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Staging and Grading Cancer

The stage of a cancer is a measure of how much the cancer has grown and spread. Some cancers are also graded by looking at features of the cancer cells, using a microscope or other tests. The stage and grade of a cancer help to say how advanced it is, and how well it may respond to treatment. As a general rule, the earlier the stage and the lower the grade of a cancer, the better the outlook (prognosis).

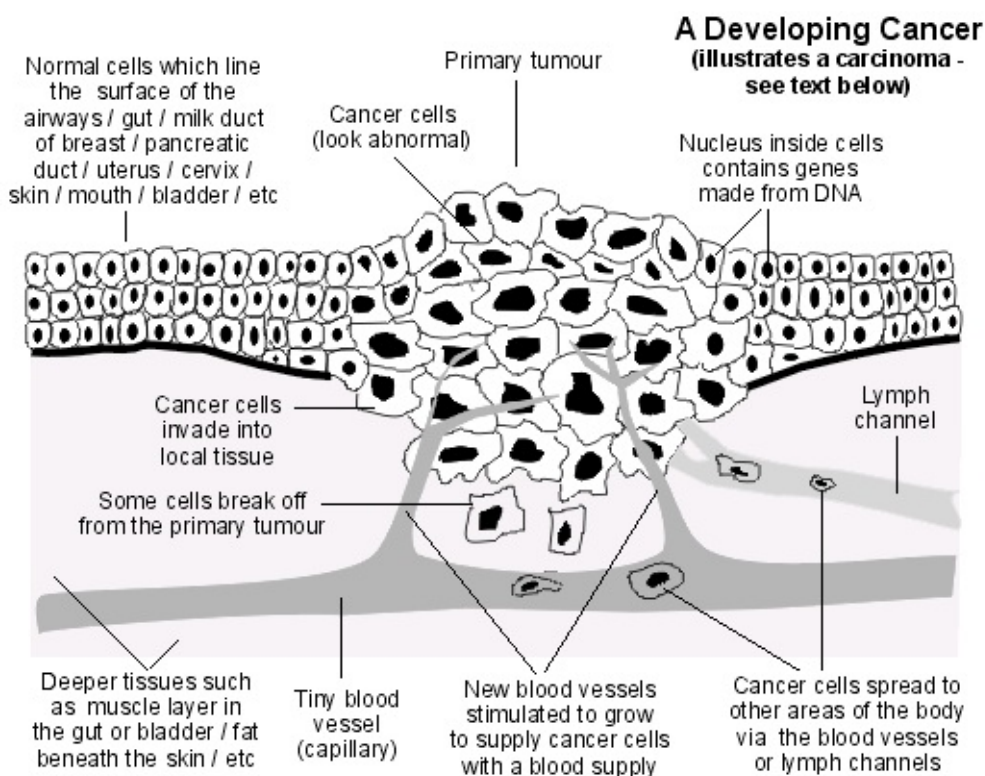
How do cancers grow and spread?

If left untreated, cancers often go through three stages:

1. Local growth and damage to nearby tissues

Cancer cells multiply quickly. A cancerous (malignant) tumour is a lump or growth of tissue made up from cancer cells. Cancerous tumours normally first develop in one site - the primary tumour. However, to get larger, a tumour has to develop a blood supply to obtain oxygen and nourishment for the new and dividing cells. In fact, a tumour would not grow bigger than the size of a pinhead if it did not also develop a blood supply. Cancer cells make chemicals that stimulate tiny blood vessels to grow around them which branch off from the existing blood vessels. This ability for cancer cells to stimulate blood vessels to grow is called angiogenesis.

Cancer cells also have the ability to push through or between normal cells. So, as they divide and multiply, cancer cells invade and damage the local surrounding tissue.



2. Spread to lymph channels and lymph glands (nodes)

Some cancer cells may get into local lymph channels. (The body contains a network of lymph channels which drains the fluid called lymph which bathes and surrounds the body's cells.) The lymph channels drain lymph into lymph nodes. There are many lymph nodes all over the body. A cancer cell may be carried to a lymph node and there it may become trapped. However, it may multiply and develop into a tumour. This is why lymph nodes that are near to a tumour may enlarge and contain cancer cells.

3. Spread to other areas of the body

Some cancer cells may get into a local small blood vessel (capillary). They may then get carried in the bloodstream to other parts of the body. The cells may then multiply to form secondary tumours (metastases) in one or more parts of the body. These secondary tumours may then grow, invade and damage nearby tissues, and spread again.

Types of cancer

There are more than 100 different types of cancer. Each type is classified by the type of cell the cancer originates from. For example, a breast cell, a lung cell, etc. Each type of cancer generally falls into one of three categories:

- Carcinomas are cancers that arise from cells which line a body surface, or the lining of a gland - for example, the skin, or the lining of the gut, mouth, neck of the womb (cervix), airways, etc.
- Sarcomas are cancers that arise from cells which make up the connective tissues such as bones or muscles. For example, an osteosarcoma is a cancer of bone tissue.
- Leukaemias and lymphomas are cancers of cells in bone marrow and lymph glands. For example, **leukaemia** is a cancer of cells that make white blood cells.

The five most common cancers in the UK are breast, lung, prostate, bowel and skin cancer. See separate leaflets called [Breast Cancer](#), [Lung Cancer](#), [Prostate Cancer](#), [Colorectal \(Bowel\) Cancer](#) and [Skin Cancer - An Overview](#) for more details. There are also separate leaflets giving details about other types of cancer.

What is cancer staging?

Staging is a way of describing how much a cancer has grown and spread. A common way of staging cancer is called the TNM classification:

- T stands for tumour - how far the primary tumour has grown locally.
- N stands for nodes - if the cancer has spread to the local lymph glands (nodes).
- M stands for metastases - if the cancer has spread to other parts of the body.

When a cancer is staged, a number is given for each of these three characteristics. For example, in stomach cancer:

- T-1 means the primary tumour is still in the stomach wall. T-3 means the primary tumour has grown right through the stomach wall and T-4 means it is invading nearby structures such as the pancreas.
- N-0 means there is no spread to lymph nodes. N-1 means that some local lymph nodes are affected. N-2 means more extensive spread to local lymph nodes.
- M-0 means there are no metastases. M-1 means that there are metastases to some other area of the body such as the liver or brain.

So, for a certain case of stomach cancer, a doctor may say something like "the stage is T-3, N-1, M-0" which means "the cancer has spread through the stomach wall, there is some spread to local lymph nodes, but no metastases in other parts of the body".

There are other staging classifications which are sometimes used for various cancers. For example, a number system is used for some cancers. That is, a cancer may simply be said to be stage 1, 2, 3 or 4 (or stage I, II, III, or IV). Again, the stages reflect how large the primary tumour has become, and whether the cancer has spread to lymph nodes or other areas of the body. It can become complicated as each number may be subdivided into a, b, c, etc. For example, you may have a cancer at stage 3b. A grade 4 stage is often referred to as an advanced cancer.

Why are cancers staged?

By finding the stage of a cancer, it:

- Helps doctors to advise on what is the best treatment.
- Gives a reasonable indication of outlook (prognosis).
- Describes the cancer in a standard language (a kind of shorthand language) which is useful when doctors discuss patients, and when patients are involved in clinical trials.

For example, if you have bowel cancer and it is diagnosed in an early stage then surgery to remove the tumour may be curative. (That is, if the cancer is confined to the lining of the bowel, with no spread to lymph glands (nodes) or to other parts of the body.) However, if the cancer is in a later stage, the primary tumour may or may not be able to be removed, treatment may also involve chemotherapy, and the chance of a cure is reduced.

How are cancers staged?

After a cancer is first diagnosed, to get an accurate staging you may need various tests. The tests can vary depending on the cancer but may include blood tests and scans such as **CT scan**, **MRI scan**, **bone scan**, **ultrasound scan**, etc. You may even need an operation to look inside part or parts of your body.

Sometimes a cancer cannot be accurately staged until after an operation has been done to remove the primary tumour. The tissues removed with the tumour are examined under a microscope to see how far the cancer cells have grown through the normal tissues, and whether the nearby lymph glands (nodes) contain cancer cells. There are separate leaflets which give details on the various scans and tests which may be advised to stage a cancer.

What is cancer grading?

Some cancers are also graded. A sample of the cancer (a biopsy) is looked at under the microscope or tested in other ways. By looking at certain features of the cells, the cancer can be graded as low, intermediate or high.

- Low-grade means the cancer cells tend to be slow-growing, look quite similar to normal cells (are well differentiated), tend to be less aggressive, and are less likely to spread quickly.
- Intermediate-grade is a middle grade.
- High-grade means the cancer cells tend to be fast growing, look very abnormal (are poorly differentiated), tend to be more aggressive, and are more likely to spread quickly.

Some cancers have a slightly different system of grading. For example, breast cancers are graded 1, 2 or 3 which is much the same as low-grade, intermediate-grade and high-grade. Another example is prostate cancer which is graded by a Gleason score. This is similar to other grading systems with a low Gleason score meaning much the same as low-grade, and a high Gleason score meaning much the same as high-grade.

For some cancers, a doctor will use the information about the grade as well as the stage of the cancer when advising about treatment options, and when giving an opinion about outlook (prognosis).

Further help & information

Cancer Research UK

Angel Building, 407 St John Street, London, EC1V 4AD

Tel: (Nurse team) 0808 800 4040, (Switchboard) 020 7242 0200

Web: www.cancerresearchuk.org

Macmillan Cancer Support

89 Albert Embankment, London, SE1 7UQ

Tel: (Support Line) 0808 808 00 00

Further reading & references

- [What is Cancer?](#); National Cancer Institute
- [Cancer Staging](#); National Cancer Institute

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