Stomach cancer

What is stomach cancer?

Stomach (gastric) cancer usually develops slowly over several years. It should not be confused with other cancers in the abdomen (i.e. the region between the chest and pelvic area). These other cancers (e.g. affecting the large intestine [colon], liver, pancreas or small intestine [duodenum, jejunum, ileum]) may have different symptoms, prognosis (outlook) and treatments.

Position of the stomach in the abdomen

Before stomach cancer occurs, pre-cancerous changes usually arise in the innermost layer of the stomach wall (called the mucosa). These changes rarely cause any symptoms and so usually go unnoticed. The stomach wall has five layers:

1. The mucosa produces digestive enzymes (proteins) and gastric acid and is where most stomach tumours start.
2. The submucosa is a structural, supporting layer.
3. The muscularis propria is a muscular layer. Its function is to contract and to mix the stomach contents.
4. The subserosa is “wrapping” or a structural, supporting layer of connective tissue.
5. The serosa, the outermost layer, also has a structural function, similar to that of the subserosa.

**The 5 layers of the stomach**

These layers are central to defining: (a) the cancer stage (extent); and (b) a patient’s prognosis. When a cancer (also called tumour) extends from the mucosa into deeper layers of the stomach wall, the disease stage is more advanced and the prognosis is worse.

Most cases of stomach cancer start in the innermost layer (mucosa), but tumours can start in any of the five stomach regions *(see graphic below)*:

1. Cardia — this is closest to the gullet (oesophagus) and entrance to the stomach.
2. Fundus — this is the top part of the stomach.
3. Body (corpus) — this is the region between the top and bottom of the stomach.
4. Antrum — in this region, gastric juice and food are mixed.
5. Pylorus — this is, essentially, the stomach “valve” and controls the rate at which stomach contents are released into the small intestine.

**The 5 regions of the stomach**
Tumours that start in different parts of the stomach may have different symptoms and outcomes. Therefore, tumour location has a major bearing on which treatment is offered. A tumour at the top of the cardia (the gastro-oesophageal junction), for example, will be staged and treated as an oesophageal cancer.

The spread or metastasis of stomach cancer varies. That is, a tumour can extend through the stomach wall and invade nearby organs. It may also spread via the lymphatic system to local lymph nodes. Stomach cancer can also spread via the bloodstream to other organs (e.g. bones, liver, lung). If stomach cancer does spread, then a patient’s prognosis is worse.

Who is most at risk of getting stomach cancer?

In New Zealand, stomach cancer is less common than many other cancers (like breast, prostate, lung or bowel cancer). Around 390 people are diagnosed with stomach cancer in New Zealand each year.¹ A study conducted between 2003 and 2009 found that approximately 5 in every 100,000 people develop stomach cancer.² However, the rates were higher in Maori (about 7 cases per 100,000 people) and Pacific Islanders (approximately 8 per 100,000) than in other ethnic groups.³

Stomach cancer occurs more frequently in men than women. Most people with the disease are elderly (aged in their late 60s to 80s), and the average age at diagnosis is 67 years. In New Zealand, Maori and Pacific Island people tend to develop stomach cancer at a younger age (e.g. in their in their late 50s and early 60s) than European New Zealanders do.²

*Helicobacter pylori* (a type of bacteria) is considered to be a potential cause of stomach cancer, particularly in the lower parts of the stomach. Long-term infection with *H. pylori* causes inflammation, stomach ulcers, and precancerous changes in the stomach mucosa.

*Helicobacter pylori*, a type of bacteria that lives in the stomach and causes inflammation that might lead to cancer
Other factors that may increase a person’s risk of developing stomach cancer include the following: mucosa-associated lymphoid tissue (MALT) lymphoma; ingestion of large quantities of salted fish and meat, smoked foods and pickled vegetables; smoking; obesity; previous stomach surgery for non-cancerous conditions (e.g. ulcers); vitamin B₁₂ deficiency and pernicious anaemia (lack of red blood cells); blood group A; genetics (heredity) and a family history of stomach cancer; stomach polyps (adenomas; non-cancerous growths in the stomach mucosa); Epstein-Barr virus infection; some occupations (e.g. working in the coal, metal or rubber industries); and common variable immune deficiency (i.e. when people don’t produce enough antibodies to fight infections).

**Major types of stomach cancer**

Almost all cases of stomach cancer (around 90%) are adenocarcinoma and start in the mucosa of the stomach wall. Approximately 4% of stomach cancers are lymphomas, which affect immune system tissue in the stomach wall. Approximately 3% of stomach cancers are carcinoid tumours. These tumours start in hormone (“chemical messenger”)-producing stomach cells and generally do not spread to other tissues. Gastrointestinal stromal tumours (GIST) are rare. They begin in specialised stomach cells called the interstitial cells of Cajal; some are benign (non-cancerous), whereas others are cancerous.

Because adenocarcinoma is the most common type of stomach cancer, it is the key focus of these pages.

**How is stomach cancer diagnosed?**

**Signs and symptoms**

The initial stages of stomach cancer rarely have symptoms, so it easy for the cancer to go unrecognised. However, signs and symptoms of early-stage stomach cancer can include the following:

- Feeling full after eating a small meal is eaten
- Fluid accumulation or swelling in the abdomen
- Indigestion or heartburn
- Loss of appetite
- Loss of bodyweight
- Nausea
- Pain in the abdomen
- Reduced red blood cell count (anaemia)
- Slight tenderness in the abdomen, usually just above the “belly button” (navel)
- Vomiting (with or without blood).

Most of these symptoms are also linked with conditions other than cancer (e.g. a stomach viral infection; ulcer), so your doctor will need to do other tests to work out the cause.
Diagnostic tests

Firstly, your doctor will ask questions about your current and previous health (e.g. bloating, eating problems, pain, etc.) and about possible risk factors for stomach cancer (e.g. diet, and smoking and work history). Your doctor will also examine your abdomen to look for any abnormalities. If the doctor’s initial examination suggests stomach cancer, more detailed tests will be needed. These include endoscopy (inspection of the stomach lining), collection (biopsy) and microscopic assessment of cells from the stomach wall, and imaging tests (e.g. x-rays, various scans).

Upper endoscopy (or EGD)

Endoscopy is the key test used to identify stomach cancer. The doctor will insert an endoscope — a narrow, flexible tube with a small camera at the end — into your throat. The doctor can then view the gullet (oesophagus), stomach and upper part of the small intestine. If any unusual areas are seen, tissue samples (biopsies) can be collected from instruments inserted into the endoscope. These samples are sent to a laboratory and then viewed through a microscope.

Endoscopic ultrasound (EUS)

Ultrasound imaging uses sound waves and echoes to create images of the stomach wall, local lymph nodes and other nearby structures, and EUS is done using an endoscope. EUS may be used to identify the extent of cancer spread within the stomach, and to assist the doctor in obtaining cell samples (this is called EUS-guided needle biopsy).

Tissue biopsy

Looking at the cells from the stomach under a microscope is the only way to definitively diagnose stomach cancer. Biopsy samples are usually obtained during endoscopy. If microscopic assessment of cells reveals adenocarcinoma, then cells can be tested for the presence of HER2/neu. This is a growth-promoting gene (protein) that can be permanently “switched on” in some cancers, including stomach cancer. These cancers are then referred to as HER2-positive. Such cancers can be treated with therapies that target the HER2/neu gene (e.g. trastuzumab [Herceptin®]; see Targeted treatments).

X-rays

Although x-rays are used less frequently than endoscopy for stomach cancer diagnosis, they are sometimes appropriate for some people. The patient drinks a chalky, white solution containing barium, which coats the areas to be viewed. Various x-rays are then taken to obtain pictures of the inside lining of the upper gastrointestinal “pipes”.
CT scan

CT stands for “computed tomography” and it is sometimes also called a CAT scan. A CT scan provides exact details about the size, shape and position of any stomach cancer. It can be used to decide whether surgery is an appropriate treatment option. It can also highlight any large lymph nodes containing cancer that has spread from the stomach.

MRI or PET scan

An MRI (magnetic resonance imaging) or PET (positron emission tomography) scan may be used to try to picture any spread of stomach cancer to other parts of the body; doctors generally use CT scans to look at the stomach.

How is stomach cancer treated?

This section provides an overview of treatments for Stomach Cancer. Remember each person is different and your doctor will discuss with you the best treatment options for the particular type of cancer you have.

Before treatment, the diagnosis of stomach cancer must be confirmed and the disease “staged”. Basically, when stomach cancer is staged, the doctor decides how far the disease has spread. The cancer’s stage will then define treatment and prognosis. The tumour-node-metastasis (TNM) staging system is widely used, but this is complex. Essentially, T describes the size of the main tumour; N indicates whether cancer has spread to local (nearby) lymph nodes; and M outlines whether the cancer has spread to other organs. T, N and M are each assigned a score, according to disease severity. These numbers are then combined, and an overall stage grouping (0, I, II, III or IV) is assigned to the cancer: 0 is the least severe; IV is the most severe. There is no distinction in the TNM staging system between resectable (removable by surgery) and unresectable stomach cancer. However, resection is more likely to be successful in early-stage stomach cancer.

Four key treatment options

After diagnosis and staging, treatment is usually selected from two or more of the following options:

2. Chemotherapy.
3. Targeted therapy.
4. Radiation therapy.

Surgery

Surgery can be performed in people with stage 0–III stomach cancer, and can potentially cure the disease. Depending on the extent of tumour spread, all or part of the stomach, and sometimes other organs, may have to be
removed. Even in patients with widespread cancer, palliative (symptom-relieving) surgery may be helpful. Such surgery may help to prevent tumour bleeding and prevent tumour growth from blocking the stomach.

Chemotherapy

Chemotherapy consists of injected or swallowed medicines that enter the bloodstream and go everywhere in the body. Chemotherapy can be used:

- Before surgery (neoadjuvant treatment) — this is designed to shrink the tumour and assist with surgery. It may also prevent the cancer from coming back and prolong survival.
- After surgery (adjuvant treatment) — the aim of this treatment is to kill any tumour cells that may remain after surgery because the surgeon could not see them. In stomach cancer, adjuvant chemotherapy is regularly combined with radiation therapy (chemoradiation).
- As the main treatment in advanced (metastatic) stomach cancer that has spread to several organs.

Chemotherapy is usually given in cycles. That is, a treatment phase is generally followed by a “rest” phase to allow the body to recover. The next cycle of treatment then starts. In stomach cancer, chemotherapy is often used in combination with targeted treatments.

Biological or targeted treatments

This form of treatment specifically targets changes inside tumour cells that are helping the tumour to grow. Approximately 20% of stomach cancers have too much of the growth-promoting protein HER2/neu and are therefore HER2-positive.

Herceptin (trastuzumab)® is a biologic anti-cancer agent that is approved in New Zealand for HER2-positive advanced gastric (stomach) cancer.

Radiation therapy

Radiotherapy uses x-rays or other high-energy rays or particles to kill tumour cells. In stomach cancer, radiation therapy can be used:

- In the neoadjuvant setting (before surgery), together with chemotherapy.
- In the adjuvant setting (after surgery), particularly with chemotherapy drugs such as capecitabine. This strategy may prolong patient survival by delaying or preventing tumour from coming back.
- In advanced disease; i.e. to slow tumour growth and reduce symptoms such as bleeding, eating problems and pain.

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External beam radiation therapy (EBRT) targets radiation from outside the body onto the tumour and is often used to treat stomach cancer.

Reference
Herceptin Consumer Panel

Herceptin® (trastuzumab), 150mg and 440mg vials, is a Prescription Medicine used to treat patients with metastatic (spreading) cancer of the stomach who have tumours with a large amount of the HER2 protein. Stomach cancer is also known as gastric cancer.

Do not use Herceptin if: you have had an allergic reaction to trastuzumab or any of the ingredients, benzyl alcohol, or to any medicines that are made using Chinese hamster ovary cells.

Tell your doctor if: you have a history of coronary artery disease, high blood pressure, heart failure, arrhythmia (an abnormal or rapid heartbeat), angina (feeling pain, tightness, heaviness or pressure in the chest), or any other type of heart disease; you are currently taking any other medicines, including medicines for cancer, or if you have previously received chemotherapy treatment with medicines known as anthracyclines; you have breathing or lung problems; you are pregnant or breast-feeding, or plan to become pregnant or breast-feed.

Tell your doctor immediately or go to your nearest Accident and Emergency Centre if you notice any of the following: swelling of your lips, face, tongue or throat with difficulty breathing; severe shortness of breath, difficulty breathing or wheezing; severe chest pain spreading out to the arms, neck, shoulder and/or back; rash, itching or hives on the skin; fever or chills; abnormal or irregular heartbeat; severe swelling of the hands, feet or legs; severe coughing. Possible common side effects may also include: getting tired more easily after light physical activity; shortness of breath, especially when lying down or if it disturbs your sleep; runny or blocked nose or nosebleeds; difficulty sleeping, anxiety or depression; weakness or soreness in muscles and/or joints; increased cough; feeling dizzy, tired, looking pale; flu and/or cold symptoms; frequent infections with fever, severe chills, sore throat or mouth ulcers; hot flushes; diarrhoea; changes in weight; redness, dryness or peeling of the hands or feet; unusual hair loss or thinning; nail problems; eye problems such as producing more tears, swollen runny eyes or conjunctivitis (eye infection).

Herceptin has risks and benefits. Ask your oncologist if Herceptin is right for you. Use strictly as directed. If symptoms continue or you have side effects, see your healthcare professional. For further information on Herceptin, please talk to your healthcare professional or visit www.medsafe.govt.nz for Herceptin Consumer Medicine Information.

Herceptin is not funded by PHARMAC for the treatment of HER2-positive gastric cancer. You will need to pay the full cost of this medicine. A prescription charge and normal oncologist’s fees may apply.

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