The Mouth and Throat

These notes are about cancers that occur in the mouth (oral cavity) and the part of the throat at the back of the mouth (oropharynx).

The oral cavity and oropharynx have many parts:

- Lips
- Lining of your cheeks
- Salivary glands (glands that make saliva)
- Roof of your mouth (hard palate)
- Back of your mouth (soft palate and uvula)
- Floor of your mouth (area under the tongue)
- Gums and teeth
- Tongue
- Tonsils

This picture shows the parts of the mouth and throat.
Oral Cancer

Oral cancer can form in any part of the mouth or throat. Most oral cancers begin in the tongue and in the floor of the mouth. Anyone can get oral cancer, but the risk is higher if you are male, over age 40, use tobacco or alcohol or have a history of head or neck cancer. Frequent sun exposure is also a risk for lip cancer.

Symptoms of oral cancer include

- White or red patches in your mouth
- A mouth sore that won't heal
- Bleeding in your mouth
- Loose teeth
- Problems or pain with swallowing
- A lump in your neck
- An earache

Oral cancer treatments may include surgery, radiation therapy or chemotherapy. Some patients have a combination of treatments.

Causes
Oral or mouth cancer most commonly involves the tissue of the lips or the tongue. It may also occur on the floor of the mouth, cheek lining, gingiva (gums), or palate (roof of the mouth). Most oral cancers look very similar under the microscope and are called squamous cell carcinomas. These are malignant and tend to spread rapidly.

Smoking and other tobacco use are associated with 70-80% of oral cancer cases. Smoke and heat from cigarettes, cigars, and pipes irritate the mucous membranes of the mouth. Use of chewing tobacco or snuff causes irritation from direct contact with the mucous membranes. Heavy alcohol use is another high-risk activity associated with oral cancer.

Other risks include poor dental and oral hygiene and chronic irritation (such as that from rough teeth, dentures, or fillings). Some oral cancers begin as leukoplakia or mouth ulcers. Oral cancer accounts for about 8% of all malignant growths. Men are affected twice as often as women, particularly men older than 40.

**Symptoms**

Skin lesion, lump, or ulcer:

- On the tongue, lip, or other mouth area
- Usually small
- Most often pale colored, may be dark or discolored
- May be a deep, hard edged crack in the tissue
- Usually painless initially
- May develop a burning sensation or pain when the tumor is advanced

Additional symptoms that may be associated with this disease:

- Tongue problems
- Swallowing difficulty
- Mouth sores
• Abnormal taste

**Exams and Tests**

An examination of the mouth by the health care provider or dentist shows a visible or palpable (can be felt) lesion of the lip, tongue, or other mouth area. As the tumor enlarges, it may become an ulcer and bleed. Speech difficulties, chewing problems, or swallowing difficulties may develop, particularly if the cancer is on the tongue.

A tongue biopsy, gum biopsy, and microscopic examination of the lesion confirm the diagnosis of oral cancer.

**Treatment**

Surgical excision (removal) of the tumor is usually recommended if the tumor is small enough. Radiation therapy and chemotherapy would likely be used when the tumor is larger or has spread to lymph nodes in the neck. Surgery may be necessary for large tumors.

Rehabilitation may include speech therapy or other therapy to improve movement, chewing, swallowing, and speech.

**Support Groups**

The stress of illness can often be eased by joining a support group of people who share common experiences and problems. See cancer - support group.

**Outlook (Prognosis)**

Approximately 50% of people with oral cancer will live more than 5 years after diagnosis and treatment. If the cancer is detected early, before it has spread to other tissues, the cure rate is nearly 75%. Unfortunately, more than 50% of oral cancers are advanced at the time the cancer is detected. Most have spread to the throat or neck.
Approximately 25% of people with oral cancer die because of delayed diagnosis and treatment.

**Possible Complications**

- Postoperative disfigurement of the face, head and neck
- Complications of radiation therapy, including dry mouth and difficulty swallowing
- Other metastasis (spread) of the cancer

**When to Contact a Medical Professional**  This disorder may be discovered when the dentist performs a routine cleaning and examination.

Call for an appointment with your health care provider if a lesion of the mouth or lip or a lump in the neck are present and do not clear within 1 month. Early diagnosis and treatment of oral cancer greatly increases the chances of survival.

**Prevention**

You should have the soft tissue of the mouth examined once a year. Many oral cancers are discovered by routine dental examination.

Other tips:

- Minimize or avoid smoking or other tobacco use
- Minimize or avoid alcohol use
- Practice good oral hygiene
- Have dental problems corrected

**Understanding Cancer**

Cancer begins in *cells*, the building blocks that make up *tissues*. Tissues make up the *organs* of the body.

Normally, cells grow and divide to form new cells as the body needs them. When cells grow old, they die, and new cells take their place.
Sometimes this orderly process goes wrong. New cells form when the body does not need them, and old cells do not die when they should. These extra cells can form a mass of tissue called a growth or tumor.

Tumors can be \textit{benign} or \textit{malignant}:

- **Benign tumors** are not cancer:
  - Benign tumors are rarely life-threatening.
  - Generally, benign tumors can be removed, and they usually do not grow back.
  - Cells from benign tumors do not invade the tissues around them.
  - Cells from benign tumors do not spread to other parts of the body.

- **Malignant tumors** are cancer:
  - Malignant tumors are generally more serious than benign tumors. They may be life-threatening.
  - Malignant tumors often can be removed, but sometimes they grow back.
  - Cells from malignant tumors can invade and damage nearby tissues and organs.
  - Cells from malignant tumors can spread to other parts of the body. The cells spread by breaking away from the original cancer (primary tumor) and entering the bloodstream or lymphatic system. They invade other organs, forming new tumors and damaging these organs. The spread of cancer is called \textit{metastasis}.

**Oral Cancer**

Oral cancer is part of a group of cancers called \textit{head and neck cancers}. Oral cancer can develop in any part of the oral cavity or oropharynx. Most oral cancers begin in the tongue and in the floor of the mouth. Almost all oral cancers begin in the flat cells (\textit{squamous cells}) that cover the surfaces of the mouth, tongue, and lips. These cancers are called \textit{squamous cell carcinomas}.
When oral cancer spreads (metastasizes), it usually travels through the lymphatic system. Cancer cells that enter the lymphatic system are carried along by lymph, a clear, watery fluid. The cancer cells often appear first in nearby lymph nodes in the neck.

Cancer cells can also spread to other parts of the neck, the lungs, and other parts of the body. When this happens, the new tumor has the same kind of abnormal cells as the primary tumor. For example, if oral cancer spreads to the lungs, the cancer cells in the lungs are actually oral cancer cells. The disease is metastatic oral cancer, not lung cancer. It is treated as oral cancer, not lung cancer. Doctors sometimes call the new tumor "distant" or metastatic disease.

**Symptoms**

Common symptoms of oral cancer include:

- Patches inside your mouth or on your lips that are white, a mixture of red and white, or red
  - White patches (*leukoplakia*) are the most common. White patches sometimes become malignant.
  - Mixed red and white patches (*erythroplakia*) are more likely than white patches to become malignant.
  - Red patches (*erythroplakia*) are brightly colored, smooth areas that often become malignant.
- A sore on your lip or in your mouth that won't heal
- Bleeding in your mouth
- Loose teeth
- Difficulty or pain when swallowing
- Difficulty wearing dentures
- A lump in your neck
- An earache

Anyone with these symptoms should see a doctor or dentist so that any problem can be diagnosed and treated as early as possible. Most often, these symptoms do not mean cancer. An infection or another problem can cause the same symptoms.
**Diagnosis**

If you have symptoms that suggest oral cancer, the doctor or dentist checks your mouth and throat for red or white patches, lumps, swelling, or other problems. This exam includes looking carefully at the roof of the mouth, back of the throat, and insides of the cheeks and lips. The doctor or dentist also gently pulls out your tongue so it can be checked on the sides and underneath. The floor of your mouth and lymph nodes in your neck also are checked.

If an exam shows an abnormal area, a small sample of tissue may be removed. Removing tissue to look for cancer cells is called a **biopsy**. Usually, a biopsy is done with **local anesthesia**. Sometimes, it is done under **general anesthesia**. A **pathologist** then looks at the tissue under a microscope to check for cancer cells. A biopsy is the only sure way to know if the abnormal area is cancerous.

If you need a biopsy, you may want to ask the doctor or dentist some of the following questions:

- Why do I need a biopsy?
- How much tissue do you expect to remove?
- How long will it take? Will I be awake? Will it hurt?
- How soon will I know the results?
- Are there any risks? What are the chances of infection or bleeding after the biopsy?
- How should I care for the biopsy site afterward? How long will it take to heal?
- Will I be able to eat and drink normally after the biopsy?
- If I do have cancer, who will talk with me about treatment? When?

**Staging**
If the biopsy shows that cancer is present, your doctor needs to know the stage (extent) of your disease to plan the best treatment. The stage is based on the size of the tumor, whether the cancer has spread and, if so, to what parts of the body.

Staging may require lab tests. It also may involve endoscopy. The doctor uses a thin, lighted tube (endoscope) to check your throat, windpipe, and lungs. The doctor inserts the endoscope through your nose or mouth. Local anesthesia is used to ease your discomfort and prevent you from gagging. Some people also may have a mild sedative. Sometimes the doctor uses general anesthesia to put a person to sleep. This exam may be done in a doctor's office, an outpatient clinic, or a hospital.

The doctor may order one or more imaging tests to learn whether the cancer has spread:

- **Dental x-rays**: An x-ray of your entire mouth can show whether cancer has spread to the jaw.
- **Chest x-rays**: Images of your chest and lungs can show whether cancer has spread to these areas.
- **CT scan**: An x-ray machine linked to a computer takes a series of detailed pictures of your body. You may receive an injection of dye. Tumors in the mouth, throat, neck, or elsewhere in the body show up on the CT scan.
- **MRI**: A powerful magnet linked to a computer is used to make detailed pictures of your body. The doctor can view these pictures on a monitor and can print them on film. An MRI can show whether oral cancer has spread.

**Treatment**

Many people with oral cancer want to take an active part in making decisions about their medical care. It is natural to want to learn all you can about your disease and your treatment choices. However, shock and stress after the diagnosis can make it hard to think of everything you want to ask the doctor. It often helps to make a list of
questions before an appointment. To help remember what the doctor says, you may take notes or ask whether you may use a tape recorder. You may also want to have a family member or friend with you when you talk to the doctor—to take part in the discussion, to take notes, or just to listen.

Your doctor may refer you to a specialist, or you may ask for a referral. Specialists who treat oral cancer include oral and maxillofacial surgeons, otolaryngologists (ear, nose, and throat doctors), medical oncologists, radiation oncologists, and plastic surgeons. You may be referred to a team that includes specialists in surgery, radiation therapy, or chemotherapy. Other health care professionals who may work with the specialists as a team include a dentist, speech pathologist, nutritionist, and mental health counselor.

**Getting a Second Opinion**

Before starting treatment, you might want a second opinion about the diagnosis and the treatment plan. Some insurance companies require a second opinion; others may cover a second opinion if you or your doctor requests it.

There are a number of ways to find a doctor for a second opinion:

- Your doctor may refer you to one or more specialists. At cancer centers, several specialists often work together as a team.
- The Cancer Information Service, at 1-800-4-CANCER, can tell you about nearby treatment centers.
- A local or state medical or dental society, a nearby hospital, or a medical or dental school can usually provide the names of specialists in your area.
- The American Board of Medical Specialties (ABMS) has a list of doctors who have had training and exams in their specialty. You can find this list in the *Official ABMS Directory of Board Certified Medical Specialists*. The directory is available in most public libraries. Or you can look up doctors at http://www.abms.org/. (Click on Who's Certified.)
• The American Dental Association (ADA) Web site provides a list of dentists by specialty and location. The ADA Member Directory is available on the Internet at http://www.ada.org/public/directory/index.html.

• The NCI provides a helpful fact sheet on how to find a doctor called "How To Find a Doctor or Treatment Facility If You Have Cancer." It is available on the Internet at https://cissecure.nci.nih.gov/ncipubs/.

You may want to ask the doctor these questions before treatment begins:

• What is the stage of the disease? Has the cancer spread? If so, where?
• What are my treatment choices? Which do you recommend for me? Will I have more than one kind of treatment?
• What are the expected benefits of each kind of treatment?
• What are the risks and possible side effects of each treatment? How will treatment affect my normal activities? Will I be given anything to control side effects?
• How long will treatment last?
• Will I have to stay in the hospital?
• What is the treatment likely to cost? Is this treatment covered by my insurance plan?
• Would a clinical trial (research study) be appropriate for me? (See "The Promise of Cancer Research" for more information about clinical trials.)
• Should I try to quit smoking?

Preparing for Treatment

The choice of treatment depends mainly on your general health, where in your mouth or oropharynx the cancer began, the size of the tumor, and whether the cancer has spread. Your doctor can describe
your treatment choices and the expected results. You will want to consider how treatment may affect normal activities such as swallowing and talking, and whether it will change the way you look. You and your doctor can work together to develop a treatment plan that meets your needs and personal values.

You do not need to ask all your questions or understand all the answers at once. You will have other chances to ask your doctor to explain things that are not clear and to ask for more information.

**Methods of Treatment**

Oral cancer treatment may include surgery, radiation therapy, or chemotherapy. Some patients have a combination of treatments.

At any stage of disease, people with oral cancer may have treatment to control pain and other symptoms, to relieve the side effects of therapy, and to ease emotional and practical problems. This kind of treatment is called *supportive care*, *symptom management*, or *palliative care*. Information about supportive care is available on NCI's Web site at http://www.nci.nih.gov/ and from NCI's Cancer Information Service at 1-800-4-CANCER.

You may want to talk to the doctor about taking part in a clinical trial, a research study of new treatment methods. The section on "The Promise of Cancer Research" has more information about clinical trials.

**Surgery**

Surgery to remove the tumor in the mouth or throat is a common treatment for oral cancer. Sometimes the surgeon also removes lymph nodes in the neck. Other tissues in the mouth and neck may be removed as well. Patients may have surgery alone or in combination with radiation therapy.
You may want to ask the doctor these questions before having surgery:

- What kind of operation do you recommend for me?
- Do I need any lymph nodes removed? Why?
- How will I feel after the operation? How long will I be in the hospital?
- What are the risks of surgery?
- Will I have trouble speaking, swallowing, or eating?
- Where will the scars be? What will they look like?
- Will I have any long-term effects?
- Will I look different?
- Will I need reconstructive or plastic surgery? When can that be done?
- Will I lose my teeth? Can they be replaced? How soon?
- Will I need to see a specialist for help with my speech?
- When can I get back to my normal activities?
- How often will I need checkups?
- Would a clinical trial be appropriate for me?

**Radiation Therapy**

Radiation therapy (also called radiotherapy) is a type of local therapy. It affects cells only in the treated area. Radiation therapy is used alone for small tumors or for patients who cannot have surgery. It may be used before surgery to kill cancer cells and shrink the tumor. It also may be used after surgery to destroy cancer cells that may remain in the area.

Radiation therapy uses high-energy rays to kill cancer cells. Doctors use two types of radiation therapy to treat oral cancer:

- **External radiation:** The radiation comes from a machine. Patients go to the hospital or clinic once or twice a day, generally 5 days a week for several weeks.
• **Internal radiation (implant radiation):** The radiation comes from *radioactive* material placed in seeds, needles, or thin plastic tubes put directly in the tissue. The patient stays in the hospital. The implants remain in place for several days. Usually they are removed before the patient goes home.

Some people with oral cancer have both kinds of radiation therapy.

You may want to ask the doctor these questions before having radiation therapy:

- Which type of radiation therapy do you recommend for me? Why do I need this treatment?
- When will the treatments begin? When will they end?
- Should I see my dentist before I start treatment? If I need dental treatment, how much time does my mouth need to heal before radiation therapy starts?
- What are the risks and side effects of this treatment? What can I do about them?
- How will I feel during therapy?
- What can I do to take care of myself during therapy?
- How will my mouth and face look afterward?
- Are there any long-term effects?
- Can I continue my normal activities?
- Will I need a special diet? For how long?
- How often will I need checkups?
- Would a clinical trial be appropriate for me?

**Chemotherapy**

Chemotherapy uses anticancer drugs to kill cancer cells. It is called *systemic therapy* because it enters the bloodstream and can affect cancer cells throughout the body.
Chemotherapy is usually given by injection. It may be given in an outpatient part of the hospital, at the doctor's office, or at home. Rarely, a hospital stay may be needed.

You may want to ask the doctor these questions before having chemotherapy:

- Why do I need this treatment?
- Which drug or drugs will I have?
- How do the drugs work?
- Should I see my dentist before I start chemotherapy? If I need dental treatment, how much time does my mouth need to heal before the chemotherapy begins?
- What are the expected benefits of the treatment?
- What are the risks and possible side effects of treatment? What can I do about them?
- When will treatment start? When will it end?
- Will I need to stay in the hospital? How long?
- How will treatment affect my normal activities?
- Would a clinical trial be appropriate for me?

Side Effects of Cancer Treatment

Because treatment often damages healthy cells and tissues, unwanted side effects are common. These side effects depend mainly on the location of the tumor and the type and extent of the treatment. Side effects may not be the same for each person, and they may even change from one treatment session to the next. Before treatment starts, your health care team will explain possible side effects and suggest ways to help you manage them.

The NCI provides helpful booklets about cancer treatments and coping with side effects. Booklets such as Radiation Therapy and You,
Chemotherapy and You, and Eating Hints for Cancer Patients may be viewed, downloaded, and ordered from https://cissecure.nci.nih.gov/ncipubs/. These materials also may be ordered by calling the Cancer Information Service at 1-800-4-CANCER.

The National Institute of Dental and Craniofacial Research (NIDCR) also provides helpful materials. Head and Neck Radiation Treatment and Your Mouth, Chemotherapy and Your Mouth, and other booklets are available from NIDCR. See "National Institute of Dental and Craniofacial Research Information Resources" for a list of publications.

Surgery

It takes time to heal after surgery, and the time needed to recover is different for each person. You may be uncomfortable for the first few days after surgery. However, medicine can usually control the pain. Before surgery, you should discuss the plan for pain relief with your doctor or nurse. After surgery, your doctor can adjust the plan if you need more pain relief.

It is common to feel tired or weak for a while. Also, surgery may cause tissues in your face to swell. This swelling usually goes away within a few weeks. However, removing lymph nodes can result in swelling that lasts a long time.

Surgery to remove a small tumor in the mouth may not cause any lasting problems. For a larger tumor, however, the surgeon may remove part of the palate, tongue, or jaw. This surgery may change your ability to chew, swallow, or talk. Also, your face may look different after surgery. Reconstructive or plastic surgery may be done to rebuild the bones or tissues of the mouth. (See "Reconstruction.")

Radiation Therapy
Almost all patients who have radiation therapy to the head and neck area develop oral side effects. That is why it is important to get the mouth in good condition before cancer treatment begins. Seeing a dentist two weeks before cancer treatment begins gives the mouth time to heal after dental work.

The side effects of radiation therapy depend mainly on the amount of radiation given. Some side effects in the mouth go away after radiation treatment ends, while others last a long time. A few side effects (such as dry mouth) may never go away.

Radiation therapy may cause some or all of these side effects:

- **Dry mouth:** Dry mouth can make it hard for you to eat, talk, and swallow. It can also lead to tooth decay. You may find it helpful to drink lots of water, suck ice chips or sugar-free hard candy, and use a saliva substitute to moisten your mouth.

- **Tooth decay:** Radiation can cause major tooth decay problems. Good mouth care can help you keep your teeth and gums healthy and can help you feel better.
  - Doctors usually suggest that people gently brush their teeth, gums, and tongue with an extra-soft toothbrush and fluoride toothpaste after every meal and before bed. If brushing hurts, you can soften the bristles in warm water.
  - Your dentist may suggest that you use fluoride gel before, during, and after radiation treatment.
  - It also helps to rinse your mouth several times a day with a solution made from 1/4 teaspoon baking soda and 1/8 teaspoon salt in one cup of warm water. After you rinse with this solution, follow with a plain water rinse.

- **Sore throat or mouth:** Radiation therapy can cause painful ulcers and inflammation. Your doctor can suggest medicines to help control the pain. Your doctor also may suggest special rinses to numb the throat and mouth to help relieve the soreness. If your pain continues, you can ask your doctor about stronger medicines.
• **Sore or bleeding gums:** It is important to brush and floss teeth gently. You may want to avoid areas that are sore or bleeding. To protect your gums from damage, it is a good idea to avoid the use of toothpicks.

• **Infection:** Dry mouth and damage to the lining of the mouth from radiation therapy can cause infection to develop. It helps to check your mouth every day for sores or other changes and to tell your doctor or nurse about any mouth problems.

• **Delayed healing after dental care:** Radiation treatment may make it hard for tissues in the mouth to heal. It helps to have a thorough dental exam and complete all needed dental treatment well before radiation therapy begins.

• **Jaw stiffness:** Radiation can affect the chewing muscles and make it difficult for you to open your mouth. You can prevent or reduce jaw stiffness by exercising your jaw muscles. Health care providers often suggest opening and closing the mouth as far as possible (without causing pain) 20 times in a row, 3 times a day.

• **Denture problems:** Radiation therapy can change the tissues in your mouth so that dentures do not fit anymore. Because of soreness and dry mouth, some people may not be able to wear dentures for as long as one year after radiation therapy. After the tissues heal completely and your mouth is no longer sore, your dentist may need to refit or replace your dentures.

• **Changes in the sense of taste and smell:** During radiation therapy, food may taste or smell different.

• **Changes in voice quality:** Your voice may be weak at the end of the day. It may also be affected by changes in the weather. Radiation directed at the neck may cause your larynx to swell, causing voice changes and the feeling of a lump in your throat. Your doctor may suggest medicine to reduce this swelling.

• **Changes in the thyroid:** Radiation treatment can affect your thyroid (an organ in your neck beneath the voice box). If your thyroid does not make enough thyroid hormone, you may feel tired, gain weight, feel cold, and have dry skin and hair. Your doctor can check the level of thyroid hormone with a blood test. If the level is low, you may need to take thyroid hormone pills.
• **Skin changes in the treated area:** The skin in the treated area may become red or dry. Good skin care is important at this time. It is helpful to expose this area to the air while protecting it from the sun. Also, avoid wearing clothes that rub the treated area, and do not shave the treated area. You should not use lotions or creams in the treated area without your doctor's advice.

• **Fatigue:** You may become very tired, especially in the later weeks of radiation therapy. Resting is important, but doctors usually advise their patients to stay as active as they can.

Although the side effects of radiation therapy can be distressing, your doctor can usually treat or control them. It helps to report any problems that you are having so that your doctor can work with you to relieve them.

**Chemotherapy**

Chemotherapy and radiation therapy can cause some of the same side effects, including painful mouth and gums, dry mouth, infection, and changes in taste. Some anticancer drugs can also cause bleeding in the mouth and a deep pain that feels like a toothache. The problems you have depend on the type and amount of anticancer drugs you receive, and how your body reacts to them. You may have these problems only during treatment or for a short time after treatment ends.

Generally, anticancer drugs affect cells that divide rapidly. In addition to cancer cells, these rapidly dividing cells include the following:

• **Blood cells:** These cells fight infection, help your blood to clot, and carry oxygen to all parts of the body. When drugs affect your blood cells, you are more likely to get infections, bruise or bleed easily, and feel very weak and tired.

• **Cells in hair roots:** Chemotherapy can lead to hair loss. The hair grows back, but sometimes the new hair is somewhat different in color and texture.
• **Cells that line the digestive tract:** Chemotherapy can cause poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores. Many of these side effects can be controlled with drugs.

**Nutrition**

Eating well during cancer treatment means getting enough calories and protein to prevent weight loss, regain strength, and rebuild healthy tissues. But eating well may be difficult after treatment for oral cancer. Some people with cancer find it hard to eat because they lose their appetite. They may not feel like eating because they are uncomfortable or tired. A dry or sore mouth or changes in smell and taste also may make eating difficult.

If your mouth is dry, you may find that soft foods moistened with sauces or gravies are easier to eat. Thick soups, puddings, and milkshakes often are easier to swallow. Nurses and dietitians can help you choose the right foods. Also, the National Cancer Institute booklet *Eating Hints for Cancer Patients* contains many useful ideas and recipes. The "National Cancer Institute Information Resources" section tells how to get this publication.

After surgery or radiation therapy for oral cancer, some people need a feeding tube. A feeding tube is a flexible plastic tube that is passed into the stomach through an incision in the abdomen. In almost all cases, the tube is temporary. Most people gradually return to a regular diet.

To protect your mouth during cancer treatment, it helps to avoid:

- Sharp, crunchy foods like taco chips
- Foods that are hot, spicy, or high in acid like citrus fruits and juices
- Sugary foods that can cause cavities
- Alcoholic drinks
Oral and pharyngeal cancer is the sixth most common malignancy reported worldwide and one with high mortality ratios among all malignancies. The global number of new cases was estimated at 405,318 about two-thirds of them arising in developing countries. Highest rates are reported in South Asian countries such as India and Sri Lanka. The Indian sub-continent accounts for one-third of the world burden. The incidence and mortality from oral cancer is rising in several regions of Europe, Taiwan, Japan and Australia. Every year in Europe, around 100,800 people are diagnosed with head and neck cancer and almost 40,000 die from the disease. In the USA alone, 30,000 Americans are diagnosed with oral or pharyngeal cancer each year. About 90 percent of head and neck cancers are of the squamous cell variety. Although there have been significant improvements in chemotherapy and surgical techniques, the disease is often particularly challenging to treat since most patients present with advanced disease, have secondary tumours and suffer from other co-morbidities. Unfortunately 5-year survival rate has not improved (50% overall) for the last few decades except in specialized cancer centres.

More than 34,000 Americans will be diagnosed with oral or pharyngeal cancer this year. It will cause over 8,000 deaths, killing roughly 1 person per hour, 24 hours per day. Of those 34,000 newly diagnosed individuals, only half will be alive in 5 years. This is a number which has not significantly improved in decades. The death rate for oral cancer is higher than that of cancers which we hear about routinely such as cervical cancer, Hodgkin's lymphoma, laryngeal cancer, cancer of the testes, endocrine system cancers such as thyroid, or skin cancer (malignant melanoma). If you expand the definition of oral cancers to include cancer of the larynx, for which the risk factors are the same, the numbers of diagnosed cases grow to 41,000 individuals, and 12,500 deaths per year in the US alone. Worldwide the problem is much greater, with over 400,000 new cases being found each year. Statistics on worldwide occurrence
The death rate associated with this cancer is particularly high not because it is hard to discover or diagnose, but due to the cancer being routinely discovered late in its development. Often it is only discovered when the cancer has metastasized to another location, most likely the lymph nodes of the neck. Prognosis at this stage of discovery is significantly worse than when it is caught in a localized intra oral area. Besides the metastasis, at these later stages, the primary tumor has had time to invade deep into local structures. Oral cancer is particularly dangerous because in its early stages it may not be noticed by the patient, as it can frequently prosper without producing pain or symptoms they might readily recognize, and because it has a high risk of producing second, primary tumors. This means that patients who survive a first encounter with the disease, have up to a 20 times higher risk of developing a second cancer. This heightened risk factor can last for 5 to 10 years after the first occurrence. There are several types of oral cancers, but around 90% are squamous cell carcinomas.

The demographics of those who develop this cancer have been consistent for some time. While historically the majority of people are over the age of 40 at the time of discovery, it does occur in those under this age. Exact causes for those affected at a younger age are now becoming clearer in peer reviewed research. There are links to young men and women who use conventional "smokeless" chewing or spit tobacco. Promoted by some as a safer alternative to smoking, it has in actuality not proven to be any safer to those who use it when referring to oral cancers. Campaigns to promote the safety of smokeless are being initiated, but it is clear that while it may reduce lung cancers, it has a negative effect on the rates of oral cancers, pancreatic cancer, periodontal disease, and the chronic infections that it produces may even link it to heart disease as well. The gains against lung cancers may occur, but there will be new losses in other areas.

It is also now confirmed that in a younger age group, including those who have never used tobacco products, have a cause which is HPV viral based. The human papilloma virus, particularly version 16, has
now been shown to be sexually transmitted between partners, and is conclusively implicated in the increasing incidence of young non-smoking oral cancer patients. This is the same virus that is the causative agent in more than 90% of all cervical cancers. It is the foundation's belief, based on recent revelation in peer reviewed published data in the last few years that in people under the age of 50, HPV may even be replacing tobacco as the primary causative agent in the initiation of the disease process.

From a gender perspective, for decades this has been a cancer which affected 6 men for every woman. That ratio has now become 2 men to each woman. Again, while published studies do not exist to draw finite conclusions, we will probably find that this increase is due to lifestyle changes, primarily the increased number of women smokers over the last few decades. It is a cancer which occurs twice as often in the black population as in whites, and survival statistics for blacks over five years are also poorer at 33%, versus 55% for whites. As in the above examples, it is unlikely we will find a genetic reason for this. Lifestyle choices still remain the biggest cause. These published statistics do not consider such socio-economic factors as income levels, education, availability of proper health care, and the increased use of both tobacco and alcohol by different ethnic populations, but all these factors likely play a role in who develops the disease.

**Risk Factors**

Understanding the causative factors of cancer will contribute to prevention of the disease. Age is frequently named as a risk factor for
oral cancer, as historically it occurs in those over the age of 40. The age of diagnosed patients may indicate a time component in the biochemical or biophysical processes of aging cells that allows malignant transformation, or perhaps, immune system competence diminishes with age. Very recent data (late 2007-2008) lead us to believe that the fastest growing segment of the oral cancer population are non smokers under the age of fifty, which would indicate a paradigm shift in the cause of the disease, and in the locations where it most frequently occurs in the oral environment.

However, it is likely that the accumulative damage from other factors, such as tobacco use, alcohol consumption, and persistent viral infections such as HPV, are the real culprits. It may take several decades of smoking for instance, to precipitate the development of a cancer. Having said that, tobacco use in all its forms is number one on the list of risk factors in individuals over 50. Historically at least 75% of those diagnosed are tobacco users. This percentage is now changing, and has yet to be definitively determined as new data related to viral causes are changing the demographics rapidly. When you combine tobacco with heavy use of alcohol, your risk is significantly increased, as the two act synergistically. Those who both smoke and drink, have a 15 times greater risk of developing oral cancer than others. More about tobacco and alcohol

It does not appear that the viral causes act synergistically with tobacco or alcohol, and represent a completely unique disease process.

Tobacco and alcohol are essentially chemical factors, but they can also be considered lifestyle factors, since we have some control over them. Besides these, there are physical factors such as exposure to ultraviolet radiation. This is a causative agent in cancers of the lip, as well as other skin cancers. Cancer of the lip is one oral cancer whose numbers have declined in the last few decades. This is likely due to the increased awareness of the damaging effects of prolonged exposure to sunlight, and the use of sunscreens for protection. Another physical factor is exposure to x-rays. Radiographs regularly taken during examinations, and at the dental office, are safe, but
remember that radiation exposure is accumulative over a lifetime. It has been implicated in several head and neck cancers.

Biological factors include viruses and fungi, which have been found in association with oral cancers. The human papilloma virus, particularly HPV16, has been implicated in oral cancers, particularly those that occur in the back of the mouth. (Oropharynx, base of tongue, tonsillar pillars and crypt, as well as the tonsils themselves.) HPV is a common, sexually transmitted virus, which infects about 40 million Americans today. There are over 100 strains of HPV, most thought to be harmless. But 1% of those infected, have the HPV16 strain which is a primary causative agent in cervical cancer, cancers of the anus and penis, and now is a known cause of oral cancer as well. It is likely that the changes in sexual behaviors of young adults over the last few decades, and which are continuing today, are increasing the spread of HPV, and the oncogenic versions of it. There are other minor risk factors which have been associated with oral cancers, but have not yet been definitively shown to participate in their development. These include lichen planus, an inflammatory disease of the oral soft tissues.

There are studies which indicate a diet low in fruits and vegetables could be a risk factor, and that conversely, one high in these foods may have a protective value against many types of cancer. More about nutrition and cancer

Possible signs and symptoms

One of the real dangers of this cancer is that in its early stages, it can go unnoticed. It can be painless, and little in the way of physical changes may be obvious. The good news is however, that your dentist or doctor can see or feel the precursor tissue changes or the actual cancer while it is still very small, or in its earliest stages. It may appear as a white or red patch of tissue in the mouth, or a small indurated ulcer which looks like a common canker sore. Because there are so many benign tissue changes that occur normally in your
mouth, and some things as simple as a bite on the inside of your cheek may mimic the look of a dangerous tissue change, it is important to have any sore or discolored area of your mouth, **which does not heal within 14 days**, looked at by a professional. Other symptoms include; a lump or mass which can be felt inside the mouth or neck, pain or difficulty in swallowing, speaking, or chewing, any wart like masses, hoarseness which lasts for a long time, or any numbness in the oral/facial region. Unilateral persistent ear ache can also be a warning sign.

Other than the lips which are not a major site for occurrence any longer, common areas for oral cancer to develop in the anterior (front) of the mouth are on the tongue and the floor of the mouth. Individuals that use chewing tobacco, are likely to have them develop in the sulcus between the lip or cheek and the soft tissue (gingiva) covering the lower jaw (mandible). In the US, cancers of the hard palate are uncommon, though not unknown. The base of the tongue at the back of the mouth, the oropharynx (the back of the throat) and on the pillars of the tonsils, and the tonsillar crypt and the tonsil itself, are other sites where it is now more commonly found, particularly in young non smoking individuals. If your dentist or doctor decides that an area is suspicious, the only way to know for sure is to do a biopsy of the area. This is not painful, is inexpensive, and takes little time. It is important to have a firm diagnosis as early as possible. It is possible that your general dentist or medical doctor, may refer you to a specialist to have the biopsy performed. This is not cause for alarm, but a normal part of referring that happens between doctors of different specialties. More about biopsy and diagnosis

### How oral cancer develops

We know that all cancers (neoplastic transformations) result from changes (mutations) in genes which control cell behaviors. Mutated genes may result in a cell which grows and proliferates at an uncontrolled rate, is unable to repair DNA damage within itself, or
refuses to self destruct or die (apoptosis). It takes more than one mutation to turn a cell cancerous. Specific classes of genes must be mutated several times to result in a neoplastic cell, which then grows in an uncontrolled manner. When a cell does become mutated to this point, it is capable of passing on the mutations to all of its progeny when it divides. Genetic mistakes randomly happen each day in the course of our bodies replacing billions of cells. Besides these random occurrences, genetic errors can be inherited, be caused by viruses, or develop as a result of exposure to chemicals or radiation. Our bodies normally have mechanisms that destroy these abnormal cells. We are now discovering some of the reasons this fails to take place, and cancers occur.

**Treatment**

After a definitive diagnosis has been made and the cancer has been staged, treatment may begin. **Treatment of oral cancers is ideally a multidisciplinary approach** involving the efforts of surgeons, radiation oncologists, chemotherapy oncologists, dental practitioners, nutritionists, and rehabilitation and restorative specialists. The actual curative treatment modalities are usually Chemotherapy with concurrent radiation, sometimes combined with surgery. Chemotherapy while able to kill cancer cells itself is currently not used as a monotherapy for oral cancers. Added to decrease the
possibility of metastasis, to sensitize the malignant cells to radiation, to reduce the size of any malignancy prior to surgery, or for those patients who have confirmed distant metastasis of the disease, it is a powerful component of treatment.

More on the metastasis of cancer

Prior to the commencement of curative treatment, it is likely that other oral health needs will be addressed. The purpose is to decrease the likelihood of developing post therapeutic complications. Teeth with poor prognosis from periodontal problems, caries, etc. may be extracted. This avoidance of post radiotherapy surgery is important as it can sometimes induce osteonecrosis, a condition which can develop when tissue damaged by radiation exposes the underlying bone. The bone, which has lost its ability to efficiently repair itself due to reduced blood supply, again from radiation exposure, yields a chronic and difficult to treat situation. A thorough prophylaxis, or cleaning will likely be done as well.

Whether a patient has surgery, radiation and surgery, or radiation, surgery, and chemotherapy, is dependent on the stage of development of the cancer. Each case is individual. More about radiation therapy, surgery, chemotherapy and targeted therapies. Patients with cancers treated in their early stages, may have little in the way of post treatment disfigurement. For those whose cancer is caught at a later stage, the results of surgical removal of the disease may require reconstruction of portions of their oral cavity or facial features. There may be adjunctive therapy required to assist in speech, chewing of foods, the problems associated with the lack of salivary function, as well as the fabrication of dental or facial prostheses.

Extremely detailed overview of oral cancer in all respects.

**Biotherapies and current research**
Every phase of how a cancer develops is potentially an avenue to finding a new therapy for treatment. Research into these mechanisms has yielded new exploration into therapies based on the molecules and genes involved in the cancer process. Apoptosis, (cell suicide), angiogenesis inhibitors, genetic "cocktails" whose ingredients could stimulate immune system activity that was specific to a particular tumor, viruses that only kill specific cancer cells, and techniques which would allow the replacement of a damaged p53 gene, are all being researched now. It is possible that in our lifetimes we will see cures for cancer develop from this ongoing research. Targeted therapies such as the use of monoclonal antibodies are now an FDA approved adjunctive treatment for combating head and neck cancers.

The demographics of those who develop this cancer have been consistent for some time. While historically the majority of people are over the age of 40 at the time of discovery, it does occur in those under this age. Exact causes for those affected at a younger age are now becoming clearer in peer reviewed research. There are links to young men and women who use conventional "smokeless" chewing or spit tobacco. Promoted by some as a safer alternative to smoking, it has in actuality not proven to be any safer to those who use it when referring to oral cancers. Campaigns to promote the safety of smokeless are being initiated, but it is clear that while it may reduce lung cancers, it has a negative effect on the rates of oral cancers, pancreatic cancer, periodontal disease, and the chronic infections that it produces may even link it to heart disease as well. The gains against lung cancers may occur, but there will be new losses in other areas.

It is also now confirmed that in a younger age group, including those who have never used tobacco products, have a cause which is HPV viral based. The human papilloma virus, particularly version 16, has now been shown to be sexually transmitted between partners, and is conclusively implicated in the increasing incidence of young non-smoking oral cancer patients. This is the same virus that is the causative agent in more than 90% of all cervical cancers. It is the foundation's belief, based on recent revelation in peer reviewed
published data in the last few years that in people under the age of 50, HPV may even be replacing tobacco as the primary causative agent in the initiation of the disease process.

From a gender perspective, for decades this has been a cancer which affected 6 men for every woman. That ratio has now become 2 men to each woman. Again, while published studies do not exist to draw finite conclusions, we will probably find that this increase is due to lifestyle changes, primarily the increased number of women smokers over the last few decades. It is a cancer which occurs twice as often in the black population as in whites, and survival statistics for blacks over five years are also poorer at 33%, versus 55% for whites. As in the above examples, it is unlikely we will find a genetic reason for this. Lifestyle choices still remain the biggest cause. These published statistics do not consider such socio-economic factors as income levels, education, availability of proper health care, and the increased use of both tobacco and alcohol by different ethnic populations, but all these factors likely play a role in who develops the disease.

The tongue is actually divided into 2 separate anatomical areas, the oral tongue is the part you can "stick out" at somebody and extends backward to a V-shaped group of lumps on the back of the tongue which are actually specialized taste buds. The base of tongue is behind these. The oral tongue and the base of the tongue comprise the whole tongue but it is important to know that they develop from different embryonic tissue and really are somewhat dissimilar. Most importantly, this explains why the treatment for squamous cell carcinoma for the oral tongue is usually quite different from the treatment for squamous cell carcinoma of the base of tongue.

Squamous Cell Cancer of the oral tongue.

This tumor is usually located on the side, or what we call the lateral border, of the oral tongue. It is usually somewhat ulcerated and is grayish-pink to red in color. It will often bleed easily if bitten or touched. It is generally seen in the older age groups
though we have had one 21 year old woman present with a small cancer, and just recently a 32 old lady from the Austin area come to us from the Internet for treatment of a significant squamous cell cancer of the tongue. Smoking and drinking are known to contribute to the formation of the cancers, although some folks have developed squamous cancer of the tongue with no known extra risk factors.

Most very small cancers of the oral tongue can be quickly and successfully treated by surgical removal leaving behind little cosmetic or functional change. THIS IS NOT ALWAYS TRUE, HOWEVER, AS THERE CAN BE MANY VARIABLES AND FACTORS THAT CAN SERIOUSLY IMPACT SPEECH AND SWALLOWING. This can only be assessed by a face to face Surgeon/Patient meeting and examination.

Larger cancers may indeed have some effect on speech and on swallowing, but one must remember that not treating this problem would cause far more significant problems, up to, and including death. If one thinks about that for a moment; a few changes in speech or swallowing seem like a pretty good swap.

There is a school of thought that small oral tongue cancers can be better managed by radiation therapy alone, and this is indeed true in some cases, especially where the patient has serious heart and/or lung disease that might make anesthesia risky. Fortunately, this is a rare occurrence.

The main reason for treating small squamous cancer of the oral tongue with surgery is that it is at least as curative as radiation, possibly better, it is over with quickly, oftentimes done as an out patient procedure instead of 5 - 6 weeks of daily therapy, it may be significantly less expensive, and finally, and most importantly, it means that if a patient were to later present with a 2nd or 3rd Squamous Cell Cancer of the mouth/throat/or voice box area,
you would still have radiation therapy as a treatment option, perhaps then being able to avoid a significant and disfiguring operation. There is a limit as to how much radiation normal tissue can take before it dies.

Some cases of Oral Tongue Cancer can be treated with just removal of the primary tumor in the tongue. But as the size of the primary tumor increases the statistical possibility of some cancer cells spreading through lymphatic vessels to the lymph nodes of the neck increases. The site and pattern of the involved lymph nodes is pretty much constant --- that is to say we know where in the neck to look for enlarged lymph nodes that might contain metastatic cancer cells from the oral tongue cancer. Exceptions to these rules are sometimes seen, but they are uncommon. When the presence of enlarged lymph nodes in the neck is detected or when the index of suspicion is high that there may be cancer cells present in lymph nodes, then an operation called a neck dissection is performed to remove these "secondary" deposits of cancer. Remember, the oral tongue cancer is the "primary" tumor from where the spreading cells originate.

There are many forms of neck dissections from radical to conservative and I can not really go into the differences and unique characteristics of each one. Suffice to say that this is an area of medical judgement and decision making that relies heavily on the experience of the surgeon. While many physicians may have had some exposure to neck dissections at some point in their career, there are very few Head and Neck Surgeons, usually found in large medical centers, who can truly say that their career has been dedicated to this type of disease and they have done hundreds or perhaps thousands of these procedures. At The Head and Neck Surgery Clinic of Houston, we will have been doing Head and Neck cancer surgery and neck dissections for half a century come 1999.
Finally, there may sometimes be the need to perform plastic surgery and/or reconstruction following removal of the tumor, and radiation treatments may have to be given after the surgery to try to minimize the possibility of recurrence of the disease and ultimate treatment failure. Yes, sometimes in spite of every effort, every bit of hard work, in spite of supportive care and even our prayers, some patients will be lost to this disease. It is a sad thing to have to watch and be a part of, but it is one of life's unpleasant realities. For now, we will have to content ourselves with the knowledge that most of our tongue cancer patients survive quite nicely and hope that new research and new discoveries in the future will allow us to help our patients even more.

Squamous Cell Cancer of the base of tongue

Like the oral tongue, the base of tongue (or posterior 1/3) can also grow several types of cancers, but again, squamous cell carcinoma is the most common and we will direct our comments with that in mind. Unlike oral tongue cancers, base of tongue squamous cell cancer is usually larger when diagnosed because in the early stages it can not be seen and it creates few, if any, symptoms. Later however, base of tongue cancer may create pain, a sense of fullness, changes in what the voice sounds like, and perhaps even some difficulty in swallowing. Also, because the diagnosis often comes a bit later, a greater number of patients with this disease will already have neck metastasis, that is, cancer cells in the lymph nodes of the neck, by the time they are seen by the Head and Neck Surgeon.

While it may technically feasible to surgically remove some base of tongue cancers, it is our opinion that most can and should be treated by radiotherapy. These tumors are arguably more sensitive to radiation treatment than some other cancers. Certainly, there are exceptions to this. Radiation therapy
can also be used to control the cancer in the neck nodes as long as it is not too advanced. Interestingly, in those cases, we will sometimes remove massive neck node disease before starting radiation therapy when we know that x-ray therapy alone would not be successful in controlling the neck disease.

The prognosis after treatment of base of tongue cancer will vary from patient to patient as with any type of malignant disease. It has been our experience that the cure rate is good, but not quite as good as for early detected oral tongue cancer. The fact that base of tongue cancers are usually larger at the time of diagnosis probably is a significant contributing factor to this disparity. Very large base of tongue cancer may require a combination of surgery and radiation.

**Hairy Tongue:** This is a relatively rare condition which is caused by the elongation of the taste buds. This condition can be caused by poor oral hygiene, chronic oral irritation or smoking. The far right photograph shows a patient who has been treated with radiation therapy for head and neck cancer and has chronic oral inflammation. Treatment involves good oral hygiene, brushing of the tongue, mouth rinses and sometimes trimming of the elongated papilla. The left picture shows the same patient two months later after improvement in his oral hygiene.

Another patient with a Black Hairy Tongue. This patient had significant gastroesophageal reflux. Control of her reflux along with the use of Nystatin and bushing of her tongue resulted in a marked improvement in her condition. The pre-treatment picture is the picture on the right. The patient's tongue 2 months post treatment is shown on the left.

*Click on Pictures to Enlarge*
The patient shown on the right has a combination of a geographic and hairy tongue. This condition did not produce any symptoms and has been refractory to oral antibiotics, Nystatin, steroids and good oral hygiene.

Click on Pictures to Enlarge

**Acute Tonsillitis**: This is a common condition which is usually caused by gram positive bacteria. If the organism is Streptococcus Pyrogenesis, there is a risk of developing Rheumatic Fever. Often multiple different bacteria exists in the tonsillar crypts, which can be difficult to culture. Treatment with antibiotics to prevent Rheumatic Fever or tonsillar abscess formation is usually advisable.

Click on Pictures to Enlarge

The picture to the right shows the appearance of acute tonsillitis due to Infectious Mononucleosis. The patient was a 24 year old male with bilateral 4 cm non-tender jugulo-diagastric (upper neck) lymph nodes. The infection was resistant to antibiotics (as all viral infections are).

Click on Pictures to Enlarge

**Ankyloglossia** or a persistent lingual frenulum is a congenital persistence of tissue which binds the tongue to the floor of the mouth. When severe, the frenulum should be cut to mobilize the tongue.

Click on Pictures to Enlarge
Torus palatinus is a hard bony growth in the center of the roof of the mouth (palate). It is not a tumor or neoplasm by a benign bony growth called an exostosis. This growth commonly occurs in females over the age of 30 and rarely needs treatment. Occasionally it is removed for the proper fitting of dentures.

The torus to the right has a chronic non-healing ulceration exposing a focus of dead bone. This is a rare finding and may require surgical excision. This patient had been on Fosamax for five years. Fosamax is a bisphosphonate, a medication used to treat osteoporosis. As of 12/5/07, this complication had not been reported occurring in bones other than the mandible (lower jaw) or maxilla (upper jaw). This patient also had ear surgery (mastoidectomy) three years previously, while on Foxamax for two years, without any problems.

Fosamax inhibits bone resorption by suppressing the activity of the cells which remodel bone, osteoclasts. Some patients taking Fosamax have been found to form dead bone in their jaws (mandibular necrosis). This is especially true if the patient has infected teeth or trauma to the overlying mucosa. Less frequently, this complication has been found to occur in the upper jaw bone or palate (maxilla). Treatment is difficult since any trauma or surgery to the area may expand the bone loss.

For more information:  
Marx RE 2005  
Farrugia MC 2006  
Merigo E 2006

Lip Cancer:  Cancer of the lip is a relatively common condition. When caught early, it is treatable with surgery or radiation therapy. Cancers of the lower lip have a better prognosis than those of the upper lip. Chronic sun exposure is the most common cause, but smoking can also be an etiology. The picture on the right shows a T2 N0 (tumor size between 2 to 4 cm, with no lymph node spread) squamous cell carcinoma of the lower lip. The patient was treated with surgical resection and reconstruction using an Abby-Estlander Lip Flap.

***More On Lip Flaps***
These patients have a basal cell carcinoma lip cancer. It is a less aggressive tumor than squamous cell carcinoma, see above photo. Basal Cell Carcinoma spread and destroy tissue locally, but do not metastasize (spread by blood or lymphatics). Treatment is surgical excision or radiation therapy.

Click on Pictures to Enlarge

Oral Cancer: This patient is a 57 year old, with a 75 pack year history of smoking and alcohol intake. He has an oral cancer involving the uvula (uvular cancer) which has also spread onto the nasopharynx surface of the soft palate. He was also found to have a carcinoma in the upper portion of his right lung. See Bronchoscopy Video

Click on Pictures to Enlarge

Another common oral cancer is tongue cancer. The picture on the right shows a cancer on the tongue in a 45 year old male who was a non-smoker. The most common cause of oral tumors is Human Papilloma Virus which is found in 70% of oral tumors. This virus most commonly causes tumors on the tonsil and base of tongue. Learn more about HPV and oral cancer.

Click on Pictures to Enlarge
The picture on the right is from a 22 year old male who has used over one can of snuff for the past 15 years. He has high blood pressure from the vasoconstrictive (contraction of blood vessels) effect of nicotine and gastroesophageal reflux disease (stomach acid coming up from the stomach towards the mouth) which is made worse from using tobacco products. The picture on the right shows extensive leukoplakia forming between his gums and lips. This is a pre-cancerous condition and if it does not resolve with his cessation of using tobacco products, it will need to be surgically removed.

Click on Pictures to Enlarge

This patient is a 87 year old who used to smoke 1 pack per day many years ago. She was not sure how long she smoked. This patient has a tumor on both her tongue and right floor of the mouth. The tumor is her alveolus and extends onto the anterior tonsillar pillar. These types of tumors are often treated with a commando operation which consists of resection of the mandible floor of mouth and tongue; along with a radical neck dissection which removes muscles and lymph nodes in the neck.

Click on Pictures to Enlarge

This patient is a 70 year old who smoked 1 pack per day for 50 years he also drank alcohol heavily. He presented with severe dysphagia (trouble swallowing) and on examination was found to have a very small airway. He underwent an emergency tracheotomy (breathing hole placed in the neck) under local anesthesia no IV sedation or analgesia was given. The was then put to sleep with general anesthesia and had his oral tumor debulked. The pictures on the right show a large oral tumor in the hypopharynx with a very small airway under the epiglottis.
Carcinoma of the Tongue: This patient has a T1 (2 cm or less) squamous cell carcinoma of the tongue.

Chelitis: This is crusting and cracking which occurs in the corners of the mouth. It is caused by a fungus and anti-fungal creams are usually curative.

Aphthosis Ulcers: Aphthosis ulcers are shallow small painful ulcers which appear on mobile mucosa in the oral cavity. They are often found in individuals that are under stress. The cause of these ulcers is unknown. They can be treated by applying Amlexanox gel to the ulcers four times a day for 7 to 10 days.
**Cold Sores:** Cold sores are caused by the Herpes Simplex Virus. Once infected, they plague the patient for life. Penciclovir cream is a prescription medication which is approved by the FDA for treatment. Other medications, Acyclovir ointment, Valacyclovir and Famciclovir are only approved for genital herpes but many doctors also use them to treat oral herpes (cold sores). A new over-the-counter medication approved by the FDA is Abreva. It also effective in the treatment of cold sores. It is believed to protect the skin cells from viral damage.

*Click on Pictures to Enlarge*

**Shingles (Herpes Zoster):** Shingles are caused by the Herpes Zoster Virus. They occur many years after an individual has had chicken pox. Once an individual has had chicken pox, he/she will carry, for life, the virus in a dormant state in the cell bodies of nerve tissue. Over the years, a patient's antibody levels fall and the dormant virus emerges. The virus causes lesions to erupt on the skin in which the nerve innervates. In the right-hand picture, the lesions are seen on the patient's right jaw and right half of his tongue. This corresponds to the lower division of the trigeminal nerve (V cranial nerve) and the lingual nerve (XII cranial nerve). This patient was treated with a seven day course of Valacyclovir given one gram three times a day. *Click on Pictures to Enlarge*

**Stomatitis:** The pictures on the right show a 47 year old male with an intraoral viral eruption 24 hours after exposure to caustic chemicals. This patient was also treated with Famvir (famciclovir) 500 mg three times a day for 7 days. The probable cause of these lesions is herpes simplex. *Click on Pictures to Enlarge*

The pictures on the right are from a 14 year old girl with punctuate viral lesions on the hard palate and tongue. She was treated with Famvir (famciclovir) 500 mg three times a day for 7 days. The probable cause of these lesions is herpes simplex. *Click on Pictures to Enlarge*
Leukoplakia is a white patch in the oral cavity. It is often caused by chronic irritation or infection but may also be a cancer. In this patient the leukoplakia has areas of redness called erythroplakia. Erythroplakia more often represents a cancer. On biopsy, the patient was found to have a fungal infection. Fungal infections of the oral cavity may often mimic a cancer both on gross appearance and sometimes even histologically.

Click on Pictures to Enlarge

Salivary Gland Stone: This patient had a stone which formed in the Submandibula (Submaxillary) Gland Duct. The picture on the far right shows the duct's papilla in the floor of the mouth, underneath the patient's tongue. This duct drains uphill, is wide and has a mucoid or viscous secretion. Thus, when salivary gland stones occur, they usually occur in this duct. Treatment consists of excising the stone. Prevention is with hydration, gland massage and using a few drops of sour lemon juice several times a day to increase salivary flow.

The picture on the right is from a patient who has a small salivary gland stone in its duct. Note the dilatation of the salivary gland duct.

For more information on Salivary Gland Stones Click Here !!!

Click on Pictures to Enlarge

The pictures on the right show a patient with severe sialothiasis (salivary gland stones). One of the stones has eroded through the floor of the mouth. Two stones were recovered with a third still in the duct. This patient had a long history of recurrent salivary gland swelling and infection. Treatment will probably require excision of the submandibular salivary gland.
**Oral Fibroma.** This is a benign lesion in a young patient which can easily be removed as an office procedure.

**Lingual Cavernous Hemangioma.** This is a benign lesion but one which is very hard to treat. Surgery is difficult. Angiography is often needed to outline the feeding vessels and to embolize the hemangioma.

**Lingual Hemangioma.** The picture on the right is a small peduncular hemangioma on the tip of the tongue of a six year old male. It was removed under local anesthesia in the surgeon's office.

**Geographic Tongue.** This is a benign non-painful condition caused by the atrophy of taste bud papilla. The glassy patches move around the tongue and change shape. The cause of this condition is unknown and treatments are not reliable.
To the left is a picture of a hairy and geographic tongue in an 18 yr old male.

Mass on Base of Tongue: This mushroom like mass presented on a 40 yr old female with a one month history of choking. It was treated with surgical excision. The pathology report showed that the mass was a benign vascular tu

Click on Pictures to Enlarge
Sialocele. A sialocele arises from the blockage of a salivary gland duct. The duct enlarges and forms a sac of saliva. Treatment is with surgical excision.

Click on Pictures to Enlarge

Oral-Maxillary Fistula. In this condition, a hole (fistula) develops between the mouth and the large sinus cavity above the palate (roof of the mouth). This condition can be caused by dental infections or a complication of surgery. Treatment is with a two layer surgical closure. An incision is made around the periphery of the fistula. The mucosa of the fistula is elevated and inverted. It is then sewn together, forming an inner layer. The cheek mucosa is then advanced over the inner closure and sewn over the defect.

Click on Pictures to Enlarge

The patient shown on the right has a small hole in the middle of a tooth socket. A tooth had been pulled and a hole was made into the maxillary sinus. The hole did not fully heal and a small fistula was left in the middle of the upper alveolar ridge.

Click on Pictures to Enlarge

Lichen Planus: This condition presents as a white lace like pattern on the inside of the cheeks. It can be confused with many other conditions and evaluation by a physician is mandatory to make sure other serious problems are not present. Often the condition is caused by a reaction to medications. Beta Blockers and oral hypoglycemics are the most common offending medications. Lichen Planus can be associated with other conditions such as Hepatitis C. Treatment is with oral prednisone (5mg/ 5cc) rinses, mixed (1:1) with kopectate to allow the medication to stick to the oral mucosa.

Click on Pictures to Enlarge
Phemphigoid: Bullous phemphigoid is an auto-immune disease which causes blistering of the skin. It involves the mucous membranes in 10% to 25% of patients. Blistering occurs when antibodies attack proteins in the basement membrane of the skin (between the dermis and epidermis). Many cases are self limited and go into remission in five years or less. However, severe cases may require treatment with corticosteroids and immunosuppressive agents.

Phemphigoid should not be confused with Phemphigus Vulgaris which is a much more aggressive disease. In Phemphigus Vulgaris antibodies attack proteins called desmogleins. Desmogleins are the proteins which hold the skin together. Diagnosis of Phemphigoid and Phemphigus requires biopsy. For more