Head and Neck Cancer

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Head and Neck cancers are the 6th most common type of cancer in the world and account for 6% of all tumors. Most head and neck cancers are squamous cell carcinomas that develop in the upper throat as a result of exposure to risk factors. It usually presents itself in an advanced stage and predominantly in older men.1, 2 The American Cancer Society estimates 54,540 new cases and 11,580 deaths due to cancers of the oral cavity and pharynx in 2023.3

The following sections can be found on this page:

- Head and Neck Cancer: Anatomy
- Head and Neck Cancer: Types
- Head and Neck Cancer: Risk Factors
- Head and Neck Cancer: Symptoms
- Head and Neck Cancer: Diagnosis
- Head and Neck Cancer: Staging
- Head and Neck Cancer: Treatment

Anatomy

“Head and Neck” is a broad and general term in oncology that is used to refer to the areas in this region that are most susceptible to cancer and do not include the brain, the eye, the esophagus (food pipe), thyroid glands, scalp, skin, bones, or blood; these are not classified as head and neck cancers. “Head and Neck” refers primarily to the oral cavity, salivary glands, pharynx, larynx, nasal cavity, and paranasal sinuses. Combined, these parts preform a variety of functions and make up various different systems.

The oral cavity, also known as the mouth, includes the gums, lips, tongue, the hard palate or bone at the top of the mouth, and the bottom of the mouth below the tongue. The oral cavity is used for chewing, tasting, swallowing and manipulating air to form words.4

The salivary glands are glands found in the oral cavity (mouth) and throat. There are three types of salivary glands; the parotid gland secretes saliva near your upper teeth, the submandibular gland secretes saliva under your tongue, and the sublingual secretes saliva from the floor in your mouth. This saliva contains enzymes that chemically break down food to begin the digestion process.5

The pharynx, also known as the throat, is a hollow tube that starts behind the nose and leads to the esophagus (food pipe). It is made up of three sections, the nasopharynx (the beginning of the pharynx, behind the nose), the oropharynx (the middle part of the tube, towards the back of the mouth), and the hypopharynx (the end of the tube, near the beginning of the esophagus). The pharynx serves digestive and respiratory functions as a passageway for food and air.

The larynx, also known as the voicebox, is another short tube found in the neck. It starts at the bottom of the pharynx, although it is separate from the esophagus (food pipe), and continues down to the trachea (wind pipe). The vocal cords and a flap of tissue that contracts during swallowing called the epiglottis are found in the larynx and help it perform its primary functions. The larynx serves to prevent food from entering the trachea (wind pipe), keep the airway open, and help with vocalization.6

The nasal cavity is the hollow space inside the nose. It helps filter and provide passage of air into lungs, as well as providing your sense of smell. Similarly, paranasal sinuses are small hollow spaces in the head surrounding the bone. These sinuses serve various functions, including humidifying and warming up inhaled air and serving as a protective barrier in facial trauma.7

Types

Head and neck cancer may be located in any of the following:

- oral cavity
- salivary glands
- pharynx
- larynx

- nasal cavity and paranasal sinuses

Cancer in the eye, brain, scalp, skin, muscles, as well as bone and blood in this area are not considered head and neck cancers.

Most head and neck cancer is found in the **squamous epithelial cells** (flat cells that line moist, mucus membranes) of these structures, and these cancerous cells are called carcinomas. Cancer that is limited to this outer, lining layer of cells is called **carcinoma *in situ***. Cancer that grows beyond this layer into the deeper tissue is called **invasive squamous cell carcinoma**.

However, because there are many different tissues that make up the head and neck, especially with regards to the salivary gland and nasal cavity, there are many other types of cancerous cells that be considered head and neck cancer.

Risk Factors

The following are risk factors for the different types of head and neck cancer:8, 9, 10, 11, 12

- Alcohol Consumption and Tobacco Use
- Pre-existing Conditions and Infection
- Family History
- Age
- Gender
- Nutrition
- Workplace Exposure
- Oral Hygiene
- Radiation

Alcohol Consumption and Tobacco Use

These are the two most common risk factors for head and neck cancer, especially cancers of the oral cavity, oropharynx, hypopharynx and larynx. Tobacco alone accounts for more than 75% of all cases of head and neck cancer. For more information on the risks tobacco pose, visit CancerQuest's page on tobacco. Heavy drinkers are also more likely to develop head and neck cancer. Combined, these two factors create the greatest risk of all and people who both smoke and drink are many times more likely to develop head and neck cancer than people who only do one or neither.

Pre-existing Conditions or Infections

Certain pre-existing conditions or infections can be risk factors for specific types of head and neck cancer.

The infection most highly linked with the most types of head and neck cancer is the **human papillomavirus (HPV)**. HPV is explained thoroughly on the Cervical Cancer: Risk Factors page. HPV causes wart growths called papillomas aroun the affected area. Different types of HPV are found in different areas of the body; the type that causes head and neck cancers is HPV 16. While it is rare for people to develop oropharyngeal cancer from an HPV infection, the number of cases linked to HPV has increased dramatically and 2 out of 3 cases are found to contain HPV DNA.

The **Epstein-Barr virus** (the virus most commonly know to cause mononucleosis or "mono") has also been linked to many cases of head and neck cancer. It can cause salivary gland cancer and nasopharyngeal cancer.

There are many less associated conditions and diseases that can also cause certain types of head and neck cancer. Fanconi anemia and Dyakeratosis congenital are both conditions caused by inherited defects in certain genes and people with these genetic disorders have a very high risk of oral, oropharyngeal, laryngeal and hypopharyngeal cancer. Graft-versus-host disease (GVHD), which sometimes occurs after a stem cell transplant has been linked to oral cancer. Lastly, in a few, rare cases, Lichen planus, a disease that affects the skin in middle-aged people, has been shown to slightly increase the risk of oral cancer.

Family History

People with a family history of nasopharyngeal and salivary gland cancer may be more likely to contract those two types of head and neck cancer. However, most cases of salivary gland cancer do not have any family history.

Age

For all types of head and neck cancer, like most other cancers, risk increases with age. Most cases of head and

neck cancer are found in people 50 years or older. However, because of the prevalence of the HPV virus among teens, the average patient with head and neck cancer is getting younger.

Gender

It has been found that men are more likely to contract head and neck cancer than women.

Nutrition

Vitamin deficiencies, as a result of excessive alcohol consumption or a diet high in fat and low in vegetables, can increase risk of getting head and neck cancer. Furthermore, certain practices of preserving food in salt, which is common in eastern Asia, or consumption of mate, a tea like beverage in South America, can increase this risk of getting head and neck cancer.

Workplace Exposure

Exposure to and breathing in dusts from certain substances, including wood, textiles, leather, nickel and chromium, can increase risk. Flour, formaldehyde, mustard gas, radium, glue and asbestos can also contribute to higher risk.

Oral Hygiene

Practicing poor oral hygiene or using mouthwash containing too much alcohol has been debatably linked to a higher risk of oral cancer.

Radiation

Prolonged exposure to sunlight or x-rays can increase risk of cancer.

Symptoms

The most common symptoms of head and neck cancers include a lump or sore that does not heal, a sore throat that does not go away, difficulty swallowing, and hoarseness or other voice changes.[4]

However, the American Cancer Society also cites other signs and symptoms that may be specific to each type of head and neck cancer and should be considered.

Laryngeal/Hypopharyngeal cancer:

- Constant coughing
- Ear pain
- Trouble breathing
- Weight loss

Nasal/Paranasal Sinus cancer:

- Nasal congestion and stuffiness that doesn’t get better or even worsens
- Pain above or below the eyes
- Blockage of one side of the nose
- Post-nasal drip (nasal drainage in the back of the nose and throat)
- Nosebleeds
- Pus draining from the nose
- Decreased sense of smell
- Numbness or pain in parts of the face

- Loosening or numbness of the teeth
- Growth or mass of the face, nose, or palate
- Constant watery eyes
- Bulging of one eye
- Loss or change in vision
- Pain or pressure in one of the ears
- Trouble opening the mouth
- Lymph nodes in the neck getting larger (seen or felt as lumps under the skin)

Salivary Gland cancer:

- Pain in your mouth, cheek, jaw, ear, or neck that does not go away
- A difference between the size and/or shape of the left and right sides of your face or neck
- Numbness in part of your face
- Weakness of the muscles on one side of your face
- Trouble opening your mouth widely
- Fluid draining from an ear

Oral cavity/Oropharyngeal cancer:

- A white or red patch on the gums, tongue, tonsil, or lining of the mouth
- Trouble moving the jaw or tongue
- Numbness of the tongue or other area of the mouth
- Swelling of the jaw that causes dentures to fit poorly or become uncomfortable
- Loosening of the teeth or pain around the teeth or jaw
- Weight loss
- Constant bad breath

Nasopharyngeal cancer:

- Hearing loss, ringing in the ear, or feeling of fullness in the ear (especially on one side only)
- Ear infections that keep coming back
- Nasal blockage or stuffiness
- Nosebleeds
- Headache
- Facial pain or numbness
- Trouble opening the mouth
- Blurred or double vision

Most of these symptoms can or may be caused by conditions other than cancer however it is important to seek out medical attention if they persist.

Diagnosis

Early stages of head and neck cancers present very few noticeable symptoms so dentists, physicians and oral surgeons have to be on the look out for anything suspicious. If a patient shows symptoms or is suspected to have head and neck cancer, a physical examination is preformed to find any abnormalities such as white mucusy or red patches. If these are found then there is an array of different techniques to help stage or further classify the type

of cancer.

An endoscopy, a procedure to look at the digestive tract, is the most accurate way to classify and diagnose head and neck cancers. It is recommended for patients diagnosed with any type of head and neck cancer to get an endoscopy. Biopsies are then performed on any abnormalities found during the physical exam or endoscopy. Radiological evaluations are used to determine staging. While in the past this was traditionally done with MRI or CT scans, new studies are showing that PET scans may provide a more accurate evaluation. These evaluations are done at the primary site of cancer and the neck. However, new findings have shown new non-invasive methods that could possibly be used to diagnose head and neck cancers. DNA analysis from blood or other bodily fluids could show mutations linked to cancer or the presence of EPV or HPV DNA, which have also been linked to head and neck cancer. Furthermore, molecular studies of areas directly surrounding a tumor could help determine staging and treatment options.

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Staging

All Head and Neck cancers can be staged using the T/N/M system, which assigns a degree of severity based on size, location and spread of the cancer in the body. This degree is assigned a number I-IV and that is the stage of the cancer. Each type of Head and Neck cancer has different staging criteria which you can learn more about from the American Cancer Society using these links:

- Nasopharyngeal cancer
- Laryngeal/Hypopharyngeal cancer
- Oral Cavity/Oropharyngeal cancer
- Salivary Gland cancer
- Nasal/Paranasal cancer

Treatment

The treatment of head and neck cancers varies by primary site and stage. As our focus is on the biology of the cancers and not their treatments, we do not give detailed treatment guidelines. Instead, we link to organizations in the U.S. that generate the treatment guidelines.

Consult with your doctor to determine specific treatments for your type of cancer because different primary sites respond better to different treatment options. However, the National Comprehensive Cancer Network (NCCN) lists the following treatments for most types of Head and Neck cancer:

-Surgery

-Radiation Therapy

-Chemotherapy

Head/Neck/Oral Cancer Resources

Risks for Head/Neck/Oral Cancer

Oral Cancer Prevention (NCI)

Head and Neck Cancer

Oral Cavity and Oropharyngeal Cancer Risks

Detection and Diagnosis of Head/Neck/Oral Cancer

Head and Neck Cancer (NCI)

Oral Cavity and Oropharyngeal Cancer (ACS)

Head/Neck/Oral Cancer Treatments

Treatment at Winship Cancer Institute

Head and Neck Cancer Treatment (NCI)

Radiology.info Treatment Options

Head/Neck/Oral Cancer Survivorship

Head and Neck Cancer Alliance

Support for People with Oral, Head, and Neck Cancer

Head and Neck Cancer Guide

Long Term Risks for Head/Neck/Oral Cancer Survivors

Support for People with Oral and Head and Neck Cancer.

International Head/Neck/Oral Cancer Resources

Oral Cancer Risk Factors (UK)

Canadian Society of Head and Neck Surgery

Head and Neck Cancer (Cancer Council Australia)

Head & Neck Cancer (Cancer Australia)

Merseyside Regional Head and Neck Cancer Centre (UK)

Foundation for Head and Neck Oncology (India)

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2 The Lancet: Head and Neck Cancer [http://www.sciencedirect.com/science/article/pii/S014067360860728X]
3 American Cancer Society.Cancer Facts & Figures 2023. Atlanta: American Cancer Society. (2023). Retrieved from https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/2023-cancer-facts-figures.html
4 [ab] National Cancer Institute, Head and Neck Fact Sheet [http://www.cancer.gov/cancertopics/types/head-and-neck/head-neck-fact-sheet]
5 American Academy of Otolaryngology, Salivary Glands Fact Sheet [http://www.entnet.org/content/salivary-glands]
6 Dartmouth Basic Human Anatomy. Chapter 53: The Pharynx and the Larynx [http://www.dartmouth.edu/~humananatomy/part_8/chapter_53.html]
7 Fahrioglu, S. L., & Andaloro, C. (2020). Anatomy, Head and Neck, Sinus Function and Development. FL: Treasure Island: StatPearls Publishing. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK532926/ [PUBMED]
8 American Cancer Society: Nasal and Paranasal Sinus Risk Factors [http://www.cancer.org/cancer/nasalcavityandparanasalsinuscancer/detailedguide/nasal-cavity-and-paranasal-sinuses-cancer-risk-factors]
9 American Cancer Society: Oral Cavity and Oropharyngeal Risk Factors [http://www.cancer.org/cancer/oralcavityandoropharyngealcancer/detailedguide/oral-cavity-and-oropharyngeal-cancer-risk-factors]
10 American Cancer Society: Salivary Gland Risk Factors [http://www.cancer.org/cancer/salivaryglandcancer/detailedguide/salivary-gland-cancer-risk-factors]
11 American Cancer Society: Nasopharyngeal Cancer Risk Factors [http://www.cancer.org/cancer/nasopharyngealcancer/detailedguide/nasopharyngeal-cancer-risk-factors]
12 American Cancer Society: Laryngeal and Hypopharyngeal Cancer Risk Factors [http://www.cancer.org/cancer/laryngealandhypopharyngealcancer/detailedguide/laryngeal-and-hypopharyngeal-cancer-risk-factors]
13 Diagnosis and Staging of Head and Neck Cancer: A Comparison of Modern Imaging Modalities (Positron Emission Tomography, Computed Tomography, Color-Coded Duplex Sonography) With Panendoscopic and Histopathologic Findings [http://archotol.jamanetwork.com/article.aspx?articleid=405572]
14 Staging of the neck in patients with oral cavity squamous cell carcinomas: a prospective comparison of PET, ultrasound, CT and MRI. [http://www.ncbi.nlm.nih.gov/pubmed/11465137] [PUBMED]
15 New England Journal of Medicine, Head and Neck Cancer [http://www.nejm.org/doi/full/10.1056/NEJM199301213280306]
16 New England Journal of Medicine, Head and Neck Cancer [http://www.nejm.org/doi/full/10.1056/NEJMra001375]
17 Mayo Clinic Proceedings, Head and Neck Cancer: Changing Epidemiology, Diagnosis, and Treatment [http://www.sciencedirect.com/science/article/pii/S0025619611607064]