Pancreatic cancer is one of the leading causes of cancer death in the United States. Surgical resection of tumors is considered the only curative form of treatment and can occur only when tumors are diagnosed early. Currently, researchers are attempting to develop screening tests to detect pancreatic cancer while at an early stage. Until the tests are perfected, primary care providers need to be aware of the earliest symptoms of pancreatic cancer and know which tests will assist in diagnosing pancreatic cancer at an early stage. The purpose of this article is to educate primary care providers about the early symptoms of pancreatic cancer and appropriate diagnostics to order.

Pancreatic cancer is the ninth most common cancer (Von Hoff, Evans, & Hruban, 2005) and the fourth-leading cause of cancer deaths in the United States (Dunn, Michael, & Stevens, 2002). Every year, approximately 32,000 Americans are diagnosed with pancreatic cancer. It strikes 5 out of every 100 people (Johns Hopkins University, 2007). An almost equal number of patients will die from pancreatic cancer in 2007 (Johns Hopkins University, 2007).

Pancreatic neoplasms are classified into five cancer types. Ductal pancreatic cancer comprises 65% of tumors (see Figure 1). Local or metastatic spread of this type of pancreatic cancer at the time of diagnosis results in 80% of tumors being considered unresectable as well as a 4% five-year survival rate (Hruban & Ali, 2005). Twenty-five percent of pancreatic neoplasms are considered other periampullary cancers and include duodenal, ampullary, and distal common bile duct cancers. The 5- and 10-year survival rates for these tumors vary from 24%–56% and are directly dependent on the histologic type, grade, and size of the tumor and the presence of metastasis (Mino & Lauwers, 2005). Mucinous cystic neoplasms are noninvasive, comprise 5% of pancreatic neoplasms, occur almost exclusively in perimenopausal women, and have a five-year survival rate of greater than 70% (Von Hoff et al., 2005).

Risk factors for the development of pancreatic cancer are listed in Figure 2. Few pancreatic cancers have been related to genetic familial predisposition. Thus, the prevailing philosophy among practitioners is that environmental and genetic factors have a role in the development of pancreatic cancer (Von Hoff et al., 2005).

Anorexia, early satiety, and sudden onset asthenia are early symptoms that may be present six months before the more common symptoms of pancreatic cancer, which include abdominal pain and jaundice (Gullo, Tomassetti, Migliori, Casadei, & Marrano, 2001). Also, dysgeusia, diabetes mellitus, pancreatitis, pruritis, psychological disturbances, skin changes, and thrombophlebitis may be present for as long as 24 months prior to the onset of pain or jaundice (Von Hoff et al., 2005).

Currently, no prevention or screening strategies for pancreatic cancer exist. Presenting clinical complaints and laboratory results may be nonspecific or normal. Despite such challenges, early detection and diagnosis result in a better prognosis. Thus, the challenge for clinicians is to develop an algorithm that allows the disease to be diagnosed while in an early stage. Demographic information such as age may be used as an initial screening factor. Pancreatic cancer is rare in individuals younger than 40 but is present in greater numbers among those aged 70–80. Diabetes mellitus, a prior history of pancreatitis, any history of abdominal surgery, a family history of pancreatic cancer, and smoking increase the susceptibility for this disease. Although

**At a Glance**

✦ Pancreatic cancer is diagnosed in 32,000 people annually, and patients have a life expectancy of 6–12 months.

✦ Knowledge of the early, nondescript symptoms of pancreatic cancer can promote early diagnosis, resulting in less invasive treatment.

✦ Nurses are in a key position to decrease the morbidity and mortality associated with pancreatic cancer.
the disease tends to occur more frequently in men of African American descent, that characteristic has not been identified as a useful screening variable (Picozzi, 2005).

Abdominal pain, weight loss, and jaundice are the most frequent initial complaints associated with pancreatic cancer. The pain is described as vague, epigastric in location, worse when lying down, and progressive. Weight loss is associated with a decreased desire for food, nausea with vomiting after eating, and fat malabsorption. Jaundice occurs because of direct compression of the distal bile duct, resulting in biliary obstruction.

A physical examination is not useful for diagnosing pancreatic cancer because the disease has no reliable distinguishing features that can be detected on examination. An enlarged liver is nonspecific and is seen in less than 50% of patients diagnosed with cancer of the pancreas. A palpable gallbladder is present in approximately 33% of patients at diagnosis. Thrombophlebitis, depression, anxiety, and an impending sense of doom have been associated with pancreatic cancer (Picozzi, 2005). Pancreatic malabsorption also is responsible for changes in hair and nail growth as well as skin changes (Picozzi).

Early diagnosis of pancreatic cancer dramatically increases the chance of survival (Fernandez-Zapico, Kaczynski, & Urnuta, 2002). If cancer is suspected, a combination of screening procedures has been recommended. CA 19-9 is elevated in 50%–75% of individuals with pancreatic cancer, but determining tumor size and effectiveness of cancer treatment is more useful (Johns Hopkins University, 2005; Li, Xie, Wolff, & Abbruzzese, 2004). The role of radiotherapy and chemotherapy as treatment for pancreatic cancer is limited. Comorbidities, including age, poor performance status, and anorexia, prohibit aggressive treatment. Current choices for chemotherapy include gemcitabine, 5-fluorouracil, and docetaxel.

Gemcitabine is considered first-line therapy at this time (Johns Hopkins University, 2005; Li et al., 2004). Even with treatment, advanced pancreatic cancer carries a high mortality rate, with Surveillance Epidemiology and End Results (SEER) reporting the current mean average survival at 14 months (Reis et al., 2003).

Surgical resection provides the only realistic hope of long-term survival (Bendell, Ryan, & Willett, 2003). It is of value only if the tumor is no larger than a few centimeters in diameter and no major blood vessel involvement and no evidence of metastases exist (Bowles & Benjamin, 2001). Currently, partial pancreatectomy is the preferred treatment for pancreatic tumors.

**Treatment for Pancreatic Cancer**

Standard treatment for localized or stage I pancreatic cancer includes radical pancreatic resection such as the Whipple procedure or a total pancreatectomy (O’Neal & Cleary, 2000). Postoperative mortality associated with those procedures, when performed by qualified surgeons at appropriate healthcare centers, is less than 2% (Balcom, Rattner, Warshaw, Chang, & Fernandez-del Castillo, 2001). The role of radiotherapy and chemotherapy as treatment for pancreatic cancer is limited. Comorbidities, including age, poor performance status, and anorexia, prohibit aggressive treatment. Current choices for chemotherapy include gemcitabine, 5-fluorouracil, and docetaxel.

Gemcitabine is considered first-line therapy at this time (Johns Hopkins University, 2005; Li, Xie, Wolff, & Abbruzzese, 2004). Phase I-IV clinical trials that combine radiation and chemotherapy are available for patients with various stages of pancreatic cancer (National Cancer Institute, 2006). Unfortunately, as many as 60% of patients with pancreatic cancer have metastases at the time of diagnosis (Tamm & Charnsangavej, 2001). Treatments available at these stages include radiation, chemotherapy, and palliative biliary bypass (Li et al., 2004). Even with treatment, advanced pancreatic cancer carries a high mortality rate, with Surveillance Epidemiology and End Results (SEER) reporting the current mean average survival at 14 months (Reis et al., 2003).

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- History of smoking
- Age 70–80 years
- African American race
- Male gender
- Obesity
- History of chronic pancreatitis
- Previous surgery for peptic ulcer disease
- Diet high in red meats and fried foods ("Reducing Your Risk," 2002)
- Diabetes
- Exposure to organochlorines

**Figure 2. Risk Factors for Pancreatic Cancer**

*Note. Based on information from Picozzi, 2005.*
smaller than three centimeters in diameter (Johns Hopkins University, 2005). Incomplete resection carries no survival benefit, and pancreaticoduodenectomy has considerable comorbidity because of the extent of the operation. Tseng, Sheppard, and Hunter (2005) recommended laparoscopic evaluation to definitively stage and appropriately treat pancreatic cancer.

**Implications for Nursing**

Nurses need to be aware of the early, nondescript symptoms of pancreatic cancer and encourage people with symptoms to seek medical attention. Encouraging people to see their healthcare providers and follow up with recommended screening procedures will assist in diagnosing the disease while it is treatable. Explaining the purpose and procedure for any planned testing will decrease anxiety and increase compliance with pretesting protocols. Although tumor resection is possible for the 5%-22% of patients who are diagnosed with early disease (Takahashi & Brown, 2002), all patients diagnosed with pancreatic cancer need compassionate care, psychosocial support, and education so that they make appropriate treatment decisions.

To assist in the identification of those at risk for pancreatic cancer, an algorithm has been developed to identify symptoms and determine the need for additional diagnostic tests (see Figure 3). Clinical use of the algorithm will help nurses identify and refer individuals at risk for pancreatic cancer and will provide a blueprint for nurses to assist in determining when the vague symptoms associated with pancreatic cancer should be investigated further.

The spiral or helical CT scan is recommended for surveillance of potential pancreatic tumors. Unlike conventional CT scans, spiral CT scans are able to detect tumors smaller than one centimeter by using three-dimensional imaging (Johns Hopkins University, 2005). Spiral CT is able to identify enlargement of the pancreas head when no other abnormalities are present, which may be indicative of pancreatic cancer. However, the symptom also may be a sign of a preexisting condition such as pancreatitis (Johns Hopkins University, 2005). Any abnormal findings should be followed up with fine-needle aspiration.

A spiral CT scan is used for diagnosing and staging pancreatic cancer. For patients not considered as surgical candidates, a tissue sample may be obtained with fine-needle aspiration. The procedure confirms the diagnosis, eliminates a painful postoperative period, and allows an appropriate plan of care to be developed using palliative care concepts. Nursing care should include education regarding each procedure, risks, and postprocedure care required. Assessment should include the level of pain tolerance and anxiety. Appropriate preprocedure medications should be administered.

A needle biopsy is performed using radiologic guidance whereby a needle is inserted through the anterior abdominal wall into the pancreatic mass. In general, patients should be instructed to refrain from food or fluid for 6–12 hours prior to the procedure. Although it is generally not painful and the procedure can be performed without general anesthesia, anti-anxiety medication may be administered prior to the procedure. Patients must lie still while the procedure is performed. Few adverse effects usually occur, yet patients should be monitored afterward to ensure that vital signs are stable and no incidence of intra-abdominal bleeding occurs.

![Figure 3. Early Symptom Management Algorithm for Pancreatic Cancer](image-url)
prevent infection and maintain the drain’s integrity. Once it is no longer necessary, the drain is removed by a physician and a dressing is placed over the site.

Conclusion

Approximately 15% of people diagnosed with pancreatic cancer have previous symptoms that should raise suspicion (Gullo et al., 2001). The symptoms often are present more than six months prior to the onset of abdominal pain and jaundice. Gullo et al. concluded that anorexia, early satiety, and/or asthenia with sudden onset of symptoms were present 7–20 months before onset of pain or jaundice. Also, dysgeusia, diabetes mellitus, pancreatitis, pruritis, psychological disturbances, skin changes, and migratory thrombophlebitis may be present as many as 24 months prior to onset of pain or jaundice (Von Hoff et al., 2005).

Gullo et al. suggested that a sudden disgust for coffee, smoking, or wine 7–20 months prior to onset of jaundice and pain needs to be investigated. Another interesting variable seen as an early symptom is unexplained anxiety, depression, and sense of doom that occurred without the patient having knowledge of a possible disease process (O’Neal & Cleary, 2000; Passik & Roth, 1999). Passik and Roth concluded that 76% of patients with abdominal pathologies who went on to be diagnosed with pancreatic cancer had psychiatric symptoms. This was not present with patients diagnosed with gastric cancer.

Numerous other symptoms are seen in the presentation of pancreatic cancer. Diarrhea, changes in bowel habits, and weight loss may occur because of fat malabsorption (Picozzi, 2005). Less common symptoms of early pancreatic cancer include dyspepsia, pyrosis (heartburn), skin changes, pruritis, sleep disorders, fever, gastrointestinal bleeding, and thrombophlebitis (Picozzi).

Preventive or screening strategies are not available presently for pancreatic cancer. Thus, appropriate assessment and early intervention are the only available mechanisms that will alter the devastating outcome of the disease. Knowledge of the demographics that make an individual at risk for the disease, together with careful attention to their clinical symptoms and scheduling of screening procedures, are within the realm of nursing practice. Advocating for patients with clinical symptomology to ensure that follow-through is performed will save lives. Incorporating this information into evidence-based practice provides a framework for nurses to intervene when appropriate.

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References


