Cancer chemotherapy in the community

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It is essential that all pharmacists have a working knowledge of cancer and its management in order to safely dispense chemotherapies and targeted therapies, writes Sue Kirsa, Director of Pharmacy at the Peter MacCallum Cancer Centre.

Cancer is one of the most prevalent diseases in Australia and, depending on how it is measured, is a leading cause of death. It is estimated that in Australia, one in three men and one in four women will be directly affected by cancer in the first 75 years of life. This increases to one in two men and one in three women by the age of 85. Around 111,000 new cancer diagnoses (excluding non-melanoma skin cancer) are made each year in Australia.

Major advances in the detection and early and effective treatment of cancer have changed this group of diseases from an acute, often rapidly terminal disease to a chronic condition in which patients may be treated for many years and over several prolonged courses of therapy. More than 60% of cancer patients will survive more than five years after diagnosis.

The other relatively recent major change in cancer treatment has been the introduction of many oral cancer chemotherapy agents and targeted therapies, leading to a move away from hospital admissions for parenteral administration of chemotherapy to community- or ambulatory-based treatment regimens. Many patients remain relatively or completely well over many of their treatment courses, allowing them to remain in the community and often at work.

However, cancer chemotherapy remains complex, involving cyclical multi-drug regimens requiring periods on treatment and periods of rest to allow recovery of normal systems such as bone marrow, skin and mucous membranes.

Doses of oral chemotherapy may involve multiple strengths of tablets to achieve the desired dosage, or the combination of different agents in a particular cancer type. Frequent monitoring of haematological and biochemical blood tests are required to ensure adequate recovery of normal systems before the next planned cycle of treatment can begin, or whether ongoing treatment should continue.

Many patients living with cancer also have other chronic medical conditions requiring treatment with medicines, many of which interact with the cancer therapies. To further complicate things, many patients living with cancer also take complementary therapies in the belief that these will either enhance their survival or help to manage symptoms associated with their disease or treatment. Interactions with these therapies is less well understood.

Learning objectives:
1. To have an understanding of the range of chemotherapeutic medicines used in community-based care.
2. To be able to use the checklist provided to assess the appropriateness of prescriptions for chemotherapeutic medicines.

Pharmacist competency units addressed include:
3.1 Participate in therapeutic decision making
3.2 Provide ongoing pharmaceutical management
3.3 Promote rational drug use
4.2 Evaluate prescribed medicines
Many examples have been reported in the literature of errors involving chemotherapy agents that could have been avoided if adequate checks had been done or if efforts had been made to ensure that patients understood their treatment regimen before the drugs were supplied by the dispensing pharmacist.

These errors have commonly involved patients taking their drug continuously when it was meant to be taken intermittently. In most, if not all cases, these patients have had multiple prescriptions dispensed either by the same or different pharmacies without the error being detected.

This issue is not unique to the Australian setting. Recently the National Patient Safety Authority in the UK issued a patient safety advisory concerning safe use of oral chemotherapy. It recommends that: ‘…non-specialists who prescribe, dispense or administer ongoing oral anti-cancer medication should have ready access to appropriate written protocols and treatment plans including guidance on monitoring and treatment of toxicity.’

Generally, pharmacists’ knowledge and familiarity with these groups of drugs is poor, as they are not well covered in pharmacy undergraduate courses, and have previously been considered to be the specialist oncology pharmacists’ area of expertise.

Two specialist cancer pharmacists groups; the Clinical Oncological Society of Australia’s Cancer Pharmacists Group (COSACPG) and the Society of Hospital Pharmacists of Australia Oncology Committee of Specialty Practice (SHPA COSP) have published guidelines to assist pharmacists who dispense oral chemotherapy agents and targeted therapies. Both these guidelines recommend that only pharmacists with some expertise in cancer therapies dispense oral chemotherapy agents.

However, in Australia, many of these agents are listed on the Pharmaceutical Benefits Scheme (PBS) and some may be self-funded by the patient or funded by private health insurance, giving patients choice as to where they have their prescriptions dispensed, including at their local community pharmacy or general hospital outpatient dispensary. Few of these locations would include a specialist oncology pharmacist.

This makes it essential that all pharmacists have a working knowledge of cancer and its management in order to safely dispense chemotherapies and targeted therapies when these prescriptions are presented. It is unimaginable that pharmacists would graduate and be registered with as little knowledge of the management of asthma or migraine as they do for cancer. These are both less prevalent in the community and much less deadly conditions.

Drugs that are available on the PBS or may be dispensed in the community that are generally considered to be included in the categories of chemotherapies or targeted therapies include (but are not limited to):

- **Chemotherapy drugs:**
  - capcitabine, methotroxte,
  - etoposide, vinorelbine,
  - fludarabine, cyclophosphamide,
  - mercaptoturine, thioguanine,
  - temozolomide, idarubicin,
  - procarbazine, hydroxyurea,
  - chlorambucil, melphalan; and
- **Targeted therapies:**
  - lapatinib, sunitinib, sorafenib, gefitinib,
  - imatinib, dasatinib, everolimus,
  - sirolimus thalidomide, lenalidomide.

**BEFORE DISPENSING**

So, what should pharmacists do when faced with a prescription for cancer chemotherapy or targeted therapy? Following is a list of points that should be considered by the pharmacist before releasing the medicine to the patient.
1. Establish what condition the patient has and, if possible, which regimen the prescriber is following for this patient. There may be multiple drug regimens for particular drugs and diseases, involving one or more chemotherapy and/or targeted therapy. There are a number of freely available sources of information regarding common cancer regimens. In Australia, the NSW Cancer Institute’s website has most commonly used regimens available for healthcare professionals to view free of charge. See www.eviq.org.au.

2. Determine whether the patient is taking any other medicine, either prescribed or over the counter, that may interact with the cancer chemotherapy or targeted therapy. Many of these agents are metabolised by the cytochrome P450 group of liver enzymes and so interactions are frequent with inhibitors or inducers of these medications. Others may rely heavily on renal excretion, and so may be affected by drugs that either compete at excretion sites or change urinary pH conditions. Take particular care with herbal or other complementary therapies.

3. From the information above, or directly from the prescriber, establish what the intended dose and schedule is. Find out whether the regimen is continuous or intermittent and which days the patient is to take and not to take the medication over the cycle. For example, in breast cancer capecitabine may be given for two weeks out of every three and may be combined with lypatinib which is given continuously. The dose of capecitabine is often expressed as mg/m2 in the drug protocol (ie. a dose per measure of body surface area) and then calculated for the particular patient’s prescription. The patient’s body surface area is a function of their height and weight and is calculated using an established formula. A body surface area calculator is available from the www.eviq.org.au site. Patients’ weight can change markedly over the course of therapy, and should be checked prior to each dispensing.

4. Check that the patient has had blood taken for pathology testing (or at least ordered with the date set for collection). In the hospital setting, blood test results should be checked by the dispensing pharmacist to ensure that they are within defined limits before the patient is given the next cycle of chemotherapy to take at home. It is recognised that access to these results are not routinely available in the community pharmacy setting, so at the very least, the community pharmacist should ensure that the test has been taken or scheduled, and arrangements have been made for either the patient’s oncologist or general practitioner to review the results and communicate action to be taken by the patient before the next cycle starts.

   The patient should be instructed not to start taking the next cycle before they have been told by their prescribing doctor that it is safe to do so.

5. Establish that the patient clearly understands how to take the medicine. If a patient is unable to swallow oral dose forms, then provision should be made to provide the dose in another form. Oral chemotherapy dose forms should not be crushed by carers as this increases their exposure to the agents. Pharmacists should not attempt to provide extemporaneously prepared preparations of chemotherapy agents unless they are properly equipped to do so. Usually, referral back to the treating team will be required to consider alternative administration methods.

   Provision of charts or calendars that detail which days the patient should take their medication can aid in patient understanding and adherence to the prescribed regimen.

   Generally, it is not recommended to mix chemotherapy medicines with other medicines in dose administration containers, particularly when carers or residential care facility staff are required to assist patients in the administration of their medications. However, if a dose administration aid is required to enable the patient to remain independent, then a separate, clearly marked container should be used. If being supplied to residential care facilities, this container should be clearly marked as ‘cytotoxic’, with instructions for staff to handle with care to prevent occupational exposure to these drugs.

   Pharmacists should utilise information sources available to them to augment information available in pharmacies. These include:
   - the SHPA and COSA guidelines and standards;
   - the recognised websites of the American Society of Clinical Oncology;
   - specialist cancer centres;
   - the National Cancer Institute; and
   - the NSW Cancer Institute.

   Hospital drug information centres, particularly at the hospital at which the patient’s oncologist is based, can also be useful sources of information where it has been difficult to source information from standard texts. However, a conversation with the prescribing doctor will often be required to answer or clarify the treatment intent. Certainly this is the case where presented information is insufficient to ascertain with certainty that what appears on the prescription is consistent with the intent of the treating team.

   Increasingly, specialist societies such as COSA are recommending that protocol and patient details are included by the prescribing doctor on the prescription for these therapies. Oncologists should be encouraged to reference the patient’s diagnosis and the prescribed protocol along with the height and weight of the patient when completing the prescription.

   The prescription forms used in the community have no prompts for this information currently, but with electronic prescribing being taken up by community, specialist and hospital prescribers, the capacity for this information to be included on prescriptions should become more easily available. Software users should demand this capacity from their software providers. This sharing of information between members of the healthcare team will go a long way to improving the safe use of this group of drugs.

   As chemotherapeutic medicines become more commonly handled in the community and generalist hospital settings, it is incumbent on our professional societies and universities to ensure that they are well covered in undergraduate and continuing professional development activities. Both the COSA CPD and SHPA run annual basic oncology seminars that are open to all pharmacists to attend. Interested pharmacists should check the respective websites for further information.

The material in this program has been accredited by SHPA as suitable for inclusion in an individual pharmacist’s CPD plan as outlined in the shpaCPD program at http://cpd.shpa.org.au/scripts/cgip.exe/ WService=SHPA/CPD/cms.r

This is considered a Group 2 CPD activity: Improving Knowledge and Skills with assessment; the number of hours will be dependent on the time you have taken to read the article and complete the multiple choice questions (approximately 1 hour).