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A Compendium of Cancer Therapeutic Strategies and their Modality

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Introduction

Pancreatic cancer arises when cells in the pancreas, a glandular organ behind the stomach, begin to multiply out of control and form a mass. These cancerous cells have the ability to invade other parts of the body. A number of types of pancreatic cancer are known.

Pancreatic cancer rarely occurs before the age of 40, and more than half of cases of pancreatic adenocarcinoma occur in those over 70. Risk factors for pancreatic cancer include tobacco smoking, obesity, diabetes, and certain rare genetic conditions. About 25% of cases are linked to smoking, and 5–10% are linked to inherited genes. Pancreatic cancer is usually diagnosed by a combination of medical imaging techniques such as ultrasound or computed tomography, blood tests, and examination of tissue samples (biopsy). The disease is divided into stages, from early (stage I) to late (stage IV). Screening the general population has not been found to be effective.

The risk of developing pancreatic cancer is lower among nonsmokers, and people who maintain a healthy weight and limit their consumption of red or processed meat. Smokers' chances of developing the disease decrease if they stop smoking and almost return to that of the rest of the population after 20 years. Pancreatic cancer can be treated with surgery, radiotherapy, chemotherapy, palliative care, or a combination of these. Treatment options are partly based on the cancer stage. Surgery is the only treatment that can cure pancreatic adenocarcinoma, and may also be done to improve quality of life without the potential for cure. Pain management and medications to improve digestion are sometimes needed. Early palliative care is recommended even for those receiving treatment that aims for a cure.

In 20, pancreatic cancers of all types resulted in 411,600 deaths globally. Pancreatic cancer is the fifth most-common cause of death from cancer in the United Kingdom, and the third most-common in the United States. The disease occurs most often in the developed world, where about 70% of the new cases in 2012 originated. Pancreatic adenocarcinoma typically has a very poor prognosis; after diagnosis, 25% of people survive one year and 5% live for five years. For cancers diagnosed early, the five-year survival rate rises to about 20%. Neuroendocrine cancers have better outcomes; at five years from diagnosis, 65% of those diagnosed are living, though survival considerably varies depending on the type of tumor.

Exocrine cancers

The exocrine group is dominated by pancreatic adenocarcinoma (variations of this name may add "invasive" and "ductal"), which is by far the most common type, representing about 85% of all pancreatic cancers. Nearly all these start in the ducts of the pancreas, as pancreatic ducal adenocarcinoma (PDAC). This is despite the fact that the tissue from which it arises – the pancreatic ductal epithelium – represents less than 10% of the pancreas by cell volume, because it constitutes only the ducts (an extensive but capillary-like duct-system fanning out) within the pancreas. This cancer originates in the ducts that carry secretions (such as enzymes and bicarbonate) away from the pancreas. About 60–70% of adenocarcinomas occur in the head of the pancreas.

Signs and symptoms of the most-common form of pancreatic cancer may include yellow skin, abdominal or back pain, unexplained weight loss, light-colored stools, dark urine, and loss of appetite. Usually, no symptoms are seen in the disease's early stages, and symptoms that are specific enough to suggest pancreatic cancer typically do not develop until the disease has reached an advanced stage. By the time of diagnosis, pancreatic cancer has often spread to other parts of the body.

The next-most common type, acinar cell carcinoma of the pancreas, arises in the clusters of cells that produce these enzymes, and represents 5% of exocrine pancreas cancers. Like the 'functioning' endocrine cancers described below, acinar cell carcinomas may cause over-production of certain molecules, in this case digestive enzymes, which may cause symptoms such as skin rashes and joint pain.

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