Oral Chemotherapy Medications: The Need for a Nurse’s Touch

Debra L. Winkeljohn, RN, MSN, AOCN®, CNS

Since 2005, many oral chemotherapy agents have been released. Nurses often are not directly involved with patients who receive oral agents. Difficulties with adherence, safety, patient teaching, and access to oral agents can hinder treatment. Nurses can increase adherence and keep patients safe by developing standardized written prescriptions, encouraging the use of patient diaries, offering dosage calendars, and supplying contact information for an office pharmacist.

Oral chemotherapy agents may be handled differently than IV chemotherapy. In a busy clinic, physicians and nurse practitioners write for, prescribe, and teach patients about oral agents. Many times nurses are not involved in any aspect of the process of prescribing oral chemotherapy. Oral agents still are considered chemotherapy and can be as dangerous as IV forms. To ensure patient adherence, safety, and education, nurses should be involved in the process when oral agents are initiated. Issues related to oral agents include adherence, safety, patient teaching, side-effect management, and drug access. See Table 1 for a list of the latest oral medications, dates of U.S. Food and Drug Administration release, and indications for use.

Advantages of Oral Agents

The primary advantage of oral chemotherapy is one of convenience (Aisner, 2007). Patients can take their medications at home instead of needing an appointment in an office for administration of IV chemotherapy. Visits to a physician’s office are less frequent than with IV chemotherapy, which saves time and reduces costs such as office copayments and administrative fees. Quality of life may be better for patients taking oral medications at home because of flexibility, convenience, and a sense of control.

Adherence With Oral Agents

Adherence with oral chemotherapy can be an issue if not addressed by the oncology team. Adherence is “the extent to which a patient’s behavior coincides with medical advice” (Partridge, Avorn, Wang, & Winer, 2002, p. 652). A number of studies have addressed adherence with tamoxifen; long-term use drops to less than 80% (Chlebowski & Geller, 2006; Grunfeld, Hunter, Sikka, & Mittal, 2005; Kahn, Schneider, Malin, Adams, & Epstein, 2007; Lash, Fox, Westrup, Fink, & Sillman, 2006; Partridge, 2006; Partridge, Wang, Winer, & Avorn, 2003; Waterhouse, Calzone, Mele, & Brenner, 1993). Various factors, including the experience of side effects and number of other medications, were associated with nonadherence. Few studies have evaluated adherence to oral chemotherapy. Other long-term medications that decrease mortality, such as those for high blood pressure or myocardial infarction, also have low adherence rates, ranging from 40%-50% (Partridge et al., 2002).

Adherence issues include dosing schedules, complexity of dosing regimens, administration of other potentially interacting medications, timing of a dose in relation to food intake, a feeling of not wanting to appear “bad” to the physician for not taking medication, cost, and side-effect management (Moore, 2006). Complexity of dosing regimens causes patient confusion and may be related to the number of pills needed or a combination of different oral chemotherapy agents (e.g., capecitabine and lapatinib). In a study conducted by Taylor, Winter, Geyer, and Hawkins (2006), the error rate for oral chemotherapy administration at home was found to be approximately...

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interact with the cytochrome P450 enzymes in the liver (Aisner, 2007). Examples of these medications include diltiazem, erythromycin, phenobarbital, and St. John’s Wort.

Patients who do not fully understand the interaction of their oral chemotherapy and food intake may have trouble adhering to regimens. Some oral chemotherapy, such as capecitabine and imatinib, must be taken with food or near times of consumption (Viele, 2007). Others, such as erlotinib and sorafenib, need to be taken well before or after a meal (Bayer Pharmaceuticals Corp., 2006; Genentech Inc., 2005). Most oral chemotherapy requires patients to eliminate grapefruit juice because of its interaction with CYP enzymes in the liver (Goodin, 2007). Patients need to be taught how and when to take their oral chemotherapy in relation to food. Generally, oral chemotherapy agents are not crushed because of their biohazard nature, not only for the patient but also the family (Birner, 2003).

Patients who do not want to appear “bad” to their physicians may under- or overreport what they actually take (Partridge et al., 2002). Self-reporting is how many physicians determine adherence, although it can be erroneous (Partridge et al., 2002). Patients may not remember taking their medications for the entire time period between appointments or the symptoms they experience. They may fail to report episodes of vomiting after taking their medications, impacting therapeutic levels. Of more concern is the potential for patients to over-adhere to the regimen, taking more of their medications than they are prescribed (Partridge et al., 2002), which can increase toxicity and side effects.

Side effects may affect adherence, although multiple studies in patients with cancer have found no relationship between side effects and adherence (Partridge et al., 2002).

If not well managed, side effects can cause patients to stop taking their oral chemotherapy. Patients need to be educated both in writing and verbally about what side effects should be reported to the healthcare team. Patients should be taught which side effects or problems (e.g., fever greater than 100.5°F) they must report.

The cost of newer oral chemotherapy medications can impact adherence. IV formulations are covered under Medicare Part A (Bartel, 2007). Oral agents can be covered under Medicare B and D, but they require selection of a plan and monthly

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### Table 1. New Oral Chemotherapy Agents and U.S. Food and Drug Administration Indications for Use

<table>
<thead>
<tr>
<th>DATE</th>
<th>GENERIC NAME</th>
<th>BRAND NAME</th>
<th>FDA INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 2005</td>
<td>Temozolomide</td>
<td>Temodar® (Schering Corporation)</td>
<td>GBM</td>
</tr>
<tr>
<td>June 2005</td>
<td>Capecitabine</td>
<td>Xeloda® (Roche Laboratories Inc.)</td>
<td>Adjuvant Dukes C colon cancer</td>
</tr>
<tr>
<td>December 2005</td>
<td>Sorafenib</td>
<td>Nexavar® (Bayer Pharmaceuticals)</td>
<td>Renal cell cancer</td>
</tr>
<tr>
<td>December 2005</td>
<td>Lenalidomide</td>
<td>Revlimid® (Celgene Corporation)</td>
<td>MDS</td>
</tr>
<tr>
<td>January 2006</td>
<td>Sunitinib</td>
<td>Sutent® (Pfizer Inc.)</td>
<td>GIST or failure of Gleevec® renal cell cancer</td>
</tr>
<tr>
<td>May 2006</td>
<td>Thalidomide</td>
<td>Thalomid® (Celgene Corporation)</td>
<td>In combination with decadron for newly diagnosed multiple myeloma</td>
</tr>
<tr>
<td>June 2006</td>
<td>Dasatinib</td>
<td>Sprycel™ (Bristol-Myers Squibb)</td>
<td>CML resistant</td>
</tr>
<tr>
<td>June 2006</td>
<td>Lenalidomide</td>
<td>Revlimid® (Celgene Corporation)</td>
<td>With decadron for patients with multiple myeloma who have received one regimen</td>
</tr>
<tr>
<td>September 2006</td>
<td>Imatinib mesylate</td>
<td>Gleevec® (Novartis Pharmaceuticals Corporation)</td>
<td>Pediatric Ph+CML</td>
</tr>
<tr>
<td>June 2006</td>
<td>Volinostat</td>
<td>Zolinza® (Merck &amp; Co., Inc.)</td>
<td>Cutaneous T-cell lymphoma</td>
</tr>
<tr>
<td>March 2007</td>
<td>Lapatinib</td>
<td>Tykerb® (GlaxoSmithKline)</td>
<td>In combination with Xeloda in patients with breast cancer who have received a taxane, anthracycline, and trastuzumab</td>
</tr>
</tbody>
</table>

**Note.** Based on information from Oncology Nursing Society, 2007.

CML—chronic myelogenous leukemia; FDA—U.S. Food and Drug Administration; GBM—glioblastoma multiforme; GIST—gastrointestinal stromal tumor; MDS—myelodysplastic syndrome; Ph+CML—Philadelphia chromosome–positive chronic myelogenous leukemia

10%. The errors were classified as either incorrect dosing or failure to administer an indicated medication. Errors may be compounded by the addition of more prescriptions for other health problems.

In addition to oral chemotherapy medications, medications to manage side effects often are prescribed, perhaps increasing confusion in patients who may already be on other medications for health concerns such as gastroesophageal reflux disease or hypertension.

Interactions can occur between oral chemotherapy and other medications, leading to increases or decreases in the bioavailability of the oral chemotherapy drug, which causes increased toxicities or decreased efficacy. Such interactions include drugs that affect the cytochrome P450 enzymes in the liver (Aisner, 2007).
premiums (Bartel). Newer oral chemotherapy agents are very expensive and often come with large copayments or out-of-pocket expenses. High expenses can be incurred when patients need multiple prescriptions for oral chemotherapy and for support medications such as those for nausea and vomiting. Patients’ ability to pay should be explored.

**Nursing Touch**

With all of the issues surrounding adherence with oral chemotherapy, nurses must develop mechanisms to help patients. Nurses are instrumental in teaching patients about IV chemotherapy; however, few are involved in oral chemotherapy. Nurses are patient advocates. They do most of the patient teaching and can develop safe and comprehensive oral chemotherapy guidelines to increase adherence, promote safety, and evaluate side effects. See Figure 1 for a review of interventions that may increase adherence.

Patients can be given a calendar at the start of their oral chemotherapy that depicts which days to take their medication and instructions to check off each day that the medication was taken. A review of the calendar at the next visit can evaluate adherence (Goodin, Aisner, Bartel, & Viele, 2007). Some medications are taken only for a period of time during the cycle, not every day. The calendar can be marked for each day that the patient is to take the medication, including the number of days to take out of a cycle. Morning and evening doses can be placed on the calendar. Laboratory draws, physician visits, and any significant side effects can be marked for later review by the healthcare team.

A patient diary can be used to monitor oral adherence and side-effect profile. The patient and healthcare team should review the diary at each visit. Unfortunately, many patients do not remember to write every day or track their side effects or pill consumption. Patients need to be motivated to keep a diary that benefits them and the healthcare team. Involving a family member may be helpful.

Pill counts can be done at each visit to check adherence of medication usage, although the count will not guarantee that the medication was taken. Some electronic devices can be used on the pill vial to document when it is opened (Birner, 2003), but that also does not guarantee that the medication was taken. Pill counts are one way to attempt to increase adherence but are not foolproof. Patients should be encouraged to bring medications to the physician’s office at the end of treatment to be disposed of in an appropriate chemotherapy container (Moore, 2006).

Teaching a patient about oral chemotherapy should include information about dosages, what tablets look like, and how many of each to take. Teaching also should include side effects, when to call the clinic, and the availability of personnel for evenings and weekends. If available, manufacturer-supplied written material showing pill sizes and colors can be given to patients.

Another aspect of patient teaching is the handling of oral medications at home. Patients should have disposable gloves at home to handle their pills. They should be taught to pour the pills directly into a medication cup to limit exposure (Bartel, 2007). If pills are dropped on the floor, patients should be instructed to pick them up wearing gloves or using a paper towel and dispose of the pills in a hazardous waste container (Bartel), which may need to be supplied by the clinic. Instructions also should include proper storage, heat versus cold, and keeping pills out of the reach of children.

Because many oral medications are new, information regarding cost to patients is not well known. Patients often have to pay large sums to procure the medications. Nurses should develop lists of patient-assistance programs that can be accessed when issues of ability to pay arise. Check the Partnership for Prescription Assistance by calling 888-4PPA-NOW (888-477-2669) or go online at www.pparx.org/Intro.php for a current listing. Certain programs, such as those for thalidomide and lenalidomide, have specific criteria and processes to obtain the medications. Other informational programs include the HealthWell Foundation, which provides financial assistance to help cover some out-of-pocket costs; the Patient Advocate Foundation (www.patientadvocate.org), which helps with copayments; and the American Society of Hospital Pharmacists Web-based patient-assistance program at www.ashp.org (Bartel, 2007). By developing a list of programs, nurses can assist patients with procurement of their drugs or financial assistance with payment. The Association of Community Cancer Centers maintains a Web site (www.accc-cancer.org/ONCRES/oncres-hotlines.asp) that keeps a directory of pharmaceutical drug reimbursement hotlines that nurses can access to help patients (Bartel).

IV chemotherapy often is written on an order sheet with height, weight, body surface area, dosages, drug, routes of administration, and infusion times. The orders should be double checked routinely for accuracy by nurses and a pharmacist, nurses and a physician, or a nurse practitioner. With oral chemotherapy, a script often is written with the patient’s name, drug name, dose, and instructions on how it should be taken. Written oral chemotherapy prescriptions are double checked by two different personnel infrequently. Written oral chemotherapy prescriptions should contain “method for calculating body surface area, protocol, diagnosis, evidence of double-checking by another clinician, and cycle number” (Bartel, 2007, p. S10). Another safety measure that should be considered is printed, typed, or

**Figure 1. Nursing Interventions to Promote Patient Adherence to Oral Medications**

*Note. Based on information from Birner, 2003; Goodin et al., 2007.*

- Provide an oral medication chemotherapy calendar.
- Provide and instruct patients in the use of a diary.
- Provide pill boxes.
- Count pills at each patient visit.
- Request that patients return unused medication at the end of treatment.
- Ensure thorough patient teaching.

- Provide contact information regarding who and when to call.
- Keep an updated list of patient-assistance Web sites and phone numbers.
- Standardize printed prescription pads.
- Double check the height, weight, body surface area, diagnosis, and cycle number.
- Encourage patients to meet with an office pharmacist.
computer-generated prescriptions instead of handwritten ones (Birner, 2003).

If possible, patients should be offered the opportunity to meet with an office pharmacist who can review medication lists with patients to evaluate the potential for drug interactions. Pharmacists can be instrumental in teaching patients how to take their medications, including dosages, and whether to take with food. They also reinforce the teaching of safe and correct handling of medications in the home (Goodin et al., 2007).

Conclusion

With the rapid development of and changes occurring with new oral chemotherapy agents, nurses will be challenged to stay abreast of the information because many patients interact with office nursing staff even when they are not receiving IV chemotherapy. Nurses should learn about oral medications, including use, dosages, side effects, and dietary and medication restrictions or interactions. Nurses can be instrumental in developing mechanisms that will aid in patient adherence, safety, and teaching.

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References


