



## Review Article

# Head and Neck Cancer - An Overview

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### Abstract

**Head and neck cancers encompass a diverse group of uncommon tumors that frequently are aggressive in their biological behaviors. Some new treatments are available, as are new ways of combining old treatments.**

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Head and neck cancers encompass a diverse group of uncommon tumours that frequently are aggressive in their biological behaviour<sup>1</sup>. The way a particular head and neck cancer behaves depends on the site in which it arises (the primary site). For example, cancers that begin on the vocal cords behave very differently than do those that arise in the hypopharynx, just an inch or less from the vocal cords.

The most common type of cancer in the head and neck is squamous cell carcinoma<sup>2</sup>, which arises in the cells that line the inside of the nose, mouth and throat. Other less common type of head and neck cancers is adenocarcinoma.

Cancers spread in three main ways. The first is direct extension from the primary site to adjacent areas. The second is spread through the lymphatic channels to lymph nodes. The third is spread through the blood vessels to distant sites in the body. In head and neck cancer, a spread to the lymph nodes in the neck is relatively common.

The lymph nodes most commonly involved are located along the internal jugular vein underneath the sternocleidomastoid muscle on each side of the neck, particularly the internal jugular vein node at

the angle of the jaw. The risk of spread to other parts of the body through the bloodstream is closely related to whether the cancer has spread to the lymph nodes in the neck, how many nodes are involved, and their location in the neck. The risk is higher if cancer is in lymph nodes in the lower part of the neck rather than only in those located in the upper neck.

What are the treatment options?

The three main types of treatment for managing head and neck cancer are radiation therapy, surgery and chemotherapy. The primary treatments are radiation therapy or surgery, or both combined; adjuvant chemotherapy has a limited role<sup>2</sup>. The optimal combination of the three treatment modalities for a patient with a particular head and neck cancer depends on the site of the cancer and the stage (extent) of the disease.

In general, patients with early-stage head and neck cancers (particularly those limited to the site of origin) are treated with one modality either radiation therapy or surgery. Patients who have more extensive cancers are often treated with a combination of surgery and radiation therapy or with radiation therapy combined with adjuvant

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chemotherapy. Sometimes neo-adjuvant chemotherapy, palliative radiotherapy and surgery are also needed.

If the plan of treatment is radiation therapy alone for the primary cancer, the neck is also treated with radiation therapy. In addition, a radical neck dissection to remove involved lymph nodes in the neck may be done for persistence or recurrence of lymph nodes after radiation if primary is controlled<sup>3</sup>.

Another treatment that might be necessary before or after radiation therapy is surgery. In general, if the surgical removal of the primary tumor is indicated, radiation is given afterward if necessary. Sometimes, however, the cancer is extensive or it is not feasible to completely remove the cancer initially. Radiotherapy is then given first to try to shrink the tumor, and surgery will follow radiotherapy.

Recent studies indicate that chemotherapy given at the same time as radiation therapy is more effective than if it is given before a course of radiation therapy. Therefore, radiation treatment schedules sometimes include chemotherapy if the stage of the cancer is advanced (advanced stage III or stage IV). Drugs commonly given in conjunction with radiation therapy include cisplatin, fluorouracil, carboplatin, and paclitaxel. This is only a partial list of chemotherapy agents; oncologists may choose to use others. The chemotherapy may be given in a variety of ways, including a low daily dose, a moderately low weekly dose, or a relatively higher dose every three to four weeks.

What happens during radiation therapy?

The initial visit to the radiation oncologist is for a consultation, when the radiation oncologist will listen to the history of the problem and perform a physical examination. Consultations with other members of the head and neck team, such as the head and neck surgeon, pathologist, radiologist and dentist, should take place at this time or shortly after.

After the recommended treatment and possible options are explained, a date will be selected for

treatment planning for radiation therapy (if irradiation has been selected as the first or next step in the treatment plan). Patients then have what is called a "simulation" using either conventional radiographs (x-rays) or a computed tomography (CT) scan. These radiographic studies are used to plan the type and direction of radiation beams used to treat the cancer. For the treatment of head and neck cancer, patient mould or shell becomes essential to ensure the same position is reproduced each day and to avoid a geographical miss. Customized lead alloy blocks or a special collimator (multileaf collimator) in the treatment machine will shape the radiation beams to block areas that do not need to be treated. Treatment fields then will be aligned, and the treatment course will be started.

Typically, treatments are given once a day, five days a week for five to seven weeks (conventional fractionation), depending on the treatment schedule selected by radiation oncologist.<sup>3</sup> Each individual treatment takes just a few minutes. Patients will not feel or see anything during a radiation treatment, and any side effects usually require two or more weeks to become apparent.

What are possible side effects of radiation therapy?

The side effects depend on the site and extent of the head and neck cancer. In general, irradiation of the head and neck does not cause nausea, but a few patients do experience nausea during treatment. Many effective antiemetics can relieve this symptom if it should occur.

Generally, the side effects of radiation therapy become apparent about two weeks into the treatment course, when a sore throat, loss of taste sensation, dryness of the mouth and dry skin reactions may occur<sup>2</sup>. Sore throat is the main side effect that makes the course of radiation therapy difficult.

If sore throat is severe, patients may be unable to take in enough food and liquids by mouth to maintain weight or avoid dehydration. Doctors may then advise nasogastric feeding or total parenteral nutrition<sup>2</sup>. We can install a feeding tube

temporarily into the stomach (a gastrostomy tube), which will allow you to maintain adequate nutrition without having to swallow all of the food that is needed. Gastrostomy placement is an outpatient procedure. It is important, though, to continue swallowing even with a gastrostomy tube in place. Otherwise, swallowing muscles may atrophy; this would cause permanent swallowing problems and make it difficult to stop using the gastrostomy tube even after the radiation treatment course is completed.

A dietitian should be involved during the course of radiation treatments to help patients maintain adequate caloric intake and hydration. When side effects occur, it may be tempting to take a break from treatments. This is not a good idea. The "acutely responding" normal tissues—such as the skin and the lining of the throat—that are responsible for the side effects during radiation therapy tend to respond to radiation as do cancer cells. If the treatment produces few acute side effects, it is also not likely to be very effective against the cancer. Therefore, the treatment of most head and neck cancers represents a classic "no pain, no gain" situation. Breaks in the treatment course to lessen the side effects give the cancer a chance to regrow and will significantly reduce the likelihood of cure. Medications that are almost always needed during a course of radiation therapy include vitamin E, anti-fungal drugs, epidermal growth factors, narcotic pain medicines, both a long-acting pain medicine and a short-acting pain medicine for breakthrough pain and stool softeners, because a common side effect of narcotics is constipation. Additional medications that may be necessary are topical anesthetics such as 'magic mouthwash' to lessen the sore throat and possibly anti-emetics if nausea is a problem<sup>1</sup>.

What are some of the possible risks or complications?

A clear goal of treatment must be determined for each patient before therapy starts. The first question is often whether the goal of treatment is cure or, instead, the lessening (palliation) of symptoms associated with an incurable cancer. If cure is unlikely, then potential risks associated

with treatment ought to be less than those associated with a potentially curative course of radiation therapy.

Palliative courses of treatment generally entail giving a moderate dose of radiation over a short time. This provides a relatively high chance of shrinking the tumor and lessening symptoms while exposing the patient to less risk of side effects and complications, and requiring a relatively brief time to complete the therapy. A typical course of palliative radiation treatments would be divided into 5- 10 treatments given over one to two weeks<sup>2</sup>.

On the other hand, if there is a reasonable chance of cure then a longer and more arduous course of treatment is generally planned. The risks associated with treatment depend on the location and extent of the tumor and the normal structures that are nearby.

In general, for any type of treatment, the treating physician tries to estimate the potential risk of a major complication; if this risk is similar to or exceeds the anticipated likelihood of cure, then the treatment plan is modified. However, if the likelihood of cure is significantly greater than the risk of a major complication, then treatment is initiated.

What kind of treatment follow-up should be expected?

There are several reasons for follow-up examinations<sup>2</sup>.

- To detect recurrent cancer and possibly try further treatment, such as an operation, if the radiation therapy is unsuccessful.

- To treat the acute side effects of the radiation therapy.

- To detect and treat late side effects or complications from the radiation therapy, should they occur.

- To detect and treat additional, unrelated head and neck cancers that may arise.

If the initial treatment for the cancer is successful and the patient is cured, there is still a relatively

low risk (2 percent to 3 percent per year) of developing a new, completely unrelated head and neck cancer. Follow-up examinations usually take place:

- Every four to six weeks for the first year.
- Every two months for the second year.
- Every three months for the third year.
- Every six months for the fourth and fifth years.
- Annually thereafter.

A chest radiograph (x-ray) is obtained once a year, and thyroid functions are often checked annually to detect any occurrence of hypothyroidism (decreased thyroid function), which is easily treatable. Sometimes additional tests are indicated, such as a CT scan or a fluorodeoxyglucose (FDG) positron emission tomography (PET) scan, to assist in difficult situations where it may not be clear whether the cancer persists after treatment.

Are there any new developments in treating the disease?

Some new treatments are available, as are new ways of combining old treatments. A good example of the latter is the use in recent years of a combination of radiation therapy and chemotherapy for advanced head and neck cancer<sup>4</sup>. Some new agents include molecularly targeted agents, biologic response modifiers, antiangiogenic drugs, which attack the blood vessels that nourish the tumor, and drugs such as erythropoietin that provide oxygen to the tumor, making it more sensitive to radiation and increasing the chance of cure.

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