

## CANCER

### Palliative care

Palliative care refers to treatment which attempts to make the patient feel better and may or may not be combined with an attempt to attack the cancer. Palliative care includes action to reduce the physical, emotional, spiritual, and psycho-social distress experienced by people with cancer. Unlike treatment that is aimed at directly killing cancer cells, the primary goal of palliative care is to improve the patient's quality of life.

Patients at all stages of cancer treatment need some kind of palliative care to comfort them. In some cases, medical specialty professional organizations recommend that patients and physicians respond to cancer only with palliative care and not with cancer-directed therapy.

Those cases have the following characteristics:

- patient has low performance status, corresponding with limited ability to care for oneself
- patient received no benefit from prior evidence-based treatments
- patient is ineligible to participate in any appropriate clinical trial
- the physician sees no strong evidence that treatment would be effective

Palliative care is often confused with hospice and therefore only involved when people approach end of life. Like hospice care, palliative care attempts to help the person cope with the immediate needs and to increase the person's comfort. Unlike hospice care, palliative care does not require people to stop treatment aimed at prolonging their lives or curing the cancer.

Multiple national medical guidelines recommend early palliative care for people whose cancer has produced distressing symptoms (pain, shortness of breath, fatigue, nausea) or who need help coping with their illness. In people who have metastatic disease when first diagnosed, oncologists should consider a palliative care consult immediately. Additionally, an oncologist should consider a palliative care consult in any patient they feel has a prognosis of less than 12 months even if continuing aggressive treatment.

### Surgery

Surgery is the primary method of treatment of most isolated solid cancers and may play a role in palliation and prolongation of survival. It is typically an important part of making the definitive diagnosis and staging the tumor as biopsies are usually required. In localized cancer surgery typically attempts to remove the entire mass along with, in certain cases, the lymph nodes in the area. For some types of cancer this is all that is needed to eliminate the cancer.

### Chemotherapy

Chemotherapy in addition to surgery has proven useful in a number of different cancer types including: breast cancer, colorectal cancer, pancreatic cancer, osteogenic sarcoma, testicular cancer, ovarian cancer, and certain lung cancers. The effectiveness of chemotherapy is often limited by toxicity to other tissues in the body.

## **Radiotherapy & Radiosurgery**

Radiation therapy involves the use of ionizing radiation in an attempt to either cure or improve the symptoms of cancer. It is used in about half of all cases and the radiation can be from either internal sources in the form of brachytherapy or external sources. Radiation is typically used in addition to surgery and or chemotherapy but for certain types of cancer such as early head and neck cancer may be used alone. For painful bone metastasis it has been found to be effective in about 70% of people.

Brachytherapy is a form of radiotherapy where a radiation source is placed inside or next to the area requiring treatment. Brachytherapy is commonly used as an effective treatment for cervical, prostate, breast, and skin cancer and can also be used to treat tumors in many other body sites. Brachytherapy can be used alone or in combination with other therapies such as surgery, External Beam Radiotherapy (EBRT) and chemotherapy.

External beam radiotherapy or teletherapy is the most common form of radiotherapy. The patient sits or lies on a couch and an external source of radiation is pointed at a particular part of the body. In contrast to internal radiotherapy, in which the radiation source is inside the body, external beam radiotherapy directs the radiation at the tumor from outside the body. Kilovoltage ("superficial") X-rays are used for treating skin cancer and superficial structures. Megavoltage ("deep") X-rays are used to treat deep-seated tumors (e.g. bladder, bowel, prostate, lung, or brain).

While X-ray and electron beams are by far the most widely used sources for external beam radiotherapy, a small number of centers operate experimental and pilot programs employing heavier particle beams, particularly proton sources.

## **Radiosurgery**

Radiotherapy may be used following, or in some cases in place of, resection of the tumor. Forms of radiotherapy used for brain cancer include external beam radiation therapy, brachytherapy, and in more difficult cases, such as Gamma knife, Cyberknife.

## **Gamma Knife Therapy**

Gamma Knife therapy like all radiosurgery, uses doses of radiation to kill cancer cells and shrink tumors, delivered precisely to avoid damaging healthy brain tissue. Gamma Knife radiosurgery is able to accurately focus many beams of high-intensity gamma radiation to converge on one or more tumors. Each individual beam is of relatively low intensity, so the radiation has little effect on intervening brain tissue and is concentrated only at the tumor itself.

Gamma Knife radiosurgery has proven effective for patients with benign or malignant brain tumors up to 4 centimeters in size, vascular malformations such as an arteriovenous malformation (AVM), pain or other functional problems. For treatment of trigeminal neuralgia, the procedure may be used repeatedly on patients. The risks of gamma knife radiosurgery treatment are very low and complications are related to the condition being treated.

## **Cyber Knife Therapy**

The Cyber Knife system is a method of delivering radiotherapy, with the intention of targeting treatment more accurately than standard radiotherapy. The two main elements of the Cyber Knife are the radiation produced from a small linear particle accelerator and a robotic arm which allows the energy to be directed at any part of the body from any direction.

Since August 2001, the Cyber Knife system has FDA clearance for treatment of tumors in any location of the body. Some of the tumors treated include: pancreas, liver, prostate, Spinal Lesions, head and neck cancers, and benign tumors. None of these studies have shown any general survival benefit over conventional treatment methods. By increasing the accuracy with which treatment is delivered there is a potential for dose escalation, and potentially a subsequent increase in effectiveness, particularly in local control rates.

However the studies cited are so far limited in scope, and more extensive research will need to be completed in order to show any effects on survival. In 2008 actor Patrick Swayze was among the people to be treated with Cyber Knife radiosurgery.

## **Alternative treatments**

Complementary and alternative cancer treatments are a diverse group of health care systems, practices, and products that are not part of conventional medicine. "Complementary medicine" refers to methods and substances used along with conventional medicine, while "alternative medicine" refers to compounds used instead of conventional medicine.