1

Introduction to Pharmacology, Children and Young People

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Aim

This chapter provides the reader with an introduction to pharmacology and its application to children and young people (CYP).

Learning Outcomes

After reading this chapter the reader will:

- **Understand the importance of following policies and the issues associated with medicine management**
- **Recognise the legal frameworks and NMC code within this important aspect of care**
- **Increase knowledge and understanding of pharmacological principles associated with the child, young person and their family**
- **Appreciate the importance of the role of the family/carer and family-centred care**

Test Your Knowledge

1. **What is your role in medicine management?**
2. **What are the five principles of medication administration?**
3. **What is the difference between the terms 'drug' and 'medicine'?**
4. **Describe family-centred care and its importance in your practice?**
5. **What does medicine optimisation mean?**

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Companion website: www.wiley.com/go/pharmacologyforCN

Table 1.1 Pharmacokinetics and pharmacodynamics.

PHARMACOKINETICS	PHARMACODYNAMICS
absorption	molecular
distribution	biochemical
metabolism	physiological effects of drugs on the body
excretion of drugs in the body	

Source: Based on Haddad and Nutt, 2020.

Introduction to Pharmacology

Pharmacology is present in daily life, from medicines bought over the counter in shops such as decongestants, nappy rash cream and pain relief, to prescription-only medicines including antibiotics and inhalers. Lifestyle and what we eat and drink also have an impact on our bodies and our health, which can often be categorised as drugs. This includes drinks containing cafeine, chocolate, alcohol, vitamins and minerals as well as illegal substances. Before going further into this chapter, it is useful to define the terms 'drug' and 'medicine', which are often used interchangeably in texts. Medicine can be defined as a drug or other preparation for the treatment or prevention of disease, whereas a drug is described as a medicine or other substance that can be natural or artificially made which has a physiological effect when inhaled, ingested or inserted into the body or applied topically to the skin. The definitions link to each other except that the word 'drug' can be used for a product not necessarily designed to treat or prevent disease.

Pharmacology can be described in its most simple terms as a science or branch of medicine that looks at all aspects of medicinal drugs, including how they are used, what effect they have on the body and how they are excreted. It is important to understand how medications work and the actions they have on the systems of the body for the safety of the people you offer care and support to. You may read the term 'drug actions', which is the commonly used shortened term for this.

Pharmacology has been divided into two overarching categories, pharmacokinetics and pharmacodynamics and it is important to understand the difference (see Table 1.1). The pharmacokinetic aspect of pharmacology examines the absorption, distribution, metabolism and excretion of drugs in the body. Pharmacodynamics is a more detailed scientific aspect of the molecular, biochemical and physiological effects of drugs. As a lifelong learner you will learn about and develop your understanding of the pharmacokinetics of different medications, as well as the side effects, how to manage these and how medications interact with each other. This is an important aspect of healthcare, ensuring that you are providing safe and effective care to CYP, whilst being knowledgeable in detecting side effects or contraindications and seeking further support in managing these for the safety of individual patients.

Professional Framework

The Nursing and Midwifery Council (NMC) set the standards that all nurses must adhere to as outlined in the Code of Conduct (NMC, 2018a). As part of a nurse's role the NMC highlight that the CYP in your care, and their family, must be able to trust you with their health and well-being (NMC, 2018a). To be able to justify that trust, nurses must adhere to the following four P's:

- Prioritise people
- Practise effectively
- Preserve safety
- Promote professionalism and trust

Within Preserving Safety, section 18 of the Code specifically focuses on aspects of medicine management and the role of the nurse which includes:

> *Advise on, prescribe, supply, dispense or administer medicines within the limits of your training and competence, the law, our guidance and other relevant policies, guidance and regulations.*
>
> **NMC, 2018a – see Table 1.2**

Table 1.2 Medicine administration, preservation of safety.

To preserve safety in relation to medicine administration, you must:	
18.1	Prescribe, advise on, or provide medicines or treatment, including repeat prescriptions (only if you are suitably qualified) if you have enough knowledge of that person's health and are satisfied that the medicines or treatment serve that person's health needs
18.2	Keep to appropriate guidelines when giving advice on using controlled drugs and recording the prescribing, supply, dispensing or administration of controlled drugs
18.3	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
18.4	Take all steps to keep medicines stored securely
18.5	Wherever possible, avoid prescribing for yourself or for anyone with whom you have a close personal relationship

Source: NMC (2018a). This extract is reproduced and reprinted with permission with thanks to the Nursing and Midwifery Council.

It must be clarified at this point that not all registered nurses are permitted to prescribe, as further qualifications and registration with the NMC as an Independent Prescriber must be achieved first. The NMC's Future Nurse: Standards of Proficiency for Registered Nurses (2018b) are designed for newly registered nurses to be 'prescriber-ready' on admission to the register, and therefore have more knowledge of pharmacology as detailed within the previous education standards. Although the knowledge level will be in more depth, further training, practice and supervision will be required to be a registered prescriber. This is reinforced in the NMC Code, section 13.5, which states that you must complete the necessary training before carrying out a new role (NMC, 2018a). Table 1.2 outlines the NMC's (2018a) requirements regarding medicine administration.

The Importance and Value of Medicine Within Healthcare

It has been identified that medicines are the most common intervention in healthcare and are used to prevent, treat and manage conditions and illnesses for people of all ages (National Institute for Health and Care Excellence (NICE), 2015). With the increase in technology and the increase in survival rates of premature births and complex health conditions, the need for medicines has increased. As with adults, more CYP are living with several long-term conditions that are being managed with an increasing number of medicines. Medicine use can be complex and how patients can take their medicines safely and effectively can be a challenge for the health service (NICE, 2021).

The safety of administering medicines is imperative as healthcare professionals strive to 'do no harm'. Despite this, it has been estimated that there are 237 million medication errors within England each year across all ages and areas of primary and secondary care (Elliott et al., 2020). It is also estimated from the same systematic review that 72% of errors have little or no harm on the patient and they are identified before the medication reaches the patient. The National Patient Safety Agency (NPSA) monitors medication errors across all aspects of the process and reports to the multidisciplinary team involved in medication management. The NPSA (2007) reported that 1 in 10 patients experience medication-related errors somewhere in the process and that 41% of the most serious incidents that are reported are caused by errors in administration. Within the literature, it is considered that many errors are unreported and so the statistics available are not completely accurate.

Therapeutic Pharmacology

In general, when a prescription is issued it should not be issued unless a detailed clinical assessment is completed and before having explored the psychological mechanisms underlying symptoms (this especially important in the case of mental ill health).

Healthcare providers and patients should consider that mental health disorders can effectively be managed by the use of pharmacological and non-pharmacological interventions. When a decision has been made to prescribe, for example, a psychotropic drug, it should never be suggested that psychological and/or psychosocial interventions will not be indicated. Combining medicines with psychosocial interventions can be associated with better patient outcomes. Considering medications as the only therapeutic strategy is very often unacceptable (World Health Organization, 2009). Articulated, comprehensive and individualised treatment plans can very often be seen as the best therapeutic option.

Social Prescribing

Social prescribing is a key component of universal personalised care (NHS, 2020). Based on the notion that medicine alone may not always provide a solution, it can help to point patients in the right direction to seek advice or social activities that aim to encourage partnership working between health and social sectors in order to attend to the wider determinants of health. Those patients who have non-clinical needs can be referred to community activities with the intention of improving their health and well-being. Social prescribing can work for a wide range of people, including:

- Those with one or more long-term conditions
- People who need support with their mental health
- Individuals who are lonely or isolated
- People who have complex social needs which affect their well-being.

Horner (2019) discusses how social prescribing can provide social support for those young people who have been socially excluded. The key elements associated with social prescribing that need to be in place for effective social prescribing are summarised in Figure 1.1.

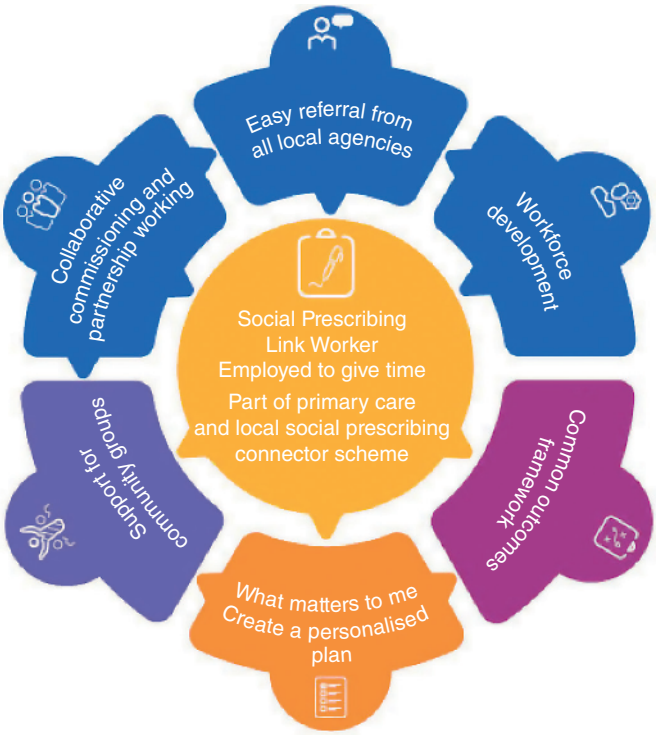

Figure 1.1 The key elements associated with social prescribing (NHS, 2020). ***Source*****: National Health Service/Public Domain/Open Government Licence.**

Safety Within Paediatric Care

Within paediatric environments care may be provided for CYP across a wide age range, from birth (possibly premature) to 16 years or potentially older depending on the clinical environment and the needs of the young person. Calculating medicine doses can be complicated as they can be very small doses in neonates and babies, requiring accurate calculation skills. Even a small miscalculation resulting in an overdose can have a severe or life-threatening effect due to the prematurity of the infant's development and the body's ability to process the medication. Barber (2013) identified that children are three times more likely to receive a medication error than an adult due to the complexity of the calculations required, a misplaced decimal point and the complexity of calculating the individual dosage for each CYP based on weight, height or surface area. Within neonatal care this risk is higher due to the size of the neonates and the complexity of calculations.

Episode of Care

Lucy is a 3-month-old baby who presented to a Children's Emergency Assessment Department with a 36-hour history of not taking her milk, being unsettled and crying more than usual. In the last 24 hours her temperature has increased to 38.5°C, she looks flushed, but her hands and feet are cool to touch.

On examination Lucy is crying and not being comforted by being held. As the doctor examines Lucy she is concerned at Lucy's condition and temperature and is prescribing paracetamol to reduce the discomfort that Lucy appears to be in. The nurse allocated to Lucy weighs her with no clothes on, to gain an accurate weight to be able to calculate the accurate dose of paracetamol for her body weight. Lucy's weight is 12lb 4oz (5.8kg) and '12.4' is verbally passed on to the doctor writing the prescription.

As the measurement unit was passed on verbally (it was not communicated by writing it down), the doctor wrote the paracetamol dose based on a weight of 12.4kg and not 5.8kg. It was only when drawing up the amount of liquid paracetamol needed that an experienced nurse realised that this was too much for the age of the baby.

- What would you do in this situation?
- What dangers have you identified?
- How could this potential error be prevented in the future?

Medicines Optimisation

NICE guidance has identified the term 'medicines optimisation', meaning 'to make the best or most effective use of' medicines, equipment or resources. To this end the Royal Pharmaceutical Society (2013) have developed four guiding principles:

- Aim to understand the patient's experience
- Evidence-based choice of medicines
- Ensure medicines use is as safe as possible
- Make medicines optimisation part of routine practice

Medicines optimisation is a wider encompassing approach than the system approach of medicine management. Medicines optimisation is an important concept in health and social care and is relevant for CYP with chronic or long-term conditions or those who are taking more than one medication. The optimisation approach is person-centred and develops an individual patient- or professional-led self-management plan for patients. Within paediatrics, depending on the age of the CYP, the family-centred care approach maybe more appropriate, with the family being involved in the development of the self-care plan for the child. It is also important to identify any over the counter medications or complementary therapies that may interfere with the effectiveness of any prescribed medication.

Where a child is on multiple medicines or the medicines need to be administered in a different way such as via a feeding tube, additional support and follow-up might be needed. This should be identified whilst in hospital and support arranged before discharge. Within elderly care environments a screening tool is available to identify potential medicine-related patient safety incidents. Within CYP care environments there does not appear to be such a screening tool available.

Medicines

Medicines can be grouped into four types in terms of access.

- General sales list
- Pharmacy medicines
- Prescription-only medicines
- Controlled drugs.

Medicines within the general sales list are readily available in shops and there is no legal age restriction for the purchase of these medicines, although some shops have their own age limits for sales. GPs and nurses will not prescribe over the counter medications, such as paracetamol, for minor illnesses for a child or adult when they can be bought readily and at a cheaper cost to the individual and NHS, although there is a list of exemptions. The cost of prescribing over the counter medications to the NHS is approximately £136 million per year (NHS, 2018).

Pharmacy medications are also known as restricted medicines and are a small group of medicines that a pharmacist can prescribe without the patient seeing a doctor or a nurse.

Prescription-only medicines are prescribed by a GP, nurse, dentist, midwife or a doctor working in environments other than general practice. The medications on this list are considered to be needed to be used under the supervision of a licensed healthcare practitioner due to the potential to cause harm. There are also many medicines that are used but are not licensed for CYP and these can only be prescribed by a paediatrician or hospital-based doctor. In comparison to general sales and pharmacy medications, prescription-only medicines are prescribed for an individual after assessment and the dose is calculated on the child or young person's height and weight or surface area rather than a standard dose that is more often found with adults.

Controlled drugs are a group of medicines that can be abused and cause dependence and therefore they are controlled and regulated by the government. The term 'control' covers how and where the medicine is made, how it is used, the way that it is handled and stored as well as how it is distributed. In a hospital environment, GP surgery or community care environment such as a hospice or children's unit, controlled drugs are stored in a metal locked cupboard inside another locked cupboard on a wall, usually in a specific room where medicines are checked and prepared. Access to the keys to the cupboards is limited and controlled. The stock levels of controlled drugs are checked daily by two people and new supplies are also often checked by two people and everything is recorded in a specific logbook (sometimes known as the controlled drugs register) according to local policy and procedure. When preparing a controlled medication to administer to a patient the stock level is checked against the logbook and the details of the patient including the dose, date and time are recorded and signed by two members of staff. The types of controlled substances most often used include opioids (morphine, diamorphine), sedatives (diazepam, temazepam), stimulants (amphetamines used in attention deficit hyperactive disorder), central nervous system depressants (diazepam), hallucinogens and anabolic steroids (testosterone).

Medicine Management

Medicine management involves the safe storage, management and administration of medications, which includes following local and national policies and guidelines for the safe administration of medication. Monitoring the effectiveness of any medication given, as well as understanding the side effects and contraindications, and being able to explain these to CYP and their family is part of the advancing role in healthcare. The 'Professional Guidance on the Administration of Medicines in Healthcare Settings' (RPS and RCN, 2019) outlines professional accountability and covers these aspects in more detail. This document is essential reading for all healthcare staff involved in medicine management and administration. Healthcare students and healthcare professionals are involved in medicine management in a variety of settings and should refer to the Standards of Proficiency for Pre-registration Nursing Education for Guidance (NMC, 2018b) as well ensuring they are familiar with and abiding to local policy and procedure.

The Standards of Proficiency for Nursing Associates along with the Standards for Pre-registration Nursing Associate Programmes (NMC, 2018c, 2018d) provide details regarding the preparation of nursing associates and the proficiencies that have to be met prior to the nursing associate's name being entered on the professional

register. The nursing associate (as is the case for the registered nurse) must be able, at the point of registration, to demonstrate and apply knowledge of pharmacology when delivering care. There is also a need to understand the principles of safe and effective administration and optimisation of medicines. Importantly, this must be done in accordance with local and national policies. Procedural competencies (very much related to local policy) must be demonstrated concerning the safe administration of medicines.

Safety: Rights of Medication Administration

Safety elements when administering medication include the 5 Rights, more commonly known as the 5 Rs (NMC, 2007):

- Right patient
- Right medication
- Right dose
- Right time
- Right route.

Working within these 5 principles whilst preparing medications and again at the bedside ensures a safe process. As more confidence is amassed in medicine management these principles can be expanded. Elliott and Liu (2010) believe that you should also include giving the medication for the 'right reason' and ensure that the 'right documentation' is completed correctly. As more understanding of the reasons for errors in medication management are understood, a further 5 rights can be added to the list, culminating in 10 rights, which include the original 5 Rs listed earlier as well as the following five (Edwards and Axe, 2015):

- The right to refuse (know what to do if the patient refuses)
- Right knowledge and understanding (of the drug and patient)
- Right questions (if there is any doubt with the process)
- Right response (monitor the effectiveness of the medication
- Right advice.

Chapter 4 of this text discusses medicines management and the role of the healthcare provider working with CYP and families in detail.

Specific Considerations for Babies, Children and Young People

When caring for CYP there are many aspects of medicine administration that need to be given special consideration, including the age of the child, gaining consent, if they have the ability to swallow tablets, the taste of medicines and what to do if a child refuses to take it. Consent will be explored in more depth in Chapter 3.

The changes in body proportions and composition in CYP change rapidly and this affects the efficacy, toxicity and dosage of medicines for children. Proportions of body fat, protein and extracellular water change over months in newborn babies, whereas at the age of 1 to 2, metabolism and elimination of medications from the liver and kidneys is at its greatest (NICE, 2021). Development of the gastrointestinal tract also affects the absorption of oral medications, and difficulties with this may indicate an intravenous route being more appropriate.

Infancy

Babies are unable to communicate their needs and feelings and assessment of a baby through body language and vital signs is important. The first 12 months of life involve rapid stages of development, from milk feeds through weaning to tolerating solid food as one example. Taste is developing and unusual tastes or textures can often be spat out or refused. It has been recommended that new foods should be introduced to babies four times before giving up, but this might not be possible with medicines. In babies and young children who cannot swallow tablets, liquid medicines or syrups are prescribed. Some liquid medicines/syrups do not have

a palatable taste, antibiotics being the most common. Flucloxacillin is an example of a syrup that has a very bitter taste and is not palatable to many. Baguley et al. (2012) recommend not prescribing such medications without first allowing the child to taste it. If a child will not comply with taking the medication, this increases the stress for the parent(s)/carers in encouraging the child to take the medication. It also increases the risk of non-concordance; the infection or condition not being treated appropriately and the development of drug resistance for the child. If a child is refusing to take liquid medicine due to the taste, further discussion should be had with the prescriber and involve the parent and child (where possible) to promote concordance to treatment.

Additional negative aspects to liquid medicines or syrups are that they often have sugar added to sweeten the taste and promote concordance in taking the medication (Baguley et al., 2012). If a medicine is to be taken long-term or prescribed for a child with diabetes mellitus, a sugar-free version should be considered if a tablet is not an option. This will also aid dental health, where taking sugary medicine regularly throughout the day can result in tooth decay. In Chapter 4 drug formulations are discussed.

Clinical Consideration

In cases where there is not an alternative or a baby or young child spits out the medicine or refuses to take it, having a drink of the child's choice to take straight after the medicine will take away the taste quickly. If the medicine does not have to be given on an empty stomach, a favourite food or snack may also be an option. Putting the medicine into a drink or bottle of milk is discouraged due to the following risks.

- If some of the drink is left, it is difficult to estimate how much of the medicine has been taken.
- The medicine may react with the fluid.
- If the medicine is denser, it will sink to the bottom of the container or adhere to the inside of the container.
- If the drink takes a long time to drink, the medicine is not given at the same time.
- The medicine may alter the taste of `the drink or milk and the child then refuse to drink it.

Clinical Consideration

With babies, oral syringes are commonly used to drip liquid medicine into the buccal cavity or onto the tongue. Assessing the swallowing ability is important and awareness of tongue tie, or cleft lip and palate difficulties should be considered. Oral and nasal cavities are closely linked, and liquid medicine can come out of the nasal passages if the baby does not suck and swallow and is distressed or sneezes. Cradling babies, ensuring their arms are not flailing about, and talking to them provides comfort and reassurance. It is important for babies to feel secure and loved by those around them and cuddling a baby when giving a liquid medicine can often help. Family-centred care, where the family is treated as a unit, recognises the importance of the parent/carers in nurturing the child whilst in hospital.

Clinical Consideration

In the first year, babies learn to roll over, sit, crawl, stand and walk. With these developing skills toddlers often want to be in control where they can, and allowing them to hold and press the syringe to control the medicine is often a positive approach for concordance.

As children develop and become more independent with everyday skills, they should understand what medicine they are taking is for and why it is important.

Safety is the priority, and as is highlighted on all medicine containers, medicine must be kept out of the reach of children both in hospital and the community. It is important to watch a child taking their medication to ensure that they have taken it. If medicine is left next to the child in hospital or community, it may be taken by another child, knocked over or forgotten.

In younger children they may not have the ability to swallow a tablet and even in older CYP the tablet may be so large they have difficulty swallowing. In tablets that are enteric-coated it is important not to crush them so as to aid swallowing. Enteric coating is used for medicines that cause irritation to the upper gastrointestinal tract and the coating is broken down in the stomach by digestive acids, allowing the medication to be absorbed through the stomach and intestines. Crushing the tablet will increase the risk of gastric irritation. Where possible, liquid preparations should be prescribed. This is commonly seen in over the counter medicines that can be purchased in pharmacies or supermarkets, and an example of this is paracetamol, which is available in numerous formats.

Clinical Consideration

In a local store or pharmacy find out the following information:

	PARACETAMOL TABLETS	SOLUBLE TABLETS	MELTS	CALPOL INFANT SYRUP	CALPOL 6 PLUS	PARACETAMOL SUPPOSITORY
What is the recommended age range?						
What is the strength of the active ingredient?						
What is the cost of medicine?						
How many tablets or doses are in each container?						
What additional company (trade) names can you find for each of them?						

Adolescents

Teenagers develop through a complex range of emotions, physical changes and exploring identity. Through the onset of puberty hormones such as testosterone and oestrogen are produced, resulting in growth spurts and the production of secondary sexual characteristics such as body odour, body and facial hair, breast development and menstruation. During this time there is an increase in self-awareness and the need to be accepted by peers and society. There is an increase in mental health conditions developing in this age group, including eating disorders, anxiety, depression as well as lack of confidence. It has been noted that young people often rebel against strict boundaries and want to be treated and act like adults, leading to risk-taking behaviours.

Coping with ill health and being separated from friends and peers can be very isolating, especially when in hospital for long periods with a complex or long-term condition. Taking medication or carrying emergency medication, such as an epi pen in case of an allergic reaction, ventolin inhaler in case of an asthma attack or insulin and equipment to monitor and correct blood sugar levels in diabetes, can be rejected by some.

Young people should be involved in the decision-making process about their treatment and share the responsibility where appropriate. Their independence should be supported and plans developed to encourage their self-management as they move to adulthood and in the future leaving the family home. Encouraging independence supports normality in life and allows young people to stay at friends houses or go on residential

trips with their peers. Promoting the self-management of treatment and medication develops responsibility, time-management and decision-making skills. One area that can be difficult with this is supporting parents to allow their child to have some independence and responsibility for their own health. When medication is vital, not taking medication can be life-threatening. This is very difficult for parents/carers, having maintained their child's safety and health for many years.

Episode of Care

Krishna aged 15 years has cystic fibrosis and has had 3 hospital admissions in the last 6 months for chest infections requiring antibiotics and increased physiotherapy. Krishna has regular medication including digestive enzyme tablets to take with food, salbutamol inhaler as a bronchodilator, dornase alfa to thin the secretions in his lungs and antibiotics for a chest infection. Due to the amount of regular medications taken at home Krishna brings his medications in to hospital to show the admitting nurse practitioner during the assessment so that the ongoing treatment can be maintained, and a review of the medication optimisation can occur effectively.

Whilst in hospital Krishna's own medication can be used if he were able to self-medicate and a lockable cupboard is at the side of his bed. This gives Krishna some independence and control over his treatment.

Prior to discharge the level of each of Krishna's medications are assessed by a pharmacist and a top up supply given on discharge preventing medication expiring whilst being in hospital and being wasted. This system is effective when CYP are on long-term medications.

Tablets

Tablets should be considered as more accurate than liquid medicines and therefore safer, they are cheaper and easier to obtain from pharmacies and more convenient to transport and administer. Non-enteric-coated tablets maybe broken into smaller pieces if scored or crushed, they can be given on a spoon, or placed on the back of the tongue and swallowed with a drink. It is advisable to teach children to swallow tablets as soon as possible and this can be done as an inpatient or outpatient using a structured process. Tse et al. (2019) published the KidzMed project findings, which focused on teaching children how to swallow tablets with a structured programme within one outpatient appointment. This project, how it was set up, and the successful outcomes will be discussed in more detail in Chapter 3, which concerns legal and ethical issues. Parents may also need support to encourage their child to take tablets and to be taught the most effective methods to swallow a tablet or capsule.

Distraction Techniques

Play and distraction have been used in healthcare for many years to relax children and reduce fear and anxiety. The use of role play with children should not be underestimated. Children's nurses need to develop a good relationship with their patients and a good place to start is to find out their favourite games, toys, characters and television programmes or films. Using a favourite soft toy or character to take their medicine first can help young children to take their own medicine. Praise and rewards are another way of encouraging children who are reluctant to take their medicine. Forcing a child to take medication is not ethical and will possibly engender a fear of taking medicine in the future. As previously discussed, allowing a child to taste a medicine before it is prescribed alongside education will help with concordance.

Inhaled medication via a face mask can also be frightening for children due to the noise, the sensation and having their face covered. Building up wearing a mask can help children if it is not an urgent situation. Staying with the child and talking to them to keep them calm and keeping their breathing regular is also good practice.

Clinical Consideration

Where CYP have a fear of taking medicine orally, via a nebuliser or as an injection, the inclusion of a play specialist should be encouraged to develop an individual programme to explore the issue and help the child overcome their fear.

Some conditions that CYP present with may require long-term medications with unpleasant side effects such as nausea, vomiting, swelling, hair loss, weight gain or loss. This text will focus on numerous conditions and medications used within systems such as cardiovascular gastroenterology, immune, integumentary, neurology, respiratory and endocrine systems. In addition to this, medications used for mental health and cancer care will be explained in detail, as well as analgesia and adverse drug reactions.

Conclusion

The use of medicine within healthcare is a growing area, with more people having a chronic condition or acute illness requiring medication treatment. Medication management is a multidisciplinary process including pharmacists, doctors, allied health professionals and nurses and one with risk of error. Under the professional bodies within healthcare we are expected to 'do no harm' and yet there are still errors happening with regard to medicine management. It is important to follow the professional guidelines and to work within local policies and procedures as well as ensuring individual capability. Reporting errors when found and learning from the factors surrounding those errors as a reflective practitioner can improve the safety of patients and improve the support for the various systems in place. Ensuring that nurses have the knowledge and skills going forward with regard to medicine storage, management and administration following the 10 Rs is essential. There is a need for healthcare students to develop knowledge as lifelong learners and apply skills so that when they are admitted to the professional register they will be fit for purpose and fit for practice.

Glossary

Adherence: The extent to which a person follows an agreed set of actions. It assumes an equal relationship between two people, it is a voluntary process.
Autonomy: A person's ability to make choices on the basis of that person's own preferences, beliefs and values
Capacity: An ability to understand, deliberate and communicate a choice in relation to a specific healthcare decision at a particular time
Competence: The achievement and application of knowledge, intellectual capacities, practice skills, integrity and professional and ethical values needed for safe, accountable, compassionate and effective practice as a registered practitioner
Compliance: Medication compliance refers to the degree or extent of conformity to the recommendations about day-to-day treatment by the healthcare provider with regard to timing, dosage and frequency. It relates to a more paternalistic or autocratic relationship, where a person is either following instructions (compliant) or disregarding them (non-compliant)
Conduct: A person's moral practices, actions, beliefs and standards of behaviour
Evidence-based practice: The conscious consideration and the application of the best available evidence along with the healthcare provider's expertise and a person's values and preferences in making healthcare decisions
Guidance: A principle or criterion that guides or directs action
Health and well-being: A state of complete physical, social and mental well-being, not just the absence of disease or infirmity
Pharmacology: A branch of science that deals with the study of drugs and their actions on living systems
Regulations: A rule or law designed to control or govern conduct
Social prescribing: Also known as community referral, a means of enabling healthcare staff to refer people to a variety of local, non-clinical services
Standards: Authoritative statements developed, monitored and enforced by, for example, healthcare regulators to describe the responsibilities and conduct expected of registrants
Therapeutic: Relating to therapeutics, the branch of healthcare concerned specifically with the treatment of disease.

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Further Resources

- EasyHealth (www.easyhealth.org.uk): A resource with over 500 health leaflets that include pictures and very simple text. EasyHealth's information is accessible to those with low literacy levels, which may include people with learning disabilities.
- British Pharmacological Society (www.bps.ac.uk): The BPS, a charity, exists to promote and advance pharmacology in all its forms
- National Institute for Health and Care Excellence (NICE) (www.nice.org.uk): NICE provides national guidance and advice to improve health and social care. The role of NICE is to improve outcomes for people using the NHS and other public health and social care services.
- Royal College of Nursing (www.rcn.org.uk/clinical-topics/medicines-management): Medicines management. A resource providing guidance and clinical support for nurses and other healthcare professionals on medicines matters.

- Royal Pharmaceutical Society (www.rpharms.com): The RPS gives pharmacy a clear, strong voice in all healthcare discussions and decisions across Britain. They also publish the British National Formulary Child.
- Street Games (https://network.streetgames.org/our-work-changing-lives-health/youth-social-prescribing): Youth Social Prescribing. Learn more about social prescribing, the work of the Social Prescribing Youth Network and Street Games' involvement within it, by accessing the various resources.

Multiple Choice Questions

1. The Nursing and Midwifery Council's purpose is to:
   - **(a)** Provide government with the details of those nurses and nursing associates who have been found guilty of misconduct
   - **(b)** Inform nurse managers how they are to determine patient dependency
   - **(c)** Promote and uphold the highest professional standards in nursing and midwifery to protect the public and inspire confidence in the professions
   - **(d)** All of the above
2. To help patients make decisions about medicines:
   - **(a)** Provide time for them to ask questions
   - **(b)** Offer them relevant information which is easy to understand and avoid the use of jargon
   - **(c)** Provide information that is structured and tailor this to the needs of the individual patient.
   - **(d)** All of the above
3. Medicines optimisation is generally associated with:
   - **(a)** The legal regulations in place to safely administer medicines
   - **(b)** A more people-centred approach to the use of medicine as part of a person's care
   - **(c)** Another phrase for capacity
   - **(d)** Is only ever used when the patient lacks capacity
4. Pharmacokinetics is associated with:
   - **(a)** The ability to safely calculate a drug dose
   - **(b)** The biology of home remedies
   - **(c)** What the body does to a drug, the movement of drugs into, through and out of the body
   - **(d)** How enzymes are metabolised in plants
   - **(e)** Infusion pumps and equipment used to administer drugs
5. Pharmacodynamics is associated with:
   - **(a)** How toxins have effects on the body
   - **(b)** How drugs have effects on the body
   - **(c)** The prescribers prescribing skills
   - **(d)** The nurse's competence in the administration of medicines
6. Adherence refers to:
   - **(a)** Specific patient behaviours
   - **(b)** The study of power differentials
   - **(c)** The extent to which the patient's behaviour matches agreed recommendations from the prescriber
   - **(d)** The extent to which the patient's behaviour matches the prescriber's recommendation
7. The purpose of a medicine is to:
   - **(a)** Cause a build of toxins in the blood stream
   - **(b)** Prevent, alleviate or cure a symptom, disorder or disease state
   - **(c)** Cause a negative impact on a person's health and well-being
   - **(d)** None of the above
8. A patient's/family's beliefs and preferences about medication:
   - **(a)** May affect medication adherence
   - **(b)** Should be moderated during medicines management
   - **(c)** Is only appropriate in the adult patient
   - **(d)** Will not impact on medication adherence
9. Non-adherence can result in:
   - **(a)** Unnecessary health costs and unnecessary investigations
   - **(b)** Changes to routines which lead to increased safety risks

(c) Enhanced care provision
(d) A better use of resources

10. The term 'compliance':
(a) Is a term with positive connotations
(b) Can also infer 'nurse knows best'
(c) Is never used in the care of CYP
(d) Is the same as concordance

11. Summaries of Product Characteristics (SPC) are:
(a) Held at all general practices
(b) Do not apply to CYP
(c) Is a description of a medicinal product's properties and the conditions attached to its use
(d) Only apply to medicines that are imported from the USA

12. Every medicine pack includes a patient information leaflet:
(a) Providing information on using the medicine safely
(b) The patient information leaflet is based on information in the SPC of the medicine
(c) Provides information on using controlled drugs only
(d) A and B

13. Independent prescribers:
(a) Must be supervised at all times by a pharmacist
(b) Are only allowed to prescribe in the independent and voluntary sectors
(c) Are able to prescribe any medicine provided it is in their competency to do so.
(d) Must also hold a pharmacy qualification

14. Pharmacology is:
(a) The study of chemical reactions and medication
(b) The study of how communities respond to the introduction of vaccinations
(c) A branch of science that deals only with the effects of alcohol, nicotine and cannabis on living systems
(d) A branch of science that deals with the study of drugs and their actions on living systems

15. A pharmacist is:
(a) A doctor who has a special interest in drugs and medications
(b) A licensed health professional who prepares, dispenses and advises on medicinal products
(c) A scientist who researches new drugs
(d) Another name for a chemist

Find Out More

The following are a list of conditions that are associated with this chapter. Take some time and write notes about each of the conditions and how they apply to chapter content. Think about the medications that may be used in order to treat these conditions and be specific about the pharmacokinetics and pharmacodynamics. Remember to include aspects of patient care. If you are making notes about people you have offered care and support to, you must ensure that you have adhered to the rules of confidentiality.

THE CONDITION	YOUR NOTES
Sarcoma	
Attention deficit hyperactive disorder	
Diabetes	

THE CONDITION	YOUR NOTES
Pneumonia	
Drug overdose on lysergic acid	