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Safe Administration of Oral Chemotherapy

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High standards of care are desirable for patients in any setting who receive chemotherapy by any route. Patients who self-administer oral chemotherapy are subject to risks of adverse effects similar to those who receive IV chemotherapy. Safeguards to prevent medication error in these patients may not be achieved to the same degree as for patients receiving IV drugs in an institutional setting. This article describes the differences between typical administration standards for IV chemotherapy versus oral chemotherapy. The process of oral chemotherapy provision is examined, with examples of drug characteristics and patient features important in each step. Recommendations are made for improving the care of patients receiving oral chemotherapy medications, particularly in the home setting.

Key Words: antineoplastic agents; self medication; prescriptions, drug

Cancer chemotherapy is widely regarded as a category of pharmacologic treatment with a narrow therapeutic index. Medication errors involving chemotherapy administration have the potential for harmful, even lethal, results. In recent years, considerable effort has been devoted to raising standards of care and minimizing the risk of medication error for patients receiving cancer chemotherapy at many institutions in the United States and elsewhere (Iizuka, Hosokawa, Hashimoto, Yamamoto, & Horiuchi, 2001; Kilbey & Summersgill, 2001; Perini, Topping, Brown, Roberts, & Robertson, 1997; Upton, 1997). Numerous articles have been published outlining suggestions for error prevention with antineoplastic agents (Attilio, 1997; Beckwith & Tyler, 2000a, 2000b; Cohen et al., 1996; Goldspiel, DeChristoforo, & Daniels, 2000; Ogletree, 2001). Recommendations often are based on the assumption that chemotherapy will be administered in the setting of a healthcare facility. Such published recommendations include improved staff education, laboratory value verification, restrictions on personnel involved in the process of treating patients with chemotherapy, and double and triple checks by healthcare professionals at various points in the process. Meanwhile, many patients with cancer are self-administering cancer chemotherapy regimens with a high potential for toxicity in the home, via the use of oral dosage forms (see Figure 1).

The amount and intensity of oral chemotherapy administered in the home likely will escalate in the foreseeable future. An estimated 20%–25% of the more than 300 new antineoplastic agents currently in development are oral products (Bowers, Silberman, & Mortenson, 2002; Thomas, Cahill, Mortenson, & Schoenfeldt, 2000). Some of these agents are new chemical entities, whereas others are drugs already available in IV form and under study as oral products. Recently, the U.S. Food and Drug Administration approved capecitabine, an oral fluorouracil derivative; temozolomide, an oral agent related to dacarbazine; and imatinib capsules, the first signal transduction inhibitor to become commercially available to treat cancer in the United States. These drugs are additions to an armamentarium that includes cyclophosphamide, methotrexate, etoposide, melphalan, and many more oral chemotherapeutic agents. See Figure 2 for a more complete list of chemotherapeutic agents commercially available or under study in the United States in oral dosage forms. Some of these drugs can be used for conditions other than cancer; for example, methotrexate often is administered orally to treat arthritis. This article pertains to chemotherapy agents such as direct cytotoxins that have a particularly narrow therapeutic window, while acknowledging that many agents not discussed also are given orally to treat cancer (e.g., corticosteroids, hormonal therapies).

Nurses who care for patients with cancer who self-administer oral chemotherapy medications can be of great service. Familiarity with the characteristics of various oral agents will provide a background to allow for effective education of patients so as to maximize benefit and minimize risk. Identification of specific barriers to safe and efficacious self-administration of chemotherapy and the development of strategies to overcome these barriers will provide an important measure of safety for patients in their homes.

What Are the Issues?

Although safety is the focus of this article, it is only one of many factors to be considered regarding oral chemotherapy. Efficacy, patient preference, quality of life, and economic issues all are considerations when determining the mode of treatment for a particular patient's cancer. Oral chemotherapy offers several advantages to patients. The need for IV access with attendant care and risks may be obviated. Hospitalizations and

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