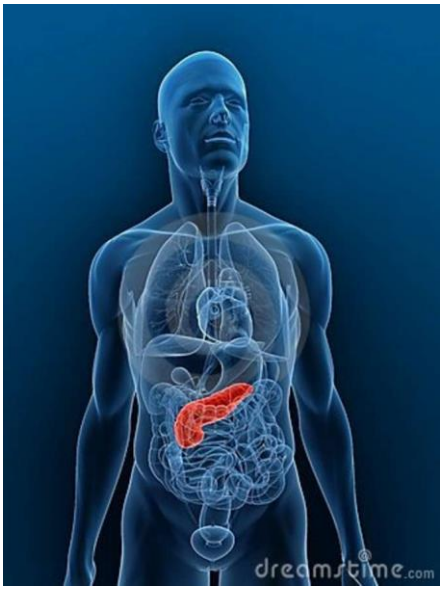
Cancer Association of South Africa (CANSA)

Research • Educate • Support

Fact Sheet
on
Pancreatic Cancer

Introduction

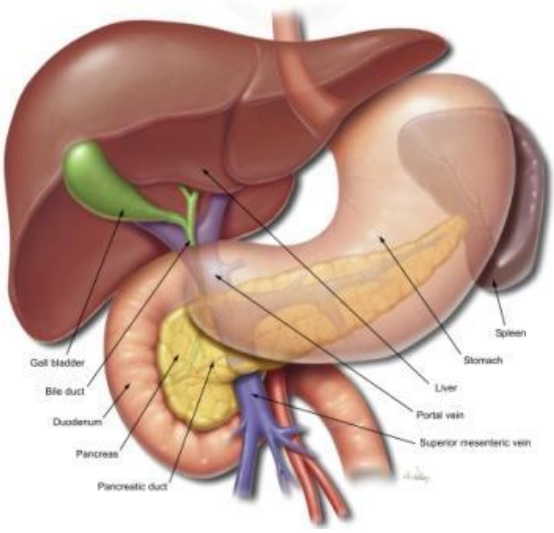
The pancreas is a glandular organ in the digestive and endocrine systems of vertebrates including humans. It is both an endocrine gland producing several important hormones, including insulin, glucagon, somatostatin and pancreatic polypeptide, as well as a digestive organ it secretes pancreatic juice which contains digestive enzymes that assist in the absorption of nutrients and digestion in the small intestine. These enzymes help to further break down the carbohydrates, proteins and lipids in the contents of the small intestine.



[Picture Credit: Pancreas Picture 1]

As the pancreas is a 'storage depot' for digestive enzymes and provides certain hormones, an injury to the pancreas is potentially fatal . A puncture of the pancreas generally requires prompt and experienced medical intervention.

- Problems associated with the pancreas include:
- Pancreatitis - inflammation of the pancreas. Gallstone and alcohol are the two most common causes of pancreatitis.



- Pancreatic cancers - particularly cancer of the exocrine pancreas, remain one of the most deadly cancers, and the mortality rate is very high. Pancreatic endocrine tumours are rare.

[Picture Credit: Pancreas Picture 2]

- Diabetes Mellitus Type 1 (Also known as Juvenile Diabetes) - is a chronic auto-immune disorder in which the immune system attacks the insulin-secreting cells in the pancreas. This causes the patient's blood sugar levels to rise to a dangerous level. To correct this, the patient must use insulin on a daily basis. There is also some correlations

Researched and Authored by Prof Michael C Herbst
[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health]
Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

between diabetes, chronic pancreatitis and pancreatic cancer.

- Diabetes Mellitus Type 2 - is more common among overweight adults, but has been seen in children also. Unlike Type 1, it can be permanently corrected with weight loss and medicine.

(Wikipedia).

Pancreatic Cancer

Pancreatic cancer is a disease in which malignant (cancerous) cell are found in the tissues of the pancreas.

All types of pancreatic cancer begin when abnormal cells grow out of control within the pancreas. There are two types of cells in the pancreas, the exocrine cells (which produce digestive juices) and endocrine cells (which produce hormones). These cells also have different functions.

More than 95% of pancreatic cancers are classified as exocrine tumours. These tumours start in the exocrine cells that make pancreatic enzymes that help in digestion. In this category, the vast majority of tumours are adenocarcinomas.

Accounting for less than 5% of all pancreatic tumours are neuroendocrine tumours, also called 'endocrine' or 'islet cell' tumours. Islet cells are the endocrine cells in the pancreas that produce and secrete the hormones insulin, glucagon and somatostatin into the bloodstream. Insulin and glucagon are the two main pancreatic hormones. Insulin lowers blood sugar levels while glucagon raises blood sugar levels. Together these two main hormones work to maintain the proper level of sugar in the blood. Somatostatin regulates the levels of a variety of other hormones in the blood.

Pancreatic neuroendocrine tumours may be benign (non-cancerous) or malignant and they tend to grow slower than exocrine tumours. Pancreatic neuroendocrine tumours are either functional (produce hormones) or non-functional (produce no hormones. Most functional neuroendocrine tumours are benign), however, 90% of non-functional neuroendocrine tumours are malignant (cancerous).
(Pancreatic Cancer Action Network).

Incidence of Pancreatic Cancer in South Africa

The National Cancer Registry (2012) does not provide any information regarding the incidence of Insulinoma.

According to the National Cancer Registry (2012) the following number of pancreatic cancer cases was histologically diagnosed in South Africa during 2012:

Group - Males 2012	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All males	191	1:698	0,52%
Asian males	7	1:695	0,88%
Black males	66	1:1 345	0,57%
Coloured males	21	1:444	0,49%
White males	96	1:328	0,48%

Group - Females 2012	Actual No of Cases	Estimated Lifetime Risk	Percentage of All Cancers
All females	148	1:1 211	0,39%
Asian females	3	1:2 034	0,29%
Black females	46	1:3 133	0,28%
Coloured females	18	1:657	0,42%
White females	81	1:433	0,51%

The frequency of histologically diagnosed cases of pancreatic cancer in South Africa for 2012 was as follows (National Cancer Registry, 2012):

Group - Males 2012	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All males	0	0	4	20	43	68	36	17
Asian males	0	0	0	3	1	2	1	0
Black males	0	0	1	10	19	20	10	1
Coloured males	0	0	2	0	4	8	4	2
White males	0	0	1	6	16	35	20	12

Group - Females 2012	0 – 19 Years	20 – 29 Years	30 – 39 Years	40 – 49 Years	50 – 59 Years	60 – 69 Years	70 – 79 Years	80+ Years
All females	3	2	6	7	31	49	39	11
Asian females	0	0	0	0	2	1	0	0
Black females	3	2	4	3	9	14	8	1
Coloured females	0	0	1	1	3	4	7	1
White females	0	0	1	3	14	29	23	8

N.B. In the event that the totals in any of the above tables do not tally, this may be the result of uncertainties as to the age, race or sex of the individual. The totals for 'all males' and 'all females', however, always reflect the correct totals.

Risk Factors for Pancreatic Cancer

A risk factor is anything that affects one's chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, cannot be changed. Having a risk factor, or even several risk factors, does not mean that one will get the disease. Many people who get the disease may not have had any known risk factors.

Researchers have found several factors that affect a person's chance of getting cancer of the pancreas. Most of these are risk factors for exocrine pancreatic cancer.

- Age - the risk of developing pancreatic cancer increases as people age. Almost all patients are older than 45.
- Gender - men are 30% more likely to develop pancreatic cancer than women. This may be due, at least in part, to increased tobacco use in men.
- Race - African Americans are more likely to develop pancreatic cancer than whites.
- Cigarette smoking - the risk of getting pancreatic cancer is at least twice as high among smokers compared to those who have never smoked. Scientists think this may be due to cancer-causing chemicals in cigarette smoke that enter the blood and damage the pancreas. About 20% to 30% of exocrine pancreatic cancer cases are thought to be caused by cigarette smoking. Cigar and pipe smoking also increase

risk. Quitting smoking helps lower risk – 10 years after quitting, former smokers have the same risk as those who never smoked. People who use smokeless tobacco are also more likely to get pancreatic cancer.

- Obesity and physical activity - very overweight (obese) people are more likely to develop exocrine pancreatic cancer. Studies looking at the link between physical activity and the risk of pancreatic cancer have had mixed results.

- Diabetes - exocrine pancreatic cancer is more common in people who have diabetes. The reason for this link is not known. Most of the risk is found in people with type 2 diabetes. This type of diabetes most often starts in adulthood. It is often related to being overweight or obese.

- Chronic pancreatitis - chronic pancreatitis is a long-term inflammation of the pancreas. This condition is linked with an increased risk of pancreatic cancer, but most patients with pancreatitis never develop pancreatic cancer. The link between chronic pancreatitis and pancreatic cancer is strongest in smokers.

- Cirrhosis of the liver - cirrhosis is a scarring of the liver. It develops in people with liver damage from things like hepatitis and alcohol use. People with cirrhosis seem to have an increased risk of pancreatic cancer.

- Occupational exposure - heavy exposure at work to certain pesticides, dyes, and chemicals used in metal refining and the petroleum products may increase the risk of developing pancreatic cancer.

- Family history - pancreatic cancer seems to run in some families.

- Genetic syndromes - inherited gene mutations are abnormal copies of certain genes that can be passed from parent to child. These abnormal genes may cause as many as 10% of pancreatic cancers and can cause other problems as well.

  Examples of the genetic syndromes that can cause exocrine pancreatic cancer include:

  - Hereditary breast and ovarian cancer syndrome, caused by mutations in the gene *BRCA2*
  - Familial melanoma, caused by mutations in the gene *p16/CDKN2A*
  - Familial pancreatitis, caused by mutations in the gene *PRSS1*
  - Hereditary non-polyposis colorectal cancer (HNPCC), most often caused by a defect in either the gene *MLH1* or the gene *MSH2*. At least 5 other genes can also cause HNPCC: *MLH3, MSH6, TGBR2, PMS1*, and *PMS2.* This disorder is also known as Lynch syndrome
  - Peutz-Jeghers syndrome (PJS), caused by defects in the gene *STK1*. This syndrome is also linked with polyps in the digestive tract and several other cancers
  - Von Hippel-Lindau syndrome, caused by mutations in the gene *VHL*, can lead to an increased risk of pancreatic cancer and carcinoma of the ampulla of Vater
  - Pancreatic neuroendocrine tumours and cancers can also be caused by a genetic syndrome, such as:

- ✓ Neurofibromatosis, type 1, which is caused by mutations in the gene *NF1*. This syndrome leads to an increased risk of many tumours, including somatostatinomas.
- ✓ Multiple endocrine neoplasia, type 1, caused by mutations in the gene *MEN1*, leads to an increased risk of tumours of the parathyroid gland, the pituitary gland, and the islet cells of the pancreas

- Stomach problems - infection of the stomach with the ulcer-causing bacteria *Helicobacter pylori* (*H. pylori*) may increase the risk of getting pancreatic cancer. Some researchers believe that excess stomach acid might also increase the risk.

- Diet - some studies linked pancreatic cancer and diets high in fat, or those that include a lot of red meat, pork, and processed meat (such as sausage and bacon). Some studies have found that diets high in fruits and vegetables may help reduce the risk of pancreatic cancer. Diets high in meats, cholesterol fried foods and nitrosamines may increase the risk, while diets high in fruits and vegetables may reduce the risk of pancreatic cancer.

- Coffee - some older studies have suggested that drinking coffee might increase the risk of pancreatic cancer, although more recent studies have not confirmed this.

- Alcohol - some studies have shown a link between heavy alcohol intake and pancreatic cancer.
- Religious/Ethnic Background **-** pancreatic cancer is proportionally more common in Jews than the rest of the population. This may be the result of a particular inherited mutation in the BRCA2 breast cancer gene which runs in some Jewish families.

- Peptic ulcer surgery **-** patients who have had a portion of their stomach removed (partial gastrectomy) appear to have an increased risk for developing pancreatic cancer.

(American Cancer Society; Cancer Research UK; Mayo Clinic; Johns Hopkins Medicine).

Signs and Symptoms of Pancreatic Cancer

Signs and symptoms of pancreatic cancer can be summarised as follows:

Pancreatic cancer doesn't usually give rise to any symptoms or signs in the early stages. This is the main reason why it is so difficult to detect and diagnose. As the cancer grows, the symptoms caused, will depend on the type of pancreatic cancer and where it is in the pancreas. Any symptoms people do have can be quite vague and may come and go at first. An example is abdominal pain, which may start off as occasional discomfort before becoming more painful and more frequent. The symptoms can also be a sign of other more common, less serious illnesses. This means that people may end up seeing their medical practitioner several times or being sent for a number of different tests before pancreatic cancer is even considered.

Many of the symptoms are common for lots of illnesses and may not be a specific sign of pancreatic cancer. If persistent unexplained symptoms persist it is important to be referred for tests in order to determine the cause of the symptoms.

Most pancreatic cancers are exocrine tumours (90%). The symptoms can be very vague and depend on whether the tumour is in the head, body or tail of the pancreas.

Abdominal pain - pain is a symptom in about 70% of pancreatic cancer cases. It often starts as general discomfort or pain in the abdomen (tummy), which can spread to the back. It can be worse after eating or when lying down. Sitting forward can sometimes relieve the pain. At first the pain may come and go, but over time it may become more constant. If any of the organs (pancreas, liver or gall bladder) in the abdomen are inflamed or enlarged the area may also be tender to touch.

Pain is caused by the cancer affecting nerves or organs near the pancreas. It can also be a result of a tumour causing a blockage in the stomach or duodenum (top part of the small intestines).

Jaundice occurs in about 50% of pancreatic cancer cases. It is an illness where the skin and the whites of the eyes turn yellow. Other signs of jaundice include dark urine, pale stools and itchy skin. Jaundice develops when there is a build-up in the blood of a chemical called bilirubin. This chemical is always present in the blood. It usually gets removed from the body in the bile fluid produced by the liver which empties into the small intestines through the bile duct. Cancer growing in the pancreas can block the bile duct so that bile and bilirubin keep building up in the body. This is known as obstructive jaundice.

Jaundice can be caused by other non-cancerous conditions, such as a gallstone blocking the bile duct which makes it important for all the obvious causes to be explored.

Weight loss - losing a lot of weight for no particular reason can be a sign that something is wrong. People may also notice a loss of appetite or changes in their eating habits. Pancreatic cancer can affect the ability of the pancreas to produce digestive enzymes that help to digest food. This means that the body cannot digest food properly or get the nutrients it needs, leading to weight loss. Weight loss is more common with cancers in the head of the pancreas.

Other common symptoms of pancreatic cancer:
Bowel problems - a condition called steatorrhoea (stools that are large, pale, oily, floating and smelly) is a common symptom of diseases of the pancreas. It happens because the cancer affects the production of the enzymes needed to digest food, particularly high fat food. Undigested food passing quickly through the body can also cause diarrhoea and subsequent weight loss.

Nausea and vomiting - nausea (feeling sick) and vomiting can occur for several different reasons. A tumour can block the bile duct or press on the duodenum, which obstructs digestion. It may also cause inflammation in the pancreas, or jaundice. Both of these can lead to a chemical imbalance in the body which can make people feel sick.

Fever and shivering - if the pancreas is inflamed or the ducts are blocked because of a tumour, this can cause a high temperature and shivering.

Diabetes - diabetes can develop if a tumour stops the pancreas from functioning properly. This is because the pancreas produces the hormone insulin which the body needs to regulate the amount of sugar in the blood. People with diabetes often feel extremely thirsty, pass more urine than normal, lose weight and feel weak and lacking in energy. Diabetes is particularly associated with pancreatic cancer in older people. If someone develops late onset diabetes with no other explanation a diagnosis of pancreatic cancer should be considered.

Symptoms of endocrine pancreatic tumours - less than 5% of all pancreatic cancers are endocrine tumours, which develop in the hormone producing cells of the pancreas. It can be divided into functioning and non-functioning tumours, depending on whether or not it overproduces hormones and cause a chemical syndrome. Most endocrine tumours do not produce a clinical syndrome, thus by being non-functioning, it does not cause specific symptoms. As they grow or spread they may cause pain, jaundice or a lump that can be felt in the abdomen.

By being functioning it, therefore, gives rise to different symptoms depending on the type of tumour and hormone it produces. This includes the following clinical syndromes:

- Gastrinomas overproduce gastrin, which causes peptic ulcers in the stomach or duodenum. Symptoms include severe pain, black tarry stools and diarrhoea
- Glucagonomas overproduce glucagon. Symptoms include a specific type of skin rash (redness, ulceration and scabbing), anaemia (lack of red blood cells), weight loss and inflammation inside the cheeks and lips
- Insulinomas overproduce insulin, leading to hypoglycaemia (low blood sugar levels). Symptoms may include weakness, drowsiness, dizziness or lack of energy
- Somatostatinomas overproduce somatostatin, which causes gall stones, diabetes, diarrhoea and steatorrhoea
- VIPomas overproduce a hormone called vasoactive intestinal peptide (VIP). Symptoms include watery diarrhoea, high blood pressure and flushing of the face

(Pancreatic Cancer UK; WebMD; University of California San Francisco).

Diagnosis of Pancreatic Cancer

Pancreatic cancer may go undetected until it's advanced. By the time symptoms occur, diagnosing pancreatic cancer is usually relatively straightforward. Unfortunately, a cure is rarely possible at that point.

Diagnosing pancreatic cancer usually happens when someone comes to the doctor after experiencing weeks or months of symptoms. Pancreatic cancer symptoms frequently include abdominal pain, weight loss, itching, or jaundice (yellow skin). A doctor then embarks on a search for the cause, using the tools of the trade:

- By taking a medical history, a doctor learns the story of the illness, such as the time of onset, nature and location of pain, smoking history, and other medical problems

- During a physical exam, a doctor might feel a mass in the abdomen and notice swollen lymph nodes in the neck, jaundiced skin, or weight loss

- Lab tests may show evidence that bile flow is being blocked, or other abnormalities

- Based on a person's physical examination, laboratory restuls and description of symptoms, a doctor often orders an imaging test:
    - Computed tomography (CT scan): A scanner takes multiple X-ray pictures, and a computer reconstructs them into detailed images of the inside of the abdomen. A CT scan helps doctors make a pancreatic cancer diagnosis
    - Magnetic resonance imaging (MRI): Using magnetic waves, a scanner creates detailed images of the abdomen, in particular the area around the pancreas, liver, and gallbladder

- Ultrasound: Harmless sound waves reflected off organs in the belly create images, potentially helping doctors make a pancreatic cancer diagnosis
- Positron emission tomography (PET scan): Radioactive glucose injected into the veins is absorbed by cancer cells. PET scans may help determine the degree of pancreatic cancer spread

- If imaging studies detect a mass in the pancreas, a pancreatic cancer diagnosis is likely, but not definite. Only a biopsy -- taking actual tissue from the mass -- can diagnose pancreatic cancer.

  Biopsies can be performed in several ways:
  - Percutaneous needle biopsy: Under imaging guidance, a radiologist inserts a needle into the mass, capturing some tissue. This procedure is also called a fine needle aspiration (FNA)
  - Endoscopic retrograde cholangiopancreatography (ERCP): A flexible tube with a camera and other tools on its end (endoscope) is put through the mouth to the small intestine, near the pancreas. ERCP can collect images from the area, as well as take a small biopsy with a brush
  - Endoscopic ultrasound: Similar to ERCP, an endoscope is advanced near the pancreas. An ultrasound probe on the endoscope locates the mass, and a needle on the endoscope plucks some tissue from the mass
  - Laparoscopy is a surgical procedure that uses several small incisions. Using laparoscopy, a surgeon can collect tissue for biopsy, as well as see inside the abdomen to determine if pancreatic cancer has spread. However, laparoscopy has higher risks than other biopsy approaches
- If pancreatic cancer seems very likely and the tumor appears removable by surgery, doctors may recommend surgery without a biopsy.

(WebMD; Mayo Clinic; National Cancer Institute).

Types of Pancreatic Cancer

The following are all different types of pancreatic cancers

Non-Endocrine Adenocarcinomas This is the form of cancer that most people are talking about when they refer to 'cancer of the pancreas'. These tumours account for more than 75% of all pancreas cancers. Microscopically, adenocarcinomas form glands (collections of cells surrounding an empty space). These tumours can grow large enough to invade nerves which can cause back pain. It may also frequently spread (metastasise) to the liver or lymph nodes. If this happens the tumour may be considered unresectable – meaning that it cannot be resected (cut out).

The following rare non-endocrine tumours are listed alphabetically.

- *Acinar Cell Carcinomas* – these rare cancers may produce excess amounts of digestive enzymes normally produced by the pancreas. This increase in enzymes causes distinct symptoms in 20% of acinar cell carcinoma cases. Symptoms may include unusual skin rashes, joint pain and an increased level of eosinophils, a type of white blood cell

- *Adenosquamous Carcinomas* – This rare variant of pancreatic cancer is similar to adenocarcinoma because it also forms glands. These tumours also show 'squamous

differentiation'. This means that the cells tend to flatten out as they grow. This variant is important to recognise because it may mimic other types of cancer that often show squamous differentiation, for example, cancer of the oesophagus. It is associated with a particularly poor prognosis

- *Colloid Carcinomas* – This is a distinctive tumour of the pancreas associated with a better prognosis than the more common adenocarcinoma. Many colloid carcinomas arise in association with intraductual papillary mucinous neoplasms (IPMNs) - a type of tumour (neoplasm) that grows within the pancreatic ducts (intraductal) and is characterised by the production of thick fluid by the tumour cells (mucinous)

- *Giant Cell Tumours* – These tumours are extremely rare and are now called 'undifferentiated carcinomas with osteoclast-like giant cells'. These tumours have unusually large 'giant' cells. This does not mean that the tumour itself is larger than other types of tumours.

- *Hepatoid Carcinomas* – these tumours are extremely rare in the pancreas. The cells that form this type of cancer look like the cells of a liver cancer (hepatoid means liver-like)

    - *Intraductal Papillary Mucinous Neoplasms* – These tumours are also known as 'IPMNs'. They represent a potentially curable precursor lesion to invasive pancreatic cancer. This tumour grows along the ducts of the pancreas that drain the pancreatic fluid into the small intestine

- *Mucinous Cystic Neoplasms* – This is a rare, cystic, fluid-containing tumour of the pancreas. Most are found in the tail of the pancreas in women

- *Pancreatoblastomas* – These rare malignant (cancerous) tumours primarily occur in children.

- *Serous Cystadenomas* – These rare tumours are usually benign (non-cancerous) growths. They are cystic, fluid containing tumours with a sponge-like appearance. The vast majority of patients with this type of tumour are cured by its removal

- *Signet Ring Cell Carcinoma* – This rare form of pancreatic cancer has a characteristic microscopic appearance. Signet ring cell carcinomas are composed of infiltrating individual cells with a large mucin vacuole. This mucin vacuole pushes the nucleus to the side, giving the cell a 'signet' or ring-like appearance

- *Solid and Pseudopapillary Tumours* – These rare tumours occur primarily in women in their 30's. As the name implies, some parts of the tumours are solid and some are papillary. They have a good prognosis. Since they can spread, they should be removed completely

- *Undifferentiated Carcinomas* – This is an extremely aggressive form of pancreatic cancer that lacks a direction of differentiation – under the microscope these cancers do not resemble any normal cell type in the body

Endocrine (Islet Cell) Tumours

These tumours are far less common than the non-endocrine tumours listed above. They account for about 1% of pancreatic cancers. The endocrine tumours may produce highly active hormones and, therefore, have very dramatic symptoms. There are different kinds. A pancreatic neuroendocrine tumour can be functioning, meaning it makes hormones, or non-functioning, meaning it does not make hormones.

A functioning neuroendocrine tumour is named based on the hormone the cells normally make:

- Insulinoma – overproduces insulin which results in hypoglycaemia (low blood sugar)
- Glucagonoma - overproduces glucagon which results in a very striking skin rash (redness, ulceration and scabbing) Anaemia (lack of red blood cells), weight loss and inflammation inside the cheeks and lips
- Gastrinoma - secretes excess of gastrin leading to ulceration in the duodenum (peptic ulcer), stomach and the small intestine. Symptoms include severe pain, black tarry stools and diarrhoea
- Somatostatinoma - overproduces somatostatin. It is associated with diabetes mellitus and abnormal glucose tolerance. It also causes gall stones, diarrhoea and steatorrhoea
- VIPomas - overproduces a hormone called vasoactive intestinal peptide (VIP). This hormone increases secretions from the intestines. It also relaxes some of the smooth muscles in the gastrointestinal system. Symptoms include watery diarrhoea, high blood pressure and flushing of the skin of the face

One exception: a functioning neuroendocrine tumour without a clinical syndrome:

- Ppomas - Sporadic pancreatic neuroendocrine tumours, which predominantly secrete pancreatic polypeptide (PPoma), are rare and have not been associated with a clinical syndrome

(Johns Hopkins Medicine; Cancer.Net).

Reducing the Risk for Pancreatic Cancer

Cancer screening exams are important medical tests done for individuals at risk but do not have symptoms. They help find cancer at its earliest stage, when the chances for successful treatment are highest. Unfortunately, no standardised screening tests have been shown to improve pancreatic cancer outcomes. If at high risk for pancreatic cancer, a doctor should be consulted to determine whether testing might be the right option.

This might include:

- Endoscopic ultrasound: An endoscope with an ultrasound probe on the end is inserted through the mouth into the pancreas
- CT or CAT (computed axial tomography) scans to look for abnormalities

The number one way to prevent pancreatic cancer is not to smoke or, if smoking, to stop smoking.

Other lifestyle choices that may lower one's chances of getting pancreatic cancer include:

- Restrict or avoid alcohol intake
- Eating a healthy diet consisting of at least five (5) vegetables and fresh fruit (in season) every day
- Maintaining a healthy weight
- Getting regular exercise

(MD Anderson Cancer Center; National Cancer Institute).

Staging of Pancreatic Cancer

Staging is a way of describing where the cancer is located, if or where it has spread and whether it is affecting the functions of other organs in the body. Doctors use diagnostic tests to determine the cancer's stage, so staging may not be complete until all the tests are finished. Knowing the stage helps the doctor to decide what kind of treatment is best and can help predict a patient's prognosis (chance of recovery). As with diagnosis, it is important for the staging of pancreatic cancer to be done at a centre with experience in staging pancreatic cancer. There are different stage descriptions for different types of cancer.

Doctors use several systems to stage pancreatic cancer. The method used to stage other cancers, the TNM classification, is not often used for pancreatic cancer; however, for completeness, it is discussed below. The more common way to classify pancreatic cancer is to divide it into three categories based on whether it can be removed with surgery and where it has spread:

*Resectable***.** This type of pancreatic cancer can be surgically removed. The tumour may be located only in the pancreas or extends beyond it, but it has not grown into important arteries or veins in the area. There is no evidence that the tumour has spread to areas outside of the pancreas. Approximately 10% to 15% of patients are diagnosed with this stage.

*Locally advanced***.** This type is still located only in the area around the pancreas, but it cannot be surgically removed because it has grown into nearby arteries or veins, or the tumour has grown into nearby organs. There is no evidence of spread to any distant parts of the body. Approximately 35% to 40% of patients are diagnosed at this stage.

*Metastatic***.** The tumour has spread beyond the area of the pancreas and to other organs, such as the liver or distant areas of the abdomen. Approximately 45% to 55% of patients are diagnosed at this stage.

By classifying each cancer into one of these categories, the health care team can plan the best treatment strategy. A fourth category that is sometimes used, which can also be a subcategory of 'Locally advanced', is borderline resectable disease. This refers to a tumour that cannot be surgically removed at the present time, but if chemotherapy and/or radiation therapy is helping to shrink the tumour, it may be able to be removed in the future.

TNM Staging System
Doctors frequently use a tool called the TNM system to stage other types of cancer. Because doctors generally classify a tumour during surgery, and because many patients with pancreatic cancer do not receive surgery, the TNM system is not used as much for pancreatic cancer as it is for other diseases.

The TNM system judges three factors: the tumour itself, the lymph nodes around the tumour, and if the tumour has spread to the rest of the body. The results are combined to determine the stage of cancer for each person. There are five stages: stage 0 (zero) and stages I through IV (one through four). The stage provides a common way of describing the cancer, so doctors can work together to plan the best treatments.

TNM is an abbreviation for tumour (T), node (N), and metastasis (M). Doctors look at these three factors to determine the stage of cancer:

- How large is the primary tumour and where is it located? **(Tumour, T)**
- Has the tumour spread to the lymph nodes? **(Node, N)**
- Has the cancer metastasized to other parts of the body? **(Metastasis, M)**

Tumour. Using the TNM system, the 'T' plus a letter or number (0 to 4) is used to describe the size and location of the tumour. This helps the doctor develop the best treatment plan for each patient. Specific tumour stage information listed below.

TX: The primary tumour cannot be evaluated
T0: No evidence of cancer was found in the pancreas
Tis: Refers to carcinoma in situ (which is very early cancer that has not spread.)
T1: The tumour is in the pancreas only, and it is 2 centimetres (cm) or smaller in size.
T2: The tumour is in the pancreas only, and it is larger than 2 cm
T3: The tumour extends beyond the pancreas, but the tumour does not involve the major arteries or veins near the pancreas
T4: The tumour extends beyond the pancreas into major arteries or veins near the pancreas. A T4 tumour is unresectable (unable to be completely removed during surgery)

Node. The 'N' in the TNM staging system is for lymph nodes. Lymph nodes are tiny, bean-shaped organs located throughout the body that normally help fight infection and disease as part of the body's immune system. In pancreatic cancer, regional lymph nodes are those lymph nodes near the pancreas and distant lymph nodes are those lymph nodes in other parts of the body.

NX: The regional lymph nodes cannot be evaluated
N0: Cancer was not found in the regional lymph nodes
N1: Cancer has spread to regional lymph nodes

Distant metastasis. The 'M' in the TNM system indicates whether the cancer has spread to other parts of the body.

MX: Distant metastasis cannot be evaluated
M0: The disease has not spread to other parts of the body
M1: Cancer has spread to another part of the body, including distant lymph nodes

Pancreatic cancer most commonly spreads to the liver, peritoneum (lining of the abdominal cavity), and lungs

Cancer Stage Grouping
Doctors assign the stage of the cancer by combining the T, N, and M classifications.

Stage 0:
Refers to cancer in situ, in which the cancer has not yet invaded outside the duct (or tube) in which it started (Tis, N0, M0)

Stage IA:
The tumour is 2 cm or smaller in the pancreas. It has not spread to lymph nodes or other parts of the body (T1, N0, M0)

Stage IB:
A tumour larger than 2 cm is in the pancreas. It has not spread to lymph nodes or other parts of the body (T2, N0, M0)

Stage IIA:
A tumour extends beyond the pancreas, but the tumour has not spread to nearby arteries or veins. It has not spread to any lymph nodes or other parts of the body (T3, N0, M0)

Stage IIB:
A tumour of any size has not spread to nearby arteries or veins. It has spread to lymph nodes but not to other parts of the body (T1, T2, or T3; N1; M0)

Stage III:
A tumour has spread to nearby arteries, veins, and/or lymph nodes but has not spread to other parts of the body (T4, N1, M0)

Stage IV:
Any tumour that has spread to other parts of the body (any T, any N, M1)

Recurrent: Recurrent cancer is cancer that comes back after treatment. If there is a recurrence, the cancer may need to be staged again (called re-staging) using the system above

Using information from staging tests, one's doctor assigns a pancreatic cancer stage. The stages of pancreatic cancer are:

Stage I
Cancer is confined to the pancreas

Stage II
Cancer has spread beyond the pancreas to nearby tissues and organs and may have spread to the lymph nodes

Stage III
Cancer has spread beyond the pancreas to the major blood vessels around the pancreas and may have spread to the lymph nodes

Stage IV
Cancer has spread to distant sites beyond the pancreas, such as the liver, lungs and the lining that surrounds your abdominal organs (peritoneum).
(Cancer.Net; Mayo Clinic).

Where Pancreatic Cancer May Spread to in the Body
Should pancreatic cancer spread (metastasise) in the body, it may spread as indicated below:

Cancer Type:	Main Sites of Metastasis (Spread)
Bladder	Bone, liver, lung
Breast	Bone, brain, liver, lung
Colon	Liver, lung
Colorectal	Liver, lung, peritoneum (lining of abdomen)
Kidney	Adrenal gland, bone, brain, liver, lung
Lung	Adrenal gland, bone, brain, liver, other lung
Melanoma	Bone, brain, liver, lung, skin, muscle
Ovary	Liver, lung, peritoneum (lining of abdomen)
Pancreas	Liver, lung, peritoneum (lining of abdomen)
Prostate	Adrenal gland, bone, liver, lung
Stomach	Liver, lung, peritoneum (lining of abdomen), ovaries
Thyroid	Bone, liver, lung
Uterus	Boner, liver, lung, peritoneum (lining of abdomen), vagina
Non-melanoma skin cancer	Very rare: lymph nodes, lung, bone (if in head/neck region)

(National Cancer Institute)

Prognosis (Outlook)
While pancreatic cancer survival rates have been improving from decade to decade, the disease is still considered largely incurable.

Survival Rates - According to the American Cancer Society, for all stages of pancreatic cancer combined, the one-year relative survival rate is 20%, and the five-year rate is 4%. These low survival rates are attributable to the fact that fewer than 20% of patients' tumours are confined to the pancreas at the time of diagnosis - in most cases, the malignancy has already progressed to the point where surgical removal is impossible.

In those cases where resection can be performed, the average survival rate is 18 to 20 months. The overall five-year survival rate is about 10%, although this can rise as high as 20% to 25% if the tumour is removed completely and when cancer has not spread to lymph nodes.

Tumour Size - Tumour size does appear to impact survival rates. The larger the tumour, the less likely it is to be cured by resection. However, even large tumours may be removed and a number of patients with tumours greater than 4-5 cm appear to have been cured by surgery. There is increasing evidence that the best pancreatic cancer outcomes are achieved at major medical centres with extensive experience -- those that perform frequent Whipple procedures annually.

Progression - In patients where a cure is not possible, progression of the disease may be accompanied by progressive weakness, weight loss and pain. Effective techniques for pain management are widely available today and used by physicians experienced in the care of

pancreatic cancer patients. The techniques include nerve blocks and various drugs that can be taken by mouth or injection. There are also a variety of effective techniques available to treat bile duct obstruction which may produce jaundice and stomach obstruction caused by growth of the tumour. Both surgical and non-surgical techniques may be effective.

Palliative therapy may be chosen for treatment with patients that have incurable or uncontrollable pancreatic cancer. Palliative therapy is treatment given to relieve the symptoms and reduce the suffering caused by cancer. Palliative therapy aims to improve *quality of life* by controlling pain and other problems caused by this disease.
(Hirshberg Foundation for Pancreatic Research; University of Cincinnati Pancreatic Disease Center; National Cancer Institute).

Treatment of Pancreatic Cancer
When pancreatic cancer is diagnosed or even suspected, the doctor needs to know the extent (also known as the *stage*) of disease to plan the best treatment. Staging is a careful attempt to find out the size of the tumour in the pancreas, whether the cancer has spread and if so, to what parts of the body. At the time of diagnosis, only about 20% of pancreatic cancers can be removed by surgery.

Surgery for pancreatic cancer is a major operation. The surgeon may remove all or part of the pancreas. The extent of surgery depends on the location and size of the tumour, the stage of the disease, and the patient's general health.

- *Whipple procedure* - If the tumour is in the head (the widest part) of the pancreas, the surgeon removes the head of the pancreas and part of the small intestine, bile duct, and stomach. The surgeon may also remove other nearby tissues such as lymph nodes

- *Distal pancreatectomy* - The surgeon removes the body and tail of the pancreas if the tumour is in either of these parts. The surgeon commonly also removes the *spleen*

- *Total pancreatectomy* - The surgeon removes the entire pancreas, part of the small intestine, a portion of the stomach, the common bile duct, the gallbladder, the spleen, and nearby lymph nodes

Sometimes the cancer cannot be completely removed. If the tumour is blocking the common bile duct or small intestine, the surgeon can create a bypass. A bypass allows fluids to flow through the digestive tract. It can help relieve jaundice, pain, nausea and vomiting that often result from a blockage.

The doctor often can relieve blockage without doing bypass surgery. The doctor (generally, a specialist known as a gastroenterologist) uses an endoscope to place a *stent* in the blocked area. A stent is a tiny plastic or metal mesh tube that helps keep the duct or duodenum open.

After surgery, some patients are fed liquids *intravenously* (by IV) and through feeding tubes placed into the abdomen. Patients slowly return to eating solid foods by mouth. A few weeks after surgery, the feeding tubes are removed.

Removal of part or all of the pancreas may make it hard for a patient to digest foods. The health care team can suggest a diet plan and medicines to help relieve diarrhoea, pain,

cramping, or feelings of fullness. During the recovery from surgery, the doctor will carefully monitor the patient's diet and weight. At first, a patient may have only liquids and may receive extra nourishment intravenously or by feeding tube into the intestine. Solid foods are added to the diet gradually.

Also, patients may not have enough pancreatic enzymes or hormones after surgery. Those who do not have enough insulin may develop diabetes. The doctor can give the patient insulin, other hormones and enzymes to help maintain good nutrition and proper control of the blood sugar.

When a pancreatic cancer is removed surgically, often additional treatments such as radiation therapy and chemotherapy are recommended.

Radiation therapy (also called radiotherapy) uses high-energy rays to kill cancer cells. A large machine directs radiation at the abdomen. Radiation therapy may be given alone, or with surgery, chemotherapy, or both.

Radiation therapy affects cancer cells only in the treated area. For radiation therapy, patients go to the hospital or clinic, often 5 days a week for several weeks. Radiation therapy may cause patients to become very tired as treatment continues. Resting is important, but doctors usually advise patients to try to stay as active as they can. In addition, when patients receive radiation therapy, the skin in the treated area may sometimes become red, dry, and tender.

Radiation therapy to the abdomen may cause nausea, vomiting, diarrhoea, or other problems with digestion. The health care team can offer medicine or suggest diet changes to control these problems. For most patients, the side effects of radiation therapy go away when treatment is over.

Chemotherapy is the use of drugs to kill cancer cells. Doctors also give chemotherapy to help reduce pain and other problems caused by pancreatic cancer. The side effects of chemotherapy depend mainly on the drugs and the doses the patient receives as well as how the drugs are given. In addition, as with other types of treatment, side effects vary from patient to patient. It may be given alone, with radiation, or with surgery and radiation.

Chemotherapy is an *outpatient* treatment given at the hospital, clinic, or doctor's office. Chemotherapy, mainly given by injection, affects rapidly dividing cells throughout the body, including blood cells. Blood cells fight infection, help the blood to clot and carry oxygen to all parts of the body.

When anticancer drugs damage healthy blood cells, patients are more likely to get infections, may bruise or bleed easily, and may have less energy. Cells in hair roots and cells that line the stomach and intestines also divide rapidly. As a result, patients may lose their hair and may have other side effects such as poor appetite, nausea and vomiting, diarrhoea, or mouth sores. Usually, these side effects go away gradually during the recovery periods between treatments or after treatment is over. The health care team can suggest ways to relieve side effects.
(University of Cincinnati Pancreatic Disease Center; National Cancer Institute; MacMillan Cancer Support).

Celiac Plexus Block to Relieve Pain

A celiac plexus block is an injection of local anaesthetic into or around the celiac plexus of nerves (a bundle of nerves within the abdomen) that surrounds the aorta, the main artery in the abdomen. Normally these nerves control basic nerve functions. In certain conditions, these nerves can carry pain information from the gut or abdominal organ tissues back to the spinal cord and brain.

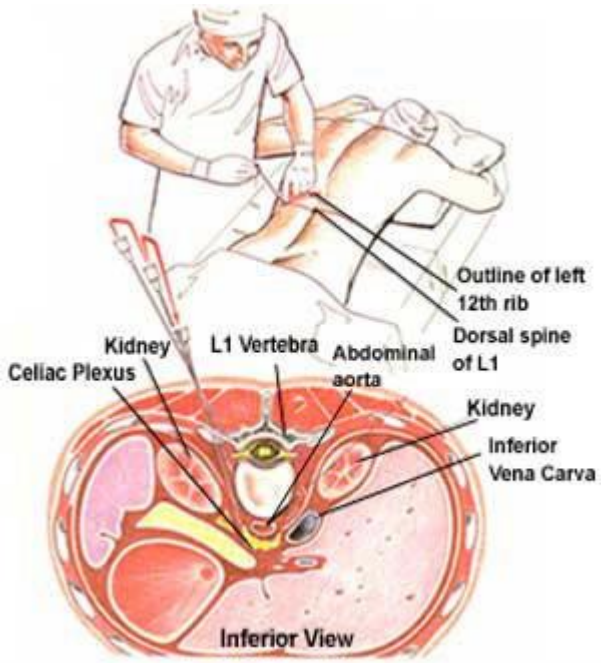
Celiac Plexus Block Procedure is available in South Africa

A celiac plexus block is performed to block the celiac plexus of nerves that go various organs and parts of the abdomen. This may in turn reduce pain in the abdomen. It is done as a part of the treatment of Chronic Pancreatitis and other types of Chronic Abdominal Pain.

The actual injection takes from 10 to 30 minutes. The injection consists of a local anaesthetic. On occasion, epinephrine, clonidine or a steroid medication may be added to prolong the effects of the celiac plexus block.

The procedure involves inserting a needle through skin and deeper tissues. So, there is some pain involved. However, the doctor usually numbs the skin and deeper tissues with a local anaesthetic using a very thin needle before inserting the actual block needle. Most of the patients also receive intravenous sedation that makes the procedure easier to tolerate.

Celiac Block Procedure – the procedure is done with the patient lying on his/her stomach. Patients are monitored with an electrocardiogram (EKG), blood pressure cuff and an oxygen-monitoring device. The celiac plexus block is performed under sterile conditions. The skin on the back is cleaned with antiseptic solution and the skin is then numbed with a local anaesthetic. An X-ray is used to guide the needle or needles into the proper position along the outside of the spine. Once in place, a test dose of dye is used to confirm that the injected medication will spread in an appropriate area. Once established, the injection takes place gradually over several minutes. The physician will use the X-ray to evaluate the spread of the injected medication. When a sufficient area is covered, the injection will be over. When done, the needle is removed and a Band Aid is applied.



[Picture Credit: Celiac Plexus Block Procedure]

Immediately after the injection, one may feel the abdomen getting warm or feeling a bit different. In addition, one may notice that one's abdominal pain may be gone or quite less. One may also notice some temporary weakness or numbness in the abdominal wall or leg, although this is actually not a desired effect of a celiac plexus block and usually wears off quickly.

After the procedure - once the procedure is complete the patient can immediately go home. Patients are advised to take it easy for a day or so after the procedure. Patients may perform the activities they can tolerate. Some patients may even go for immediate physical therapy
.
Unless there are complications, you should be able to return to your work the next day. The most common thing you may feel is soreness in the back at the injection site.
The local anaesthetic wears off in a few hours. However, the blockade of celiac plexus nerves may last for many more hours or days. Usually, the duration of relief gets longer after each injection.

Patients who respond to the first injection, will be recommended for repeat injections. Usually, a series of such injections is needed to effectively treat the pain problem. Some individuals may need only 2 to 4 procedures while some may need more than 10. The response to such injections varies from patient to patient.

Safety of the procedure - this procedure is safe. However, with any procedure there are risks, side effects and possibility of complications. The most common side effect is temporary pain or soreness at the injection site. Uncommon risks involve bleeding, infection, spinal block, epidural block, collapsed lung and injection into blood vessels and surrounding organs. Fortunately, the serious side effects and complications are uncommon.
(Ohio Health; Cleveland Clinic).

Lifestyle Changes After a Diagnosis of Pancreatic Cancer
Lifestyle changes can be helpful in a variety of important ways:

- Strengthening your body so that you can withstand some of the rigors of treatment
- Optimizing the function of your immune system to aid in the fight against cancer
- Improving your emotional outlook, so you can enjoy life to the fullest, even during treatment for pancreatic cancer

General Guidelines

- Stop smoking
- Stop drinking alcohol
- Prevent diabetes
- Follow a nutritious diet, including 5 portions of fresh fruits (in season) and vegetables
- Participate in a reasonable level of exercise
- Seek support
- Reduce the risk of infection
- Rest when tired

(Care New England).

About Clinical Trials
Clinical trials are research studies that involve people. These studies test new ways to prevent, detect, diagnose, or treat diseases. People who take part in cancer clinical trials have an opportunity to contribute to scientists' knowledge about cancer and to help in the development of improved cancer treatments. They also receive state-of-the-art care from cancer experts.

Types of Clinical Trials

Cancer clinical trials differ according to their primary purpose. They include the following types:

Treatment - these trials test the effectiveness of new treatments or new ways of using current treatments in people who have cancer. The treatments tested may include new drugs or new combinations of currently used drugs, new surgery or radiation therapy techniques, and vaccines or other treatments that stimulate a person's immune system to fight cancer. Combinations of different treatment types may also be tested in these trials.

Prevention - these trials test new interventions that may lower the risk of developing certain types of cancer. Most cancer prevention trials involve healthy people who have not had cancer; however, they often only include people who have a higher than average risk of developing a specific type of cancer. Some cancer prevention trials involve people who have had cancer in the past; these trials test interventions that may help prevent the return (recurrence) of the original cancer or reduce the chance of developing a new type of cancer.

Screening - these trials test new ways of finding cancer early. When cancer is found early, it may be easier to treat and there may be a better chance of long-term survival. Cancer screening trials usually involve people who do not have any signs or symptoms of cancer. However, participation in these trials is often limited to people who have a higher than average risk of developing a certain type of cancer because they have a family history of that type of cancer or they have a history of exposure to cancer-causing substances (e.g., cigarette smoke).

Diagnostic - these trials study new tests or procedures that may help identify, or diagnose, cancer more accurately. Diagnostic trials usually involve people who have some signs or symptoms of cancer.

Quality of life or supportive care - these trials focus on the comfort and quality of life of cancer patients and cancer survivors. New ways to decrease the number or severity of side effects of cancer or its treatment are often studied in these trials. How a specific type of cancer or its treatment affects a person's everyday life may also be studied.

Where Clinical Trials are Conducted

Cancer clinical trials take place in cities and towns in doctors' offices, cancer centres and other medical centres, community hospitals and clinics. A single trial may take place at one or two specialised medical centres only or at hundreds of offices, hospitals, and centres.

Each clinical trial is managed by a research team that can include doctors, nurses, research assistants, data analysts, and other specialists. The research team works closely with other health professionals, including other doctors and nurses, laboratory technicians, pharmacists, dieticians, and social workers, to provide medical and supportive care to people who take part in a clinical trial.

Research Team

The research team closely monitors the health of people taking part in the clinical trial and gives them specific instructions when necessary. To ensure the reliability of the trial's results, it is important for the participants to follow the research team's instructions. The instructions may include keeping logs or answering questionnaires. The research team may

also seek to contact the participants regularly after the trial ends to get updates on their health.

Clinical Trial Protocol

Every clinical trial has a protocol, or action plan, that describes what will be done in the trial, how the trial will be conducted, and why each part of the trial is necessary. The protocol also includes guidelines for who can and cannot participate in the trial. These guidelines, called eligibility criteria, describe the characteristics that all interested people must have before they can take part in the trial. Eligibility criteria can include age, sex, medical history, and current health status. Eligibility criteria for cancer treatment trials often include the type and stage of cancer, as well as the type(s) of cancer treatment already received.

Enrolling people who have similar characteristics helps ensure that the outcome of a trial is due to the intervention being tested and not to other factors. In this way, eligibility criteria help researchers obtain the most accurate and meaningful results possible.

National and International Regulations

National and international regulations and policies have been developed to help ensure that research involving people is conducted according to strict scientific and ethical principles. In these regulations and policies, people who participate in research are usually referred to as "human subjects."

Informed Consent

Informed consent is a process through which people learn the important facts about a clinical trial to help them decide whether or not to take part in it, and continue to learn new information about the trial that helps them decide whether or not to continue participating in it.

During the first part of the informed consent process, people are given detailed information about a trial, including information about the purpose of the trial, the tests and other procedures that will be required, and the possible benefits and harms of taking part in the trial. Besides talking with a doctor or nurse, potential trial participants are given a form, called an informed consent form, that provides information about the trial in writing. People who agree to take part in the trial are asked to sign the form. However, signing this form does not mean that a person must remain in the trial. Anyone can choose to leave a trial at any time—either before it starts or at any time during the trial or during the follow-up period. It is important for people who decide to leave a trial to get information from the research team about how to leave the trial safely.

The informed consent process continues throughout a trial. If new benefits, risks, or side effects are discovered during the course of a trial, the researchers must inform the participants so they can decide whether or not they want to continue to take part in the trial. In some cases, participants who want to continue to take part in a trial may be asked to sign a new informed consent form.

New interventions are often studied in a stepwise fashion, with each step representing a different "phase" in the clinical research process. The following phases are used for cancer treatment trials:

Phases of a Clinical Trial

Phase 0. These trials represent the earliest step in testing new treatments in humans. In a phase 0 trial, a very small dose of a chemical or biologic agent is given to a small number of people (approximately 10-15) to gather preliminary information about how the agent is processed by the body (pharmacokinetics) and how the agent affects the body (pharmacodynamics). Because the agents are given in such small amounts, no information is obtained about their safety or effectiveness in treating cancer. Phase 0 trials are also called micro-dosing studies, exploratory Investigational New Drug (IND) trials, or early phase I trials. The people who take part in these trials usually have advanced disease, and no known, effective treatment options are available to them.

Phase I (also called phase 1). These trials are conducted mainly to evaluate the safety of chemical or biologic agents or other types of interventions (e.g., a new radiation therapy technique). They help determine the maximum dose that can be given safely (also known as the maximum tolerated dose) and whether an intervention causes harmful side effects. Phase I trials enrol small numbers of people (20 or more) who have advanced cancer that cannot be treated effectively with standard (usual) treatments or for which no standard treatment exists. Although evaluating the effectiveness of interventions is not a primary goal of these trials, doctors do look for evidence that the interventions might be useful as treatments.

Phase II (also called phase 2). These trials test the effectiveness of interventions in people who have a specific type of cancer or related cancers. They also continue to look at the safety of interventions. Phase II trials usually enrol fewer than 100 people but may include as many as 300. The people who participate in phase II trials may or may not have been treated previously with standard therapy for their type of cancer. If a person has been treated previously, their eligibility to participate in a specific trial may depend on the type and amount of prior treatment they received. Although phase II trials can give some indication of whether or not an intervention works, they are almost never designed to show whether an intervention is better than standard therapy.

Phase III (also called phase 3). These trials compare the effectiveness of a new intervention, or new use of an existing intervention, with the current standard of care (usual treatment) for a particular type of cancer. Phase III trials also examine how the side effects of the new intervention compare with those of the usual treatment. If the new intervention is more effective than the usual treatment and/or is easier to tolerate, it may become the new standard of care.

Phase III trials usually involve large groups of people (100 to several thousand), who are randomly assigned to one of two treatment groups, or “trial arms”: (1) a control group, in which everyone in the group receives usual treatment for their type of cancer, or 2) an investigational or experimental group, in which everyone in the group receives the new intervention or new use of an existing intervention. The trial participants are assigned to their individual groups by random assignment, or randomisation. Randomisation helps ensure that the groups have similar characteristics. This balance is necessary so the researchers can have confidence that any differences they observe in how the two groups respond to the treatments they receive are due to the treatments and not to other differences between the groups.

Randomisation is usually done by a computer program to ensure that human choices do not influence the assignment to groups. The trial participants cannot request to be in a particular

group, and the researchers cannot influence how people are assigned to the groups. Usually, neither the participants nor their doctors know what treatment the participants are receiving.

People who participate in phase III trials may or may not have been treated previously. If they have been treated previously, their eligibility to participate in a specific trial may depend on the type and the amount of prior treatment they received.

In most cases, an intervention will move into phase III testing only after it has shown promise in phase I and phase II trials.

Phase IV (also called phase 4). These trials further evaluate the effectiveness and long-term safety of drugs or other interventions. They usually take place after a drug or intervention has been approved by the medicine regulatory office for standard use. Several hundred to several thousand people may take part in a phase IV trial. These trials are also known as post-marketing surveillance trials. They are generally sponsored by drug companies.

Sometimes clinical trial phases may be combined (e.g., phase I/II or phase II/III trials) to minimize the risks to participants and/or to allow faster development of a new intervention.

Although treatment trials are always assigned a phase, other clinical trials (e.g., screening, prevention, diagnostic, and quality-of-life trials) may not be labelled this way.

Use of Placebos

The use of placebos as comparison or "control" interventions in cancer treatment trials is rare. If a placebo is used by itself, it is because no standard treatment exists. In this case, a trial would compare the effects of a new treatment with the effects of a placebo. More often, however, placebos are given along with a standard treatment. For example, a trial might compare the effects of a standard treatment plus a new treatment with the effects of the same standard treatment plus a placebo.

Possible benefits of taking part in a clinical trial

The benefits of participating in a clinical trial include the following:

- Trial participants have access to promising new interventions that are generally not available outside of a clinical trial.
- The intervention being studied may be more effective than standard therapy. If it is more effective, trial participants may be the first to benefit from it.
- Trial participants receive regular and careful medical attention from a research team that includes doctors, nurses, and other health professionals.
- The results of the trial may help other people who need cancer treatment in the future.
- Trial participants are helping scientists learn more about cancer (e.g., how it grows, how it acts, and what influences its growth and spread).

Potential harms associated with taking part in a clinical trial

The potential harms of participating in a clinical trial include the following:

- The new intervention being studied may not be better than standard therapy, or it may have harmful side effects that doctors do not expect or that are worse than those associated with standard therapy.
- Trial participants may be required to make more visits to the doctor than they would if they were not in a clinical trial and/or may need to travel farther for those visits.

Correlative research studies, and how they are related to clinical trials

In addition to answering questions about the effectiveness of new interventions, clinical trials provide the opportunity for additional research. These additional research studies, called correlative or ancillary studies, may use blood, tumour, or other tissue specimens (also known as 'biospecimens') obtained from trial participants before, during, or after treatment. For example, the molecular characteristics of tumour specimens collected during a trial might be analysed to see if there is a relationship between the presence of a certain gene mutation or the amount of a specific protein and how trial participants responded to the treatment they received. Information obtained from these types of studies could lead to more accurate predictions about how individual patients will respond to certain cancer treatments, improved ways of finding cancer earlier, new methods of identifying people who have an increased risk of cancer, and new approaches to try to prevent cancer.

Clinical trial participants must give their permission before biospecimens obtained from them can be used for research purposes.

When a clinical trial is over

After a clinical trial is completed, the researchers look carefully at the data collected during the trial to understand the meaning of the findings and to plan further research. After a phase I or phase II trial, the researchers decide whether or not to move on to the next phase or stop testing the intervention because it was not safe or effective. When a phase III trial is completed, the researchers analyse the data to determine whether the results have medical importance and, if so, whether the tested intervention could become the new standard of care.

The results of clinical trials are often published in peer-reviewed scientific journals. Peer review is a process by which cancer research experts not associated with a trial review the study report before it is published to make sure that the data are sound, the data analysis was performed correctly, and the conclusions are appropriate. If the results are particularly important, they may be reported by the media and discussed at a scientific meeting and by patient advocacy groups before they are published in a journal. Once a new intervention has proven safe and effective in a clinical trial, it may become a new standard of care.
(National Cancer Institute).

Medical Disclaimer

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