

The Nurse's Guide *to* Medicines

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ABOUT THE AUTHORS

Sheila Cunningham commenced her career as a nurse after which she undertook a BSc in Life Sciences (Human Physiology) at Westminster University. Armed with this and a passion for all things physiology, pathology and pharmacology she taught on nursing and allied health profession programmes for many years and explored pedagogical approaches aimed at improving and enhancing nurses' knowledge and confidence with science for clinical practice. Through her doctoral work on inclusive learning she linked her teaching and subject knowledge especially around nurse and health professions education. She was programme lead for Nursing Exchange and the BSc in European Nursing until 2020, hence her interest in nursing international experiences. She holds a National Teaching Fellowship and is a member of the Biosciences in Nursing Network (BiNE). She is currently Deputy Dean for Research and Knowledge Exchange in the Faculty of Health Social Care and Education at Middlesex University.

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MEDICINES OPTIMISATION AND MANAGEMENT

SHEILA CUNNINGHAM

AFTER READING THIS CHAPTER YOU WILL BE ABLE TO:

- Differentiate between medicines management and medicines optimisation.
 - Discuss the importance of understanding the patient experience to improve adherence to medicines regimes.
 - Describe and argue the rationale for 'evidence-based choice of medicines'.
 - Explain the nurse's role in medicines safety for patients.
-

WHAT IS MEDICINES OPTIMISATION OR MANAGEMENT?

Nurses will come across medicines in all areas of patient care since they are a most common intervention in healthcare for the prevention, treatment and/or management of many illnesses (JFC, 2022; National Institute for Health and Care Excellence (NICE), 2015). As the population ages and illnesses become more complex (multi-morbidities) there will be an increasing need for more medicines with potentially confusing or complicated medication regimes. Alongside this, the availability and use of prescribed medicines can be confounded further if mixed with other sources of medicines, i.e. over-the-counter (OTC) medicines or nutritional supplements. Consequently, patient treatment may be affected and potentially lead to an increased risk to patients in the longer term. NICE (2024) report that approximately 33% to 50% of medicines prescribed for long-term conditions are not taken as intended, or if started well are not taken consistently or continued. It appears 5 to 8% of hospital admissions are a consequence of ineffective or inappropriate use of medicines and up to 6.5% result from adverse effects of medicines (Kaufman 2015). One Cochrane evidence review reported that many people who are prescribed medication to self-administer only take half of their prescribed dose, and many cease their medication entirely or do not take it in the way it is prescribed without informing their prescriber (Nieuwlaat et al., 2014). This issue of non-adherence to medicines may for a number of reasons either be intentional or unintentional or a combination of both. This will certainly interfere with the intended aims of treatment and create or contribute to longer-term problems.

Nurses (students, qualified and nursing associates) are highly visible in all aspects of patient care and so are ideally situated to guide, clarify and support patients with their medicines. The NMC (2018) nurse education proficiencies outline the knowledge required of pharmacology and an understanding of medicines management (Platform 4 and Annexe 5) applied to practice. As such medicines and treatments are integral to person-centred care and form part of care planning and reviewing. Nurses, therefore, need to possess accurate knowledge not just of the medication and indications. This does not mean memorising them (this would be impossible) but possess the skills to research and evaluate them in reputable texts and sources (such as the British National Formulary). Additionally, nurses need to be conscious of patient behaviours and attitudes around taking medications to ensure optimal effects. As in all care planning this requires assessing the problem, planning, implementing, evaluating and reviewing care (and medicines) in an iterative cycle by the care team. This may necessitate regular review and identifying issues patients' hold regarding 'adhering' to prescribed medications or challenges they may encounter.

WATCH OUT!

Medicines optimisation priorities (based on NICE, 2015):

- Patient safety reporting using established processes for adverse drug incidents
- Medicine review
- Medicines reconciliation
- Patient as a partner in decision making around medicines
- Clear and open communication and consistency of medicines for patients moving settings (hospital or home)

Medicines optimisation is the currently accepted term (NICE, 2015) for helping patients get the best outcome from their medicines. It is a shift to a humanised patient-centred approach for medicines focusing on how patients use medicines over time. This may mean stopping some medicines or starting or changing others whilst also considering opportunities for other interventions (non-medicine), for example lifestyle changes to reduce the need for medicines (RPS, 2013). One example to illustrate this may be a person with hypertension who, in ongoing review, does not require a prescription of anti-hypertensive medicines since, through lifestyle changes, they lost weight and have a regular exercise regimen which manages their hypertension.

This holistic approach to medicines involves the wider healthcare team (including pharmacists, prescribers and nurses). This reflects an integrated care and partnership approach around medicines as patient care practice. Medicines optimisation is a major concern. The NHS spent a total of £17.1 billion in 2020/21, an increase of 4.56% from the £16.4 billion in 2019/20 – this is the second-highest area of spending in the NHS, after staffing costs (NHSBA, 2022). Medicines also have the potential to cause harm. Between 5 and 10% of all hospital admissions are medicines-related, two-thirds of medicines-related hospital admissions are preventable and 30–50% of medicines prescribed for long-term conditions are not taken as intended (NHS, 2015).

Medicines reconciliation is another related concept. It is defined as the process of identifying an accurate list of medicines a person is taking including all prescribed and acquired from various sources such as over the counter medicines and comparing them with the current list in use by the prescriber/physician, recognising any discrepancies, and documenting any changes, thereby resulting in a complete list of medicines, accurately communicated (NICE, 2016). It is worth noting the term 'medicines' extends beyond those prescribed by a physician or prescriber. It also includes OTC, supplementary and complementary medicines or herbs. There is a section in the British National Formulary which outlines the main complementary and herbal preparations in use and any effects on other conventional medicines. However this group comprises a broad range so the principles mentioned above support assessments and decisions to optimise medicines taking.

Two key documents which are most useful around these issues are the NICE quality standard on medicines optimisation (QS120; 2016) and the NICE clinical guidelines on medicines adherence (2009, reviewed 2019). Whilst several terms have been introduced so far, there are others within the literature with connected but different meanings, and will be beneficial to your understanding to read these over; they are presented in the box below.

DEFINITIONS CONNECTED TO MEDICINES OPTIMISATION

Medicines management: 'system of processes and behaviours that determine how medicines are used by the NHS and patients' (NICE, 2015).

Medicine adherence: 'The process by which patients take their medications as prescribed, composed of initiation, implementation and discontinuation. Initiation occurs when the patient takes the first dose of a prescribed medication' (Vrijens et al., 2012).

Medicines optimisation: 'a person centred approach to safe and effective medicines use, to ensure people obtain the best possible outcomes from their medicine' (NICE, 2015).

Medicines concordance: 'is an older more complicated term which describes an approach to the prescribing and taking of medicines as an 'agreement' between a patient and a healthcare professional that respects the beliefs and wishes of the patient in determining whether, when and how medicines are to be taken. Whilst often a synonym for optimisation it should be emphasised that does not mean the same thing' (NCCSDO, 2005).

Medicine compliance: 'a relationship in which the role of the clinician is to decide on the appropriate treatment and issue the relevant instructions, whereas the role of the patient is to passively follow 'the doctor's orders' (NCCSDO, 2005).

Medicines optimisation addresses the following:

- Review of medicines (use and effect)
- Effect of polypharmacy (multiple medicines)
- Communication, guidance and support in relation to medicines
- The use of processes such as: deprescribing; medicines reconciliation, reviews and repeat prescribing; problematic polypharmacy
- Reducing medication waste and errors
- Self-management plans (RCN and RPS, 2020; BNF, 2022).

Central to this is patient experience which includes the practicalities of accessing and taking medicines as well as their attitudes and beliefs towards medicines. Medicines are chemicals and are prescribed to effect a physiological change, either to replace or control some function or symptom. However, the patient is not a passive recipient – they have their own behaviours and views and this has the potential to impact the therapeutic aim and pharmacological actions. This might include altered patterns of administration, ingestion or timing resulting in ineffective or excessive blood levels or distribution (pharmacokinetics) or ineffective action or excess action at tissues (pharmacodynamic). Readers are reminded to consult a good-quality pharmacology text to refresh their memories on these terms if they need to. The consequences could be serious or less so. These include unacceptable adverse effects or creating other physiological problems with the serious potential of being misunderstood as another condition. Further consequences could also be ineffectiveness, or worse, compromised patient safety.

NURSE'S ROLE IN MEDICINES OPTIMISATION

The World Health Organisation (2017) asserts that people are not always 'medication-wise'. In all encounters with patients, nurses and other healthcare professionals have an opportunity to evaluate a patient's situation, and understand and evaluate their relationship with medicines. Patients with chronic conditions have been reported to experience considerable issues with medications (multiple medications, drug interactions, adherence issues etc.) and having a clear overview and acting as an advocate and guide are recommended (RCN and RPS, 2020). Vulnerable groups such as the elderly, those who are confused or unable to make decisions or in the most socio-economically deprived groups are definitely in need of advocacy. These patients are more likely to have long-term conditions with increased severity (Kings Fund, n.d.). Ultimately communication and patient care episodes provide ample opportunities for addressing issues with medicines such as administration, palatability, route, timing, food and duration.

A fundamental knowledge and awareness by nurses and healthcare professionals is required of medicine side effects, recommended doses and dosing regimens for optimum effects. Simultaneously it is necessary to be mindful of drug interactions or side effects which may require other medicines to manage them. For example, a patient taking medicines for pain such as arthritis may take a mix of specific and non specific pain relief (e.g. ibuprofen) or steroids, and the common effect of these is gastric irritation which requires further medicine for relief. Or if patients are taking stronger pain relief medicines such as codeine phosphate these may lead to serious side effects which need other medication such as for nausea, constipation or drowsiness. This could potentially lead to a serious patient safety concern (falls, trips) as well as a need to manage the adverse effects.

MEDICINES ADHERENCE: INTENTIONAL OR NON-INTENTIONAL NON-ADHERENCE

Medication adherence refers to the extent to which medication taking corresponds with agreed recommendations from a healthcare professional and prescriber. Medication non-adherence

can be classified as intentional or unintentional according to the patient's perspective or behaviours, and is a worldwide concern (WHO, 2017).

- Intentional non-adherence is where patients make a deliberate decision not to follow the prescribed medication regimen, such as altering the dose, timing or frequency of their medicine therapy. Furthermore, patients' beliefs about their pathology or condition and medication may also influence non-adherence.
- Unintentional non-adherence includes behaviours such as forgetting to use the medication. This may be especially prevalent when the patient has been using their medication for an extended period.

Non-adherence may be mistaken for treatment failure if not investigated specifically. A relatively recent study (de Jager et al., 2018) found that non-adherence rather than poor response to treatment was the cause of poor control of hypertension in 35% of people. Therefore, healthcare professionals should consider non-adherence to be a significant factor in treatment failure and should attempt to discuss this with the person before any further medicines are prescribed. Failure to address this may lead to more medicines being prescribed, potentially increasing the risks associated with polypharmacy, which in turn may cause harm to the person without the underlying illness being effectively treated.

MEDICINES OPTIMISATION AND MEDICATION SAFETY IN POLYPHARMACY

The challenges faced around polypharmacy are inextricably linked to the fact that as the number of medicines prescribed increases, the risk from adverse effects increases too. Medication safety is a particular concern in key groups, such as older people, and medicines optimisation also includes safety issues such as adverse drug reactions (ADRs) – unwanted effects or harmful reactions experienced by the patient whilst taking the medication prescribed. ADRs account for around 6.5% (Osanlou et al., 2022) to 8% (Insani et al., 2021) of hospital admissions, with approximately 70% of these ADRs deemed avoidable. There is an established mechanism for reporting ADRs and each report is collated, investigated and analysed; this is known as the 'Yellow Card Scheme' managed by the Medicines and Healthcare Products Regulatory Agency (MHRA). This scheme is voluntary, though all healthcare professionals and patients are encouraged to use it if there are ADRs. It can be found in the British National Formulary (BNF) hard copy or online. These reports are welcomed for the ongoing monitoring of drug reactions, however they do not always indicate the cause or that one adverse reaction may be due to another medicine being taken at the same time, or a complication of polypharmacy. Whilst the Yellow Card Scheme is important for prescribed drugs it is also useful for non-prescribed medicines such as OTC or those purchased over the internet – a phenomenon which surged during the Covid-19 pandemic. The Government urges caution with obtaining medicines on the internet because of risks due to lack of supervision of a healthcare professional and the potential risk from the medicine which could be out of date, counterfeit or diluted (See #FakeMeds campaign 2022 run by the MHRA).

GO FURTHER

ADRs: Reporting (<https://yellowcard.mhra.gov.uk/>)

What is considered suitable to report? The MHRA indicate:

- All reactions to medicines which require 'additional monitoring' (i.e. drugs marked with inverted black triangle ▼) since they are newer with less established adverse effects.
- Any suspected serious reaction to all other medicines:
 - Prescription medicines
 - OTC medications
 - Herbal medicines
 - Vaccines
 - Blood products
 - Dental and surgical materials
 - Fake medicines or medical devices
 - Side effects or safety concerns about e-cigarettes

Over 50% of medication errors occur in four drug classes: antiplatelets, non-steroidal anti-inflammatory drugs (NSAIDs), diuretics and anticoagulants. Use of medicines which are not prescribed (i.e. over-the-counter medicines from pharmacies, herbal preparations, supplements or even someone's else's prescription drugs such as pain relief) also link to increased unwanted adverse effects or treatment concerns. Medicines most likely to be related to a hospital admission include the following:

- Antiplatelets (Chapter 6)
- NSAIDs (Chapter 7)
- Diuretics (Chapter 4)
- Anticoagulants (Chapter 6)
- Angiotensin converting enzyme (ACE) inhibitors (Chapter 6)

The above are addressed within other chapters and will not be included here. Other products or food substances to consider for unwanted and adverse effects include the examples below; whilst not 'drugs' they are included in the BNF under 'drugs' but acknowledged as food substances with significant effects. These will form the medicine 'monographs' of information here:

- St John's Wort
- Grapefruit juice
- Cranberry juice

NICE (2015) urge the need for evidence-based use of medicines and prescribing or reviewing of medicines for patient safety. This then is a foundation for working through the next chapters in this book addressing specific medicine groups and related interactions or dose considerations.

Drug (herb) name: St John's Wort

UK brand names: St John's Wort is a herbal medicine with a wide range of properties affecting serotonin levels. It is not approved for use as a medicine but is widely available in health food and other shops as a herbal supplement. It is included only for its potential to interact with drugs.

Average doses:

- Two 300 mg tablets once daily (depending on brand and formulation)

What form does it come in: Tablet, capsule, tincture, teabags

Does it interact with other medicines: Yes, over 244 interactions reported in BNF (2022). The following serious interactions are known:

- Results in decreased effectiveness of:
 - Cancer treatments: Abemaciclib, Acalabrutinib, Avapritinib, Irinotecan, Cabazitaxel
 - Cardiac/rhythmic drugs: Dronedarone
 - Anticoagulants: acenocoumarol, apixaban
 - Aminophylline
 - Antivirals: Atazanavir, Darunavir, Imatinib, Dasatinib
 - Graft rejection blockers: cyclosporin and tacrolimus
 - Anti-tuberculosis: Bedaquiline
 - Chronic kidney disease: Finerenone
 - Benzodiazepines: Midazolam
 - Opioids: Methadone, Oxycodone
 - HIV treatment: Nevirapine
 - Contraceptive hormones: Norethisterone, Levonorgestrel
 - Anti-seizure: phenobarbital, phenytoin.
- Alter serotonin levels and risk of serotonin syndrome:
 - Antidepressant medication: escitalopram, amitriptyline, Phenelzine
 - Antiemetics: Ondansetron, Granisetron
 - Analgesia: Pentazocine.
- Increased risk of severe hypotension: anaesthetic agents, e.g. Digoxin, Desflurane.
- Increased efficacy of metabolic medication inhibitor of glucosylceramide synthase: Eliglustat.

Caution: St John's Wort is unlicensed and self-administered so taking this may not be recorded and needs to be part of patient assessment.

(Continued)

Drug (food substance) name: Grapefruit juice

UK brand names: Grapefruit juice is a food substance included only for its potential to interact with drug metabolism.

Average doses:

- There is no average amount – this is self-consumed

What form does it come in: Liquid and solid (fruit) form

Does it interact with other medicines: Yes, several. Some of the following interactions are known:

- Increase drug availability and effect of:
 - Simvastatin (Statins)
 - Calcium channel blockers:
 - Amlodipine
 - Felodipine
 - Lacidipine
 - Lercanidipine
 - Nicardipine
 - Nifedipine
 - Nimodipine
 - Verapamil
 - Warfarin (Anticoagulant)
 - Anti-platelet (increases circulating drug):
 - Clopidogrel
 - Ticagrelor
 - Glucocorticoid: Budesonide
 - Graft rejection blockers: Cyclosporin and tacrolimus.

Drug (food substance) name: Cranberry juice

UK brand names: Cranberry juice is a food substance included only for its potential to interact with drug metabolism.

Average doses:

- There is no average amount – this is self-consumed

What form does it come in: Liquid and solid (fruit) form.

Does it interact with other medicines: Yes, the following interactions are known:

- Warfarin (anticoagulant) increases the actions.

MEDICINES OPTIMISATION IN PREGNANCY AND BREASTFEEDING

Some medicines are known to be harmful in pregnancy. They may affect the development of the baby or mean the baby is more likely to be born with a disability. Medicines may especially affect the baby during early development, i.e. within the first trimester (13 weeks). Thus, if medicines (prescribed or not prescribed) cannot be considered safe, avoidance is recommended. However, in pregnancy it may be necessary to continue treatments for long-term conditions and this is monitored with guidance provided. Questions may arise around different health conditions or treatments, for example in a teenage pregnancy the person may be taking medications for acne (e.g. Isotretinon (branded as Roaccutane), or Co-cyprindiol). Medicines optimisation here revolves around taking as little as possible and seeking alternatives when needed for issues such as the occasional headache or nausea. This can be challenging if multiple medications were taken beforehand but it is managed by the doctor and midwife according to need and guidance.

SUMMARY

Medicines are a valuable part of patient care and treatment. Medicines are chemicals and have the potential to be harmful as well as therapeutic. To be useful and therapeutic they need to be taken by patients in the right route, right time, right frequency and in the right way. This is complicated by multiple medicines, patients' beliefs or decisions to not take medicines or take more if their condition improves or deteriorates. Best practice is to ensure evidence-based prescribing and treatment with a focus on the best outcomes for patients or medicines optimisation. Nurses are key to ensuring this and this chapter has summarised the key issues and knowledge for developing their practice around this challenging area.

LEARNING FROM A CASE STUDY: TEST YOUR KNOWLEDGE

Arianna is a 59-year-old woman who has a history of back pain, asthma since childhood and depression for the last two years since losing her job and after a marriage break-up.

Her current medication is:

- lansoprazole (30 mg once daily)
- gabapentin (600 mg three times daily)
- tramadol (50 mg - 100 mg every 4-6 hours)
- salbutamol metered dose inhaler (2 puffs as required)
- beclomethasone (100 micrograms 2 puffs twice daily)
- mirtazapine (30 mg every night)
- zopiclone (7.5 mg every night)

She is due for review of her pain management. She has been suffering from pain and complaining of drowsiness yet insomnia and weight gain. She has also had low mood for the last two years

and has tried multiple antidepressants. She cannot stop smoking and currently smokes 20 cigarettes a day. This presents a challenge to engage Arianna in self-care. She is ordering salbutamol for her asthma frequently on a monthly basis as it is not under control. Her pain does not seem to improve with her current pain medication and she says this makes her depression worse.

Most recent consultations have been for pain and management. Prior to that consultations were regarding low mood after the break-up of her marriage and poor sleep. Arianna is also complaining about increased breathlessness, and orders a salbutamol inhaler each month.

- 1 What are the issues for medicines optimisation?
- 2 Are there any safety risks here?
- 3 What makes you think Arianna is unclear about her symptoms management (e.g. breathing)?
- 4 What considerations are there for Arianna in relation to medicines optimisation?

IF I REMEMBER 5 THINGS FROM THIS CHAPTER:

- 1 Medicines are a component in the control or management of conditions or symptoms and frequently encountered by nurses.
- 2 Patient understanding, attitude or behaviours can impact optimal outcomes from medicines and cause problems or ineffective management or treatment.
- 3 Medicines optimisation is a key term to address the optimum use of medicines in partnership with patients which may include stopping, starting or changing medicines or non-medication interventions such as lifestyle changes to improve patient outcomes.
- 4 Adverse effects can occur and will impact on medicine optimisation, and need to be reported.
- 5 Polypharmacy can make medicines use and adherence difficult as it can be confusing or cause other adverse effects, and is key to consider in patient interactions.

ANSWERS TO CASE STUDY QUESTIONS

- 1 Effects of the medicines, multiple medicines, adhering to the medicine regime (timing, dosing) and self-administration.
- 2 Drowsiness from the medicine effects, potential for falls, plus the potential problem with moving and self-care with uncontrolled asthma.
- 3 The number of inhalers used and the consequence of ineffective asthma control. Effective use of the inhaler and of the maximal dose needed. The counterproductive smoking of cigarettes whilst trying to control her asthma.
- 4 Review the role of the medicines and seek to work with Arianna. Polypharmacy may be an issue so support her understanding of her medicines and how to take them, her triggers and cycle of pain and low mood each making the other worse, adverse effects which worsen the symptoms, e.g. weight gain and insomnia. Address the issue of medicines adherence and outcomes in the short and long term. Potential considerations:

- Asthma – inhaler is ineffective – what about inhaler technique and timing.
- Drowsiness – due to breathing difficulties and inadequate rest. Compounded drowsiness from interaction of Zopiclone, Mirtazapine, Gabapentin and Tramadol.
- Pain – long-term lower back pain and use of Gabapentin needs review and whether appropriate since there are no neurological causes, and long-term side effects may include mood alterations.
- Low mood (depression) – not improved by medication so review and address alternatives or non-medication interventions.
- Weight gain – this is an adverse effect of Mirtazapine so if this is reviewed it may improve.

GO FURTHER

Age UK calls for a more considered approach to prescribing medicines for our older population: www.ageuk.org.uk/latest-press/articles/2019/august/age-uk-calls-for-a-more-considered-approach-to-prescribing-medicines-for-older-people/

Nearly 2 million older people on seven or more prescription medicines at risk of side effects that are severe in some cases, and occasionally even life threatening.

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