

Introduction to Cancer Treatment

Dear Clients,

The treatment of cancer is undergoing a major period of research and development with new treatments being introduced on a regular basis. Many of these are very expensive, with the cost of some new drugs running into tens of thousands of dollars. Cancer is highly emotive, with patients eager to benefit from the latest medical advances. It is therefore important that health underwriters and claims assessors have knowledge of these treatments.

This article introduces some types of treatment being used to combat cancer today. In future articles we will more fully explore each treatment type.

Best wishes,

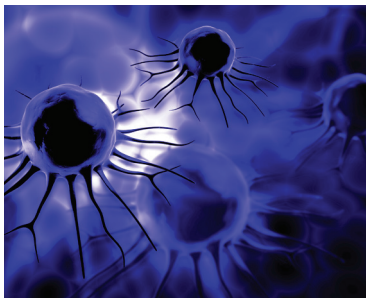
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What Is Cancer?

The human body is made up of billions of cells that group together to form the component parts of the body. Each cell has a nucleus that contains the genes that control the cell and govern what it does, when it will reproduce and when it will die.

Cells reproduce by dividing; a single cell divides to form two identical cells which divide to form four, which divide to form eight, which divide to form sixteen and so on. The new cells remain in the same area of the body and mature to take on the same function as the original cell. This process is normally well-ordered but occasionally breaks down and cells continue reproducing out of control. This unregulated production of cells causes a build-up of abnormal cells forming a lump or tumor.



Tumors are either benign or malignant. Benign tumors (non-cancerous) are made up of abnormal cells that are similar to normal cells and often have a covering of normal cells.

Benign tumors are usually slow-growing, do not invade surrounding tissue and do not spread to other parts of the body. Benign tumors are not normally life-threatening unless they impact on the function of vital organs or structures by applying pressure on them.

Malignant (cancerous) tumors are made up of cancer cells which, unlike normal cells, do not become specialized in nature, reproduce without stopping, invade and destroy surrounding tissue and spread to other parts of the body. It is this uncontrolled growth, with the invasion and destruction of tissue and ability to spread locally and throughout the body via the blood stream or lymphatic systems that makes cancer so destructive.

Cancers are normally named according to the location of the organ in which they originate; e.g., lung or breast cancer, but are also given the following names according to where the cancer cell started:

- Carcinoma – the majority (about 90%) of cancers that start in the skin or tissue covering internal organs, including organs such as the liver, lungs and kidneys, which are derived from the endodermal (inside) and ectodermal (outside) surface layers of the embryo
- Central nervous system – cancers that start in the tissues of the brain or spinal cord
- Leukemia – cancer that starts in blood-producing tissue
- Lymphoma – cancer that begins in the lymphocytes that are responsible for the immune system
- Sarcoma – cancer that starts in the connective tissues, such as bone, fat, muscle, cartilage, blood vessels or other supportive tissues, which are derived from the mesoderm (middle cell layer) of the embryo

Treatment

An increasing number of treatments available to treat cancer can be used either independently or in combination. Some treatments are localized such as surgery or radiotherapy, while others treatments such as chemotherapy treat cancer throughout the body – these are called systemic treatments.

Detailed below are the main types of cancer treatment. Future articles will explore them in more depth. From a claims point of view it is important that each treatment is correctly identified, to confirm if it is covered under the policy terms and conditions and paid claims costs allocated against any relevant benefit limit.

Surgery: The principal type of surgery for the treatment of cancer is the removal of the tumor. The aim here is to remove all or as much of the tumor as is possible. In addition to removing the tumor, a small area of normal tissue surrounding the tumor is removed. This is done to ensure only healthy tissue remains although it is not always possible to remove the complete tumor if it has already invaded other tissue or organs. Some patients receive treatment to shrink the tumor prior to surgery. In addition to removing the tumor, the nearest lymph glands are sometimes removed to help prevent the spread of cancer cells. Surgery is most effective when cancer is confined to a single location.

Surgery can also be performed as a preventative treatment. With the development of genetic tests to identify people who carry the genes that make it more likely that they will develop cancer, the incidence of preventative treatment including surgery is likely to increase. This type of preventative treatment is not normally covered by health insurance.

Radiotherapy: Is the use of radiation (energy that can travel through space as either a wave or a particle) to destroy cancer cells. Radiotherapy is used in the treatment of about 40% of cancer patients with the aim of destroying or shrinking the tumor.

Radiotherapy can be delivered externally via high energy X-rays or particle beams (proton or electron) or internally using radioactive implants or liquids. The choice of method of delivery will be made with the aim to deliver high doses of radiotherapy to cancer cells while delivering as low a dose as possible to the healthy cells surrounding the cancer.



Radiotherapy damages the DNA (genetic code) of the cancer cell, which causes the cancer cell to die or stop reproducing. Radiotherapy damages normal cells as well as cancer cells, but normal cells have a greater ability to repair themselves.

Chemotherapy: The literal meaning of chemotherapy is treatment with chemicals or drugs. There are different types of drugs used in the treatment of cancer and the term chemotherapy is used specifically to describe the use of cytotoxic drugs (agents that kills cells) in the treatment of cancer.

Chemotherapy drugs target cells that are dividing, especially cancer cells and normal cells that divide frequently, such as the bone marrow cells that produce red blood cells, white blood cells and platelets. The normal cells are able to recover more quickly than cancer cells and by giving treatment in cycles every few weeks the cancer cells are likely to be more susceptible to chemotherapy. The cytotoxic drugs used in chemotherapy damage the part of the nucleus of the cell that makes the cell divide.

Chemotherapy is most commonly delivered directly into the blood stream by either intravenous injection or infusion (drip) or taken as tablets. Less frequently the cytotoxic drugs are injected directly into the tumor, into a muscle, into the layer of fat that exists just under the skin, intra-arterially, into the fluid around the spinal cord or into one of the body's cavities, for example the peritoneal cavity in the abdomen.

Biological therapy: Is the term used to describe treatments or therapies that use substances obtained or derived from living organisms that work with the patient's own immune system. These biological agents aid the immune system to kill cancer cells, stop or reduce the production of cancer cell or prevent the spread of cancer.

Biological therapies include:

- **Angiogenics:** Angiogenesis is the formation of new blood vessels. Tumors require a blood supply to grow and can stimulate angiogenesis which then feeds the tumor. Angiogenics (or angiogenesis inhibitors) is the use of biological agents to stop tumors from developing their own blood supply
- **Cancer growth inhibitors:** Stop or interfere with the chemical signals that cancer cells use when dividing. A growing number of inhibitors that inhibit growth by blocking different chemicals types includes hedgehog pathway blockers, histone decetylase inhibitors, mTOR inhibitors and more
- **Cancer vaccines:** Are given to stimulate the patient's immune system to identify and fight cancer cells. Some vaccines are given to prevent certain types of cancer, while others are given after cancer has been detected. Vaccines can help prevent cancer recurring
- **Immunotherapy:** Are biological agents used to stimulate or suppress or supplement the patient's own immune system
- **Gene therapy:** Is the use of genes to fight cancer. Genes can be used to boost the immune system, make cells more receptive to treatment or halt processes that cancer cells use to survive
- **Monoclonal antibodies (Target therapy):** Uses antibodies of the same type that are designed to target a specific protein. They fight cancer by delivering a drug or attaching a radioactive substance directly to the cancer cell or by triggering the immune system

Hormonal therapy: Is treatment that changes the activity or production of natural hormones that some cancers use to grow. Treatment may include surgery (to remove the endocrine gland) or the use of drugs and synthetic hormones to block the effect of natural hormones.



Stem Cell and Bone Marrow Transplants: Are used to replace a patient's own blood-producing bone marrow that has been killed during very high-dosage chemotherapy.

Other Types of 'Treatment'

The treatments mentioned above are not an exhaustive list and other treatments include:

- Hyperbaric oxygen treatment
- Photodynamic therapy
- Radiofrequency ablation
- Laser therapy
- Hyperthermia

In addition, complementary therapies such as yoga and reflexology are used in association with other treatments.

Claims Considerations

Because each policy has unique benefits, policy terms and conditions, it is not possible in this article to say if a treatment is covered, but some questions that should be considered are:

- Is the treatment medically necessary? The policy definition of medical necessity should include criteria for the assessment of medical necessity including:
 - being in accordance with accepted standards of medical practice
 - being clinically appropriate in terms of type, frequency, extent, duration and location of delivery
 - not undertaken primarily for the convenience of either the patient or medical provider
 - not more costly than alternative treatments that are equally effective
- Is the condition or treatment excluded? Exclusions that may apply include:
 - Specified types of cancer early stage or premalignant diagnosis
 - Cancer caused by specified factors including exposure to radioactivity or a positive diagnosis of HIV
 - Palliative treatment
 - Preventative treatment
 - Experimental treatment

When considering if a treatment or drug is experimental, it is important to know if it has been approved by the local regulatory authority or which stage of trial it currently is in.

There are four phases of clinical trial

- Phase I – tests the safety of a new drug or treatment on a limited number of people
- Phase II – undertaken on a larger group of people to confirm if the treatment works
- Phase III – undertaken on a larger group of people, often over a longer period, tests if the treatment works better than existing treatments
- Phase IV – are undertaken after the treatment has been licensed to determine long-term benefits, risks and side effects

Most policies would not pay for any drug or treatment that is undergoing Phase I, II or III trials.

Underwriting Considerations

A history of cancer does not always preclude individuals from securing health insurance coverage. However, many of the more-aggressive types of cancers are uninsurable for health insurance, even many years post-event. If one of these aggressive cancers is disclosed the health underwriter will most likely either decline the application in its entirety, or will offer cover subject to all future cancer-related claims being excluded.

All cancers have the potential to metastasize, i.e., spread to local or distant areas of the body. Generally any applicant with a history of metastatic spread will not be accepted for health insurance.



If an applicant declares a history of a non-aggressive type of cancer the health underwriter will determine if cover can be provided based upon the following criteria:

- Full recovery with no history of metastasis, irrespective of the nature of the primary malignant lesion
- Histological proof required regarding type of cancer, classification and grade
- Full details regarding treatment and follow-ups
- Sufficient time elapsed since the cancer event (cancer recurrence rates diminish progressively over time)
- No other overt high risk factors for cancer recurrence

Insuring cancer risks for morbidity products is potentially high-risk; therefore, an evidence-based, health-specific, underwriting manual should, wherever possible, form the basis of any cancer risk underwriting determination. It is also highly advisable to obtain input from a Company Medical Officer on 'grey-area' cases. ■

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