Oral anti-cancer drugs in community pharmacy

Community pharmacists are uniquely placed to provide patients with education regarding oral anti-cancer drugs to encourage their safe and effective use, minimise medication errors and avoid preventable adverse effects.

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General principles

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General principles of oral anti-cancer drugs

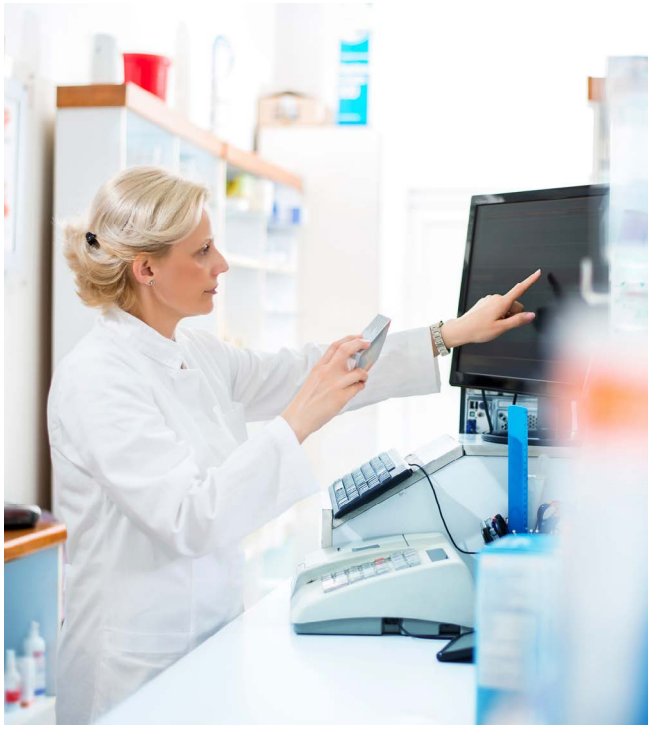
There are a variety of treatment modalities for cancer including surgery, radiation therapy, anti-cancer drugs and cellular and biological therapy.

Anti-cancer drugs may be used as a single agent or in combination with other drug therapy to target cancer cells in the body.

Anti-cancer drugs are prescribed using the following:

1. Treatment plan: provides a roadmap that will outline the course of care for the patient.
2. Treatment protocol: provides the details for the administration, dose calculations, supportive therapy and monitoring parameters of the cancer treatments used to treat a specific disease.

The administration of oral anti-cancer drugs at home is convenient for both patients and carers, however their use is also associated with the same risk of medication errors as parenteral anti-cancer drugs.



Advantages and disadvantages of oral anti-cancer drugs

Advantages	Disadvantages
Ease of administration	Reduced supervision
Improved quality of life	Requires patient concordance
Cost-saving benefits	Unpredictable pharmacology
	Increased complexity of dosing

Oral anti-cancer drugs can lead to:

- toxicity with even a small increase in dose or
- failure of therapy if they are under-dosed.

Incorrect prescribing, dispensing errors and patient misinterpretation have led to serious toxicities and fatal outcomes.

Anti-cancer drug classification

Anti-cancer drugs have different classifications, each with a different mode of action and associated risks.

The main classifications are:

- cytotoxic drugs
- targeted therapies
- hormonal drugs
- immunotherapy.

By understanding the mode of action, community pharmacists can appreciate the role of a particular drug in cancer therapy, specific safety and handling requirements, anticipate adverse effects and potential drug interactions.

Want to learn more? Check out the *General principles* module.

Prescriptions and protocols

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Oral anti-cancer drugs have a high risk of adverse effects if used for the wrong indication, at the wrong dose, for the wrong duration; or may be less effective if doses are missed.

Errors can arise from:

- prescribing
- dispensing
- administration.

A multidisciplinary approach to disease management that entails communication of current accurate and comprehensive information reduces the incidence of adverse patient outcomes.

Clinical verification of oral anti-cancer drug prescriptions provides assurance that the prescribed treatment is correct and tailored to the patient and their specific cancer type. It provides a confirmation of the treatment accuracy and is an essential step in reducing medication errors.

The five 'P's should be followed as a part of a step-wise approach to verification of oral anti-cancer drug prescriptions. The 5 'P's include:

Step	Checkpoints
1. Patient details and dosing variables	• patient full name, gender, D.O.B, history of adverse drug reactions/allergies • patient dosing variables (height, weight, body surface area) • medication history including complementary medicines
2. Prescription/ medication order	• prescriber details (prescriber's name, signature/e-signature) • prescription on the appropriate form, legible and unambiguous • date of prescribing and the intended date of treatment • drug information complete (medication name, strength, route, quantity, number of repeats) • drugs prescribed are available and supported by an approved funding/access pathway
3. Protocol and scheduling	• name of protocol and treatment arm (where relevant) • protocol appropriate based on patient factors and diagnosis • cycle length and interval • intended dose and days of administration documented for each drug
4. Prescribed medication, dose calculations and administration	• all drugs appropriate, including doses and dosing units, no unintended omissions • all supportive pre-medicines, concurrent and post medicines are appropriate for the protocol and length of the course • administration route for each medication is specified and correct according to the protocol (diluent, volume, infusion times) • regimen prescribed correctly in terms of consecutive and/or non-consecutive days stated in the protocol (e.g. Day 1, 2 and 3 or Days 1, 8 and 15) • all known adverse reactions are confirmed and documented • potential drug interactions are identified and discussed with the prescriber, including appropriate action.
5. Patient organ function and laboratory blood tests.	• relevant laboratory tests and organ function parameters available and current • ANC and platelet count is within acceptable limits • renal and hepatic function is appropriate for prescribed drugs • all other organ function parameters and blood results (electrolytes, cardiac, respiratory tests etc.) are within normal limits.

The clinical verification process should be documented on the prescription/protocol. The pharmacist responsible for the verification must sign and date each anti-cancer drug to confirm that verification has been completed.

Want to learn more? Check out the *Prescriptions and protocols* module.

Dispensing oral anti-cancer drugs

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Prior to dispensing, it is imperative that the prescription verification process has been completed and signed off by a pharmacist.

Safe dispensing and supply of anti-cancer drugs involves:

- appropriate labelling of drugs with dosing and handling instructions
- ensuring the patient understands how and when to take the prescribed doses including any additional precautions
- ensuring the patient knows when to return for supplies of their next treatment cycle.

Dispensing and supply recommendations include:

1. Label oral anti-cancer drugs to include clear and unambiguous dosing instructions.
2. Label oral anti-cancer drugs with the intended period of treatment (including start and stop dates for intermittent therapy and day of week for once weekly treatment).
3. Ensure the total dose required is included on the label (if dose requires more than one strength).
4. Communicate unique storage requirements to patients.
5. Ensure the addition of cautionary advisory labels to the container(s).

Medication Errors

Medication errors involving oral anti-cancer drugs continue to be reported. These errors can result in death or prolonged hospitalisation.

There are a number of types of medication errors that are more commonly associated with oral anti-cancer drug prescriptions. This may be due to their complexity and varied dosing schedules.

Factors that may contribute to medication errors include:

- incorrect dosing schedule
- poor handwriting
- dispensing error
- dose administration and packing errors
- poor prescribing.

Many of these errors can be avoided by increasing awareness of the risks associated with anti-cancer drugs, following a step-wise verification process and implementing safety checks in the dispensing process.

Want to learn more? Check out the *Dispensing oral anti-cancer drugs* module.

Safe handling of oral anti-cancer drugs and related waste

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What is a hazardous substance?

Drugs are considered hazardous if they exhibit one or more of the following six characteristics in humans or animals:

1. carcinogenicity
2. genotoxicity
3. developmental toxicity (including teratogenicity)
4. reproductive toxicity or fertility impairment
5. serious organ toxicity or adverse health effects at low doses in experimental animal models or treated patients
6. structure and toxicity profiles of new drugs that mimic existing drugs determined hazardous by the five previous criteria.

Hazardous drugs may include cytotoxic, hormonal, immune-system-modifying, some anti-viral and targeted therapies.

For a hazardous drug to be classified as 'cytotoxic' it must be:

1. carcinogenic
2. mutagenic and
3. teratogenic.

Related waste includes:

- items used in procedures (e.g. dressing materials, administration equipment)
- body substances of a person receiving anti-cancer drugs (e.g. urine, vomit, stools, sweat, blood or semen).

To prevent and minimise occupational exposure to hazardous substances during the dispensing and supply of oral anti-cancer drugs, the following precautions should be considered:

- **personal protective equipment (PPE)** to minimise the risk of exposure when directly handling hazardous substances
- **health and safety** precautions including the use of designated counting trays and spatulas.
- avoidance of **repackaging oral hazardous drugs** unless the benefit outweighs the risk
- **managing spills** using appropriate safety equipment and procedures.

Safety precautions for patients and carers at home

Advice for patients taking oral anti-cancer drugs:

- Keep anti-cancer drugs out of reach of children and pets.
- Drugs that require refrigeration should be separated and stored away from food.
- Carers should wear two pairs of disposable gloves when administering anti-cancer drugs to others and cleaning up any spills of vomit, urine or faeces.
- Swallow oral anti-cancer drugs whole. Never cut, crush, chew or bite tablets and do not open capsules or dissolve tablets unless directed by your doctor, pharmacist or cancer nurse.
- Wash your hands after handling oral anti-cancer drugs.
- Anyone who is pregnant or breastfeeding should avoid touching anti-cancer drugs or related waste or if necessary, use protective precautions.
- Always flush the toilet on full flush with the lid down.
- Men should sit on the toilet to urinate to avoid splashing.
- Wash soiled linen immediately. Wash separately, hot or cold wash at the maximum cycle, then line dry.
- Seal any waste such as incontinence pads in two plastic bags (double bagged) before placing in the household rubbish.
- A patient receiving cytotoxic drugs or a hazardous substance and/or or their partner should wear condoms when having sex. Female patients of childbearing age should avoid becoming pregnant during and for a period of time after active treatment.

Disposal of oral anti-cancer drugs

Anti-cancer drug waste must be incinerated in a designated facility for the destruction of hazardous waste.

The RUM (Return Unwanted Medicines) Project, is a national scheme enabling collection and disposal of consumers' unwanted and out-of-date medicines by community pharmacies. The returned medicines are disposed of by high temperature incineration which is appropriate for the destruction of oral anti-cancer drugs.

Want to learn more? Check out the *Safe handling of oral anti-cancer drugs and related waste* module.

Adverse effects and supportive care

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Although oral anti-cancer drugs are effective treatments for many types of cancer, like other cancer treatments, they have the potential to cause adverse effects, also referred to as treatment-related toxicities.

In severe cases, adverse effects can lead to:

- treatment interruption or delay
- reduced adherence to treatment
- reduced quality of life
- severe and life-threatening complications (e.g. infection).

Supportive care in cancer is the prevention and management of the symptoms and adverse effects of cancer and its treatment across the cancer continuum from diagnosis to the end of life. It includes support for patients, their families and their caregivers.

Community pharmacists are ideally placed to support patients in the prevention, identification and management of treatment-related adverse effects.

Common adverse effects

The following are some of the more common categories of adverse effects associated with anti-cancer drugs:

- haematological toxicities: neutropenia, thrombocytopenia, anaemia
- gastrointestinal toxicities: anti-cancer drug induced nausea and vomiting (AINV), diarrhoea, constipation, oral mucositis
- dermatological toxicities: acneiform rash, hand-foot syndrome
- hepatotoxicity
- nephrotoxicity
- neurological toxicity
- fatigue.

Oncological emergencies

Recognise when to immediately refer patients to the nearest hospital emergency department:

- temperature 38°C or above
- shivers, sweats, chills or shakes
- uncontrolled vomiting or diarrhoea
- flu-like symptoms
- shortness of breath
- chest pain or discomfort
- pain or tingling in arms.

Recognise when to advise the patient to contact their doctor or nurse within 24 hours of symptom onset:

- unable to eat or drink for 24 hours
  - dizziness, thirst, dry mouth
  - not passing urine for 12 hours
- nausea
  - that stops the patient eating
  - not relieved by medications
- vomiting
  - not relieved by medications
  - more than 5 times in 24 hours
- bleeding
  - black or tarry stools
  - blood in the patient's urine or stools
- swelling of hands or feet
  - tingling, burning, redness or swelling
  - skin peeling
- diarrhoea (except irinotecan or immunotherapy which requires immediate management)
  - 4 to 6 times in 24 hours
  - not relieved by medications.

Want to learn more? Check out the *Adverse effects and supportive care* module.

Patient education

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The provision of treatment information to patients and/or carers is an essential part of effective medication management, especially in the context of cancer therapy.

Community pharmacists are ideally placed to improve treatment outcomes for cancer patients by providing education and counselling on anti-cancer drug prescriptions and protocols. It also provides a final check to confirm that the correct drugs are being supplied to the patient and for the intended purpose.

As a part of comprehensive patient education and counselling on oral anti-cancer drugs, pharmacists should:

- assess the patient's current level of knowledge of their cancer type and treatment regime
- identify and address patient factors that may negatively impact adherence to their prescribed treatment
- incorporate best-practice guidelines, clinical and educational resources to ensure accurate information is provided
- communicate using a range of methods to meet the individual needs of the patient
- identify and respond to communication barriers
- confirm patient engagement and understanding prior to completing the education session.

Having a structured framework of counselling points for oral anti-cancer drugs is a simple way to ensure that you provide comprehensive education and information to the patient.

Key counselling points include:

- the medication name and indication
- how and when to take medications
- what to do in the event of missing one or more doses
- expected adverse effects
- possible drug interactions
- when to take supportive medications
- the principles of safe handling, storage and disposal
- expected tests, monitoring and follow-up
- the need for and how to obtain further supplies
- details of appropriate and readily accessible 24-hour contact to whom patients can direct queries.

Educate patients on the harm that teratogenic anti-cancer drugs can cause to a developing foetus and the need for a reliable form of contraception during, and for a period of time after anti-cancer drug treatment.

It's good practice to provide written information that reiterates what has been discussed during the patient education session. If there is an eviQ treatment protocol available, you should provide the patient with the corresponding patient information leaflet.

Following your education session, you may wish to record clinically significant information to document the activity, outcomes or follow-up actions for future patient visits.

Want to learn more? Check out the *Patient education* module.

Resources

Oral anti-cancer drugs in community pharmacy

- eviQ
- eviQ Education
- eviQ patient information sheets
- eviQ treatment protocols
- eviQ supporting document - Safe handling and waste management of hazardous drugs
- eviQ community pharmacist fact sheet: The role community pharmacists play in supporting their customers
- eviQ fact sheet: Information to assist community pharmacists in managing common adverse effects of anti-cancer drugs
- eviQ patient information sheet: Oral anti-cancer medicines
- eviQ Pharmacy professional standards competency
- eviQ Education cancer information videos for patients
- Safe use of oral cytotoxic medicines
- Society hospital pharmacists Australia (SHPA) Don't rush to crush
- National Competency Standards Framework for Pharmacists in Australia
- NPS Medicine Wise Medicines List
- Australian Adverse Drug Reaction Reporting System