kind permission of the Resuscitation Council UK.

17.2.3 Basic life-support sequence

Ensuring personal safety

Before commencing basic life support, make sure it is safe to approach the person and that you are not at risk yourself. This could mean considering something relatively simple such as, for example, that the collapsed person is lying on a slippery surface, or a more dangerous situation such as when someone has sustained a shock from an electrical power source. Before you do anything else you must make sure the power source has been isolated and it is safe for you to attend to the person.

If disposable gloves are available, you should wear them in order to prevent cross-infection.

Check the person for responsiveness

If you discover someone collapsed it is essential that you call for help before attempting life support. Once the call for help has been made, then you must check for responsiveness by simply speaking loudly and clearly, saying 'Are you all right?' while shaking the person gently by the shoulders.

If the person does respond

If the person does respond to your voice and/or gentle shaking, urgent assistance is still required, as they are obviously in a collapsed condition. Unless the airway is obviously obstructed then the person should be left as they were found. If the person has a blocked airway then it will be necessary for you to ensure a clear airway (see *Section 17.1.4*).

If the person does not respond to a verbal command

Ensure that the person has been turned onto their back. Now follow the Airway, Breathing and Circulation framework (ABC).

Procedure 17.4: ABC framework

STEP 1 Assess the airway and ensure it is free from debris and foreign bodies.

STEP 2 Apply the correct airway-opening technique to the person as previously described – either a head tilt/chin lift or, if you suspect a cervical spine injury, a jaw thrust.

STEP 3 Keeping the airway patent and open, look, listen and feel for signs of breathing, but for no longer than 10 seconds (*Figure 17.14*).

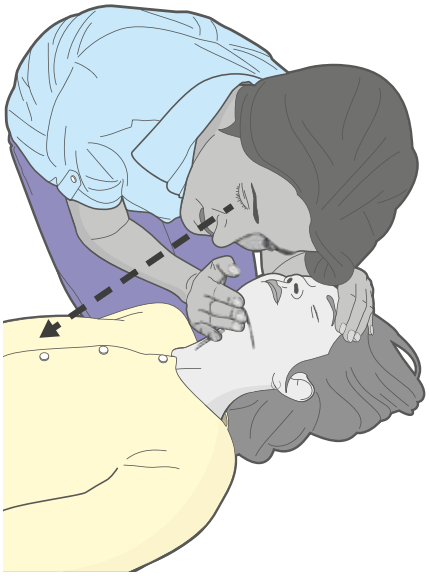


Figure 17.14 Breathing check.

STEP 4 Check the pulse. More experienced healthcare professionals may do a check of the carotid pulse at the same time as assessing the breathing status. The pulse check, like the breathing check, should take no longer than 10 seconds (*Figure 17.15*).

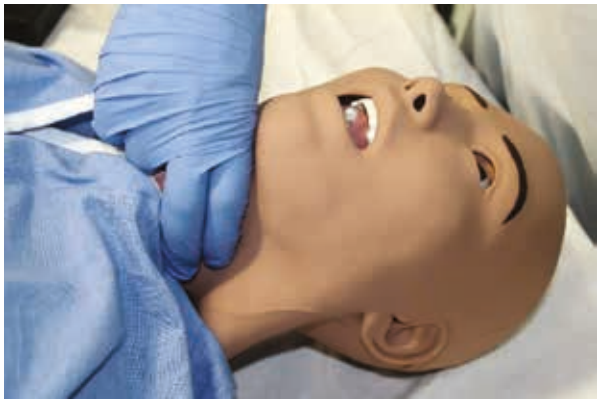


Figure 17.15 Carotid pulse check.

If the person is breathing normally

Place the person into the recovery position (*Figure 17.16*), ensure help is on the way and keep re-assessing the airway and breathing.

Figure 17.16 The recovery position.

If the person has a pulse but is not breathing

In this case urgent assistance and support will be required. Ensure the person has a clear airway and commence supportive respiratory ventilation with supplemental oxygen using a pocket mask or bag, valve and mask. Be prepared to carry out cardiopulmonary resuscitation (CPR) as the person may suffer a cardiac arrest at any moment.

As the person is not breathing it may be necessary for them to be ventilated with advanced airway techniques in conjunction with a mechanical ventilator (advanced airway management will be covered in *Section 17.3*). The person would need to be transferred as soon as possible to an appropriate treatment area, such as an Intensive Care Unit.

If there is no pulse or no signs of life

If you find that the person has no signs of life, it will be necessary to commence CPR.

Procedure 17.5: Performing cardiopulmonary resuscitation

STEP 1 Place the heel of one hand in the middle of the lower half of the sternum, with the heel of the other hand on top of the first hand.

STEP 2 Interlock your fingers, keeping away from pressing on the abdomen or the lower bony portion of the sternum (*Figure 17.17*).

STEP 3 Position yourself vertically above the chest and, with your arms straight, press down on the sternum to a depth of 5–6 cm. After each compression, release the pressure on the chest but do not lose contact between your hand and the chest. Allow the rib cage to recoil naturally so that the heart can refill ready for the next compression (*Figure 17.18*).

STEP 4 The chest should be compressed 30 times. After the first 30 compressions, ventilate the person twice, then resume compressions.

STEP 5 Repeat at a rate of 100–120 compressions per minute.

STEP 6 This 30:2 ratio should be performed for two minutes (five cycles).

STEP 7 Compressions should not be interrupted, except for ventilation or defibrillation. Remember that time compressing the chest is important as you are attempting to establish an appropriate perfusion pressure for the myocardium, the kidneys and the brain. Time off the chest will cause this pressure to reduce significantly.

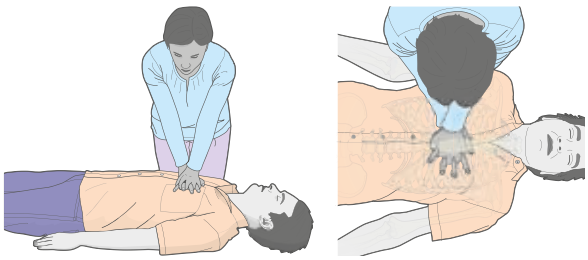


Figure 17.17 Cardiac compressions.

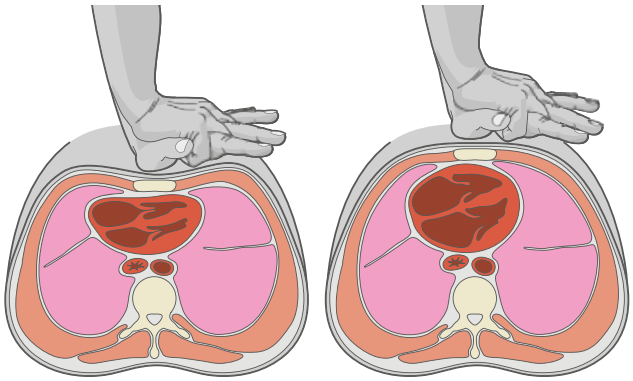


Figure 17.18 Compression and release.

ALERT

During resuscitation attempts, it is vital that chest compressions are continual. 'Time off' the person's chest must be minimised. This is because cardiac compressions increase coronary perfusion pressure; maintaining the maximum possible pressure is of critical importance, as it has a direct effect upon health outcome.

The latest evidence suggests that you should only stop basic life support if the person starts to show signs of recovery and to breathe normally. Interruptions to chest compressions must be minimal.

17.2.4 Post-resuscitation care

The goal for any life-support attempt is to regain a circulation. The post-resuscitation care phase begins as soon as you have established a return of spontaneous circulation. You may regain a circulation with your attempts at life support yet the person may still not be breathing spontaneously. If this is the case then it will be necessary for you to support the airway and ventilations. At this stage the person will require urgent transfer to an appropriate treatment area to allow for further care and support once they are stable enough to be transferred.

17.3 Adult advanced life support

Advanced life support complements basic life support. It is a sequential chain of actions that includes invasive techniques and therapies that not only support the person but also seek to reverse the possible causes of the cardiac arrest. Such advanced interventions include:

- defibrillation
- advanced airway management
- IV cannulation
- specific pharmacology.

The interventions of advanced cardiac life support (ACLS) can be seen together as a chain of survival. *Figure 17.19* shows the sequence of events, from the recognition of a problem, through to the advanced life-support interventions carried out in a logical and timely manner.

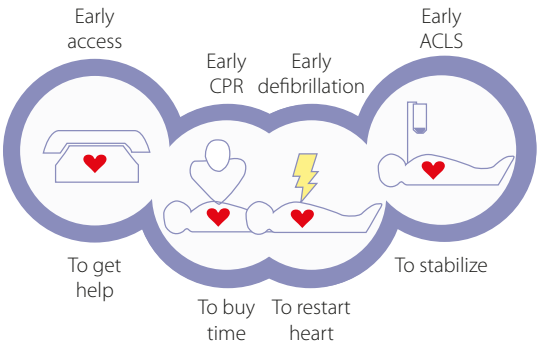


Figure 17.19 The chain of survival (Resuscitation Council UK 2015). Reproduced with the kind permission of the Resuscitation Council UK.

17.3.1 Defibrillation

ALERT

Never attempt defibrillation if you have not completed the appropriate training programme endorsed by your employing organisation.

Defibrillation is the use of a controlled electric shock, in the form of a dual current, administered through the chest wall, to restart or normalise heart rhythms. The term 'fibrillation' refers to the action of the heart muscle when it 'quivers' in an uncoordinated fashion, thus producing no cardiac output. When this happens the person is said to be in **cardiac arrest**. This term also relates to a cardiac rhythm known as **ventricular fibrillation** (VF). Defibrillation aims to stop the 'quivering' of the heart muscle.

There are two main types of external defibrillator: the manual external defibrillator (*Figure 17.20*) and the automated external defibrillator (AED – see *Figure 17.21*). Manual defibrillators monitor and record the cardiac rhythm and can also produce a printed copy of the rhythm. This printed copy is not the same as the more detailed rhythm analysis generated by a 12-lead electrocardiogram (ECG).

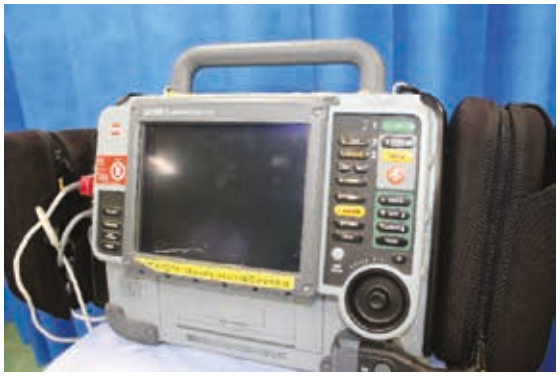


Figure 17.20 Manual external defibrillator.

Figure 17.21 Automated external defibrillator.

When do you defibrillate someone?

It is critical to know when and when not to defibrillate someone. When the resuscitation team arrive to give assistance, the clinician leading the arrest response will monitor the person's cardiac rhythm. This is done as a priority, as certain rhythms respond well to defibrillation.

There are four rhythms associated with cardiac arrest.

Ventricular fibrillation (VF) (*Figure 17.22*) is an indication for defibrillation.

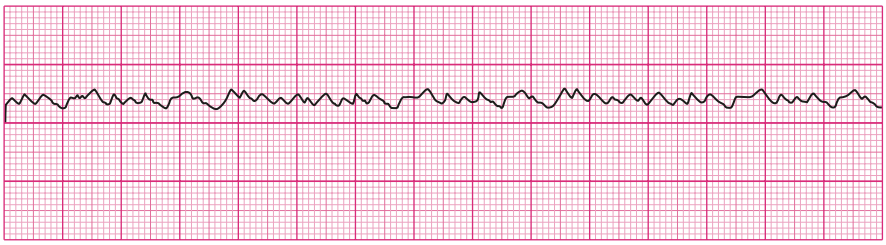


Figure 17.22 Ventricular fibrillation.

Ventricular tachycardia (VT) (*Figure 17.23*) can be either pulseless or pulsed. The ECG traces for pulseless VT and pulsed VT look identical, so a pulse check is vital to determine the need for defibrillation. Pulseless VT is an indication for defibrillation; pulsed VT is not, as the pulse indicates that a person still has a cardiac output.

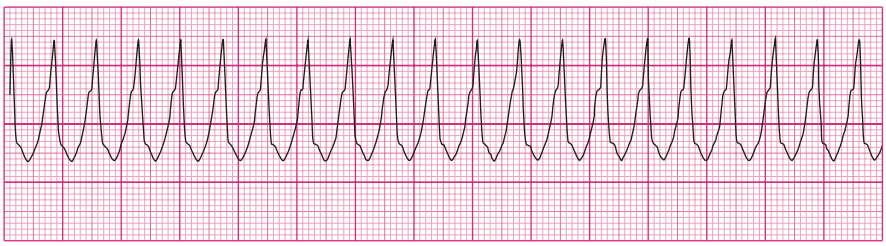


Figure 17.23 Ventricular tachycardia.

Pulseless electrical activity (PEA) (*Figure 17.24*) can be any rhythm that can generate a pulse, but a pulse will be absent. There is coordinated electrical activity within the heart, but mechanically the heart has failed. PEA can take many forms and is not always represented by the rhythm shown in *Figure 17.24*.

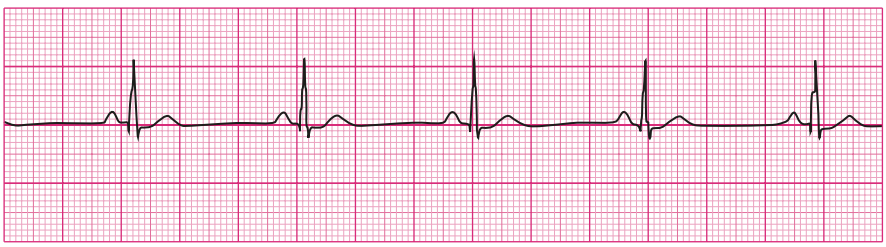
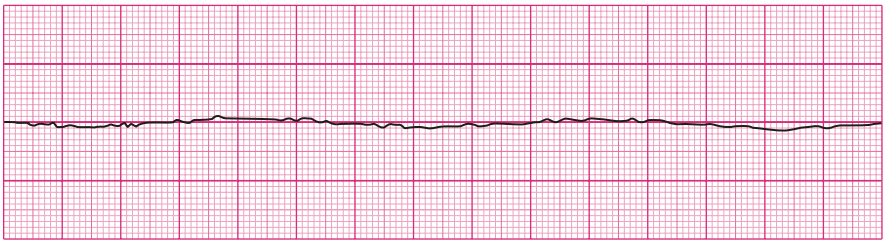


Figure 17.24 Pulseless electrical activity.

PEA should be treated with ventilation and chest compression, and **not** defibrillation.

Asystole (*Figure 17.25*) is an absence of all electrical and mechanical activity within the heart. It should be treated with ventilation and chest compression, and **not** defibrillation.

Figure 17.25 Asystole.



Defibrillation and safety

The technique of defibrillation carries a great risk to the user if performed inappropriately. Defibrillation can cause serious injury or even death if health and safety aspects are ignored. Specific safety factors must be employed and followed.

Procedure 17.6: Safe defibrillation

STEP 1 Before defibrillation takes place, the 'pad field' must be clear. The 'pad field' is the area of a person's chest where the pads will lie. It is good practice to define the area of defibrillation as the person's entire chest. Anything that will conduct electricity, such as jewellery, either around the neck or at the nipple, must be removed. Glyceryl trinitrate (GTN) patches, used to treat angina, must also be removed, as these too may conduct electricity.

STEP 2 Perspiration must be removed before defibrillation. People who are wet (due to urinary incontinence, for example), or who are lying in a wet environment, must be dried before defibrillation.

STEP 3 People who are lying on a metal surface must be moved onto a non-metallic surface before defibrillation. For example, if you are called to someone who had collapsed on a fire-exit stairwell made of metal, you must move the person first. Although hospital beds and trolleys typically have metal bases, this does not put the operator or resuscitation team at risk if the person is lying on a mattress.

STEP 4 During resuscitation attempts, any supplemental oxygen that is being used may enrich the atmosphere close to the defibrillation field. Therefore, the oxygen should be turned off or removed before defibrillation, as a spark caused during the electrical discharge (although rare) could cause combustion.

STEP 5 *Figure 17.26* shows where defibrillation pads should be placed on the chest wall. One pad is placed under the right clavicle (known as the sternum position) and the other placed on the left side of the chest so that it is just above the rib margin (known as the cardiac apex position).

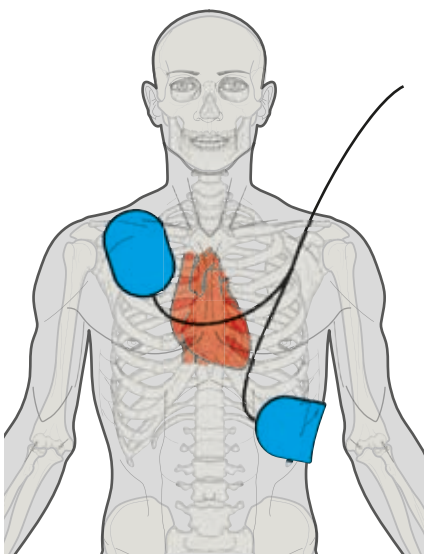


Figure 17.26 Pad placement during automated defibrillation.

STEP 6 Before the electrical charge is delivered, the operator must ensure that everyone is clear and that no one is touching any part of the person being treated. This includes the operator; they must check that they too are not in contact with the person during defibrillation. This is accomplished with a clear, loud command of 'Stand clear'. The operator also carries out a visual check to ensure it is safe to proceed and defibrillate the person. If an AED is being used, it will give verbal commands to the user.

17.3.2 Advanced airway management

Advanced airway management interventions are supplementary to basic airway management. The following is an introduction to the various techniques.

Laryngeal mask airway

Laryngeal mask airways (LMA) (*Figure 17.27*) are widely used by anaesthetists and paramedics. They are also used to provide effective ventilations for unconscious people with absent airway reflexes.

The device consists of a wide-bore tube with an inflatable cuff at the distal end which, when inflated, forms a seal around the laryngeal opening. The use of the LMA provides a clear and relatively protected airway that can be inserted without the need for intubation skills. It has a standard connection allowing the use of other resuscitation equipment such as a bag, valve and mask.

ALERT

Formal training is required prior to the use of a laryngeal mask airway.

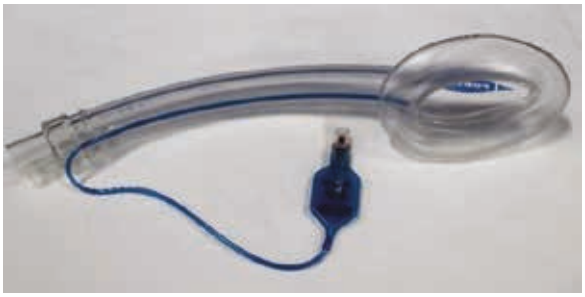


Figure 17.27 A laryngeal mask airway.

Endotracheal intubation

This technique is considered the 'gold standard' of airway management as it protects the airway more effectively than other airway maintenance techniques. Not all nurses are expected to perform intubation. However, you may be required to assist and support the process, so you need to know what equipment is required and what it is used for.

Intubation involves passing a special tube through a person's larynx, where it is temporarily fixed in place. This intervention, typically performed by doctors, anaesthetists and paramedics, carries with it certain risks. The largest risk is the incorrect placement of the tube into the person's oesophagus rather than the trachea. If this is not identified quickly it will cause severe hypoxia and, ultimately, death.

Figure 17.28 explains the different parts and the mechanics of an endotracheal tube. Endotracheal tubes are supplied in various sizes.

Figure 17.29 shows the equipment required for endotracheal intubation. It is essential to pre-check this equipment, as it will be required in an emergency and must always be ready. Supplemental oxygen, suction equipment and a correctly sized airway adjunct in the form of an oropharyngeal airway should accompany any attempts at intubation.

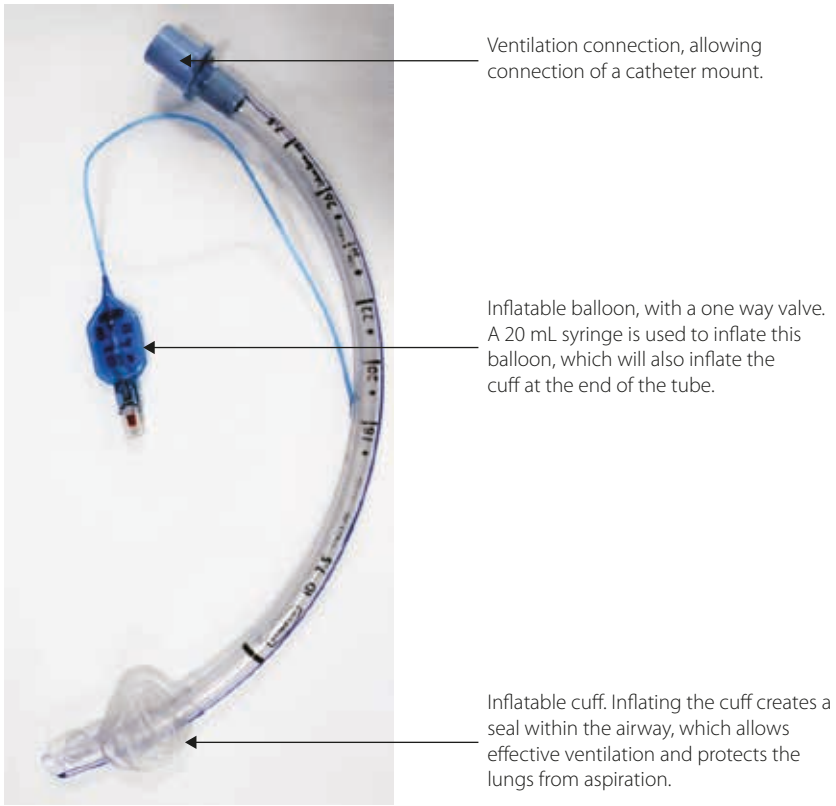


Figure 17.28 An endotracheal tube.

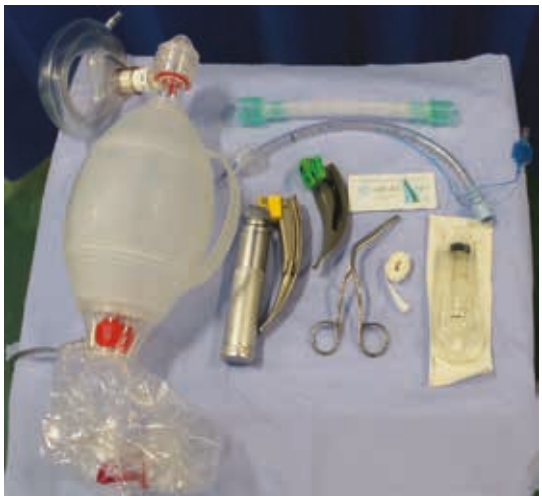


Figure 17.29 The equipment required for endotracheal intubation.

Catheter mount: Once the tube has been successfully placed past the vocal cords, the catheter mount is then connected to the endotracheal tube, which will allow connection of the bag, valve and mask.

Ribbon/gauze tie-off: Once the person has been successfully intubated, the endotracheal tube is secured into place by tying the gauze around the tube and then securing it.

Stethoscope: This is used to confirm correct placement of the tube, ensuring that lung sounds can be heard on both sides of the chest. This is also used to help avoid oesophageal intubation.

Lubricating jelly: This is applied to the distal end of the tube and will help the tube pass without causing trauma to the airway.

20 mL syringe: The syringe is used to inflate the balloon and cuff using approximately 10 mL of air.

Bag, valve and mask: These are used to ventilate a person once intubated.

Spencer Wells clamps: Should the one-way valve fail at the inflatable balloon, these clamps can be applied to prevent further air loss.

Magill forceps: These can be used to retrieve foreign objects located deep within a person's airway, under direct vision in unison with the laryngoscope handle and blade.

Laryngoscope with blades: Once the airway has been opened, the laryngoscope blade is used to visualise (i.e. allow the clinician to see) the vocal cords. Once visualised, the tube is passed through the cords.

Endotracheal tube: When correctly placed this is used to ventilate the person. A cuff at the end of the tube causes a sealing effect, protecting the airway further and allowing effective ventilations to take place.

Figure 17.30 shows the operator holding a laryngoscope in the left hand and lifting the tongue away, allowing visualisation of the vocal cords. Once the cords have been identified, the operator can then pass the tube through them. Once the tube is past the cords, a balloon at the end of the tube is inflated, giving an effective seal and preventing the risk of aspiration. The person can now be effectively ventilated with a bag, valve and mask.

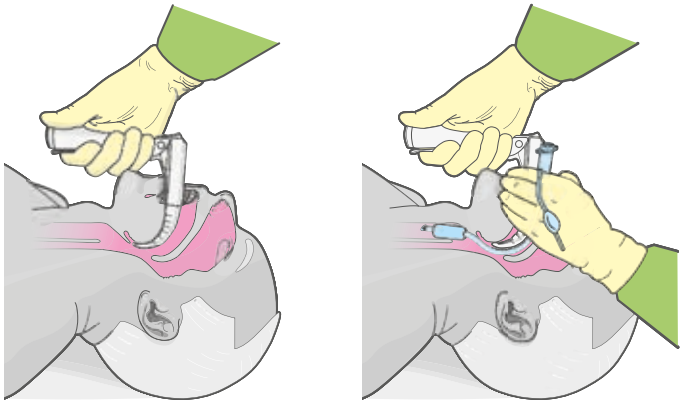


Figure 17.30 Endotracheal intubation.

The airway should be secured early during advanced life support so that a person can be connected to an appropriate ventilator immediately, allowing the performance of continuous cardiac compressions with minimal interruptions. Once someone has been successfully intubated, they can be ventilated with a bag, valve and mask or an automatic ventilator.

17.3.3 Intravenous cannulation

Peripheral IV access (also referred to as cannulation) during life support allows administration of specific drug therapies for cardiac arrest and fluids that support and complement effective basic life support and defibrillation. An appropriately

sized cannula or Venflon (these two names are used interchangeably) is used, as shown in *Figures 17.31* and *17.32*. As a student nurse you will be required to develop proficiency in venepuncture and cannulation; see *Chapter 19* for more detail on the procedure.

Once someone has been successfully cannulated, entry into the venous system can be used repeatedly for drugs or fluids. IV access is typically achieved in one of a person's arms, although the external jugular vein may be used during cardiac arrest as it is more efficient and effective for drug therapy because it lies closer to the heart.

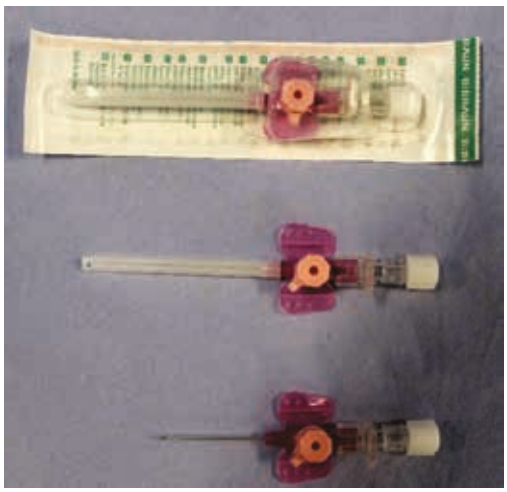


Figure 17.31 Cannulas or Venflons.

Figure 17.32 IV cannula *in situ*.

During cannulation the sharp stylet is removed from the cannula, leaving a plastic tube inside a person's vein. Cannulation is therefore hazardous as there is a potential for a needlestick injury.

17.3.4 Pharmacology

Once the resuscitation team have established IV access, specific drugs are used to aid in reversing the cause of the cardiac arrest. The Resuscitation Council (UK) has issued guidance on the order and timings of drug administration in the context of cardiac arrest.

Adrenaline (epinephrine)

No matter what the cause of the arrest and no matter what the cardiac rhythm, the first drug of choice is adrenaline. Administration of adrenaline results in improved myocardial and cerebral blood flow during CPR, which thus becomes more effective. The drug should be repeated every 3 to 5 minutes at a dose of 1 mg via a peripheral cannula.

Amiodarone

Amiodarone is an antiarrhythmic. It helps to suppress the excitability of a heart muscle that has persistent periods of VF or pulseless VT that is unresponsive to initial defibrillation. The dose of amiodarone is 300 mg administered via a peripheral cannula.

17.3.5 The process of advanced life support

Now that we have looked at the individual skills associated with advanced life support, you need to have an appreciation of how they are all put together. The following algorithm (*Figure 17.33*) is taken from the Resuscitation Council's Advanced Life Support Guidelines (2015); it shows that basic life support and defibrillation are pivotal to the whole process of advanced life support.

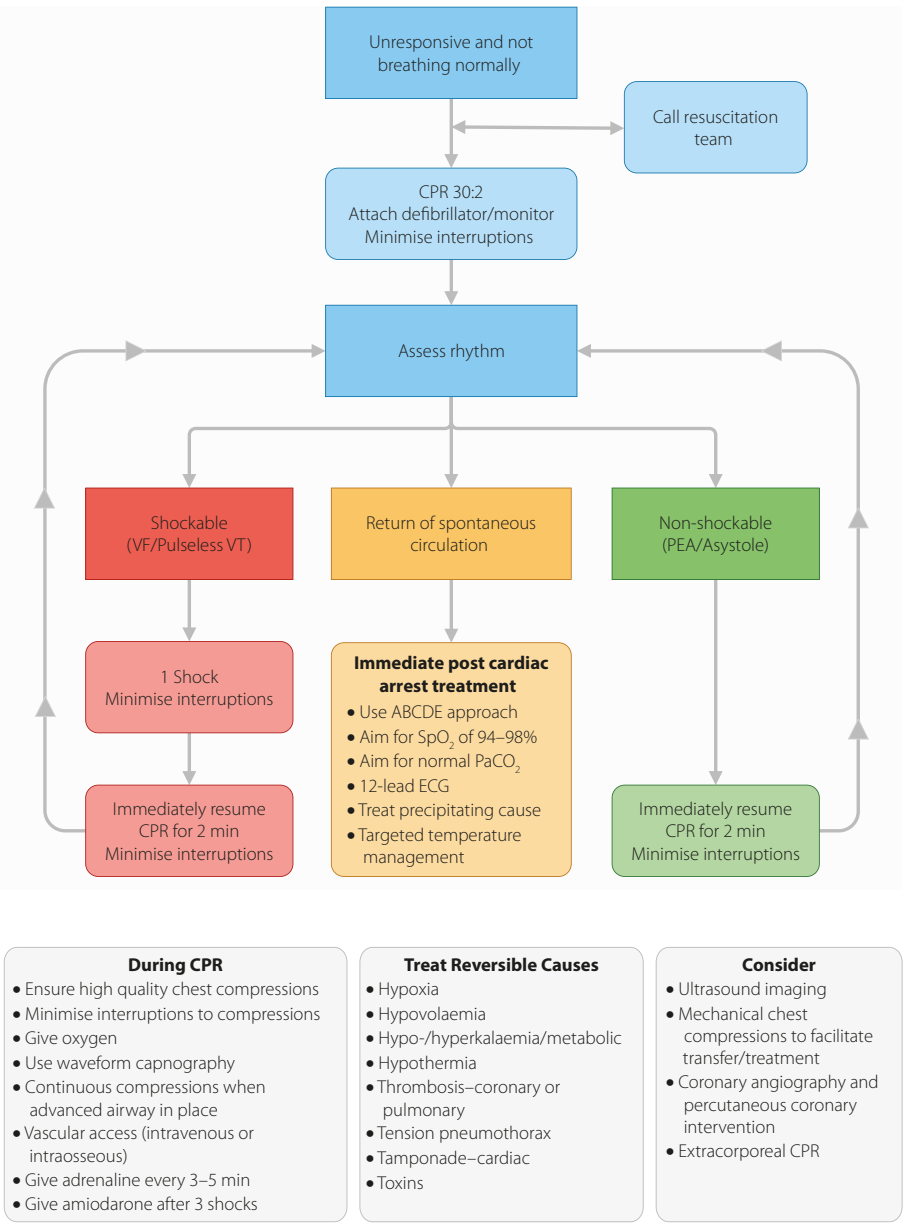


Figure 17.33 Advanced life-support algorithm. Reproduced with the kind permission of the Resuscitation Council UK.

Activity

Consider your own confidence and proficiency in performing basic life support (BLS) and the things you would need to consider in keeping yourself safe. Develop an ongoing personal development plan to ensure that you maintain proficiency in performing BLS. Ensure that you include a note of when your educational updates are planned for BLS, and be sure to keep records of when you attend. Visit the Resuscitation Council (UK) website for further reading.

Summary

Key points from this chapter:

- When dealing with someone who has collapsed, always consider your own safety first.
- Accurate assessment, using a structured approach, is essential when dealing with a collapsed person.
- Always call for help – you cannot deal with emergency situations alone.
- Life-support techniques are rarely performed daily, so regular updating of your skills is essential.

References

Resuscitation Council UK (2015) *Adult Advanced Life Support*. www.resus.org.uk/library/2015-resuscitation-guidelines/guidelines-adult-advanced-life-support

Resuscitation Council UK (2015) *Adult Basic Life Support and Automated External Defibrillation*. www.resus.org.uk/library/2015-resuscitation-guidelines/adult-basic-life-support-and-automated-external

CHAPTER 18

18 Pre- and post-operative care

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- manage the care and support of someone in the pre-operative period, including:
  - assessment
  - screening and investigation
  - consent and information
  - documentation
  - pre-medication and fasting
- manage the care and support of someone in the post-operative period, including:
  - assessment
  - monitoring strategies
  - nursing management.

Scenario: Mudiwa Muteba

Ms Mudiwa Muteba is a 57-year-old woman with no significant previous medical history. She has been admitted to the surgical ward via the emergency department with acute abdominal discomfort and suspected appendicitis.

18.1 Pre-operative care

18.1.1 The role of the nurse

In the pre-operative period, the nurse's role includes:

- providing appropriate written and verbal information to:
  - the person being cared for
  - the person's carers, with consent
  - the MDT
- physical preparation of the person for surgery
- assessment of any potential post-operative needs
- collation of medical records, nursing records and the results of pre-operative investigations
- implementation of pre-medication and fasting protocols.

18.1.2 Health information and consent

People must be informed about what is planned and predicted for them before, during and after surgery, and what the benefits and risks are of the operation. Informed consent must be obtained before any operation. Consent is dealt with in *Chapter 13*.

18.1.3 Pre-operative assessment

Hint for practice

Remember that before an operation, whether elective or not, a person may be anxious and/or frightened. Take time with the assessment and offer any reassurance required to the person in your care. Seek help from your supervisor with any questions you cannot answer.

The nature of pre-operative assessment will depend on whether someone is having elective surgery, which is planned in advance, or emergency surgery. In both cases, pre-operative assessment:

- establishes that the person is as fit as possible for both surgery and anaesthesia
- establishes that consent has been obtained for the procedure to go ahead
- aims to reduce peri-operative morbidity and mortality by identifying additional assessments and investigations that the person might need prior to surgery
- provides the person, where possible, with an opportunity to discuss their fears and anxieties.

In the case of elective surgery, pre-operative assessment is often carried out in clinics well in advance of the operation. On the surgical ward the nurse's role is to ensure the relevant information is available, including:

- height
- weight
- body mass index (used to identify risks due to obesity: a BMI of greater than 30 may lead to increased peri-operative mortality and morbidity; see *Section 11.1*)
- vital signs: assessment of temperature, pulse, blood pressure and oxygen saturations provide a baseline that enables signs of deterioration to be identified (see *Chapter 5*)
- random blood glucose (see *Section 5.8*)
- 12-lead electrocardiogram (see *Section 17.3*)
- urinalysis (see *Sections 8.1–8.2*)
- medical history and information on any underlying conditions
- additional information that may affect the person's health journey such as, for example, chronic illness, social and family well-being.

In the case of emergency surgery, the nurse who is preparing the person for surgery is responsible for providing as much of the relevant information as possible.

The nurse is responsible for ensuring that a record of the assessment is documented in the nursing notes.

Scenario: Mudiwa Muteba

On admission to A&E, Mudiwa is examined by a doctor and has observations taken by a nurse. She is referred to surgeons who review her and decide she needs to go to theatre for a laparotomy to confirm the diagnosis of appendicitis. The A&E nurse prepares Mudiwa for theatre, including collation of information such as blood test results and other examinations, and the consent form. The A&E nurse takes Mudiwa to theatre and hands her care over to the theatre nurse or operating department practitioner.

The laparotomy confirms the diagnosis, and Mudiwa's appendix is removed. While Mudiwa is in surgery the A&E nurse contacts the bed manager to arrange a post-op bed on a surgical ward.

After theatre, the surgical ward nurse collects Mudiwa from recovery, and the recovery nurse hands over all the relevant information about her surgery and explains any specific post-op instructions to the ward nurse.

18.1.4 Psychological preparation

Allaying a person's anxiety in the pre-operative period is important and leads to decreased dependence and a smooth transition into the post-operative period. The nurse will talk to people, provide written information regarding peri-operative practice and answer questions to help address fears and anxieties. For some people a visit to theatre with the nurse or from the theatre nurse or operating department practitioner before their operation might also be helpful.

18.1.5 Documentation and record-keeping

The nurse is responsible for recording in the nursing notes that the person was prepared for theatre. The nurse is also responsible for collating all the documentation that needs to accompany someone to theatre.

This information will form a pre-operative checklist to ensure the person's safety and smooth transition from pre-operative to post-operative care. An example is shown in *Figure 18.1*.

Figure 18.1 Pre-operative checklist.

Pre-operative checklist		✓
Identification	Correct Name band present Details confirmed with person	
Consent form	Signed & dated Conforms to operation list	
Operation site	Marked Prepared Side in words (L or R) Conforms to operating list	
Documentation	Notes Prescription charts (drug & fluid) Infection risk	
Nil by mouth	Time last ate & drank	
Pre-medication	Sedatives Bowel prep Prophylactic antibiotics	
Confirm the following have been removed	Jewellery (or taped) Hair clips Make-up Nail varnish	
Prostheses	Pacemaker Artificial eyes/limbs Contact lenses Hearing aids Metal implants	
Last passed urine	Time	
Dental	Loose teeth Crowns Bridges Dentures	
Venous thrombotic embolism risk	Risk assessment completed TED stockings	
Blood	Group & save form present and in date Cross-matched blood available Latest results recorded	
Females	Last menstrual period (LMP) date Pregnancy test	
Any other relevant information		

18.1.6 Pre-medication

Pre-medication is the administration of medication, usually an analgesic or anxiolytic, before anaesthesia in order to help relieve anxiety and facilitate a smooth transition to anaesthesia. Pre-medication may be prescribed by the anaesthetist. The nurse is responsible for ensuring that the pre-medication is administered at the correct time, which is usually two hours before the operation.

18.1.7 Pre-operative fasting

Local protocols for pre-operative fasting periods should be used by nurses involved in pre-operative care. Evidence has shown that prolonged pre-op fasting can increase the incidence of dehydration and, as a result, clear fluids may be given up to two hours before the time of surgery (Hamid 2014).

18.2 Post-operative care

Hint for practice

People in the recovery period may be confused and frightened. Using your communication and caring skills at this time is vital in ensuring that the person in your care is provided with not just the best physical care but the best emotional support too.

Most people return to the surgical ward able to breathe normally, with a stable cardiovascular status, and in a rousable but not necessarily conscious state. Post-anaesthesia and post-operative care aim to ensure that a person returns to their pre-operative physiological state. This recovery period may take several days or weeks as both anaesthesia and surgery produce a series of hormonal and stress responses that affect the homeostasis of the body.

18.2.1 Post-operative assessment

Post-operative assessment and care depend on the nature of the surgery and the type of anaesthetic. People who have undergone an operation under general anaesthetic are at risk of compromise to their airway, breathing and circulation. Until they have regained control of their airway, demonstrated cardiovascular stability and recovered the ability to communicate, people must be cared for in the recovery area by appropriate trained staff, on a one-to-one basis.

The nurse's role involves close monitoring of a person's wound and their respiratory, cardiovascular and neurological status, and supporting an individual through the period of recovery. Monitoring involves:

- taking observations of the person's vital signs (see *Chapter 5*)
- communicating
- listening to the sounds produced by the person's body
- touching the person for signs of heat, cold, clamminess, etc.

18.2.2 Respiratory monitoring and support

Respiratory monitoring involves:

- observing the person's appearance looking for:
  - colour – blueness, or cyanosis, could indicate lack of oxygen in the tissues (hypoxia) or poor oxygenation of blood in the lungs; in the case of a dark-skinned person, look inside the mouth at the gums for signs of cyanosis
  - steady rise and fall of the person's chest
- positioning the person so that the airway is not compromised – the person should be in a semi-prone position, well supported with pillows, to maximise airway patency
- listening for sounds that might indicate dyspnoea (respiratory distress), such as wheezing, gurgling, coughing, stridor and so on
- counting the respiratory rate
- monitoring oxygen saturations by means of pulse oximetry (see *Section 5.6*).

The monitoring and support may include initiation of airway management and oxygen therapy. People with significant respiratory complications need to be managed within the critical care setting, where more detailed observations and ventilator support can be provided.

Airway management

Observation and maintenance of a person's airway is vital in the immediate post-operative period. Airway obstruction requires immediate treatment and interventions to maintain airway patency.

Airway obstruction can occur as a result of the loss of the normal protective reflexes due to anaesthesia. Signs are:

- sounds such as wheezing, gurgling, etc.
- blueness (cyanosis).

If you see these signs, you should:

- alert a senior nurse and seek help
- reposition the person to ensure maximum airway patency
- check for any obvious obstruction
- use suction to remove secretions as necessary (under supervision).

If the problem persists, advanced airway management may be necessary. See *Chapter 17* for procedures that secure and maintain the airway.

Oxygen therapy

Oxygen is administered in the post-operative period to help support the reversal of anaesthesia. Oxygen therapy is dealt with in more detail in *Section 14.4*.

On return from surgery, most people can be managed using a low-flow oxygen device.

Scenario: Mudiwa Muteba

On admission to the surgical ward, Mudiwa is connected to the ward supply of oxygen, and observations commence. These are carried out every quarter hour for the first hour, half-hourly for the next two hours, hourly for a further two hours, and every four hours thereafter, based on an uneventful recovery.

Specific complications may arise after surgery that can affect pulse oximetry readings (see *Section 5.6* and *Table 18.1*). These must be treated to support the person's recovery in addition to enabling accurate monitoring of oxygen therapy.

Table 18.1 Common post-anaesthesia and post-operative complications affecting pulse oximetry readings.

Cause of inaccuracy	Reason
Low blood pressure	Loss of body fluid through trauma, the disease process and treatment regimes (e.g. vomiting, diarrhoea or diuretic therapy)
Reduced perfusion to tissues	Reduced temperature, hypothermia
Venous pulsation	Oedema in limbs

ALERT

Remember to observe the person and not just the pulse oximeter. Normal haemoglobin levels are 13.8–18.0 g/dL in men and 12.1–15.1 g/dL in women. However, someone with a low haemoglobin level of 8 g/dL could have a reading of 95–100% SpO_2 on the pulse oximeter. In addition to reading the pulse oximeter, you thus need to consider:

- how much blood has been lost during surgery
- how much has been replaced
- the appearance and colour of the person, and whether there are signs of peripheral shutdown and/or cyanosis (peripheral shutdown refers to vasoconstriction of the peripheral circulation within the dermis of the skin, allowing blood to be diverted to the core away from the periphery; it may be a response to hypothermia, shock, haemorrhage or hypotension)
- any change in the person's respiratory rate – an increase indicates that the body is trying to take in more oxygen
- any change in the person's pulse – an increase indicates that the heart is working harder to increase circulation.

Any signs of deterioration should be reported immediately to a senior nurse or doctor.

18.2.3 Cardiovascular support and monitoring

Post-operatively, people are initially often cold and peripherally shut down, and they need close observation until their body temperature returns within normal limits. Cardiovascular monitoring involves:

- monitoring the person's pulse rate and rhythm and blood pressure
- as with respiratory monitoring, observing the person's colour:
  - blueness (cyanosis, see *Section 18.2.2*)
  - pallor and greyness – could indicate poor oxygen delivery to the tissues
- touching the person to feel for warmth – the presence of warmth in the peripheral areas, especially the hands and feet, demonstrates a good blood supply and circulatory status.

Cardiovascular observations

The frequency of the clinical cardiovascular observations depends on the stage of recovery, the nature of the surgery and someone's clinical condition. The following cardiovascular observations should be recorded as a minimum:

- blood pressure
- pulse
- heart rate
- heart rhythm.

Additional information that can support the cardiovascular assessment includes: level of consciousness, oxygen saturations, body temperature, pain assessment and fluid status.

Hydration status monitoring

Surgery and anaesthesia often cause fluid losses, mainly due to:

- pre-operative starvation
- blood loss during surgery
- blood loss after surgery via wound drainage.

By using direct observation skills, you can assess a person's fluid status. Signs of dehydration are:

- person complaining of thirst
- dry mouth
- loss of elasticity of skin (decreased **turgor**).

IV fluids may be needed during the post-operative period to correct any deficiencies noted. These should be administered as prescribed.

Scenario: Mudiwa Muteba

Mudiwa has an IV infusion of 1 L combination of normal saline and 5% dextrose every eight hours and is prescribed IV antibiotics.

Hypotension and hypertension

Common cardiovascular complications often experienced in the post-operative period include hypotension and hypertension.

Post-operative hypotension should resolve during recovery, but the nurse should monitor the person's blood pressure to ensure that they are indeed recovering.

Table 18.2 Causes of post-operative hypotension.

Cause	Action	Further action if hypotension fails to resolve
Blood loss during and/or following surgery causing hypovolaemia	Replace fluids as prescribed.	If blood pressure continues to fall consider haemorrhage; check for tachycardia; check wound.
Anaesthetic drugs	Monitor blood pressure against pre-operative baseline reading.	Seek advice from a senior nurse or doctor.
Opioid analgesia	Monitor blood pressure, which would be expected to fall as a result of the opioid.	Monitor respirations and pulse oximetry for early detection of any respiratory depression.

The main cause of post-operative hypertension is pain. Analgesia should be administered as prescribed and its effectiveness monitored and recorded.

Cardiac monitoring

Cardiac monitoring after surgery is not routine and will only be required if indicated by a person's condition and previous medical history. Underlying conditions identified in the pre-operative assessment will determine the level of monitoring required.

Monitoring is done by means of the ECG.

Procedure 18.1: Cardiac monitoring

STEP 1 Explain the procedure and obtain consent.

STEP 2 Prepare skin according to electrode manufacturer instructions.

STEP 3 Place the electrodes and attach the leads (see *Figure 18.2*):

- red – right midclavicular line just below clavicle
- yellow – left midclavicular line just below clavicle
- green – left midclavicular line at the 6th–7th intercostal space.

STEP 4 Switch on the monitor.

STEP 5 Set alarm limits according to person's baseline pulse rate obtained from pre-operative assessment.

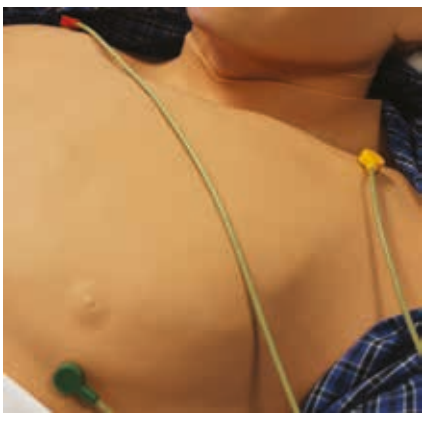


Figure 18.2 ECG lead placement.

The ECG is an electrical representation of the activity that occurs in the heart. The PQRST complex (*Figure 18.3*) represents one heartbeat.

The P wave represents depolarisation and contraction of the atria.

The QRS complex represents depolarisation and contraction of the ventricles.

The T wave represents repolarisation and relaxation of the ventricles.

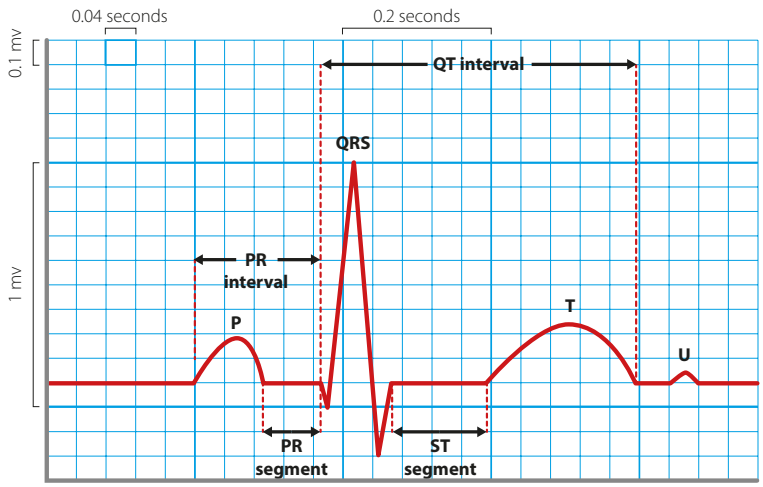


Figure 18.3 PQRST complex.

Figure 18.3 shows a normal ECG trace. See *Section 5.3* for information about normal ranges of frequency. If abnormal frequency is observed, the nurse should inform a senior nurse or doctor.

Central venous access devices

The use of central venous access devices is not routine. They are required when:

- a person needs a combination of:
  - long-term fluid replacement
  - nutritional support
  - IV medication
- a person has poor peripheral venous access
- a person requires monitoring of the central venous pressure (*Figure 18.6*).

Central venous pressure (CVP) is an indication of blood volume, which is related to the person's hydration status. The normal CVP range is 3–10 mmHg (5–12 cmH_2O). If the CVP is lower than this range, the person requires more fluid. If the CVP is higher than this parameter, then the fluid balance needs to be investigated to ensure that output (urine excretion) equals input in order to prevent overloading of the circulatory system.

Central venous access is achieved with devices known as long lines, central lines, Hickman lines or Broviac catheters (*Figures 18.4* and *18.5*).

Figure 18.4 Single-lumen central venous access line.

Figure 18.5 Multiple-lumen central venous access line.

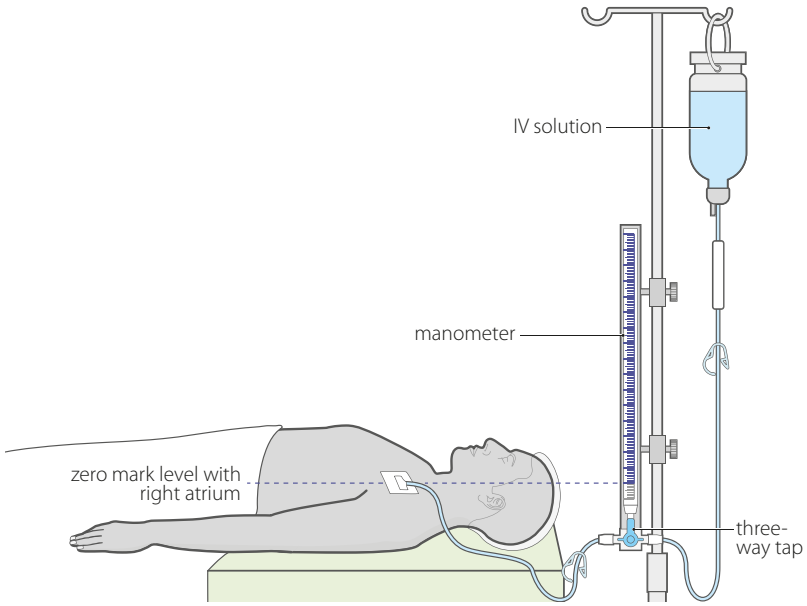


Figure 18.6 Central venous pressure monitoring.

Infection prevention and control is especially important in the management of central venous access devices, as bloodstream infections associated with central venous catheter insertion are among the most dangerous of complications and increase the risk of sepsis.

Special precautions include:

- using aseptic non-touch technique when handling the line (see *Chapter 3*)
- observing the insertion site regularly for signs of inflammation and infection
- ensuring that the line is kept patent by flushing each lumen with saline after use
- preventing the person being cared for from handling the line.

18.2.4 Assessment of level of consciousness

Anaesthesia is a marked change in a person's neurological status. Following reversal of anaesthesia, the person moves along a continuum from unconsciousness to a conscious state. Most people move along the continuum with no ill effect, and the nurse's role is to monitor their recovery. Someone's level of consciousness can be most easily monitored by communicating with them – talking to the person, asking them questions, offering them a drink of water (if allowed).

Neurological observations

Neurological observations are indicated for people who have undergone neurosurgery. See *Section 5.7* for information on neurological assessment and observations.

18.2.5 Wound care

All people returning from surgery will have a wound. The nurse's main concerns regarding the wound are:

- monitoring the wound to ensure that the person is not haemorrhaging
- monitoring any wound drainage system in relation to the amount of exudate
- cleaning the wound and changing the dressing to ensure that it does not become infected (see *Section 3.4* for the procedure for changing a dressing using an aseptic non-touch technique); the dressing normally requires changing in the immediate post-operative period only if it becomes heavily soiled with wound exudate
- observing the wound site for signs of inflammation and infection.

18.2.6 Pain management

The general principles of pain management (see *Chapter 15*) apply in the post-operative situation, though with some special considerations:

- Pain and discomfort originating from the operation should be minimised.
- Opioid analgesia is likely to decrease the blood pressure and depress the respiratory system, so non-steroidal anti-inflammatories and IV paracetamol may be used in preference.
- Continuous infusions and PCA are commonly used in post-operative care.

Scenario: Mudiwa Muteba

After one hour on the ward, Mudiwa complains of pain and is given 5 mL of morphine sulphate intravenously combined with 10 mL of metoclopramide to counteract any nausea. The nurse monitors Mudiwa's respiratory rate after this in case respiratory depression occurs.

18.2.7 Post-operative nausea and vomiting

Post-operative nausea and vomiting (PONV) is a common complication of surgery that can lead to increased recovery time. The nurse's role is to:

- administer any prescribed anti-emetic medication
- assist the person, for example by providing a vomit bowl and tissues
- ensure the person's privacy and dignity are maintained
- offer reassurance
- assist the person in cleaning and mouth care.

18.2.8 Temperature regulation

It is not unusual for people to return from surgery with either a raised or lowered body temperature. Causes and responses are listed in *Table 18.3*.

Table 18.3 Post-operative hypo- and hyperthermia.

Condition	Cause	Treatment
Hypothermia (temperature below 36°C)	Exposure during surgery Decrease in metabolic rate due to anaesthesia Absence of shivering reflex due to anaesthesia	Warming strategies: additional blankets, warming devices, heated fluids
Hyperthermia (temperature above 38°C)	Over-warming Systemic response to surgical trauma	Cool air round person with fan; use tepid sponging; reduce bed clothing Consider anti-pyretic medication Consider raised temperature in relation to other vital signs and report concerns to doctor

18.2.9 Pressure ulcers

Someone who is recovering from an operation may be especially at risk of developing pressure ulcers. The tools used to assess this risk and the measures to prevent the development of pressure ulcers are covered in *Chapter 9*.

18.2.10 Elimination

Urinary retention

Hint for practice

Ensure you assess what the person may need in order to get to the toilet or whether you may need to provide a commode. Nursing care post-operatively involves assessment of a range of aspects, and is almost always about the how as well as the why.

General anaesthesia can cause acute retention of urine. If a person is not catheterised the nurse should ensure that they pass urine by encouraging them to go to the toilet. Catheterisation should be considered if a person needs to pass urine but cannot.

Bowel habits

Surgery that involves disruption to the abdominal cavity can cause a condition called paralytic ileus, in which the peristaltic movements within the intestines become sluggish or stop altogether. Until normal bowel sounds return or the bowels open, the person should be kept nil by mouth.

Some anaesthetic drugs and analgesia (particularly opiates) can also cause post-operative constipation and/or nausea and vomiting. In this situation the nurse should consider anti-emetic medication, aperients and alternative analgesia.

Scenario: Mudiwa Muteba

Mudiwa is initially kept nil by mouth and monitored by the nurse, who documents healthy bowel sounds. The day after surgery the doctor reviews Mudiwa and allows her to eat and drink.

Mudiwa's wound is inspected the day after the operation and re-dressed.

On discharge Mudiwa is referred into the care of her GP, who arranges an appointment with the practice nurse to review the wound and the dressing. Her stitches are removed by the practice nurse 10 days after her operation.

Activity

When allocated to a surgical unit for your clinical placement, take note of:

- the various types of surgery
- types of anaesthesia
- how people are prepared for theatre
- how people are cared for post-operatively (in relation to airway management, pain relief, fluid balance monitoring and nutritional intake)
- wound care practices
- follow-up and discharge processes.

Summary

Key points from this chapter:

- Safety is paramount, so pre-operative checklists must be adhered to.
- Psychological preparation is as important as physical preparation.
- Careful and accurate post-operative observations of a person's condition are key to an uneventful recovery.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

NICE (2020) *Perioperative Care in Adults. NICE Guideline 180*. www.nice.org.uk/guidance/NG180

Reference

Hamid, S. (2014) Pre-operative fasting – a patient centered approach. *BMJ Open Qual* 2:u605.w1252. doi: 10.1136/bmjquality.u605.w1252.

CHAPTER 19

19 Venepuncture and cannulation

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the principles and procedures of venepuncture and cannulation
- assist in the care of people who have had these procedures performed.

Scenario: Michael Roberts

Mr Michael Roberts is a 77-year old man who has been admitted to a medical ward with a painful, swollen left leg that is red in appearance and warm to touch.

The admitting physician has requested that bloods are sent to the lab for a full blood count and urea and electrolytes.

19.1 Introduction

Venepuncture is the introduction of a needle into a vein to obtain a blood sample for haematological, biochemical or bacteriological analysis. Cannulation is the insertion of a tube into a body duct or cavity to provide access to an individual's circulation in order to administer IV fluid or medication on a short-term basis.

As a student nurse you will be required to develop proficiency in venepuncture, cannulation and blood sampling (NMC 2018). This will involve using the evidence base to inform your practice.

19.2 Vein selection for venepuncture and cannulation

19.2.1 The circulatory system

Figure 19.1 highlights the general position of the veins within the body. The veins are coloured blue and the arteries are shown in red. Note that arteries often run alongside the veins so the nurse performing venepuncture or cannulation must be able to differentiate between the two. Arteries are usually positioned more deeply than veins, although some individuals may have an aberrant artery that is located superficially, in an unusual place.

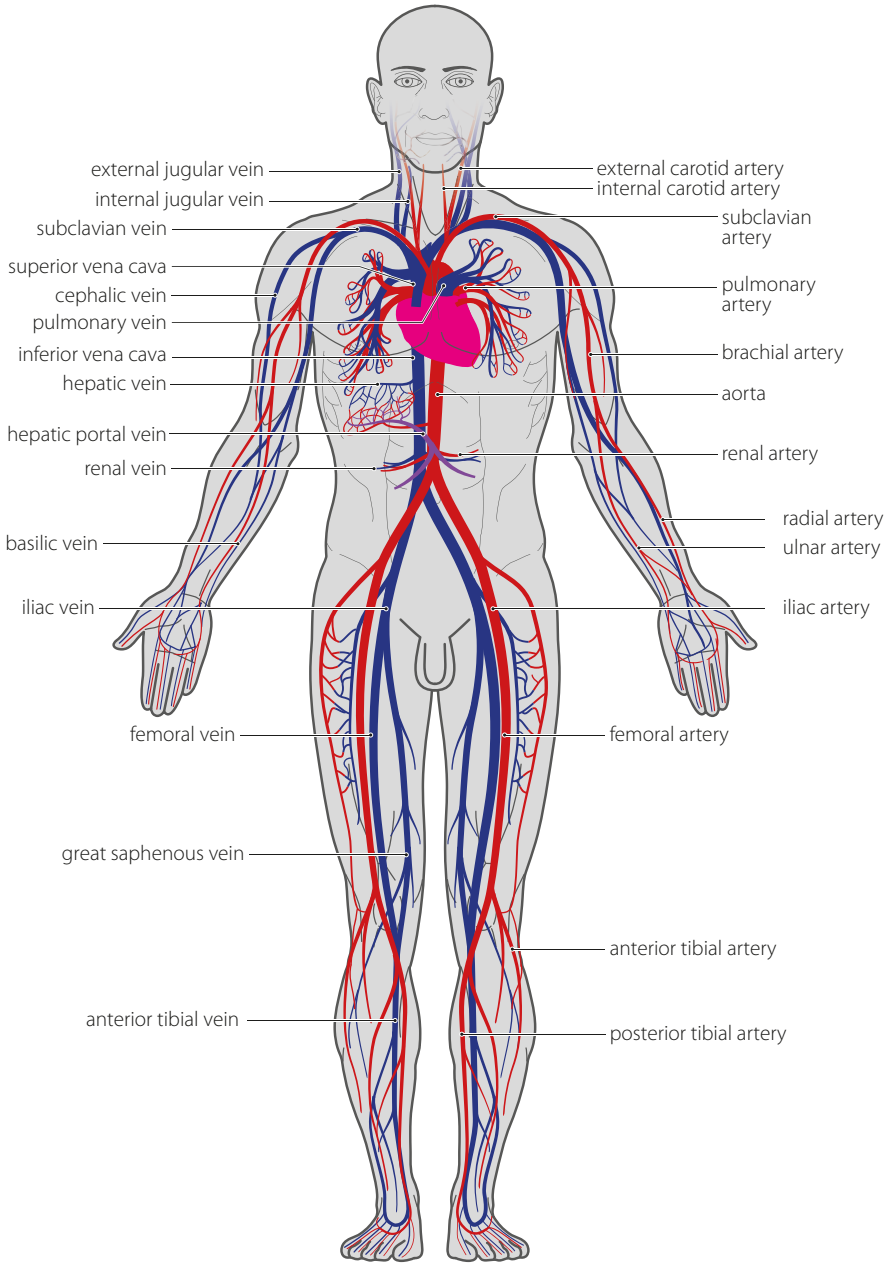


Figure 19.1 The main veins and arteries in the body. Adapted from Minett, P. and Ginesi, L. *Anatomy & Physiology: an introduction for nursing and healthcare* (2020), Lantern Publishing.

The superficial veins of the arms are most commonly chosen for venepuncture and cannulation. Veins situated in this area are numerous and accessible, which ensures that the procedure can be performed efficiently with minimal discomfort to the individual. In some situations the superficial veins of the feet may be used, although there is an increased risk of complications such as **thromboembolism** with the use of these veins for cannulation. The main veins of choice are (*Figure 19.2*):

- median cubital veins
- the cephalic veins
- the basilic veins
- the metacarpal veins.

Careful inspection of a person's veins may reveal other issues that need to be taken into consideration (*Table 19.1*). Choosing a suitable and healthy vein will determine the success of the procedure.

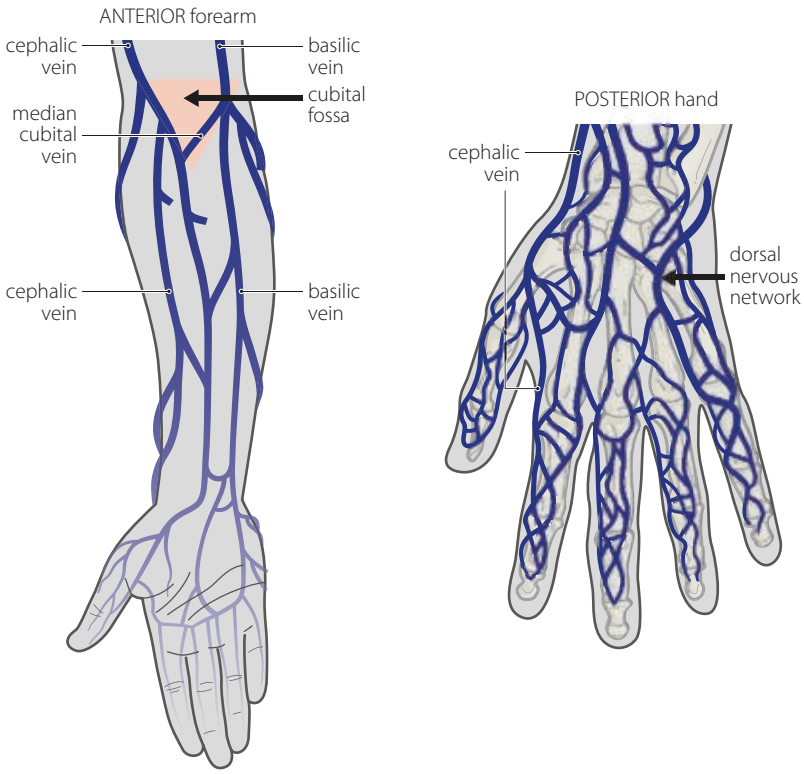


Figure 19.2 Common veins for venepuncture and cannulation.

Table 19.1 Characteristics of suitable and unsuitable veins.

Healthy, suitable vein	Unsuitable vein
Visible	Fragile
Bouncy	Hard
Straight	Thrombosed
Well supported	Mobile

19.2.2 Venous access

In order to assess the veins for suitability it is important to improve venous access. There are various methods of doing this.

- *Tourniquets* – applying a tourniquet helps to impede venous return and promotes venous distension (*Figure 19.3*). The tourniquet should not be applied too tightly as this may restrict the arterial blood flow.

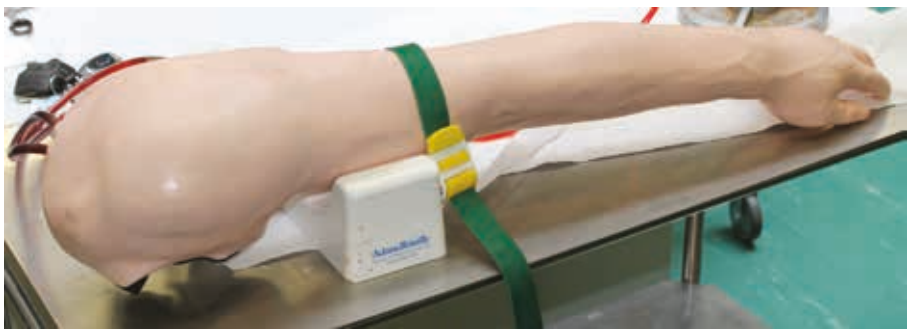


Figure 19.3 Applying a tourniquet.

- *The use of gravity* – lowering the arm below heart level will also increase the blood supply to the veins and promote venous distension (*Figure 19.4*).

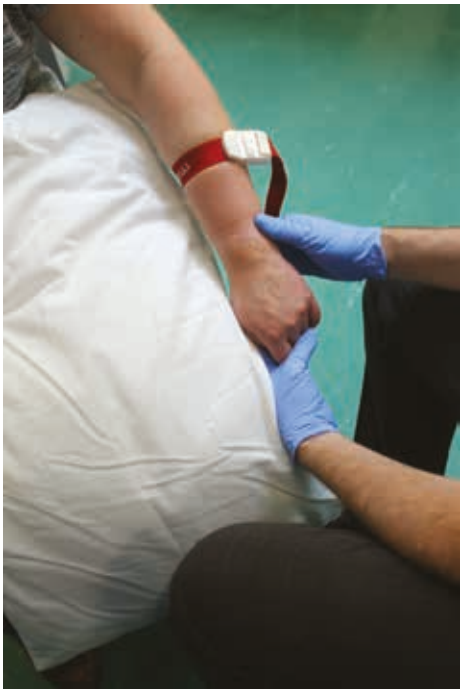


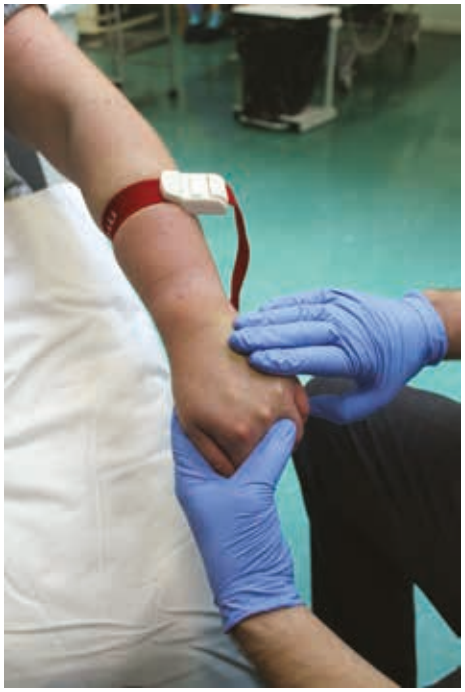
Figure 19.4 Using gravity to improve venous access.

- *Fist clenching by the individual* – ask the person to open and close their fist, as this helps the muscles to force blood into veins and promotes venous distension (*Figure 19.5*).

Figure 19.5 Fist-clenching to promote venous distension.

- *Stimulating the vein* – light tapping and stroking of the vein may be useful but can be painful and, in some cases, may cause subsequent bruising (*Figure 19.6*).

Figure 19.6 Stimulating the vein.

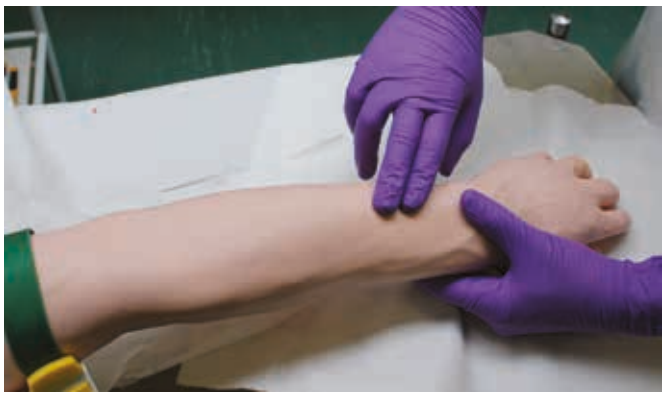


- *Less frequently used methods* – venospasm, caused by a change in temperature, mechanical irritation or chemical irritation, may impede blood flow and cause pain. The application of heat may prevent these problems, relieving both spasm and pain. This can be achieved by immersing the person's arm in a bowl of warm water for 10 minutes. Other solutions include using a local anaesthetic cream as this will prevent pain when the needle is inserted and will therefore help to reduce any anxiety. Some creams also have a mild vasodilatory effect. As a last resort, glyceryl trinitrate patches may be applied to facilitate venous dilation.

19.2.3 Choosing the vein

The veins should be inspected visually and palpated in order to choose the most appropriate vein (*Figure 19.7*).

Figure 19.7 Palpating the vein.



Involve the person you are caring for in the process, as they may have undergone venepuncture or cannulation in the past. In that case, they may be able to tell you which of their veins has been used previously and whether there have been any problems.

Present injuries, disease or treatment

Take any current injuries, disease or treatment into consideration. This is both an issue of caring and compassion and a practical consideration. In some instances, the venous access sites of certain limbs may be inaccessible because of injury, treatment or disease – for example, fractures that have been put into plaster. In other cases, sites may be contraindicated and should be avoided; for example:

- extensive scars from burns and surgery
- limbs with any oedema
- areas where there is a haematoma, dermatitis or cellulitis
- limbs affected following a cerebral vascular attack.

Present medical condition of the person

The present medical condition of the person also needs to be considered. For example, limbs should not be used if they already have an IV therapy or blood transfusion sited or a cannula/fistula/heparin lock.

If someone is suffering from serious shock it is likely that their peripheral venous system will start to 'shut down'. In these instances, the person is likely to need urgent cannulation in order to treat the cause of whichever shock they are suffering from and to prevent any potential fatality. It is especially important that the healthcare worker performing the procedure is highly skilled, as failure on the first attempt may result in a lack of other suitable veins. (See *Section 6.4.1* for types of shock.)

Present medications

You must be aware of the medications that the person is presently taking. Some medications can affect the condition of the veins themselves, or may increase the risks involved in venepuncture and cannulation. For example, steroids may increase the risk of venous thromboembolism; anticoagulants such as warfarin increase the risk of subcutaneous haemorrhage, which leads to bruising.

Age and weight

The age and weight of an individual may affect your choice of vein. Young children have short fine veins and older people tend to have prominent but fragile veins. People who are malnourished and underweight also tend to have fragile veins, whereas those who are particularly overweight may have veins that are difficult to find because of the extra subcutaneous tissue.

Environmental factors

Environmental factors include ensuring that the individual is warm, as this will promote venous dilation. If they are cold, this will promote vasoconstriction, which will impede the process.

A good source of light will help with the selection of the vein and the actual procedure.

Belonephobia

It is important to be aware that some people may be affected by belonephobia, fear of needles. Belonephobia may be an inherited **vasovagal reflex** of shock

that is triggered by needle puncture, or may be a condition that is learned from memory of previous experiences. The physical symptoms may be minor, such as sweating, or more serious, such as fainting or convulsions.

There are several techniques to help to deal with belonephobia:

- technical confidence – with people suspected of having a fear of needles, the procedure is best undertaken by a practitioner who performs the task regularly
- minimising pain by applying a local anaesthetic cream such as EMLA
- diversion and distraction of the individual
- relaxation techniques
- good communication skills.

Even if someone is merely anxious, this can lead to vasoconstriction and obtaining a sample of blood will therefore become much more difficult.

19.3 Equipment and procedures

19.3.1 Equipment required for venepuncture and cannulation

It is the nurse's responsibility to ensure that the equipment selected and used is appropriately packaged, undamaged and in date.

Usual equipment for venepuncture

Venepuncture equipment is shown in *Figure 19.8*; the full requirement is:

- personal protective equipment: gloves, disposable apron, eye protection
- clinically clean tray
- tourniquet
- disposable wipe containing isopropyl alcohol 70% or a swab with chlorhexidine gluconate
- 21 g multi sample monovette needle
- monovette blood sample tubes as directed by blood request form
- gauze swabs
- plasters
- sharps bin
- blood request forms.

Figure 19.8 Usual equipment for venepuncture.

Usual equipment for cannulation

Cannulation equipment is shown in *Figure 19.9*; the full requirement is:

- personal protective equipment: gloves, disposable apron, eye protection
- clinically clean tray or receiver
- tourniquet
- steret containing isopropyl alcohol 70% or a swab with chlorhexidine gluconate
- IV cannula, sized according to clinical requirements
- gauze swabs
- sterile occlusive dressing
- 5 mL syringe containing 0.9% sodium chloride flush
- injection cap
- sharps bin.

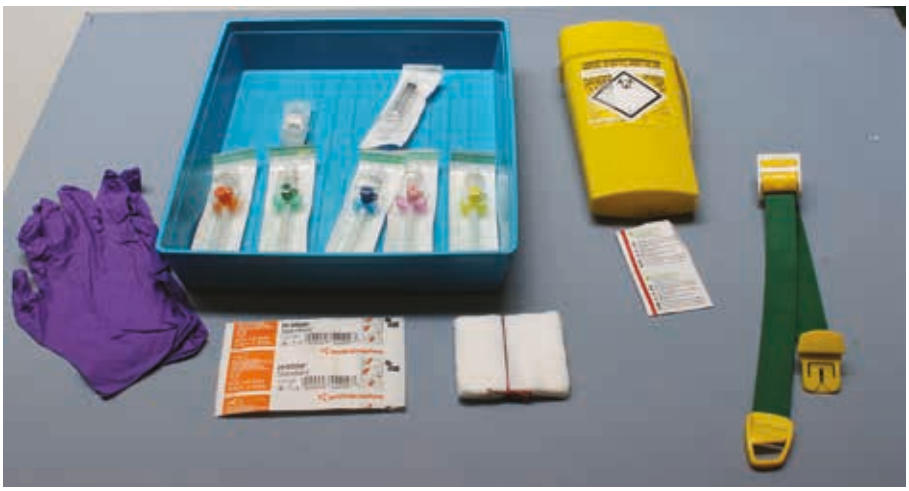


Figure 19.9 Usual equipment for cannulation.

ALERT

Asepsis is vital when performing venepuncture or cannulation, because the integrity of the skin is breached and an alien device is introduced to the circulatory system.

Cannulas are sized by their gauge (see *Section 14.4.7*).

Small cannulas are recommended as they are less likely to cause problems such as pain and chemical and mechanical **phlebitis**, while still providing a sufficiently high flow rate to deliver most therapies. Manufacturers colour-code their devices according to size, but the colours used are not necessarily the same for all manufacturers, so you must check the information provided on the individual packaging to be sure of using the correct size.

19.3.2 Introduction to the procedures

Many individual healthcare organisations have their own guidelines on these procedures. Although many of them are very similar, you should make sure that you follow the guidelines that your own organisation has implemented.

The following procedure guidelines will give you a brief explanation and demonstration of what is involved in venepuncture and cannulation. The first parts of both procedures are the same and therefore will be covered only once.

Procedure 19.1: Initial procedure for both venepuncture and cannulation

STEP 1 Ensure that you have correctly identified the individual for whom you will perform the procedure.

STEP 2 Gain consent from the person by:

- ensuring capacity to give consent
- explaining the full procedure calmly and confidently
- answering any questions about the procedure, and about the potential consequences or risks associated with it.

STEP 3 Establish which veins are likely to be the most appropriate for both the individual being cared for (to ensure comfort and promote management) and the nurse (to ensure success) and whether they have had any problems with venepuncture previously.

STEP 4 Assemble the necessary equipment (see *Figures 19.8* and *19.9*), ensuring that all the packaging is undamaged, and that the equipment is in date. Place all the equipment on a tray or receiver and take the equipment to the person.

STEP 5 Wash your hands and put your apron on.

STEP 6 Ensure that the chosen limb is supported and that there is adequate lighting, ventilation and privacy, and that the person is in a comfortable position.

STEP 7 Improve venous dilation in order to help with vein selection, using a tourniquet or other method.

STEP 8 Inspect the veins visually and palpate them in order to choose the most appropriate vein.

STEP 9 Trace the path of veins, try to ascertain their condition and differentiate between the veins and the arteries. Be aware of the potential risk of inserting the needle at the site of a vein valve as this will compress the lumen of the vein, resulting in a prevention of blood flow through the needle. Should this occur the process must be reattempted elsewhere or above the valve area.

STEP 10 Release the tourniquet and either rewash your hands (if your hands are soiled) or apply an alcohol hand-rub.

STEP 11 When your hands are dry, put on your gloves and protective eyewear.

STEP 12 Clean the selected site (*Figure 19.10*). At least 30 seconds of cleansing is required. Once cleansing has been performed, the site must not be touched by the nurse or the person, otherwise re-cleansing would be required.

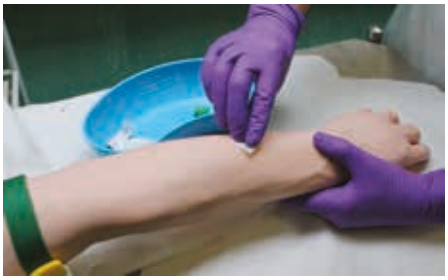


Figure 19.10 Cleansing the skin.

STEP 13 Allow the site to dry naturally before any device is inserted, otherwise the cleansing solution may sting the person and, if you are taking bloods, it may interfere with the results.

STEP 14 Inspect your equipment carefully when out of its packaging.

STEP 15 Reapply the tourniquet.

STEP 16 Anchor the selected vein with your thumb just below the selected insertion site.

Scenario: Michael Roberts

Following review by his doctors, Michael is diagnosed with bacterial cellulitis. He is prescribed IV antibiotics. Michael therefore requires cannula insertion to facilitate administration of the antibiotics.

Procedure 19.2: Venepuncture

STEP 1 For venepuncture, insert the needle smoothly at an angle of approximately 30°. Reduce the angle slightly as you feel the puncture of the vein wall. If possible, the needle should be advanced into the vein slightly to improve anchorage and prevent the needle tip from coming out of the vein before all the necessary samples have been collected (see *Figure 19.11*).

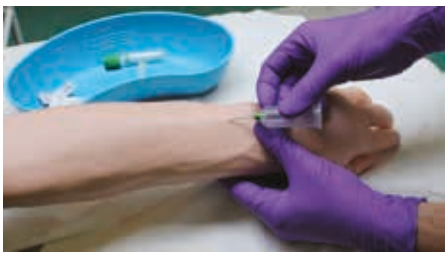


Figure 19.11 Inserting the needle.

STEP 2 Withdraw the required amount of blood using the vacuum collection system (see *Figure 19.12*).

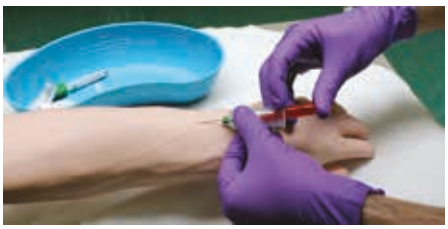


Figure 19.12 Withdraw the required amount of blood.

STEP 3 Keep the needle in position throughout the procedure, ensuring that no pressure is applied as this may push the needle further into the vein, puncturing the back of it.

STEP 4 Disconnect the first sample bottle and attach the next, depending upon which bloods need to be collected.

STEP 5 Follow the 'order of draw'. This involves using sample bottles without any additives first because the additives in some sample bottles might affect the laboratory analysis.

STEP 6 Release the tourniquet when all samples have been collected.

STEP 7 Disconnect the last vacuum collecting sample bottle before you remove the needle. Otherwise the bottle will continue to vacuum the blood and there is more likelihood of bruising.

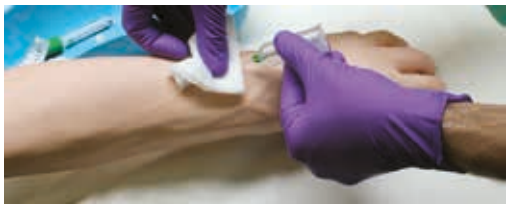


Figure 19.13 Removing the needle.

STEP 8 Apply a swab and remove the needle, applying pressure to prevent bleeding once the needle has been removed fully (see *Figure 19.13*).

STEP 9 Continued digital pressure may then be applied by the individual. Applying pressure by bending the elbow is not advocated as this may increase the blood flow and result in bruising.

STEP 10 Discard the needle appropriately as soon as it is disconnected.

STEP 11 Sample bottles should be inverted a few times to mix if needed, labelled with the necessary details while you are at the side of the person, and then placed in the relevant sample bag with the request form.

STEP 12 Check the person's puncture site again for bleeding and, if all is well, apply a plaster to the puncture site (or an alternative dressing if allergic to plaster).

STEP 13 Throughout the procedure act calmly and confidently and ensure that the person is comfortable at all times.

Procedure 19.3: Cannulation

STEP 1 Follow the initial procedure for venepuncture and cannulation as described above.

STEP 2 Once the ideal vein has been chosen, select the appropriate cannula.

STEP 3 Inspect the selected device carefully for any faults when out of its packaging.

STEP 4 Reapply the tourniquet and anchor the selected vein with your thumb just below the insertion site.

STEP 5 Insert the cannula. This can be done in one of three ways:

a) approach from the top
b) approach from the side
c) tunnel through the tissue before entering a vein that is only partially palpable and visible.

For the purpose of this procedure we will concentrate on the most common approach, from the top.

Insert the cannula, bevel side up, at a 5–15° angle (Figure 19.14). Keep the vein immobilised with the thumb of your other hand and either insert the cannula carefully and quickly directly into the selected vein or perforate the skin and then reposition the cannula tip over the vein wall before inserting.

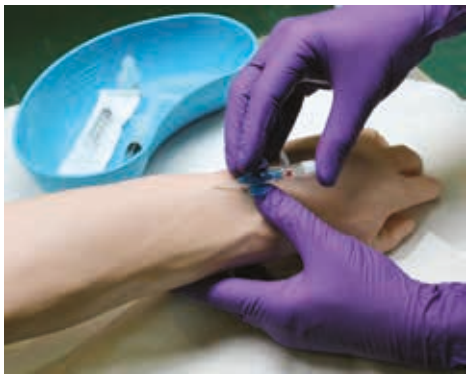


Figure 19.14 Inserting the cannula.

STEP 6 As soon as there are signs of blood in the cannula, reduce the angle of the device so that the back of the device is almost touching the skin. This is to avoid the cannula going all the way through the back of the vein. If there are no signs of blood then the vein has not been punctured or it is already thrombosed and clotted.

STEP 7 Advance the cannula and withdraw the stylet slightly. The chamber at the back of the cannula should then fill with blood. If this fails to happen then the cannula is no longer in the vein.

STEP 8 Advance the cannula fully off the stylet and push it into the vein.

STEP 9 Release the tourniquet and apply digital pressure to the vein above the cannula tip to prevent blood loss.

STEP 10 Remove the stylet and dispose of it immediately in the sharps bin (see *Figure 19.15*).

Figure 19.15 Removing the stylet.

STEP 11 Cap the device or attach it to an administration set that has been run through with the prescribed IV fluids, and then flushed slowly with 0.9% sodium chloride (*Figure 19.16*).

STEP 12 During this process you should check the site for any signs of swelling or leaking and ask the person if there is any pain or discomfort as the cannula is being flushed.

STEP 13 If all is well, open out the wings of the cannula and secure the cannula using a clear occlusive dressing to allow the insertion site to be observed regularly for any problems (see *Figure 19.17*).

STEP 14 Dispose of all waste material and protective equipment appropriately according to health and safety policies.

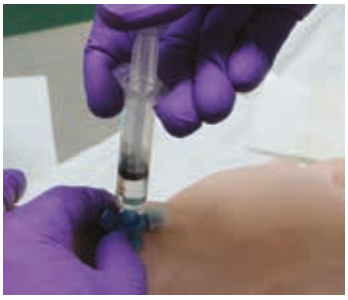


Figure 19.16 Flushing the cannula.

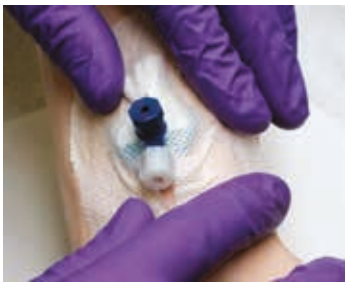


Figure 19.17 Securing the cannula.

19.3.3 Documentation

When performing venepuncture or cannulation, all actions must be fully documented during and immediately following the procedure. Documentation should include:

- that consent was obtained
- the site of venepuncture or cannulation
- the size and type of cannula used
- the type of dressing applied
- factual details of any problems encountered
- the samples taken.

19.4 Complications and precautions

19.4.1 Infection control

The infection prevention and control policies that are particularly relevant to venepuncture and cannulation are:

- standard (universal) infection control precautions
- aseptic technique
- safe handling and disposal of sharps
- prevention of occupational exposure to blood-borne viruses (BBVs), including prevention of sharps injuries
- management of occupational exposure to BBVs and post-exposure prophylaxis.

The observation of standard precautions, use of aseptic technique and product sterility are essential, as microorganisms on the person's skin (natural or acquired) enter their system during the process of insertion. Local policies on the use of indwelling devices must also be adhered to.

Wearing gloves

Gloves should be worn during venepuncture and cannulation as there is the potential for exposure to blood and for contact with non-intact skin during these invasive procedures. Gloves must also be disposed of after these procedures to prevent the transmission of microorganisms to other sites on the person or to other people.

Hand-washing

Hand-washing is a fundamental aspect of infection control, and guidelines on hand-washing should always be followed (see *Chapter 3*). This is a general rule for clinical practice, but it is stressed here because of the elevated risk of infection associated with invasive procedures.

Hint for practice

Always have all equipment prepared before a procedure or performing a clinical skill. It is not very reassuring for someone receiving care if a professional appears disorganised!

Tourniquets

Infection can be transferred via tourniquets, particularly if they are soiled with blood. Disposable tourniquets should be used wherever possible and must be used where there is the potential for microbial cross-contamination between persons.

Cannulation and infection control

If the first attempt at cannulation is unsuccessful then the nurse must dispose of the vascular device used and reattempt the procedure with a new device. Once a

device is *in situ* and has been stabilised with the necessary dressing, the site must be visually inspected on a regular basis for any signs of infection. Transparent, semi-permeable membrane dressings should always be used to secure the cannula to facilitate observation of the site. Strict aseptic techniques should always be maintained when handling the cannula and changing the dressing.

If a device should come out for whatever reason, the device must not be re-advanced into the person. This is because the external area of the device may have been exposed to microorganisms, and if the device is re-advanced, those microorganisms may be introduced into the person. A new device must be used.

Phlebitis

The most common complication of cannulation is phlebitis. This occurs following inflammation of the tunica intima (the inner layer of the vein wall); the three main types of phlebitis are:

- mechanical phlebitis, caused by the presence of the cannula itself; the risk is minimised by using the smallest cannula possible
- chemical phlebitis, caused by the fluids or medications that are being infused; care must be taken when preparing the solutions to ensure that they are at the correct strength, and they should also be checked just before administration
- infective phlebitis, caused by bacteria entering the site.

Signs of phlebitis include:

- redness/erythema to the cannula site
- pain near the site or along the path of the cannula
- swelling
- induration
- a palpable venous cord
- pyrexia.

Peripheral IV cannulas should be removed at once if they are no longer needed and they must be changed every 72–96 hours, or earlier if indicated clinically (*Figure 19.18*).

The cannula must be removed immediately if infection is suspected.

The dates of any insertions, removals or changes should be documented in the clinical records as a matter of routine.

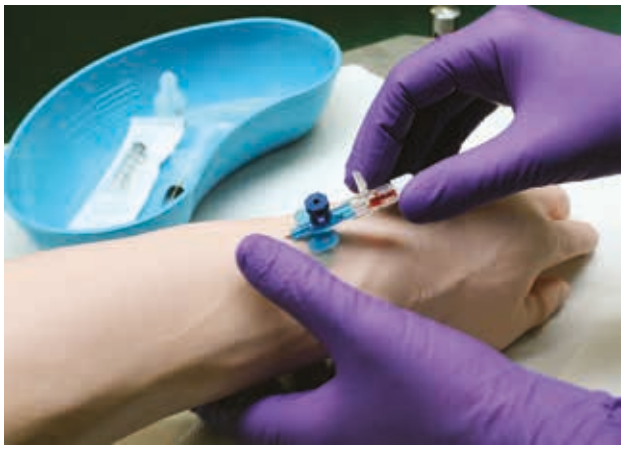


Figure 19.18 Withdrawing the cannula.

People should also be involved in the care of their own cannula site. They should be encouraged to inform nursing staff of any signs of phlebitis. People should be given advice on not touching the site or the cannula, minimising the movement of a limb if a cannula is sited in an area where flexion may occur and taking extra care when dressing and undressing.

19.4.2 Needlestick injuries

Nurses who perform venepuncture and cannulation are professionally accountable for the safe disposal of the sharps that are used during these procedures. See *Chapter 3* for details about the safe use and disposal of sharps.

19.4.3 Extravasation

Extravasation is the inadvertent administration of vesicant medication or solution into the surrounding tissue instead of into the intended blood vessel. The first symptoms of extravasation include swelling/oedema around the infusion site, blanching of the skin, coolness of the skin, leakage around the cannula and/or pain. The infusion should be discontinued immediately and, if the therapy is still required, then a new cannula should be inserted in a different site away from the inflamed site.

If you suspect extravasation you should report it immediately to the nurse in charge of the ward.

Activity

When next in clinical practice, put a tourniquet around your own arm and look at your own veins; palpate them and assess their suitability for venepuncture and/or cannulation.

Summary

Key points from this chapter:

- Venepuncture and cannulation are common invasive procedures that carry risks to people.
- Selection of the correct vein is paramount to the success of the procedure.
- Selection of an appropriately sized needle and cannula is essential.
- A cannula site must be observed regularly for signs of phlebitis and infection.
- Standard infection control and safety precautions must always be adhered to.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

RCN (2016) *Standards for Infusion Therapy* (4th ed). London: RCN. www.rcn.org.uk/clinical-topics/infection-prevention-and-control/standards-for-infusion-therapy

CHAPTER 20

20 Blood transfusion

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the composition and functions of blood
- understand the different blood groups and their compatibility
- understand the principles and procedure of blood transfusion.

Scenario: Ryan

Ryan is a 20-year-old young man who has been admitted to a local mental health unit under Section 2 of the Mental Health Act 1983 (as amended 2007) for assessment and treatment. He had presented in the community in a highly disturbed state, displaying psychotic symptoms, and was deemed to be a risk to himself or others.

Ryan kept to himself on the unit with little interaction with other people. He would speak to staff if he needed to but liked to stay in his room. One afternoon, when the nurse went to remind Ryan to attend his multidisciplinary meeting, he was found lying on his bed, bleeding profusely from both wrists. First aid was administered, and Ryan was taken to the emergency department. On examination it was decided that Ryan would need a blood transfusion and aseptic dressings to his wounds.

Once Ryan's wounds had been dealt with, it was then time to commence his blood transfusion.

20.1 Introduction

Transfusions of blood or blood components are commonplace within the acute care environment. The safe administration and monitoring of these procedures is imperative in order to prevent any complications. People who require blood transfusions are often acutely ill already and any additional problems need to be avoided. When in practice, remember that each healthcare organisation will have its own policy for this procedure, which should be followed.

20.2 Blood

Although blood is a fluid, it is regarded as a connective tissue. It contains both cellular and liquid (plasma) components. The formed elements of blood are contained within the plasma.

The circulating blood volume is 5–6 litres in an adult male and 4–5 litres in an adult female, and represents approximately 8% of total body weight. The blood is broadly composed of plasma (55%), **leucocytes** (white blood cells) (<1%), **erythrocytes** (red blood cells, RBCs) (45%) and platelets and blood clotting factors (procoagulants). The normal pH of blood ranges from 7.35 (venous) to 7.45 (arterial).

In its normal state, blood is denser than water and approximately five times more viscous. Oxygenated blood is bright red in colour while deoxygenated blood is dark red in colour.

20.2.1 Functions of blood

Blood has three main functions (*Table 20.1*):

- distribution
- regulation
- protection.

Table 20.1 The three main functions of blood.

Distribution	Regulation	Protection
Delivery of oxygen from lungs and nutrients from digestive tract to body cells Transportation of metabolic wastes from cells for elimination via lungs and kidneys Transportation of hormones to target organs	Maintenance of body temperature – absorbing and distributing heat throughout body and skin surface Maintaining normal pH in body tissues – compounds in plasma act as buffers to minimise excessive or abrupt changes in blood pH Maintenance of fluid volume within the circulatory system	Prevention of blood loss (haemostasis) via clot formation (due to platelets and plasma proteins contained within the blood) Prevention of infection: presence of antibodies, white blood cells, and complement system proteins

20.2.2 Blood groups

Red blood cells carry specific proteins (antigens) on their surface; different antigens belong to different blood groups. If blood of one type is transfused into a person with a differing red blood cell type, there is a high likelihood of incompatibility with the foreign red blood cell antigens, resulting in a transfusion reaction. In such a reaction, the immune system of the recipient identifies the proteins on the transfused red blood cells as foreign, resulting in **agglutination** and destruction, which may have severe consequences for the recipient.

ABO antigens

Red blood cells are classified into specific groups according to the presence or absence of two particular antigens, agglutinogens A and B. The A, B, AB and O grouping system was identified in 1902 by Karl Landsteiner (1868–1943) and is now applied to limit the occurrence of transfusion reactions due to incompatibility (*Table 20.2*).

Agglutinins – antibodies that cause agglutination when exposed to red blood cells carrying ABO antigens that are absent on a person's own red blood cells – are also considered within the ABO grouping system.

Table 20.2 Blood transfusion compatibility.

Blood group	Antigens on RBCs	Antibodies in plasma	Compatible with	Adverse reaction
A	A	Anti-B	A, O	The A antigen is present and accepted by the immune system. The B antigen will be identified as foreign and anti-B antibodies in the plasma will react to it.
B	B	Anti-A	B, O	The B antigen is present and accepted by the immune system. The A antigen will be identified as foreign and anti-A antibodies in the plasma will react to it.
AB	A and B	None	A, B, AB, O (universal recipient)	A and B antigens are already present – no antibodies are produced.
O	none	Anti-A and anti-B	O (universal donor)	Both A and B antigens are absent. Anti-A and anti-B in the plasma will react to A or B antigens.

Rhesus antigens in blood groupings

The term *rhesus* relates to the rhesus monkey, in which this grouping was first identified. The rhesus D antigen is found in both rhesus monkeys and humans. Thus, in addition to the A, B, AB, O classification, human blood is categorised by rhesus factor – rhesus-positive and rhesus-negative. In a person who is rhesus positive (Rh D+ or Rh+), the red blood cells carry the rhesus antigen (agglutinogen). In a person who is rhesus negative (Rh D– or Rh–), the red blood cells do not carry the rhesus antigen. This factor too must be taken into account when transfusing blood, as infusing a rhesus-negative person with rhesus-positive blood could cause an incompatibility reaction.

ALERT

In an emergency, O Rh– blood may be administered until type-specific blood is available.

Table 20.3 Frequency of blood groupings within the UK.

Group	Frequency
A	42% total
A Rh+	35%
A Rh–	7%
B	10% total
B Rh+	8%
B Rh–	2%
O	44% total
O Rh+	37%
O Rh–	7%
AB	4% total
AB Rh+	3%
AB Rh–	1%

Source: NHS Blood and Transplant (2010)

20.2.3 Clinical indications for blood and blood components

Red cells (RBCs)

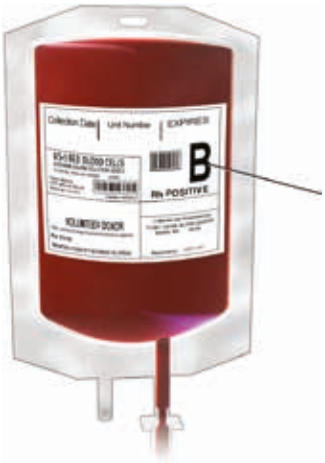


Figure 20.1 Red blood cells. Image from "Medical gallery of Blausen Medical 2014". *WikiJournal of Medicine*, 1(2). DOI: 10.15347/wjm/2014.010. Available at https://commons.wikimedia.org/wiki/File:Blausen__0086_Blood_Bag.png

Red cells are prescribed to improve the oxygen capacity of the blood. A unit of red cells is drawn from a single donation of blood. The majority of the plasma is removed (20% plasma retained) and a preservative is added (Watson and Hearnshaw 2010).

Shelf life: 35 days from donation

Storage: 4°C in an approved refrigerator (**NOT** in a ward refrigerator)

Duration: Start transfusion within 30 minutes of removal from blood fridge and complete within 4 hours.

Red cells are generally used for:

- major haemorrhage/trauma resulting in hypovolaemic shock
- anaemias due to insufficient red blood cells:
  - haemorrhagic anaemia – blood loss due to major trauma (acute haemorrhagic anaemia) or ongoing chronic bleeding (e.g. bleeding ulcer)
  - haemolytic anaemia – erythrocytes lyse prematurely; transfusion reaction, bacterial/parasitic infections
  - aplastic anaemia – destruction/suppression of bone marrow reducing RBC production (e.g. ionising radiation, drugs, chemicals, neoplasm)
- anaemias due to lowered haemoglobin levels:
  - iron-deficiency anaemia – secondary to haemorrhage (acute/chronic); dietary insufficiency; malabsorption of iron from diet
  - pernicious anaemia – vitamin B12 deficiency (intrinsic factor deficiency)
- anaemias due to abnormal haemoglobin resulting in damage/destruction of the erythrocytes:
  - thalassaemia – erythrocytes are fragile, susceptible to damage and deficient in haemoglobin, resulting in a reduced RBC count
  - sickle-cell anaemia – abnormal haemoglobin formation such that under low-oxygen conditions, the erythrocytes become crescent-shaped and then rupture, occluding small blood vessels, resulting in pain and air hunger.

Scenario: Ryan

As Ryan has suffered major blood loss, he will receive two units of red cells to replace the blood he has lost.

Fresh frozen plasma (FFP)

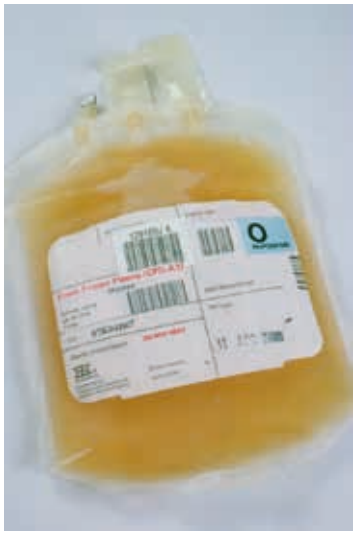


Figure 20.2 Fresh frozen plasma. Science Photo Library.

Prescribed for treatment of coagulation disorders and replacement of coagulation factors in specific situations. Plasma is removed from the red cells within 6 hours of donation and rapidly stored (Watson and Hearnshaw 2010).

Shelf life: Two years from donation

Storage: –30°C in an approved freezer (**NOT** in a ward refrigerator)

Duration: Transfusion must be completed within 4 hours of thawing.

Fresh frozen plasma is generally used for:

- replacement of coagulation factors
- immediate reversal of warfarin action/overdose when life-threatening haemorrhage occurs – note that fresh frozen plasma has only a partial effect and is not the optimal treatment: prothrombin complex concentrates (PCCs) are preferred (refer to your local policy)
- acute disseminated intravascular coagulation (DIC), abnormal blood clotting in which blood clots form throughout the body, blocking blood vessels
- thrombotic thrombocytopenia
- liver disease when there is bleeding
- following major haemorrhage when there is a bleeding disorder.

Platelet concentrates

Figure 20.3 Platelet concentrates. Science Photo Library.

Prescribed for prevention and treatment of haemorrhage in people with thrombocytopenia or platelet function defects. Platelets are drawn from four donors to make up one dose (Watson and Hearnshaw 2010).

Shelf life: Five days from donation

Storage: 22°C on an agitator to prevent agglutination. **Platelets must never be placed in a refrigerator.**

Duration: Transfusion must be completed within 30 min or as instructed.

Platelet concentrates are generally used:

- to prevent spontaneous bleeding when there is a clinically significant low platelet count
- following/during massive blood transfusion (loss of clotting factors during transfusion/replacement)

- in bleeding that is not surgically correctable and that is associated with a platelet disorder
  - in acute DIC/abnormal blood clotting in which blood clots form throughout the body, blocking blood vessels
- in inherited platelet dysfunction
- in immune thrombocytopenia
- for post-transfusion purpura in the presence of major haemorrhage.

Cryoprecipitate

Cryoprecipitate is prescribed for bleeding disorders and contains factor VIIIc, fibrinogen, von Willebrand factor and factor XIII, which are proteins that promote coagulation. Cryoprecipitate is drawn from five donors to make up one dose. It is rapidly frozen and thawed at 4°C and then the resulting precipitate (separation of coagulation factors from a frozen solution) is refrozen within plasma to –30°C.

Shelf life: Two years from donation.

Storage: –30°C following constitution.

Cryoprecipitate is used in a few uncommon situations such as:

- acute DIC when haemorrhage is present/abnormal blood clotting in which blood clots form throughout the body, blocking blood vessels – clinically significant lowered fibrinogen level
- advanced liver disease when there is bleeding
- prophylaxis before surgery when there is a clinically significant lowered fibrinogen level
- haemorrhage associated with a clinically significant lowered fibrinogen level – hypofibrinogenaemia
- hypofibrinogenaemia following massive blood transfusion.

20.3 Blood transfusion safety

Safety is paramount, and in a complex healthcare environment it is safest to standardise decisions and limit unnecessary variation in practice. With regard to blood transfusions, safety is based on protocols and procedures that reduce the probability of harm, focusing on the safe retrieval, storage, administration and documentation of blood and blood components.

20.3.1 Procedures for administering blood and blood components

The broad requirements of the procedure for administering blood and blood components are discussed below. This section should be considered in the light of your specific local organisation policy in relation to the administration of blood and blood components. Staff involved in these procedures must undertake specific training and have an in-depth knowledge and understanding of all aspects of transfusion therapy to ensure safe and effective delivery of care.

Procedure 20.1: Preparation for transfusion

STEP 1 A decision to transfuse someone is made by the doctor in response to a person's formally assessed clinical need, and is discussed with the person in question wherever possible.

STEP 2 The person is provided with the reasons for the transfusion, the benefits and risks, and any suitable alternative treatments available within the organisation. Valid informed verbal consent must be obtained by the nurse from the recipient of the transfusion.

STEP 3 If someone declines a blood component, this is documented and communicated clearly to medical staff involved with the person's care. Staff should respect the person's wishes and explore non-blood component treatments for their condition and/or alternative clinical management. Such an approach should be reflected even in a life-threatening situation.

STEP 4 If there is an advanced directive (e.g. a Jehovah's Witness may declare a general unwillingness to accept blood or blood products), the nature of this should be documented and communicated clearly to appropriate staff involved with the person's care.

STEP 5 If the person gives informed consent, any allergies, previous reactions or previous transfusions are identified and documented.

STEP 6 Blood must be prescribed by an appropriate registered medical practitioner.

STEP 7 The prescription should be clearly and unambiguously entered in the appropriate IV fluid prescription chart. This should include:

- recipient's full name
- recipient's date of birth
- recipient's NHS number
- date of transfusion
- type of blood component to be transfused
- number of units to be transfused
- duration over which each unit is to be transfused
- any associated drugs to be given during this procedure
- specific clinical requests (use of blood warmer, etc.)
- name and signature of prescriber (legible).

STEP 8 The person coordinating the transfusion must ensure that:

- the person being cared for consents to this transfusion
- the recipient has an identification band in place and that it is clear and unambiguous in its detail
- a patent, appropriate cannula is *in situ*
- a transfusion prescription has been completed correctly and clearly
- the recipient is prepared and comfortable and informed of the procedure to be undertaken
- the blood component is brought to the clinical area for transfusion (usually by hospital porters) as required. Blood products should never be stored within a ward refrigerator.

ALERT

If any irregularities occur at any stage of the checking procedure, the procedure must be stopped.

The transfusion laboratory and prescriber (or other appropriate medical practitioner) must be informed.

The nature of the incident is recorded as per organisation policy.

ALERT

Unidentified or unknown persons (emergency situations)

In an emergency, where an individual is unable to consent, staff will act to preserve life.

Where a person lacks capacity, staff will act in accordance with the recommendations of the Mental Capacity Act 2005.

Where a person's identity is unknown a temporary identifier may be used (e.g. emergency department number, the person's gender and estimated age to allow blood components to be released).

Refer to your local policy regarding procedures in such situations.

Procedure 20.2: Immediately before transfusion

STEP 1 The nurse receiving the blood from the porter confirms:

- recipient's full name
- recipient's date of birth
- recipient's NHS number
- recipient's blood group
- type of blood component to be administered
- compatibility label
- date/time of transfusion
- time blood component was released from the laboratory
- checked against the person's identification wristband.

STEP 2 A bedside check is performed, in the presence of the intended recipient, by one or two competent, appropriate practitioners, depending on local policy. This will usually include the nurse responsible for administering the transfusion and is the last opportunity to identify any irregularities before the transfusion commences.

STEP 3 The recipient must be positively identified and must have an identification wristband in place. The person must be asked verbally:

- full name
- date of birth.

STEP 4 The following must be checked against the identification wristband, prescription chart, transfusion documentation and case notes:

- recipient's address
- recipient's blood group
- blood group of the blood component
- unit donation number on the bag, in the transfusion documentation and the compatibility label
- special information from the transfusion lab has been noted
- any allergies, previous reactions, previous transfusions.

STEP 5 The blood component bag must be checked for integrity, damage, leakage, particulates, discolouration or clots. The transfusion must not commence if there any irregularities with the bag and the transfusion laboratory must be contacted immediately.

STEP 6 The recipient's blood pressure, pulse, temperature and respiratory rate must be recorded on their observation chart just before the transfusion starts, as they form the baseline from which any anomalies or reactions will be measured.

Procedure 20.3: Transfusion

STEP 1 An appropriate giving set, specific for blood transfusion in accordance with the healthcare organisation protocol, is primed.

STEP 2 No other fluid, except 0.9% saline, should be administered through the same lumen as blood.

STEP 3 Infusion pumps must not be used unless they are specifically designed for the administration of blood components and agreed for use within a specific organisation.

STEP 4 If a blood-warming device is to be used, staff must be deemed competent in its use.

STEP 5 Drugs must never be added to a blood component.

STEP 6 Giving sets must be changed as per local protocol and after completion of the transfusion.

STEP 7 The recipient should be told how to recognise an adverse reaction and to inform staff immediately of any change in their condition. *This must supplement skilled nursing observations, not take their place.*

STEP 8 The commencement of the transfusion is recorded using organisation-specific transfusion monitoring mechanisms as dictated by local policy.

STEP 9 The recipient's blood pressure, pulse, temperature and respiratory rate must be recorded 15 minutes after the commencement of the transfusion.

STEP 10 The transfusion rate/flow and integrity of the cannula should also be assessed (see *Chapter 18* for more details about care of the cannula site).

STEP 11 The above observations must then be recorded at hourly intervals until the completion of the blood component transfusion. (Check local policy.)

STEP 12 Transfusion observations should be recorded separately from already agreed clinical observation recording.

STEP 13 The person administering the transfusion should sign the appropriate part of the transfusion documentation and fluid prescription chart and reflect this within the nursing and medical record and appropriate local specific transfusion records. The transfusion should be recorded in a fluid balance chart.

STEP 14 If there is any suspected reaction to the blood component transfusion, the infusion should be stopped, the above observations rechecked, and an appropriate medical practitioner summoned.

STEP 15 The recipient's Early Warning Score should be completed as dictated by local organisation policy.

Procedure 20.4: Completion of transfusion

STEP 1 The recipient's blood pressure, pulse, temperature and respiratory rate must be recorded at the conclusion of each transfusion.

STEP 2 The integrity of the cannula should also be assessed.

STEP 3 People should be monitored for transfusion reactions beyond the completion of a transfusion of a blood component.

STEP 4 Assuming there has been no reaction or adverse event, blood component bags should be disposed of as per local policy.

STEP 5 The transfusion should be documented in:

- specific transfusion monitoring mechanisms (as per local policy)
- nursing record
- medical record
- transfusion documentation
- fluid prescription chart
- fluid balance chart
- observation chart used during procedure
- organisation-specific transfusion records.

ALERT

Adverse events:

The potential exists for an adverse reaction to the transfusion. The nurse should be vigilant for adverse reactions such as, for example:

- urticaria (rash)
- fever/rigors
- anaphylactic reaction to plasma-containing products
- acute haemolytic transfusion reaction
- pulmonary oedema
- congestive cardiac failure.

Should any adverse reaction occur:

- stop the transfusion, seek medical input and inform the transfusion laboratory staff
- manage the person's condition as appropriate (EWS – temperature, blood pressure, respiration rate, urine output)
- ABCDE assessment and respond as condition dictates
- commence emergency supplemental oxygen as condition dictates
- check the blood component matches the recipient details
- replace the unit and giving set with normal saline 0.9% as prescribed
- send the discontinued unit with giving set attached back to transfusion laboratory with any used/unused blood
- take appropriate blood samples
- document event within nursing/case notes
- inform the person concerned of the occurrence
- complete the organisation incident form
- continue monitoring the person, guided by medical staff according to the nature of the reaction.

Activity

Whilst it is imperative always to follow organisational protocol when administering blood transfusions and always to ensure the safety of the recipient, what other things will you need to consider as a nurse? Think about how people might react to the news that they need a blood transfusion or issues that they may be concerned about. Discuss this with your supervisor so that you are better prepared for all eventualities, both physical monitoring and communicating effectively throughout the intervention with people and their families and carers.

Summary

Key points from this chapter:

- As with any prescribed treatment, the safety of people is paramount during blood transfusions.
- The right blood must be given to the right person.
- Careful observation of a person during transfusion is important for early detection of any adverse reaction.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

National Archives (2005) *Blood Safety and Quality Regulations*. London: HMSO. www.legislation.gov.uk/uksi/2005/50/introduction/made

British Society for Haematology *Guidelines* https://b-s-h.org.uk/guidelines/

References

National Archives (1983) *Mental Health Act*. London: HMSO. www.legislation.gov.uk/ukpga/1983/20/contents

National Archives (2005) *Mental Capacity Act*. London: HMSO. www.legislation.gov.uk/ukpga/2005/9/contents

Watson, D., and Hearnshaw, K. (2010) Understanding blood groups and transfusion in nursing practice. *Nurs Stand* 24(30):41–8.

CHAPTER 21

21 Transferring and discharging people

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand the principles and processes of transferring and discharging people
- plan and prepare transfers and discharges
- communicate effectively with someone about their transfer and discharge
- communicate effectively with other members of the MDT regarding an individual's transfer and discharge.

Scenario: George Clarke

Mr George Clarke is 72 years old and lives at home with his wife Mary. George was diagnosed with Alzheimer's disease six months ago. This manifests itself in some minor memory difficulties around the home and disorientation when George is away from his home. He stopped driving three months ago following advice from his GP. Other than this, George has been relatively healthy with no hospital admissions in the last 10 years. However, he had to attend A&E last month when he accidentally walked into a door because he wasn't wearing his glasses. He takes four sorts of medication, one each for his Alzheimer's and arthritis and two for his blood pressure. His wife tends to all the household chores and finances, and she has to supervise George with his medication but, other than that, he is usually relatively independent.

Recently, George has started to experience some abdominal discomfort. He is becoming a little agitated and this is exacerbating his confusion. After a visit to his GP, George is admitted to the medical assessment unit at his local general hospital.

Following admission, George is examined by a doctor and assessed by his named nurse. Bloods are taken and investigations are ordered to try to ascertain the cause of George's pain. George is kept nil by mouth and an IV infusion is commenced. Shortly after admission a pain assessment is performed, and it is clear that George's pain is increasing and that it is radiating into his back. In view of the findings following the doctor's examination, his blood results and the fact that he has been on long-term NSAIDs for his arthritis, the doctor decides that he needs an endoscopy for suspected gastric ulceration.

The procedure goes as planned, with the provisional diagnosis proving to be correct. He is transferred back to the medical ward for conservative treatment.

In view of his age and his complex needs he remains in hospital for a few days pending review of his home circumstances. He is then discharged home with a care package.

21.1 Transferring people

In order to ensure that the best and most appropriate care is given, many people are transferred from one department to another. Transfers may be:

- short-term, when a person spends only a short time in a different department for an investigation or a minor or major procedure
- long-term or permanent; for example, someone may be admitted with what appears to be a medical condition that then turns out to be a surgical one, or with either a medical or surgical condition that is treated, after which the person needs to be transferred to the appropriate area for rehabilitation or palliative care.

Many hospitals have a transfer form that states any requirements that must be followed before the transfer. Whenever people need to be transferred, any such form must be filled out, and effective communication skills are essential to ensure safety and continuity of care.

21.1.1 Short-term transfers

A short-term transfer occurs when someone is transferred temporarily to a different part of the hospital for a specific procedure, treatment or investigation. This will be for a finite period when the duty of care is passed to another department, and ultimately the person will return to their original location. Examples of short-term transfers include:

- visits to radiology for X-rays and scans or medical physiology for physiological investigations
- visits to physiotherapy or occupational therapy for assessment and treatment
- transfer to theatre for surgical procedures (see *Chapter 18* for more details).

The first key aspect of a person's care in a short-term transfer is communicating the process to that individual, ensuring that they fully understand and consent to what is going to happen. The second key aspect is ensuring that the transfer is safe. This includes making sure that:

- the correct person is transferred
- appropriate transportation aids are used
- the person's medical records are transferred with them
- a nurse accompanies the person to the relevant department if their condition requires it.

Scenario: George Clarke

The procedure that George requires means that he is transferred on a short-term basis to the endoscopy unit. The nurse in charge ensures that he understands the reason for this transfer and that he will return to her care after the procedure. When Mary arrives at visiting time, she is also informed about the procedure and George's whereabouts.

21.1.2 Long-term transfers

A long-term transfer is the transfer of the whole duty of care from one department to another or to another health or social care setting in order that someone receives the most appropriate care. For example:

- Many people who need hospital care are admitted via the A&E department and then transferred to an admitting ward.

- If someone's condition deteriorates, they may be transferred to a high-dependency or intensive care unit.
- As someone's condition improves, they may be transferred to a step-down facility such as a pre-discharge unit.

A transfer may be planned or an emergency decision. In either case it is important to communicate information about the transfer to the person, to their carers and to the receiving ward or hospital. If the transfer is planned, then communication tasks can also be planned into the process.

In an emergency, the same tasks need to be performed but in a shorter time, and priorities might be different. In these instances, excellent leadership skills and teamwork are required to ensure as seamless a transfer as possible. Information still needs to be given to the person and their carers as to where exactly they are being transferred and why they are being transferred.

Hint for practice

People may be anxious about their personal belongings being transferred with them or relatives/carers knowing transfer arrangements. Always be mindful that there is a person in your care who needs reassurance and including in any arrangements.

Transfer forms

Ensuring that everything is in place for a long-term transfer is usually done by completing a transfer form, and many hospitals have adopted a checklist to ensure that all the necessary information is communicated. These forms provide a summary of the care that an individual has received and what their present needs are. The form also ensures that all the necessary preparatory tasks have been done by listing these in order and allowing the transferring nurse to tick them off as they are completed.

Nursing and medical records

Transferring the person's nursing and medical records is vital. The nurse must ensure that the care plan and individual care summary are updated immediately before the transfer and that all the necessary arrangements for the transfer have been documented.

Another important role of the transferring nurse immediately before transfer is to ensure that the bed-state and the admissions and discharge records are completed. This ensures that the right number of people are on the ward and that the number of available beds is also correct at any given time. It also allows you to locate people should the need arise. This task may be delegated to the ward clerk, but it remains the responsibility of the nurse.

Medication

Medicines dispensed for the individual will be transferred too. In addition, the transferring nurse should advise the staff on the new ward of the person's medication needs, thus allowing the new ward team the opportunity to receive their own stock of any medication required. If the transfer is out of pharmacy hours, then the new ward team may be able to get an emergency supply of the medication from the emergency drugs cupboard or, failing that, the emergency out-of-hours pharmacist can be contacted.

Personal effects and valuables

All personal effects and valuables need to be packed and taken with the individual to the new ward or hospital.

Transportation and comfort

Transport to another ward or hospital needs to be safe and comfortable. If the transfer is within the same hospital, a porter and a suitable mode of transport will need to be arranged, depending upon the person's condition at the time of transfer – for example, a hospital trolley (with sides). Alternatively, the person may be transferred using a wheelchair with the help of a porter, or they may be able to walk with the transferring nurse to the ward to which they are being transferred. The mode of transfer should be decided by the transferring nurse and it should never compromise safety and dignity.

For a transfer to another hospital, the mode of transport will again depend on the person's condition at the time of transfer. In some instances, the person may need a paramedic and nurse escort or an ambulance escort (with or without a nurse) or, if appropriate and the person's condition allows, hospital transport may be used. When an ambulance is needed, consideration also needs to be given to whether the person will need a trolley or a wheelchair for their transfer.

A person's comfort must be maintained during the transfer. Choosing the correct mode of transport will help. Blankets or personal clothing should be used to make sure the person is kept warm throughout their journey. The escorting nurse can also ask if they are comfortable at regular intervals and address any issues as they arise. Analgesia may be required in advance to ensure that the person remains pain-free.

Introduction to new staff team

Upon arrival at the new ward, the transferring nurse should introduce the person being cared for to the staff. The nurse must also provide an in-depth history of the care provided and individual needs to the receiving staff to ensure continuity of care. The duty of care is then transferred to the new ward team and the new named nurse must settle the person into their new environment, review the care needs and update any documentation. Consideration should also be given to the time medications are next due and whether the person needs something to eat or drink.

21.2 Discharging people

Many hospital admissions are readmissions caused by early discharge or inadequate care after hospitalisation. Thus, the discharge process must not be neglected. Some discharges are straightforward, especially those following less complicated illnesses and for people who have very few needs, are younger or have plenty of family back-up. Other discharges are complicated and require full involvement of the person, their carers and all the members of the MDT. Whatever the case, all hospitals should have a discharge policy that must be adhered to in order to ensure that the discharge is successfully completed and that there is no need to readmit someone.

21.2.1 Discharge planning

The DH (2010) identified the following ten steps to ensure successful discharges:

1. Start planning for discharge or transfer before or on admission.
2. Identify whether a person has simple or complex discharge and transfer planning needs, involving the person and carer in your decision.
3. Develop a clinical management plan for every person within 24 hours of admission.

Hint for practice

During transition periods such as transfer and discharge, communication needs to be seamless to ensure no errors occur. Always be mindful that the smallest omission in communication can cause countless problems for people in the future. Ensure nothing is rushed and everything is documented and communicated with those who need to know, especially the person in your care!

4. Coordinate the discharge or transfer of care process through effective leadership and handover of responsibilities at ward level.
5. Set an expected date of discharge or transfer within 24–48 hours of admission and discuss with the individual and carer.
6. Review the clinical management plan with the person each day, take any necessary action and update progress towards the discharge or transfer date.
7. Involve people and carers so that they can make informed decisions and choices that deliver a personalised care pathway and maximise their independence.
8. Plan discharges and transfers to take place over seven days to deliver continuity of care.
9. Use a discharge checklist 24–48 hours before transfer.
10. Make decisions to discharge and transfer people every day (DH 2010, p. 6).

21.2.2 The Single Assessment Process

The Single Assessment Process (SAP), established in the National Service Framework for Older People (DH 2001), is the means by which health and social care organisations work together to ensure that assessment and subsequent care planning for older people are person-centred, effective and coordinated.

The aim of the SAP is to ensure that individual needs are met appropriately, regardless of the boundaries between health and social services. The key issues involve:

- inter-agency responsibilities
- person-centred assessment and care planning
- the training of healthcare professionals in order to perform these assessments and plan care
- information sharing and IT support for SAP
- care coordination.

A small proportion of people (10–20%) have needs so complex and/or require services so intense or prolonged that they would benefit from having 'a named professional to co-ordinate the involvement of all the professionals and services involved in assessments and care planning. Professionals who act as care co-ordinators should play a prominent role in assessments and reviews, determine eligibility for services, put together packages of care, and act as a source of information and advice' (DH 2004, p. 6).

21.2.3 Specific discharge considerations

Discharge planning is started on admission at the very latest. Discharge planning tools should be in place; many will begin with a 'Risk Assessment Screen' that is completed for all people. These risk assessments vary slightly between different organisations, although many have similarities and are based upon the Blaylock assessment (Blaylock 1992).

The Blaylock Risk Assessment Screening Score (BRASS)

The BRASS index contains ten items, each of which is assessed individually and allocated a score by the nurse, depending on which item most relates to the person being cared for (*Figure 21.1*). The ten items that are assessed are:

- age
- living situation/social support
- cognition
- functional status

- behaviour pattern
- mobility
- sensory deficits
- the number of previous admissions/emergency room visits
- the number of active medical problems
- the number of drugs that the person is presently prescribed.

The higher the score, the more complex a person's discharge needs are likely to be. If the score is above 10 on this assessment, then a referral should be made to the discharge planning coordinator or discharge planning team.

Blaylock Discharge Planning Risk Assessment Screen

Circle all that apply and total. Refer to the Risk Factor Index.*

Age
- 0 = 55 years or less
- 1 = 56 to 64 years
- 2 = 65 to 79 years
- 3 = 80+ years

Living Situation/Social Support
- 0 = Lives only with spouse
- 1 = Lives with family
- 2 = Lives alone with family support
- 3 = Lives alone with friends' support
- 4 = Lives alone with no support
- 5 = Nursing home/residential care

Functional Status
- 0 = Independent in activities of daily living and instrumental activities of daily living

Dependent in:
- 1 = Eating/feeding
- 1 = Bathing/grooming
- 1 = Toileting
- 1 = Transferring
- 1 = Incontinent of bowel function
- 1 = Incontinent of bladder function
- 1 = Meal preparation
- 1 = Responsible for own medication administration
- 1 = Handling own finances
- 1 = Grocery shopping
- 1 = Transportation

Cognition
- 0 = Oriented
- 1 = Disoriented to some spheres† some of the time
- 2 = Disoriented to some spheres all of the time
- 3 = Disoriented to all spheres some of the time
- 4 = Disoriented to all spheres all of the time
- 5 = Comatose

Behavior Pattern
- 0 = Appropriate
- 1 = Wandering
- 1 = Agitated
- 1 = Confused
- 1 = Other

Mobility
- 0 = Ambulatory
- 1 = Ambulatory with mechanical assistance
- 2 = Ambulatory with human assistance
- 3 = Nonambulatory

Sensory Deficits
- 0 = None
- 1 = Visual or hearing deficits
- 2 = Visual and hearing deficits

Number of Previous Admissions/ Emergency Room Visits
- 0 = None in the last 3 months
- 1 = One in the last 3 months
- 2 = Two in the last 3 months
- 3 = More than two in the last 3 months

Number of Active Medical Problems
- 0 = Three medical problems
- 1 = Three to five medical problems
- 2 = More than five medical problems

Number of Drugs
- 0 = Fewer than three drugs
- 1 = Three to five drugs
- 2 = More than five drugs

Total Score:

*Risk Factor Index: Score of 10 = at risk for home care resources; score of 11 to 19 = at risk for extended discharge planning; score greater than 20 = at risk for placement other than home. If the patient's score is 10 or greater, refer the patient to the discharge planning coordinator or discharge planning team.
†Spheres = person, place, time, and self.

Figure 21.1 The Blaylock Risk Assessment Screening Score (Blaylock 1992). Republished with permission of SLACK, Inc., from Discharge planning: predicting patients' needs. Blaylock, A. and Cason, C.L. (1992) *Journal of Gerontological Nursing*, 18(7): 5–9; permission conveyed through Copyright Clearance Center, Inc.

Scenario: George Clarke

In preparation for George's discharge, the nurse uses the BRASS tool to assess his risk.

Age:	2
Living situation/social support:	0
Functional status:	5
Cognition:	1
Behaviour pattern:	1
Mobility:	0
Sensory deficits:	1
Number of previous admissions/emergency room visits:	1
Number of active medical problems:	1
Number of drugs:	1

George's total score is 13, so he is considered at risk for the purposes of extended discharge planning.

Referral to members of the multidisciplinary team

Following assessment, the coordination of needs can be arranged by referring the person to the relevant MDT members. Referrals will depend upon what the person's needs are and how complex they are. In some instances it may be necessary for a case conference to be organised in order that all the necessary MDT members, including the person being cared for and their carers, discuss the needs and what services can be put in place to address them.

The MDT team may include the following members.

Physiotherapist

Physiotherapists work in a wide variety of health settings and they may be involved in the treatment of conditions such as asthma, back pain, fractures, heart conditions, incontinence, nerve disorders, pain relief, cerebral vascular attacks and even tinnitus. For more information on the role of the physiotherapist see the Chartered Society of Physiotherapy website, www.csp.org.uk.

Occupational therapist

Occupational therapy helps people engage as independently as possible in the activities which enhance their health and well-being. They may address individual needs such as providing adaptations within the home or helping people to learn new ways of doing things. They may also be involved in the treatment of a range of conditions such as disabilities, injuries following accidents, Alzheimer's disease and substance abuse. Occupational therapists work in a wide variety of health settings. For more information on the role of the occupational therapist see the website of the Royal College of Occupational Therapists (RCOT), www.rcot.co.uk.

District nurse

District nurses are qualified nurses who provide care, support and education to people and their carers in the home environment. The specific duties of a district nurse include applying dressings, monitoring and assessing wounds, administering specific medications or tube or IV feeds and care of dying people.

The district nurse will continually assess a person's condition and liaise with the wider MDT, including the GP and social services.

A district nursing referral from a clinical environment needs to provide the following information:

- the ward the person is admitted to
- consultant
- the person's condition
- the treatment or care required
- their pressure areas
- date of discharge
- brief assessment of the person's capabilities on discharge
- list of any other services that are needed
- name, address and telephone number
- date of birth
- GP's name, address and telephone number
- any follow-up appointment details
- details of next of kin
- details of the location to which the person is going to be discharged.

Copies of the referral will be filed in the person's notes and distributed to relevant members of the MDT, such as district nurse liaison and the GP. The person being cared for should receive a copy.

Hint for practice

Take every opportunity to work with the range of professionals within the MDT. This will help you to develop knowledge of the skills and roles of others and to feel more confident in referring to them and seeking advice when required.

Social worker

Social workers perform a variety of roles, such as adviser, advocate, counsellor or listener, with people and with their carers and friends. They help people to live more successfully by helping them find solutions to their problems.

If someone is likely to need support from social services after discharge, an assessment must be completed in consultation with the person being referred and/or carers, and sent to the local social services with the person's consent. Details should include:

- person's name and NHS number
- expected date of admission and the hospital details
- likely discharge date
- details of any funding arrangements for future care
- details of the contact person at the hospital responsible for liaising with social services – this is often the discharge coordinator, who is often a nurse.

The referral is intended to allow the relevant local authority time to assess and plan the person's care needs after discharge. This referral is followed by a discharge notice confirming to the local authority the date of discharge as soon as it is known.

The social worker may need to work with discharged people who have mental health problems or learning difficulties, with adults and children with long-term conditions and with older people to sort out problems with their health, housing or benefits. This may include arranging alternative accommodation for the discharged person, arranging meals on wheels, assistance at home, day care or help with personal hygiene, or helping the person and/or their carers to claim financial help.

Specialist nurse

Many hospitals have specialist nurses to whom people can be referred depending upon their condition and needs. They are nurses who have a particular expertise in their field of nursing, and they can provide extensive advice about their subject and offer specialist care both in hospital and following discharge. Examples of specialisms include diabetes care, cardiac care and stoma care.

21.2.4 Communicating with people and carers about discharge

Continued communication with a person and their carers throughout the discharge process is vital. They must be involved at all times, with particular reference being made to their own perceived needs. Care must be discussed fully and, ideally, a hospital discharge leaflet that lists all the contact numbers to call in the event of any problems should be provided before discharge. Providing health education, health promotion and checking someone's understanding is also necessary to ensure a successful discharge. Again, information should be provided to reiterate this advice.

The discharge date should be communicated well in advance to allow outdoor clothes to be brought in from home, previous services to be recommenced, transport to be arranged if using their own transport (if hospital transport is required then this is usually booked on the day of discharge), and the heating to be switched on at the person's home if needed. It is also important to ensure that a supply of food is available to people on their return and that they have access to their property.

21.2.5 Discharge forms and bed-state

As with transfers, the bed-state and admissions and discharges records need to be completed on discharge. A discharge planning document should also be completed on a continual basis from admission, following the DH's guidelines (DH 2010). The planning document will include:

- the estimated date of discharge and a note that the person being cared for has been advised of this
- an assessment of whether the person is likely to have complex needs on discharge, with the opportunity to reassess this throughout their hospital stay
- specific referrals including information on who the person has been referred to, their contact details, the date they were referred, who referred them and dates/notes of any meetings that have taken place
- details of the person's home circumstances and any care already being received.

21.2.6 Other considerations regarding discharge

Medication

The person's discharge prescription can be ordered, dispensed and kept locked away for safe keeping until the day of discharge. However, instructions on how to take medication and discussion of side effects and contraindications can be performed in advance of discharge to ensure that the individual and the carers fully understand.

Confirmation of service requirements

Checks should be made to ensure that all the specific services provided by other members of the MDT (for example, equipment, alterations to the home, care packages, benefits, etc.) are arranged in preparation for the discharge date.

Discharge checklist

A discharge checklist will also need to be completed, usually on the day of discharge, to ensure that everything is in place for a safe discharge. This checklist may include confirmation of the following.

- The person's discharge prescription has been given to them, and any dressings or specific equipment have been handed over.
- A discharge leaflet, carer's pack or any written advice has been given.
- Any verbal advice previously given has been reiterated.
- Transport has been booked, whether this is hospital transport or the person being collected, highlighting an estimated time of pick-up and the type of transport arranged. Should the person need to take any specific equipment home with them then the type of transport needs to be considered and those transporting the person must be made aware of this need.
- The district nurse and other relevant community services have been informed by telephone that discharge is imminent.
- A letter for the GP has been given to the person or, if this is not possible, arrangements are made to send/email securely on to the person's GP.
- Any follow-up appointments have been made and given to the person or, if not, arrangements are made to send the details on.

Scenario: George Clarke

Before discharge, George's ongoing care needs are assessed, and it is decided that referrals need to be made to the occupational therapist and to social services, who will work together to assess his home environment and any ongoing health and personal care needs. As Mary, his wife, is managing his medication, a referral to the district nurse for nursing care is not considered necessary at this stage.

Because George has some memory problems, his named nurse ensures that communication about his discharge takes place while Mary is present.

George's GP is informed of his hospital stay and will follow up with George to assess any possible mental health needs.

On discharge he is also given a follow-up appointment for review of his gastritis.

Activity

Think about the issues that someone might be concerned about regarding a transfer or discharge from hospital. Make a list of the things that would concern you as an individual and write down the actions that you might take to reassure someone as to their safety during these transitions. Discuss this with your practice supervisor.

Summary

Key points from this chapter:

- Communication with the person and their carers about a planned transfer is important to inform them of the reasons for the transfer and to obtain their consent.
- Communication with the receiving department is also crucial, including any necessary documentation.
- Planning for someone's discharge should start before or on admission.
- Discharge planning tools should be used and should include a risk assessment screen such as the Blaylock Risk Assessment Screening Score (BRASS).
- Depending on the person's needs, referrals may need to be made to other members of the multidisciplinary team.
- Communication about discharge is vital.
- Transfers and discharges must be performed without compromising a person's dignity and safety.

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CHAPTER 22

22 Caring for the dying person

LEARNING OBJECTIVES

In this chapter you will develop the skills and knowledge required to:

- understand how the way in which significant news is given can affect how someone copes with that news
- use an action plan to prepare for breaking significant news to a person
- care for the dying person and support their family and loved ones
- recognise and respect different religious and cultural beliefs and practices
- care for a person after their death.

Scenario: Elsie Smith

Mrs Elsie Smith is a 76-year-old lady who has been living independently in warden-controlled accommodation with her husband Walter. She also has a large extended family who see her on a regular basis.

Mrs Smith is admitted to the medical ward via A&E, having collapsed at home. She is diagnosed as having had a left-sided stroke. This has left her with a profound right-sided weakness and no gag reflex.

After treatment and three weeks of rehabilitation, Mrs Smith develops aspiration pneumonia leading to respiratory failure. At this stage, both Mrs Smith and her husband and other relatives are told about Mrs Smith's worsening condition and poor prognosis. Sadly, Mrs Smith eventually dies.

22.1 Introduction

As a student nurse you will not be asked to tell someone that they are dying. However, you will encounter dying people at some point in your career, and even as a student you might be required to care for someone who is terminally ill. This chapter aims to prepare you for those eventualities and for a time in the future when you do have to break the significant news that a person is approaching the end of their life.

Breaking the news that a person is going to die imminently is one of the most difficult and anxiety-provoking activities that nurses may have to undertake. If handled poorly by the healthcare professional it can have far-reaching consequences for all involved. It was previously considered a predominantly medical task, but with the increase in nurse specialist posts and people's increased awareness of their own symptoms and diagnoses, it can fall to the registered nurse to break this important news. This requires excellent communication and interpersonal skills.

22.2 How to break significant news

Significant news is subjective, and what one person may consider significant news may be immaterial to another person. However, whatever the significant news is, it is always difficult to give and always more stressful to receive.

There is no prescribed way to break the news that someone is dying, as the words and the approach you use with one individual may not be appropriate with another. As with all care, the breaking of significant news must be individualised to the needs and wishes of each particular person. However, the way the news is given can affect how a person copes with and adjusts to their approaching death. The following action plan can be used as a guide for this difficult aspect of communication.

Action plan		
Preparation	**Action**	**Reason**
1. Information	Make sure you have all the facts before you break significant news.	This enables you to be clear about what you need to say and to plan how you are going to say it: you may use both verbal and written information and even diagrams to ensure full comprehension.
2. Environment	Ensure you and the person you are caring for have comfort and privacy (free from interruptions).	This shows sensitivity to a person's reaction to potentially devastating news, and facilitates communication and openness.
3. Support	Arrange for the person to have someone with them at their request.	This may be a relative, a friend, or another member of the healthcare team who acts as an advocate, spokesperson or as support for the person concerned.
4. Awareness	Ask the person what they already know and understand about their illness.	This will help you to assess and clarify someone's current understanding of their illness and to identify the level at which to deliver the new information.
5. Request	Find out how much the individual wants to know about their illness, diagnosis, treatment or prognosis.	Not all people want to know, or feel able to cope with, the details of their condition or prognosis. Therefore, it is important to establish how much someone really wants to know before you disclose this information. Remember they can request more information at a later date.
6. Dialogue	Provide the information in clear manageable amounts at the person's own pace and avoid using medical jargon.	This enables absorption of the information just received and ensures clear understanding.
7. Clarification	Check the person has received information correctly by repeating key points and asking them to tell you what they understand about what you have just told them.	Continuously checking understanding throughout your discussion with someone allows you to assess how much of the information they have taken in and what may need repeating.
8. Empathy	Allow the person to express their feelings and emotions openly. Recognise and validate their responses.	Empathising with someone demonstrates to the person that you understand how they feel.
9. Comfort	Spend time with the person after you have broken the news.	Enable the person to work through their early emotions to a point where you can plan their next step together. Even if their prognosis is poor you must still discuss their options in relation to managing their illness, care, any pain and even their social and financial responsibilities.
10. Debrief	Once you are safely able to leave the person in the care of another member of staff or their relatives or carers, reflect on this experience with your supervisor.	Breaking significant news is a stressful and emotional responsibility. Therefore it is important for you to debrief as soon as is practical after the event. Taking care of yourself is as important as taking care of others.

Scenario: Elsie Smith

After treatment and three weeks of rehabilitation, Mrs Smith develops aspiration pneumonia leading to respiratory failure. A time is arranged when the consultant and a staff nurse can meet with her to discuss her worsening condition. Permission is gained from Mrs Smith for her husband Walter and other relatives to attend the meeting.

Mrs Smith feels too weak to be manoeuvred in and out of her bed, so she is transferred into a side room for privacy and comfort. The consultant breaks the news to Mrs Smith and her family, ensuring they all understand the information and answering any questions they have empathetically. A decision is taken in consultation with Mrs Smith, her relatives and the MDT that resuscitation is not to be attempted in the event of a cardiac arrest.

After a while, Mrs Smith, Walter and the family are left alone for a few minutes while the staff nurse arranges for some tea to be brought to their room. The staff nurse then goes back to them and spends time answering any further questions they have and discussing their concerns with them.

22.2.1 Answering difficult questions

It can be a useful technique to reflect someone's questions back in an empathetic way. It can clarify why the person is asking the question. Many questions may not be answerable due to the uncertainty of health, life and death. It can therefore be more beneficial to explore the person's own feelings, concerns and wishes as appropriate.

22.2.2 Good practice

- Do – offer a person the opportunity to have a loved one present when receiving significant news.
- Do – give news to the person before relatives/carers. Exceptions to this may be when dealing with children or with adults who have severe cognitive impairment.
- Do not – agree to a relative/carer's demands to withhold information from a person (this would be a form of collusion), unless the person lacks the capacity to consent.
- Do – use straightforward language and avoid euphemisms such as 'little lump' instead of 'cancer', 'go to sleep' instead of 'die' (this is commonly used when speaking to children but can cause serious misunderstanding).
- Do not – make assumptions about a person's understanding.

22.3 Communicating with the dying person

This section aims to address some of the key concerns you may have as a student nurse when communicating with terminally ill or dying people and to suggest ways to respond to them.

22.3.1 Who is responsible for telling a person they are dying?

A consultant, doctor or another delegated person such as a registered nurse is responsible for telling a person that they are dying.

22.3.2 What if they ask me directly 'Am I dying?'

Hint for practice

Caring for a dying person and breaking significant news is often very emotional for everyone concerned, including you. There will be times when this emotion will overcome you and you may cry or feel inadequate in your ability to care. Ensure that you discuss this with your supervisor and seek help in managing the emotions that circumstances such as these can evoke. Remember it is OK to cry and you must never refrain from seeking help, advice and support with your own feelings.

If this happens, stop whatever you were doing, sit down and ask the person why they think they might be dying. This demonstrates that you are taking their concerns seriously and allowing them to explore their own understanding and feelings about the situation. Listen carefully and attentively.

You may find they have decided they do not want to know if they are dying. In this instance you must respect their wishes. However, you must still report what has happened to the nurse in charge.

If a person indicates that they do want to know if they are dying, then you can suggest that you will go and get a registered nurse to come and talk to them. Always make sure that someone does go back to the person concerned.

Avoid poor responses: never lie and say 'No, you are not' or 'I don't know' if you do know they are dying. Never suggest they are being silly by saying such a thing. Never ignore their question or change the subject and never walk away, leaving the question hanging in the air, claiming you are going to get someone to come back and talk to them – your actions will have already answered the question for them.

22.3.3 What do I say to a dying person?

The most important words a nurse can say to a dying person are 'How can I help you the most?' In addition, you can share other people's experiences, but without breaking confidentiality, of course. For example, you can say things such as 'When I've nursed people who were dying they've found this (music therapy, back rubbing, reading, etc.) very comforting, helpful or useful'. Comments like this make the dying person aware they are not alone; that many people have been through this experience and that you are there to help them through it.

22.3.4 What if they ask me to put them out of their misery?

Do not ignore the person or pretend you did not hear the request. Ask the person why they have asked you to do that. This turns the focus back to them as they now need to respond to your question. Your role is to listen. This question may be linked to their fear of dying or pain they are experiencing as unbearable. In particular, people say things like this when they feel they are not in control. You can help them get back that control in other areas such as giving them control over their pain, and giving them practical control over what time they get up or go to bed, what they eat and some of their treatment, etc.

You should also report the conversation to a senior nurse or doctor as there may be other things that can be done to help the person.

22.3.5 What if they say 'Why me, why now?'

Tell them the truth: answer that you don't know 'why them and why now', then turn your response into an empathetic statement such as 'It's hard, isn't it?' This will enable the person to open up to you about how they are really feeling. Questions such as this may indicate that the person could be in the anger phase of the grieving process, and should be allowed to express that anger safely and with support.

22.3.6 What if they say to me 'How would you feel?'

Be honest and sincere. How would you really feel if it was you?

22.4 Caring for the dying person

The Leadership Alliance for Care of the Dying Person identified five priorities which NICE adopted in their guidelines (Leadership Alliance 2014).

- Recognition that the person is dying: the person is likely to have experienced a significant deterioration in their condition in the previous few days which potentially cannot be reversed.
- Sensitive communication between staff and the dying person and people identified as important to them (see above).
- Decisions about treatment and care involve and include the dying person and those identified as important to them.
    - Families and loved ones are involved in decision-making, including any decisions to withhold or withdraw treatment.
    - Decision-making is informed by guidance provided by the appropriate responsible healthcare professionals.
- The needs of families and others important to the dying person are actively explored, respected and met as far as possible. These may include:
    - provision of a side room
    - open visiting
    - access to a telephone
    - refreshments.
- An individual care plan is agreed, coordinated and delivered with compassion. This may include:
    - food and drink
    - symptom control
    - psychological, social and spiritual support.

Every person is different, which means that every care plan must be individualised in order to afford the dying person a good death.

22.5 Care after death

Care after death (sometimes referred to as 'last offices') relates to the physical care given to a deceased person. Respect, dignity, communication skills with relatives, staff and carers, cultural and religious beliefs, knowledge of local policies and procedures are all issues healthcare professionals must consider when dealing with a deceased individual. People and their families and loved ones may be consulted about any particular wishes they may have for their care after death.

Death remains a taboo subject for many and, although policies and procedures may prescribe the necessary actions required by staff dealing with the transition from a living person to a dead body, all nurses need to consider their own personal views, values and culture that might affect their handling of people after death.

Scenario: Elsie Smith

Mrs Smith's husband Walter has been called and asked to come to the hospital. However, before he arrives, a nurse checks on Mrs Smith and it appears that she has stopped breathing and died. The nurse pulls the curtains around the bed to protect Mrs Smith's dignity and to avoid unnecessary distress to other people.

The nurse assesses for signs of life such as breathing, pulse, colour and movement. There are no signs of life, and the nurse is aware of Mrs Smith's 'DNAR' (do not attempt resuscitation) status, a decision which was made in consultation with Mrs Smith and her family and the MDT.

She then calmly and quietly informs the nurse in charge. Medical staff will then be informed who are required to certify death, by filling in the death certificate and stating the cause of death.

If the medical team's arrival is likely to be delayed (for example, with on-call teams occupied at night, or if the death occurs in a community or hospice care setting), then senior nursing staff who have undertaken extra training may be able to verify expected deaths. This is not the same as certifying death, and it relates to pronouncing life extinct in order that there is no delay in stopping infusions, informing relatives and commencing last offices. The death will still need to be certified by a member of the medical staff who is qualified to do so.

22.5.1 Religious and cultural beliefs

As a healthcare professional you will encounter people with a variety of religious or cultural beliefs, so it is advisable to become familiar with those most prevalent in your area of practice. Some religions have particular requirements when dealing with recently deceased individuals. Others, such as Church of England and Jehovah's Witnesses, may have no specific requirements but the family could advise on their deceased relative's wishes. A brief summary follows of the last offices practices of some religions common in the UK.

Buddhism

A Buddhist who knows that they are dying will probably wish to have their family and friends with them to meditate and chant mantras as death approaches. They will need as much peace and quiet as possible to allow this to happen. After death, do not touch or move the body of a Buddhist person until advice has been sought from an appropriate source (for example, the family, friends or a hospital chaplain).

Catholicism

When death is imminent, Roman Catholics may wish for a priest to carry out the sacrament of the 'Anointing of the Sick', which is also known as the Last Rites or Extreme Unction. If appropriate to their state of health, the person may also wish to receive Holy Communion and confess their sins to a Catholic priest or chaplain.

There are no particular rituals associated with last offices for Roman Catholics, and this also applies to other forms of Christianity.

Hinduism

Death in hospital can cause considerable religious distress to someone of Hindu faith and their family, and so they should, if at all possible, be allowed to die at home. If they are to die in hospital, they will need to be in a situation in which

they can be surrounded by their family. The family will want to read passages from holy texts, say prayers with their dying relative, and perform certain required ceremonies.

After death, real distress may be caused if a non-Hindu touches the body without wearing disposable gloves, so this should be avoided at all costs. Unless otherwise advised by the family, close the eyes and straighten the legs. Do not attempt to cut any hair, nails or beards. Hands should be placed on the chest with the palms together and fingers under the chin. Religious objects or jewellery should not be removed. The body should be wrapped in a plain white sheet.

Islam

As death approaches, a Muslim person will expect to have their family and friends around them. If members of the family are not in attendance when death occurs, healthcare staff should wear disposable gloves so that they do not directly touch the body. The person's bed should be turned so that the head is pointing towards Mecca (roughly south-east in the UK), the arms and legs straightened, eyes and mouth closed and the body covered entirely with a clean white sheet. Female bodies should be attended to by female care staff and male bodies by male care staff. The remaining preparation of the body will be carried out by a member of the family, who should be contacted immediately.

Judaism

A Jewish person who is dying may wish to hear or recite particular psalms (particularly Psalm 23). After death the body should be touched by care staff as little as possible and disposable gloves should be worn at all times. Contact should be made with either the next of kin or the Rabbi as soon as possible, as they will arrange for the preparation of the body. The face should be covered with a clean cloth or sheet, arms should not be crossed but left at the side of the body with palms facing inwards. Any catheters, drains and tubes should be left in place, as should any wound dressings. Open wounds should be covered. If the person dies at night the light should be left on when there is no one in the room or bed space. Female bodies should be attended to by female care staff and male bodies by male care staff. Further religious stipulations govern what happens if a Jewish person dies on the Sabbath: advice should be sought from the carers/relatives and Rabbi should this look likely.

Mormonism

Members of the Church of Jesus Christ of Latter-day Saints and of related branches may wear a one- or two-piece sacred undergarment. Relatives may wish to dress the person in this if it is not already being worn. There are no other special requirements, but relatives may wish to be present during last offices.

Sikhism

Sikhs have five 'signs' that they should wear at all times, known as the 'five Ks'. They are the:

- kesh – uncut beard and hair
- kangha – wooden comb
- kara – a steel bracelet worn on the right wrist
- kirpan – sharp knife with a double-edged blade (often now in the UK in the form of a badge or brooch)
- kaccha – long underpants/trousers.

Hint for practice

Never assume just because a person belongs to a particular religion that they would follow the conventions of that religion. This is why your communication with the person if possible and their family/carers in assessing preferences is so important. Maintaining person-centred care and dignity is paramount at all stages of life.

If a member of the family is not available when death occurs, healthcare staff should wear disposable gloves to avoid direct contact with the person. Do not undress the body, wash the body or remove any of the five Ks, as that is something the family would wish to carry out themselves. Drains and other tubes can be removed. The body should then be wrapped in a clean white cloth or sheet ready for the family to care for.

Zoroastrianism

Orthodox Zoroastrians and Parsees require a priest to be present, if possible. Family members may wish to be present and perhaps participate in preparation of the body. After washing, the body may be dressed in a white cotton or muslin shirt called the sadra, which symbolises purity, and a girdle called a kusti woven of 72 strands of lambs' wool, symbolising the 72 chapters of the Yasna (liturgy). A white cap or scarf may also be applied to cover the head. Organ donation is forbidden by religious law for this group.

22.5.2 Policies and procedures

Last offices policies can vary so it is important to familiarise yourself with your own organisation's policy, preferably before you encounter a death. Ideally, last offices policies should be addressed in initial orientation packages for all new staff and students. The policy should also be easily accessible and visible in case deaths in that particular clinical area are not commonplace, so that the information is available at the time you experience or are required to manage a death.

Remember that health and safety, infection control and legal requirements must always be considered. These might include requirements for dealing with MRSA, the certification of death, removal of tubes and IV lines, safe manual handling practices, and so on. A general guide to some of the actions required when conducting last offices is given below. This is by no means a comprehensive list, and the deceased must be respected as an individual within a particular social community at all times.

22.5.3 Preparing for care after death

- Ensure privacy and dignity by drawing curtains securely.
- Contact the appropriate member of the nursing or medical team to certify or verify the death. Check in the deceased's medical notes for any information regarding tissue donation, religion, culture, etc., as it is important to know these things before any discussion with carers/relatives.
- Inform next of kin. (See *Section 22.2* for good practice in breaking significant news.)
- Ask the relatives if they wish to see the hospital chaplain or any other appropriate religious leader.
- Ask if relatives wish to view the deceased person on the ward or in the chapel of rest at a later date. Check your local policy regarding this, as some organisations have a specific time limit for relatives to attend on the ward, while others may prefer relatives to visit the deceased in the mortuary or chapel of rest. Ensure you have all the details the relatives/carers will need to arrange this and give directions to find the appropriate hospital entrance if they are not being accompanied by staff. Also, be clear about any particular arrangements for night-time and weekend visits.
- If the deceased person has been transferred from a nursing or residential home, ask the next of kin for permission to inform relevant staff and do so as soon as possible.

22.5.4 Handling of the deceased person

Again, local policies differ but most organisations stipulate that the deceased person's personal hygiene should be attended to before relatives viewing (if appropriate) and before moving to the mortuary. However, it is important to check for religious and cultural preferences and to ask relatives/carers if they wish to attend to this. If relatives/carers are attending to the body then nursing staff should be present throughout to ensure correct procedures regarding property and valuables are carried out. If last offices are performed by staff there should always be two people present to witness and sign all appropriate documentation.

Procedure 22.1: Performing care after death

- Wear gloves and aprons (as per infection control policy).
- If the death is to be referred to the Coroner (if, for example the death has been unexpected or the cause of death is unknown), then all tubes, IV cannulas, catheters, etc., must be left in position. However, remember to seal these with spigots to prevent leakage, which would be distressing for carers/relatives. If you are in any doubt about tubes, etc., then leave them in place.
- Leakage from orifices should be attended to and pads or pants used to absorb this. Remember to warn carers/relatives or inexperienced staff about this and about the potential for air to be released when moving the body while it is being washed.
- Close the eyelids. Apply gentle pressure for approximately 30 seconds if necessary.
- Males may be shaved (using wet or electric shavers). Apply cream to the skin to prevent brown streaks occurring.
- Attend to mouth care and hair care as appropriate. Dentures should be replaced in the mouth if possible. If this is not possible, then they must be placed in a plastic pot clearly labelled with person's name and hospital number, and then the dentures in the pot should be placed in property bags so that staff in the mortuary can retrieve them quickly and easily. Record this in property records.
- Dress the person in their own nightwear, a hospital gown or a shroud, depending on local policy. If there is a risk of a communicable disease or infection, adhere to the relevant infection control policy. Note that if you dress someone in their own nightwear, this should be recorded in the property records. Remove jewellery (although wedding rings are usually left in place, often taped securely to the finger). If carers/relatives request that jewellery be left in place, then do so. Again, record this clearly in the property records and ensure all property is collected and documented safely. If there is any property held within the ward safe, ensure that this is also accurately recorded.
- No property or valuables should be given to carers/relatives unless they have signed for it first. Often healthcare organisations and clinical departments have a specific property procedure, which should be followed.
- Once the deceased person is clean, dry and dressed appropriately, place them in a neutral supine position.
- A pillow under the jaw may be required to support jaw closure but remember to remove this before carers/relatives enter to view.
- Ensure identity bracelets are in place (often two are required, one on the wrist and one on the ankle). Cover the deceased person with a clean sheet and perhaps a counterpane, allowing the arms and face to be exposed for people to touch and say goodbye.
- Clear the room and bed area of all medical equipment and subdue the lighting. This helps to create a peaceful environment in which the bereaved can spend some time saying goodbye to their loved one.
- Remember, people deal with grief in very many ways, and it is part of your job as a nurse to support them through this distressing period. This may make you feel extremely awkward at first, but as your career and experience moves forward, you will become more confident in this type of situation.

22.5.5 Transfer

Prior to escorting the deceased person to the mortuary with the porters, ensure that the 'Notice of Death' forms are attached at the appropriate places. Commonly, they are secured with tape to the person's nightwear, with another taped to the top sheet, which is ultimately used to wrap the person in. A copy of the relevant paperwork is recorded in the person's notes. Check your local policy for more details. Request transfer from the ward to the mortuary and ensure privacy, dignity and respect during this journey. Use appropriate moving and handling techniques to ensure safety.

22.5.6 Informing all appropriate individuals

Ensure the appropriate people and agencies/services have been informed of the person's death and any ward record system is updated, according to local policy.

Consider the feelings of others on the ward and ensure they are informed individually that the death has occurred. Be prepared to deal with their particular issues concerning either the deceased's death or perhaps their own. Also consider issues for all the healthcare team and ensure either debriefing or counselling sessions are arranged as appropriate. This is often difficult due to workload pressures but should be a priority to ensure the staff's own mental well-being. Specific teams are often available to accommodate this important activity.

Care after death remains a highly valuable cultural, personal and professional experience, a chance for healthcare staff and relatives to say goodbye in a caring and compassionate manner with the intention of making the deceased clean, safe and presentable as well as taking the opportunity to fulfil certain religious requirements. National guidelines from NICE have been in existence since 2013 to support this valued but often neglected activity. The NHS was created to provide care from the cradle to the grave, and this procedure is the conclusion to an individual's care.

22.6 Caring for yourself

Telling a person they are approaching death and caring for them as they approach death and after their death are emotional experiences for nurses. The emotional effects of these interactions should not be underestimated.

A dying person's relatives and loved ones will remember the way in which you care for them and their loved one during this difficult time. Therefore do not be afraid to allow yourself to be upset and to express your emotions.

If you are affected by the death of a person, it is helpful to talk to someone about this. Talking to your tutor, your supervisor or a fellow student and reflecting on your experience will help you to deal with similar situations in future and to continue to provide compassionate care to people.

Activity

Ask yourself the following questions:

- What experience of death and dying have you had in your own life?
- How might this affect you in your professional role?
- How would you like nurses to deal with your loved ones when they die?
- What are the important issues for carers/relatives when a loved one dies?
- How can we accommodate the needs of both the dying person and carers/relatives during this important time?
- If you were unsure of any religious practices relevant to a particular religion where would you go for advice/help?

Summary

Key points from this chapter:

- Be sensitive. You may nurse many dying people, but if you become insensitive to their needs and feelings you are failing to care.
- Be there. Avoiding a dying person out of fear of what to say to them is the worst thing you can do. It is better to have the company of someone with nothing to say than to be alone at the point of death.
- Be honest. Although a student nurse will not be the person required to tell a person that they are dying, you must never lie about their diagnosis or prognosis.
- Be realistic. Never give someone false hope.
- End-of-life care should be individualised and tailored to the needs of the dying person and their loved ones.
- Recognise and respect religious and cultural beliefs.
- Follow local policies and procedures.
- Ensure privacy and dignity for the deceased and their relatives.
- Avoid distress to other people; consider their feelings and inform them individually of the death.
- Follow standard infection control precautions.
- Take time to reflect on your own feelings and those of colleagues, and arrange debriefing or counselling sessions as appropriate.

Further reading

This list has used electronic sources so as to aid your literature searches in relation to this subject area. You should consider this list in relation to evolving literature and changing guidance within this field of practice

Kubler-Ross, E., and Kessler, D. (2005) *On Grief and Grieving: Finding the Meaning of Grief Through the Five Stages of Loss*, New York: Simon & Schuster.

National End of Life Care Intelligence Network (NEoLCIN) (2020) *Palliative and End of Life Care Profiles*. www.gov.uk/government/collections/palliative-and-end-of-life-care

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Wilson, J., Laverty, D., Mann, T. *et al*. (2020) *Care After Death: Guidance for Staff Responsible for Care After Death* (3rd ed). London, Hospice UK.

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Buckman, R. (1992) *How to Break Bad News: A Guide for Healthcare Professionals*. Toronto: University of Toronto Press.

Leadership Alliance for the Care of Dying People (2014) *One Chance to Get It Right: Improving people's experience of care in the last few days and hours of life*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/323188/One_chance_to_get_it_right.pdf

Glossary of terms

adjuvant: an additional drug that complements primary therapy

agglutination: a reaction in which particles (such as red blood cells or bacteria) suspended in a liquid collect into clumps, and which happens as a serological response to a specific antibody

agonist: a drug that causes receptors to activate

anaphylaxis: a serious, life-threatening allergic reaction

antagonist: a drug that typically binds to a receptor without activating it, and thus decreases the receptor's ability to be activated by an agonist

anthropometrical measurement: a non-invasive measurement of an individual's body composition, including body weight, height, upper arm, chest and head circumference, in order to assess physiological development and nutritional status

aphasia: a neurological disorder in which language and/or speech functions are impaired

apraxia: a neurological disorder in which the ability to carry out motor functions is impaired

arrhythmia: irregular heart contractions

aspiration pneumonia: a lung infection due to a large amount of material from the stomach or mouth entering the lungs

asystole: a life-threatening cardiac condition characterised by the absence of electrical and mechanical activity in the heart

body mass index (BMI): also known as the Quetelet index, a calculation of mass in kilograms divided by height in metres squared, used to determine whether an individual's body weight is within the expected range for their height (<19 indicates underweight, the normal range is 20–25, >26 indicates overweight or obese)

bradycardia: abnormally slow heart rate

bradypnoea: abnormally slow breathing

cardiac arrest: the abrupt cessation of normal circulation of the blood due to failure of the heart to contract effectively during systole (also known as cardiopulmonary arrest or circulatory arrest)

cardiogenic: something that occurs in the heart; often refers to a type of shock, when the heart cannot pump enough blood and thus oxygen to vital organs

colloid: a concentrated fluid containing large insoluble particles that do not pass easily through a semi-permeable membrane

compliance: the extent to which an individual takes the medication as instructed

concordance: a process that involves the person and aims to obtain their agreement to take the medication

crystalloid: an aqueous fluid containing water-soluble molecules that pass freely through a semi-permeable membrane

cyanosis: blue or purple colouration of the skin or mucous membranes

dietician: a healthcare professional who specialises in the study of food, diet and nutrition, who plans and manages diet, and dietary advice

dysmenorrhoea: pain on menstruation

dysphagia: difficulty with, or inability to, swallow

dysphasia: impaired ability to understand and use speech

dyspnoea: difficult or laboured breathing

enteral nutrition: direct delivery of a liquid feeding formula through a tube into the stomach (gastric feeding) or intestine (duodenal or jejunal feeding)

erythrocyte: red blood cell

gallipot: a small pot used to hold medicines, fluids or items for clinical use

haematemesis: vomiting blood

haemoptysis: blood in the sputum

homeostasis: the ability to maintain a stable internal state

hypercapnia: the presence of an abnormally high level of carbon dioxide in the circulating blood

hypercholesterolaemia: high levels of cholesterol in the blood

hyperglycaemia: too much glucose in the blood (blood glucose level >7 mmol/L)

hypertension: high blood pressure (>140/90 mmHg)

hyperthermia: abnormally high body temperature (>37.5°C)

hypoglycaemia: not enough glucose in the blood (usually <4 mmol/L)

hypotension: low blood pressure (<100/60 mmHg)

hypothermia: dangerously low body temperature (<36°C)

hypoventilation: insufficient ventilation leading to too much carbon dioxide in the body

hypovolaemia: loss of body fluid leading to low circulating blood volume

hypoxaemia: lack of oxygen in the blood (oxygen saturation <95%)

hypoxia: deficiency in the amount of oxygen reaching the tissues

hypoxic drive: respiratory stimulus provided by a falling pO_2 (pressure of oxygen)

induration: sclerosis: any pathological hardening or thickening of tissue

leucocyte: white blood cell

neurogenic: caused or arising in the nervous system

neurone: type of cell that carries information to and from the brain and the rest of the body

nociceptor: nerve ending receptor that initiates the sensation of pain

occult blood: blood that cannot be seen by the naked eye

oedema: swelling from excessive accumulation of watery fluid in cells, tissues, or serous cavities

oliguria: urine output that is less than 1 mL/kg/h in infants, less than 0.5 mL/kg/h in children, and less than 400 mL per 24 h in adults

palpation: using the fingers or hands during a physical examination

paraesthesia: an abnormal sensation, typically tingling or pricking ('pins and needles'), caused chiefly by pressure on or damage to peripheral nerves

paralytic ileus: condition, often occurring after general anaesthesia, in which peristaltic movements within the intestines become sluggish or stop

parenteral feeding: a method of feeding that bypasses the gastrointestinal tract and administers a slow infusion of nutrients directly into the veins; total parenteral nutrition provides the sole source of nutrients to a patient

peripheral shutdown: vasoconstriction of the peripheral circulation within the dermis of the skin, allowing blood to be diverted to the core away from the periphery, often in response to hypothermia, shock, haemorrhage or hypotension

pharmacodynamics: the effects of drugs and the mechanism of their action

pharmacokinetics: study of how the body metabolises a drug that has been administered

phlebitis: inflammation of the walls of a vein

postural hypotension: a sustained decrease in blood pressure when standing as opposed to lying

pulseless electrical activity: a clinical condition characterised by unresponsiveness and lack of palpable pulse in the presence of organised cardiac electrical activity (also referred to as PEA).

pyrexia: high body temperature caused by infection

sacrum: large triangular bone at the base of the spine

sepsis: the body's overwhelming and life-threatening response to infection that can lead to tissue damage, organ failure, and death

speech and language therapist (SLT): a healthcare professional who specialises in the assessment and management of communication problems and swallowing difficulties

sphygmomanometer: an instrument for measuring blood pressure

sterile field: an area that is considered free of microorganisms; can include equipment and people

stridor: a high pitched wheezing sound caused by disrupted air flow in ventilations

tachycardia: heart rate >100 beats per minute

tachypnoea: abnormally rapid breathing

thromboembolism: obstruction of a blood vessel by a blood clot that has become dislodged from another site in the circulation

turgor: rigidity of cells or tissues

vasoconstriction: constriction of blood vessels, which raises blood pressure

vasodilation: dilation of blood vessels, which lowers blood pressure

vasovagal reflex: a drop in blood pressure that causes a person to faint due to lack of oxygen-rich blood supplied to the brain

ventricular fibrillation: very rapid, uncoordinated, ineffective series of contractions throughout the lower chambers of the heart; unless stopped, these chaotic impulses are fatal

ventricular tachycardia: a tachycardia, or fast heart rhythm, that originates in one of the ventricles of the heart (also known as V-tach or VT); a potentially life-threatening arrhythmia because it may lead to ventricular fibrillation, asystole and sudden death

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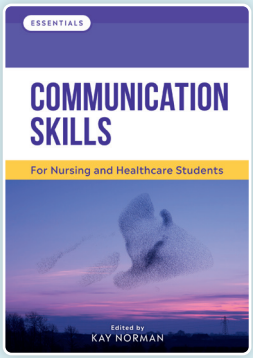

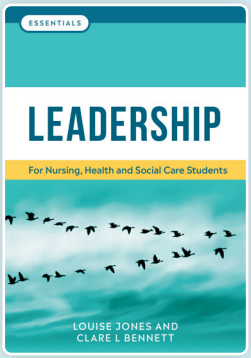

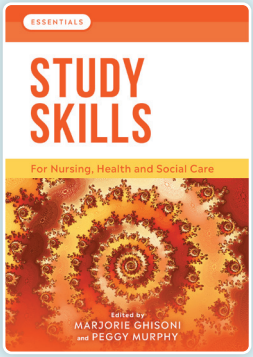

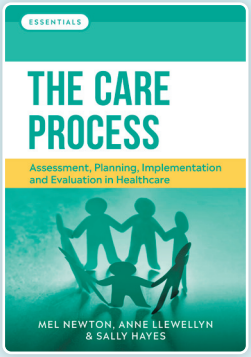

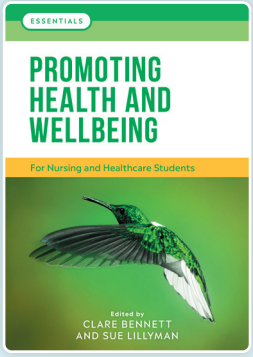

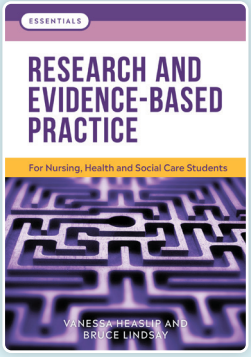

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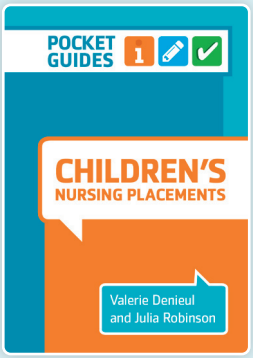

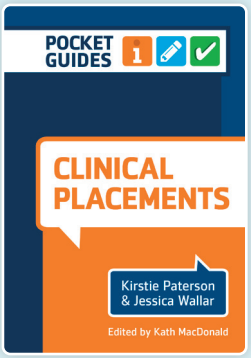

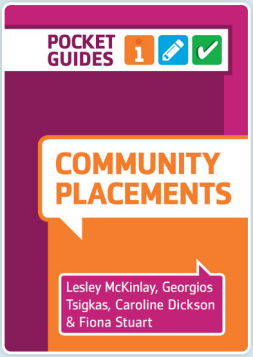

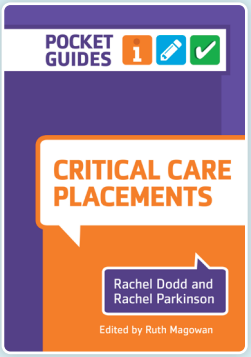

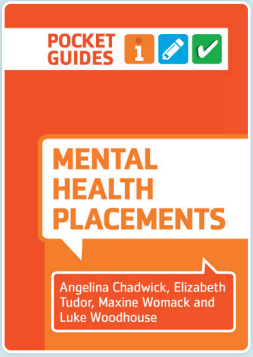

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