All About Head and Neck Cancers

What is the "head and neck?"

The head and neck encompasses parts of the body in the head and neck including the:

- **Oral cavity**: Includes the lips, front part of the tongue, roof of the mouth (hard palate), floor of the mouth, parts of the gum line (alveolar ridge), and the inside lining of the cheeks (buccal mucosa).
- **Nasopharynx**: Includes the nasopharynx (area of the pharynx behind the nose) and the lining of the nose.
- **Oropharynx**: Includes the posterior pharynx wall (area of the pharynx behind the mouth), the soft part of the roof of the mouth (soft palate), tonsils, and the base of the tongue.
- **Hypopharynx**: Includes the area of the pharynx below the oropharynx down to the esophagus.
- **Larynx**: Includes the voice box (larynx), which is located just below the pharynx, and the epiglottis, which is a flap of tissue that prevents saliva and food from entering the trachea when one swallows.
- **Sinuses (frontal, ethmoid, maxillary, sphenoid)** and salivary glands (major and minor glands).
- **Parts of the ear** (external auditory canal, middle and inner ear).
- **Neck** (lymph nodes, etc.).

This graphic is looking at a head that is cut down the center.

1. sinuses,
2. lining of the nose,
3. nasopharynx,
4. tongue,
5. oropharynx,
6. hypopharynx,
7. larynx,
8. spinal cord,
9. vertebrae,
10. esophagus,
11. trachea

What are head and neck cancers?

All cancers begin when abnormal cells in a part of the body begin to grow in an out-of-control manner. The category of head
and neck cancer has several different subtypes based on the structures that are affected. Head and neck cancers are
categorized by the area they occur in (oral cavity, pharynx, larynx, etc.). Treatments vary based on location. This article is an
introduction to the general category of head and neck cancer.

What are the causes of head and neck cancer and am I at risk?

In the United States, an estimated 53,000 new cases of head and neck cancer (HNCA) are diagnosed annually. The rate of
new head and neck cancer diagnoses has slowly declined as the number of people smoking has declined. However, there are
variations in head and neck cancer rates around the world which are a result of differences in dietary and tobacco habits,
alcohol use, and viral and environmental exposures. Head and neck cancers occur more frequently in men than women. The
average age at diagnosis is 62 however about ¼ of all head and neck cancers occur in individuals under 55.

Risk factors for head and neck cancers include:

- Tobacco use: Including cigarettes, cigars, pipes, and oral tobacco products (snuff, dip, spit or chew). Additionally,
survivors of head and neck cancers should quit as they are at a higher risk for developing a second head and neck
cancer.
- Alcohol use: Head and neck cancers are more common is heavy alcohol users.
- HPV: Has been found in many younger patients with head and neck cancers and may be related to changes in sexual
behaviors in particular an increase oral sex.
- Ultraviolet light exposure: Cancers of the lip may be associated with sun exposure.
- Being immunocompromised: Individuals with HIV or those who are on immunosuppressive medications after organ
transplant may have increased risk.
- Genetic syndromes: Individuals with Fanconi anemia or dyskeratosis congenital may have increased risk.

Internationally there are a few dietary/behavioral exposures that increase risk including betel quid (Southeast Asia), drinking
maté (South America), and a diet high in salt-cured foods. Exposure to asbestos is thought to increase the risk of laryngeal
cancers. Infection with the Epstein Barr virus (EBV), environmental or second-hand smoke, exposure to radiation, poor oral
health and the chronic inhalation of wood dust have all also been associated with increased risk of head and neck cancers.

How can I prevent head and neck cancer?

There are many lifestyle choices that can increase risk for head and neck cancer. Reduce your risk by avoiding tobacco and
alcohol use, practicing safe sex to avoid HPV infection, practice sun safety, take protective measures when working with
asbestos, wood dust and radiation, and practicing proper mouth hygiene.

There are 2 vaccines available against HPV, however it is not yet known if these will prevent infection of the mouth/throat.
Researchers continue to investigate if these vaccines will have an effect on head and neck cancer rates.

What screening tests are available for head and neck cancers?

Currently, there are no standard screening test recommendations that increase the survival of patients diagnosed with head
and neck cancer. Typically, when you receive dental care your dentist will do a brief exam of the inside of your mouth and
sometimes your neck. These exams may help to identify head and neck cancers earlier. You should also routinely examine
your mouth for changes like white patches, sore that don't heal, and lumps. This is particularly important for smokers.

What are the signs of head & neck cancers?

The signs and symptoms can vary greatly depending on the location of the tumor. Some common symptoms are weight loss
due to difficulty swallowing and/or malnutrition), a new lump or sore that does not resolve, a sore throat or change in voice that
doesn't get better, or pain (sometimes felt in the ear). More specific signs include the following:

- Oral cavity: White patches or sores, a change in how dentures fit, unusual bleeding or mouth pain.
- Nasopharyngeal area or sinuses: Sinus infections that do not respond to antibiotics, pain in the upper jaw, nose bleeds,
difficulty breathing, pain or ringing in the ears.
• Pharyngeal: Difficulty swallowing or breathing, sore throat, difficulty hearing, headaches or a hoarse voice.
• Laryngeal: Pain in ear or pain with swallowing.
• Salivary Glands: Facial swelling, pain and numbness of facial muscles.

How are head and neck cancers diagnosed?
If a head and neck cancer is suspected, your healthcare provider will perform a thorough examination of the head and neck, both inside and out. This requires the use of an endoscope, a thin tube with a camera on the end that is inserted in the nose or down the throat after numbing the patient's nose, throat and gag reflex. This is necessary to either evaluate the lesion or lump in question, or to look for any additional lumps. A sample of the tissue in question and/or other suspicious areas will be taken (biopsy). Depending on the location, this may be done in the office, or if it is not accessible, may need to be done in an operating room. A pathologist evaluates the tissue by examining the sample under a microscope. This determines the type of cell and whether or not it is cancerous.

About 95% of head and neck tumors are squamous cell carcinomas (named for the type of cells that the cancer involves). Some other types include: adenocarcinoma, mucoepidermoid carcinoma, adenoid cystic carcinoma, acinic cell carcinoma or other malignant salivary tumors, lymphoma, sarcoma and melanoma.

Computerized tomography (CT) scans, magnetic resonance imaging (MRI), and positron emission tomography (PET) scans are an important step to further evaluate the tumor and to determine the stage and options for treatment.

How are head and neck cancers staged?
With these tests, a stage is determined to help decide the treatment plan. The stage of cancer, or extent of disease, is based on information gathered through the various tests done as the diagnosis and work-up of the cancer is being performed.

Head and neck cancers are most commonly staged using the “TNM system.” The TNM system is used to describe many types of cancers. It has three components: T-describing the extent of the “primary” tumor (the tumor itself); N-describing if there is cancer in the lymph nodes; M-describing the spread to other organs (metastases). Each subtype of head and neck cancer has its own staging classification and is very complex. Though complicated, the staging system helps healthcare providers determine the extent of the cancer, and in turn, make treatment decisions for a patient’s cancer. You can review the various subtype staging systems via the AJCC staging website.

How are head and neck cancers treated?
Head and neck cancers are best treated by interdisciplinary cancer care teams. This team of specialists may include oral surgeons, otorhinolaryngologists (ENT), pathologists, medical and radiation oncologists, dentists, plastic surgeons, dietitians, social workers, nurses, physical and speech therapists. The actual treatment plan varies depending on the tumor location, stage, and your baseline medical condition and pre-existing medical conditions that may impact how much treatment you can tolerate.

In general, stage I and II cancers are treated with surgery and/or radiation therapy, whereas stages III and IV require multi-modality treatment (surgery, radiation, and chemotherapy). The following are the basic therapies used in the treatment of head and neck cancer.

Surgery
In determining whether or not a patient should have surgery, it is extremely important to look at your physical health. For example, a patient with very poor nutrition will have difficulty healing from surgery. Heart disease or pulmonary (lung) problems may make it difficult to tolerate the procedure. Your healthcare team does not want to put you in further danger in these cases. The second issue is, can the tumor be safely removed by the surgeon? This depends on where it is located, what other structures it invades, and the size of the tumor. It is also important to consider how well the plastic surgeon will be able to perform reconstruction. You can see how this complicated decision is best made by a team of specialists who are experienced in these types of surgeries.

If surgery is an option, the surgeon’s goal is usually to remove the entire tumor and some healthy tissue around it (this is
referred to as achieving clean or negative margins). In some cases, lymph nodes may be removed for further evaluation by the pathologist.

Depending on where the tumor is located, and its size, the surgery can be very complex. The plastic surgeon may use skin flaps or prosthetic (man-made) bones to replace those affected by the tumor. The surgery may affect the patient's ability to chew, swallow, speak, hear, or smell, and it may drastically change their facial appearance, either temporarily or permanently. All patients and their families should talk extensively with the healthcare team before surgery and have a complete understanding of what to expect. Don’t be afraid to ask questions, take notes and get a second opinion.

**Radiation Therapy**

Radiation is the use of high-energy x-rays to kill the tumor. This treatment is very complex and should be performed by a radiation team trained in this specialty. Radiation can be given by two different methods: external beam (from a machine outside the body) or brachytherapy (also called internal radiation, from an internally implanted radioactive source).

External beam radiation is administered by a machine called a linear accelerator. The machine points beams of radiation from many angles towards the tumor. The treatment only takes about 15-20 minutes, but is given 5 days a week, for 6-8 weeks. It is critical to be certain that you are treating the same spot each day, so a customized mask device is made and employed to maintain the head in the same position each day. Unfortunately, in attempting to target all of the cancer, the radiation also hits nearby healthy cells, leading to side effects including: sore mouth/throat (mucositis), skin burns, painful swallowing, and dry mouth or nose. External beam radiation is the most commonly used form of radiation for head and neck cancers.

**Brachytherapy** involves implanting a radioactive material (the source) in the tumor and/or around the tumor site. This source slowly releases the radiation over time, delivering it to a small area of tissue. By treating just a small area, side effects are decreased, but, this can also increase the likelihood that the cancer may return. For this reason, the treatment is not good for patients with a high risk of recurrence. Unlike external radiation, these patients are "radioactive" while the source is in place, and patients' friends and family can only spend a few minutes a day close to them (within about 5 feet). This can be a problem if the patient cannot care for himself or herself. Proper patient selection is necessary for everyone's safety. Internal radiation is most often used in treating cancers of the lip, oral cavity, and oropharynx.

**Proton therapy** is another type of radiation therapy that is being used to treat head and neck cancers. The main difference between protons and x-rays is the physical properties of the proton beam itself. Whereas x-rays enter the patient on one side of the body and travel straight through, exiting out the other side, with the radiation dose gradually decreasing as it travels through the tissues. The proton beam is able to enter the body at a fairly low dose of radiation and increase in the last 3mm of the beam to the dose required for treatment. In addition, the beam then stops, resulting in virtually no radiation to the tissue beyond the target- or no "exit dose" as it is called. This allows protons to limit the dose to surrounding healthy tissues, in turn reducing side effects. For instance, not exposing the salivary glands on the opposite side of the tumor to radiation dose. Proton therapy is becoming more widely available.

**Chemotherapy**

Chemotherapies are medications used to kill cancer cells. Chemotherapy is typically used in more advanced tumors of the head and neck. Chemotherapy can be given before surgery to shrink a tumor and thus make it easier to remove. This is called neoadjuvant chemotherapy. Chemotherapy that is given after surgery is called adjuvant chemotherapy. The chemotherapy medications used to treat your head and neck cancer will depend on the subtype of cancer you have. Chemotherapy medications commonly used to treat head and neck cancers include: cisplatin, carboplatin, 5-FU, paclitaxel, docetaxel, epirubicin, gemcitabine, and methotrexate.

Chemotherapy is commonly given in conjunction with radiation therapy. This is referred to as chemoradiation therapy. In this case, the chemotherapy serves two purposes: to treat the cancer cells and to make the radiation work better. This is called radiosensitization. Radiosensitization means that the cells are made more sensitive to radiation damage in the presence of relatively low doses of the chemotherapy. The problem is that healthy cells are also sensitized, making the side effects more severe than with radiation alone.

Chemoradiotherapy has been shown to improve the likelihood that the surgeon will be able to preserve the voice box in laryngeal cancers. It has also been shown to improve survival over chemotherapy alone, but this therapy comes with more
toxicity. The most common toxicities experienced by patients receiving chemoradiation are: low blood counts (white and red blood cells), mucositis, mouth sores and difficulty swallowing. This therapy is not the best choice for all patients, particularly those who are not able to tolerate the side effects; but in those that can be supported through the treatment, this is the standard of care.

**Targeted Therapies**

Researchers have found a majority of squamous cell head and neck cancers have an "overexpression" of the epidermal growth factor receptor (EGFR). This means they produce too many of these receptors, which could be a key factor in their growth. In turn, medications were developed that can block these receptors, hopefully slowing the tumor's growth. The two EGFR inhibitors most commonly used in head and neck cancers are cetuximab and afatinib.

Two other types of targeted therapies are also used in the treatment of certain advanced head and neck cancers. These medications are nivolumab and pembrolizumab. These medications are immunotherapies that stimulate the immune system to destroy cancer cells.

**Supportive Care**

The treatment of head and neck cancers can have a significant impact on the patient. Nutritional status is often affected by therapy. For some patients, difficulty swallowing, mucositis (sore mouth and throat), loss of taste, or a lack of saliva production may make eating difficult or impossible. It is important that patients be followed closely by a dietitian to support them in food and supplement choices and to maintain good nutritional status. If necessary, a speech and swallowing specialist can evaluate a person's ability to swallow safely, without choking or inhaling food. Many patients will need to be fed through a tube placed in their stomach (called a PEG or ‘G' tube). In most cases, this is only temporary.

Social workers can help with the financial burden, handling family responsibilities and accessing resources. Psychologists may be needed to help in dealing with the changes in body image and the patient's role in the family. When speech is affected, speech therapists can help regain function or find alternative ways of communicating. Nurses and physicians can offer help in dealing with side effects and pain management.

**Clinical Trials**

There are clinical research trials for most types of cancer, and every stage of the disease. Clinical trials are designed to determine the value of specific treatments. Trials are often designed to treat a certain stage of cancer, either as the first form of treatment offered, or as an option for treatment after other treatments have failed to work. They can be used to evaluate medications or treatments to prevent cancer, detect it earlier, or help manage side effects. Clinical trials are extremely important in furthering our knowledge of disease. It is through clinical trials that we know what we do today, and many exciting new therapies are currently being tested. Talk to your provider about participating in clinical trials in your area. You can also explore currently open clinical trials using the OncoLink Clinical Trials Matching Service.

**Follow-up Care and Survivorship**

Follow-up visits with the oncologist(s) will generally be done every 1-3 months for the first year, every 2-6 months the second year, every 4-8 months in years 3-5 and once a year after 5 years. A chest CT may be performed once a year, especially in patients with a history of smoking. In some cases, CT scans or PET scans are used to evaluate for recurrence of the cancer. For patients whose thyroid gland was in the radiation field, thyroid levels should be checked periodically as they may develop a deficiency (hypothyroidism) and require medication to treat this condition. You may also require frequent dental examinations depending on your disease type and treatments received.

If a person is still smoking after treatment, he or she should be encouraged and supported to quit. Patients who continue to smoke are at a significantly increased risk of developing a recurrence or a second cancer, either in the head and neck or elsewhere.

Fear of recurrence, financial impact of cancer treatment, employment issues, changes to appearance, ability to speak or eat and coping strategies are common emotional and practical issues experienced by head and neck cancer survivors. Your healthcare team can identify resources for support and management of these practical and emotional challenges faced during and after
Cancer survivorship is a relatively new focus of oncology care. With some 15 million cancer survivors in the US alone, there is a need to help patients transition from active treatment to survivorship. What happens next, how do you get back to normal, what should you know and do to live healthy going forward? A survivorship care plan can be a first step in educating yourself about navigating life after cancer and helping you communicate knowledgeably with your healthcare providers. Create a survivorship care plan today on OncoLink.

**Resources for More Information**

**The Oral Cancer Foundation**

Provides information and resources for oral cancer patients and oral cancer prevention.

http://oralcancerfoundation.org/

**Support for People with Oral and Head and Neck Cancer (SPOHNC)**

This site contains information about support and self-help resources available for patients with head and neck cancer.

http://www.spohnc.org/

**Head and Neck Cancer Alliance**

The mission of this organization is to fund research for head and neck cancers as well as provide support to head and neck cancer patients throughout the year.

http://www.headandneck.org/

**Radiology Info**

This site gives a good overview of head and neck cancer and treatments.


**American Academy of Otolaryngology-Head and Neck Surgery**

The American Academy of Otolaryngology site provides patient health information about a variety of head and neck cancers and conditions.

http://www.entnet.org/content/patient-health

**Oley Foundation**

Enriches the lives of those requiring home IV & tube feeding through education, outreach, & networking.

http://www.oley.org

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