

## FEATURE ARTICLE

# Pharmacologic Application of Sunitinib Malate in the Management of Gastrointestinal Stromal Tumors

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A gastrointestinal stromal tumor (GIST) is a soft tissue sarcoma that can occur anywhere along the gastrointestinal (GI) tract and is the most common noncarcinomatous malignancy of the GI tract. This article will review the pathology of GISTs, the molecular pathology related to *c-kit*, and disease management and will discuss a new drug approved in the management of GISTs, sunitinib malate. In addition, pharmacologic properties along with nursing considerations related to sunitinib malate will be reviewed.

**G**astrointestinal stromal tumors (GISTs) are soft tissue sarcomas that can develop anywhere along the gastrointestinal (GI) tract and are the most common noncarcinomatous malignancy of the GI tract (Griffin, Amand, & Demetri, 2005). Sarcomas are rare tumors that arise from cells, particularly connective tissue (i.e., muscle, fat, nerves, blood vessels, bone, and cartilage). Specifically, GISTs develop from muscle-like nerve cells called the interstitial cells of Cajal that coordinate the autonomic movements of the GI tract (Sircar et al., 1999). Approximately 60% of GISTs occur in the stomach, 25% in the small intestine, and 10% in the colon and rectum. The remainder occurs in other sites along the GI tract or in rare locations such as the gallbladder, appendix, omentum, or mesentery (D'Amato, Steinert, McAuliffe, & Trent, 2005).

The U.S. incidence of malignant GISTs among people older than age 20 is about seven cases per million, which is about 1,500 cases per year; however, some suggest that the rate in the United States is 20 per million or about 6,000 cases per year (American Cancer Society, 2006). In addition, 80% of patients diagnosed with GISTs are older than age 50 (American Cancer Society). Depending on the tumor site, disease-related symptoms can include abdominal pain or bloating, gastrointestinal bleeding, weight loss, dysphagia, and anemia-related fatigue (von Mehren, 2006). In rare occasions, GISTs in the duodenum can cause jaundice.

## Pathology

Cancer results from a disruption of the normal regulation of the cell cycle. When the cycle proceeds without control, cells divide without order and accumulate genetic defects that can lead to cancerous tumors (U.S. Library of Medicine, 2007). In

### At a Glance

- ◆ Sunitinib malate is an oral multikinase inhibitor that targets several receptor tyrosine kinases.
- ◆ Oncology nurses are caring for more patients on oral targeted therapies.
- ◆ Patient education for targeted therapies should include their side effects and common interactions.

GISTs, a specific mutation causes the proto-oncogene *c-kit* to be expressed constitutively. The *c-kit* proto-oncogene is a receptor protein tyrosine kinase whose ligand is the stem cell factor responsible for sending growth and survival signals within the cell. The mutant KIT enzyme triggers runaway growth of GIST cells. Mutated KIT has been found in approximately 90% of metastatic GISTs, but mutations have been reported in all stages, even those believed to be benign (Griffin et al., 2005). KIT expression in GISTs can be identified by antibodies to the CD117 antigen, which is a diagnostic marker (Griffin et al.). Positive CD117 staining, in conjunction with tissue that exhibits characteristic GIST histologic features (e.g., spindle cell or epithelioid morphology), confirms a GIST diagnosis (Corless, Fletcher, & Heinrich, 2004).

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