Cancer chemoprevention involves the use of synthetic and biologic agents as targeted therapies for disease prevention, reduction, or suppression. Mechanisms of blocking or suppressing cancer-related pathways include processes of carcinogenesis, chronic inflammatory responses, DNA modulation, and signal transduction. This column provides an update on pharmacologic agents and nursing considerations for chemoprevention.

AT A GLANCE

- Chemoprevention as primary, secondary, and tertiary strategies can prevent or delay the growth of cancer.
- A review of current and newer mechanisms of chemoprevention is discussed.
- Oncology nurses can provide education and support for cancer chemoprevention for patients and families.

KEYWORDS
cancer; chemoprevention; pharmacologic agents; U.S. Food and Drug Administration

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Chemoprevention

An overview of pharmacologic agents and nursing considerations

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Cancer develops from dysplasia of unregulated cells that become malignant, proliferate, and metastasize to other organs and structures. Chemoprevention has been viewed as the optimal strategy to reduce the incidence, morbidity, and mortality of cancer. Chemoprevention consists of primary, secondary, and tertiary strategies, including pharmacologic agents, to prevent the initiation or to slow down the progression of cancer (Landis-Piwowar & Iyer, 2014). Primary chemoprevention agents are administered to the general population with no particular risk factors, secondary chemoprevention agents are prescribed to patients with precancerous malignancies to prevent cancer progression, and tertiary chemoprevention agents are prescribed to prevent recurrent or secondary cancers (Landis-Piwowar & Iyer, 2014). Pharmacologic chemoprevention to prevent or reduce breast, colorectal, prostate, skin, and bladder cancers has been studied for many years. This article provides an update on approved and evolving pharmacologic agents for chemoprevention that are currently being studied.

Pharmacologic Agents

Tamoxifen and raloxifene, selective estrogen receptor modulators (SERMS) approved for chemoprevention by the U.S. Food and Drug Administration (FDA), block estrogen-positive receptors in postmenopausal women (see Table 1). Aromatase inhibitors (AIs), such as anastrozole, exemestane, and letrozole, target systemic estrogen in postmenopausal women for the prevention of tumor growth in patients at risk for or who have breast cancer. Patients on SERMS must be monitored for risks or side effects, which include venous thrombosis and uterine cancer. AIs present less risk but similar concerns. Patients may experience difficulty staying on SERMs and AIs because of intolerable long-term, unwanted side effects, such as arthralgias, hot flashes, myalgias, osteoporosis, and vaginal bleeding (Vogel, 2011).

Clinical trials have shown the benefits of aspirin in people at risk for hereditary colon cancers and in colorectal cancer (CRC) survivors (Burn, Bishop, et al., 2011). The body of robust evidence on the benefits of aspirin to reduce CRC continues to provide the advantages and disadvantages of their use in chemoprevention (Coyle, Cafferty, & Langley, 2016). Aspirin has been shown to be effective for CRC prevention in hereditary nonpolyposis colon cancer or Lynch syndrome (Burn, Bishop, et al., 2011). Aspirin, a nonsteroidal anti-inflammatory drug (NSAID), and cyclooxygenase-2 (COX-2) inhibitors reduce CRC in people with familial adenomatous polyposis (Burn, Gerdes, et al., 2011; Kim & Giardiello, 2011). Widespread use of NSAIDs in the general healthy population has not been recommended because of seminal studies noting risks for bleeding (Chan et al., 2005), as well as cardiovascular events related to COX-2 inhibitors for CRC chemoprevention (Bresalier et al., 2005). Statins, which are used to lower lipid levels (Lochhead & Chan, 2013; Taylor, Wells, & Smolak, 2008), and metformin, which is used to treat type 2 diabetes mellitus (Liu et al., 2017; Zhang et