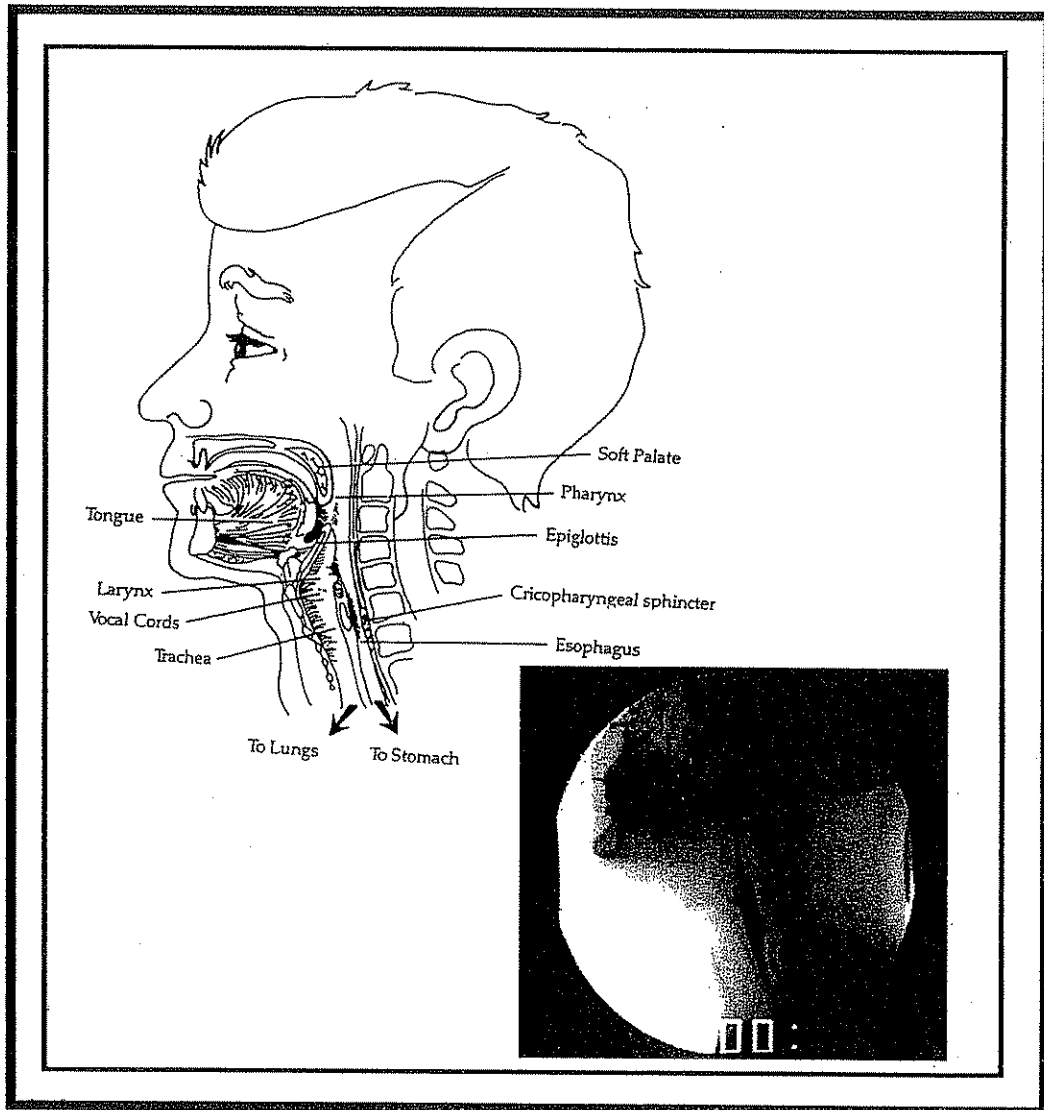


MANAGEMENT OF SWALLOWING DURING RADIATION AND CHEMOTHERAPY



University of Iowa Hospitals and Clinics
Speech and Swallowing Services

Greetings,

The University of Iowa Hospitals and Clinics Speech & Swallowing Service compiled this informational packet for those individuals who will soon be, or who are currently undergoing radiation therapy and/or chemotherapy for cancer of the head and neck.

Included in this packet is information concerning potential side effects impacting swallowing function and voice quality typically encountered by individuals undergoing radiation therapy and/or chemotherapy. Strategies for addressing these side effects are also reviewed. We believe that early intervention for swallowing and voice difficulties as a result of radiation or chemotherapy may help to lessen the duration and severity of these difficulties. It is important to note that this information is a general guideline. If you begin to have new symptoms or worsening symptoms, you should contact your physician.

One of the staff Speech-Language Pathologists will review the information with you, and will be available to work with you both during and after your treatment to address any problems that may develop with swallowing or with your voice.

Sincerely,

*University of Iowa Hospitals & Clinics
Speech & Swallowing Service*

Oral Complications of Chemotherapy and Head/Neck Radiation

(Adapted from the National Institutes of Health)

Oral complications are common in patients receiving chemotherapy or undergoing radiation therapy to the head and neck

The oral cavity is at high risk of side effects from chemotherapy and radiation therapy for a number of reasons.

- * Chemotherapy and radiation therapy stop the growth of rapidly dividing cells such as cancer cells. Since normal cells in the lining of the mouth also divide rapidly, anticancer treatment can prevent cells in the mouth from reproducing, making it difficult for oral tissue to repair itself
- * The mouth contains hundreds of different bacteria, some helpful and some harmful. Chemotherapy and radiation therapy can cause changes in the lining of the mouth and production of saliva and upset the healthy balance of bacteria. These changes may lead to mouth sores, infections, and tooth decay
- * Wear and tear occur from normal use of the mouth, teeth, and jaws, making healing more difficult

Preventive measures may lessen the severity of oral complications

Oral side effects may make it difficult for a patient to receive all of his or her cancer treatment. Sometimes treatment must be stopped. Preventing and controlling oral complications will enhance both the patient's quality of life and the effectiveness of cancer therapy.

Preventing and treating oral complications of cancer therapy involve identifying the patient at risk, starting preventive measures before cancer therapy begins, and treating complications as soon as they appear.

Description and Causes

Radiation therapy and chemotherapy may cause some of the same oral

side effects, including the following:

- * Mucositis (an inflammation of the mucous membranes in the mouth)
- * Infections in the mouth or that travel through the bloodstream, reaching and affecting cells all over the body
- * Taste changes
- * Dry mouth
- * Pain
- * Changes in dental growth and development in children
- * Malnutrition (lack of nutrients needed by the body for health, often caused by the inability to eat)
- * Dehydration (lack of water needed by the body for health, often caused by the inability to drink)
- * Tooth decay and gum disease

Complications may be caused directly or indirectly by anticancer therapy

Oral complications associated with chemotherapy and radiation therapy may be caused directly by the treatment or may result indirectly from side effects of the treatment. Radiation therapy may directly damage oral tissue, salivary glands, and bone. Areas treated may scar or waste away.

Slow healing and infection are indirect complications of cancer treatment. Both chemotherapy and radiation therapy can affect the ability of cells to reproduce, which slow the healing process in the mouth. Chemotherapy may reduce the number of white blood cells and weaken the immune system (the organs and cells that defend the body against infection and disease), making it easier for the patient to develop an infection.

Complications can be acute or chronic

Acute complications are those that occur during therapy. Chemotherapy usually causes acute complications that heal after treatment ends.

Chronic complications are those that continue or develop months to years after therapy ends. Radiation can cause acute complications but may also cause permanent tissue damage that puts the patient at a lifelong risk of oral complications. The following chronic complications commonly continue after radiation therapy to the head and/or neck has ended:

- * Dry mouth
- * Tooth decay
- * Infections
- * Taste changes
- * Problems using the mouth and jaw due to tissue and bone loss and/or the growth of benign tumors in the skin and muscle

Invasive dental procedures can cause additional problems. The dental care of patients who have undergone radiation therapy will therefore need to be adapted to the patient's ongoing complications.

Management of Oral Complications During and After Chemotherapy and/or Radiation Therapy

Routine Oral Care

Continuing good dental hygiene during and after cancer treatment can reduce complications such as cavities, mouth sores, and infections. It is important to clean the mouth after eating. The following are guidelines for everyday oral care during chemotherapy and radiation therapy:

Tooth brushing

- * Brush teeth and gums with a soft bristle brush 2 to 3 times a day for 2 to 3 minutes
- * Rinse the toothbrush in hot water every 15 to 30 seconds to soften the bristles, if needed

- * If it is necessary to use a foam toothbrush, use it with an antibacterial rinse, when possible
- * Allow the toothbrush to air dry between brushings
- * Choose toothpaste with care. Your dentist will be able to provide you with recommendations
- * If toothpaste irritates the mouth, try brushing with a solution of 1 teaspoon of salt added to 4 cups (1 quart) of water (consult with your dentist for further recommendations)

Rinsing

- * Rinse the mouth 3 or 4 times while brushing
- * Avoid rinses containing alcohol (Biotene products may be useful)
- * One of the following rinses made with salt and/or baking soda may be used:
 - * 1 teaspoon of salt in 4 cups of water
 - * 1 teaspoon of baking soda in 1 cup (8 ounces) of water
 - * 1/2 teaspoon salt and 2 tablespoons baking soda in 4 cups of water
- * An antibacterial rinse may be used 2 to 4 times a day for gum disease. Rinse for 1 to 2 minutes
- * If dry mouth occurs, rinsing may not be enough to clean the teeth after a meal. Brushing and flossing may be needed

Flossing

- * Floss gently once a day

Lip care

- * Use lip care products to prevent drying and cracking

Oral Mucositis

Mucositis is an inflammation of mucous membranes in the mouth

The terms "oral mucositis" and "stomatitis" are often used in place of each other, but their meanings are different.

- * Mucositis is an inflammation of mucous membranes in the mouth. It usually appears as red, burn-like sores or as ulcer-like sores throughout the mouth
- * Stomatitis is an inflammation of tissues in the mouth, such as the gums, tongue, roof and floor of the mouth, and tissues inside the lips and cheeks. It includes infections of mucous membranes

Mucositis may be caused by either radiation therapy or chemotherapy. In patients receiving chemotherapy, mucositis will heal by itself, usually in 2 to 4 weeks when there is no infection. Mucositis caused by radiation therapy usually lasts 6 to 8 weeks, depending on the duration of treatment.

The following problems may occur:

- * Pain
- * Infection
- * Bleeding, in patients receiving chemotherapy. Patients undergoing radiation therapy usually do not have a bleeding risk
- * Inability to breathe and eat normally

Swishing ice chips in the mouth for 30 minutes may help prevent mucositis from developing in patients who are given fluorouracil.

Care of mucositis during chemotherapy and radiation therapy focuses on cleaning the mouth and relieving the symptoms

Treatment of mucositis caused by either radiation therapy or chemotherapy is generally the same. After mucositis has developed, proper treatment depends on its severity and the patient's white blood cell count. The following are guidelines for treating mucositis during chemotherapy, stem cell transplantation, and radiation therapy:

Cleaning the mouth

- * Clean the teeth and mouth every 4 hours and at bedtime, more often if the mucositis becomes worse
- * Use a soft bristle toothbrush
- * Use water-soluble lubricating jelly to moisturize the mouth
- * Use bland rinses or plain sterile water. Frequent rinsing removes particles and bacteria from the mouth, prevents crusting of sores, and moistens and soothes sore gums and the lining of the mouth. The following rinse may be used to neutralize acid and dissolve thick saliva:
 - * *1/2 teaspoon salt and 2 tablespoons baking soda in 4 cups of water*
- * If crusting of sores occurs, the following rinse may be used:

Equal parts hydrogen peroxide and water or saltwater (1 teaspoon of salt in 4 cups of water)

THIS SHOULD NOT BE USED FOR MORE THAN 2 DAYS BECAUSE IT WILL KEEP MUCOSITIS FROM HEALING

Relieving pain

- * Try topical medications for pain. Rinse the mouth before applying the medication onto the gums or lining of the mouth. Wipe mouth and teeth gently with wet gauze dipped in saltwater to remove particles
- * Painkillers may provide relief when topical medications do not. Nonsteroidal anti-inflammatory drugs (NSAIDS, aspirin-type painkillers) should not be used by patients receiving chemotherapy because these patients have a bleeding risk
- * Capsaicin, the active ingredient in hot peppers, may be used to increase a person's ability to tolerate pain. When capsaicin is put on inflamed tissues in the mouth, mucositis pain may decrease as the burning feeling from the capsaicin decreases. The side effects of capsaicin are not known

Dry Mouth

Dry mouth (xerostomia) occurs when the salivary glands produce too little saliva

Saliva is needed for taste, swallowing, and speech. It helps prevent infection and tooth decay by neutralizing acid and cleaning the teeth and gums. Chemotherapy and radiation therapy can damage salivary glands, causing them to produce too little saliva. The mouth is less able to clean itself. Acid in the mouth is not neutralized, and minerals are lost from the teeth. Tooth decay and gum disease are more likely to develop. Symptoms of dry mouth include the following:

- * Thick, stringy saliva
- * Increased thirst
- * Changes in taste, swallowing, and speech
- * A sore or burning feeling (especially on the tongue)
- * Cuts or cracks in the lips or at the corners of the mouth
- * Changes in the surface of the tongue
- * Difficulty wearing dentures

Salivary glands usually return to normal after chemotherapy ends

Dry mouth during chemotherapy is usually temporary. The salivary glands often recover 2 to 8 weeks after chemotherapy ends.

Salivary glands may not recover completely after radiation therapy ends

Saliva production drops within 1 week after starting radiation therapy to the head and/or neck and continues to decrease as treatment continues. The severity of dry mouth depends on the dose of radiation and the number of glands irradiated. The salivary glands in the upper cheeks near the ears are more affected than other salivary glands.

Partial recovery of salivary glands may occur in the first year after radiation

therapy, but recovery is usually not complete, especially if the salivary glands were directly irradiated. Salivary glands that were not irradiated may become more active to offset the loss of saliva from the destroyed glands.

Careful oral hygiene can help prevent mouth sores, gum disease, and tooth decay caused by dry mouth.

The following are guidelines for managing dry mouth:

- * Clean the mouth and teeth at least 4 times a day
- * Floss once a day
- * Use a fluoride toothpaste when brushing
- * Apply fluoride gel once a day at bedtime, after cleaning the teeth
- * Rinse 4 to 6 times a day with a solution of salt and baking soda (mix 1/2 teaspoon salt and 1/2 teaspoon baking soda in 1 cup of warm water). Avoid foods and liquids that contain a lot of sugar. Sip water to relieve mouth dryness
- * Artificial saliva products such as Optimoist, Mouthkote, and Biotene moisture products may be beneficial

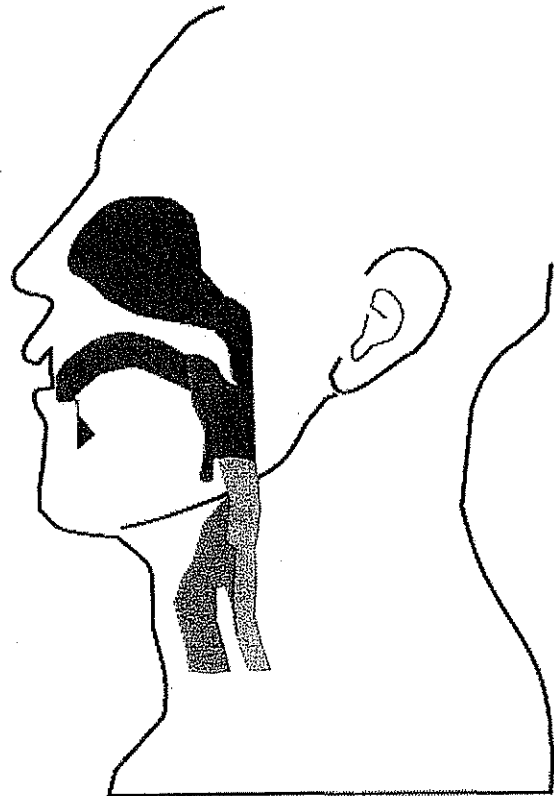
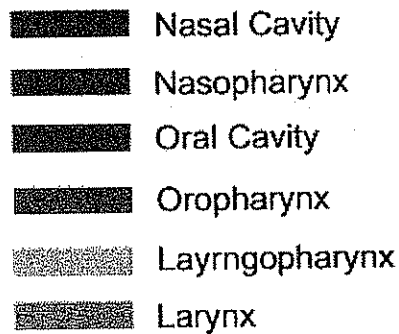
A dentist can provide the following treatments:

- * Solutions to replace minerals in the teeth
- * Rinses to fight infection in the mouth
- * Saliva substitutes or medications to stimulate the salivary glands
- * Fluoride treatments to prevent tooth decay

POSSIBLE SIGNS OF ASPIRATION

Presence of any of the following symptoms may indicate aspiration (entry of food or liquid below the vocal folds and into the trachea). Please inform your physician or Speech-language Pathologist if you develop any of these symptoms.

- Avoidance of certain foods or liquids because they are difficult to swallow
- Coughing or choking during meals
- Unplanned weight loss
- Wet, gurgly vocal quality after swallowing
- Swallowing multiple times for a single bite of food or sip of liquid
- Sensation of food stuck in the mouth or throat
- Prior history of pneumonia
- Elevated temperatures or new onset of fevers
- Chest congestion



Recommended Foods / Beverages for Dry, Sore Mouth

Beverages

Buttermilk
Egg nog
Milk shakes
Chocolate milk
Warm cocoa
Instant breakfast drinks
Iced tea
Warm tea with sugar
Pear, apricot, or peach nectar
Prune or apple juice

Meats, Poultry, Fish

Any-grind or strain if necessary
Stew instead of broiling or frying
Casseroles
French dip sandwiches

Cereals & Grains

Oatmeal
Cream of wheat or rice
Pasta

Vegetables

Any-mashed or strained with sauces
Whipped potatoes

Fruits

Mashed bananas, pears, & peaches
Avocado
Applesauce
Grapes & watermelon

Soups

Cold soups: cucumber, avocado, potato
Chicken noodle or rice
Creamed soups

Cheese

Cottage cheese
Any-sprinkled over eggs, meats, or vegetables
Cheese sauces

Eggs

Poached in milk
Cheese omelets
Quiches
Soufflés

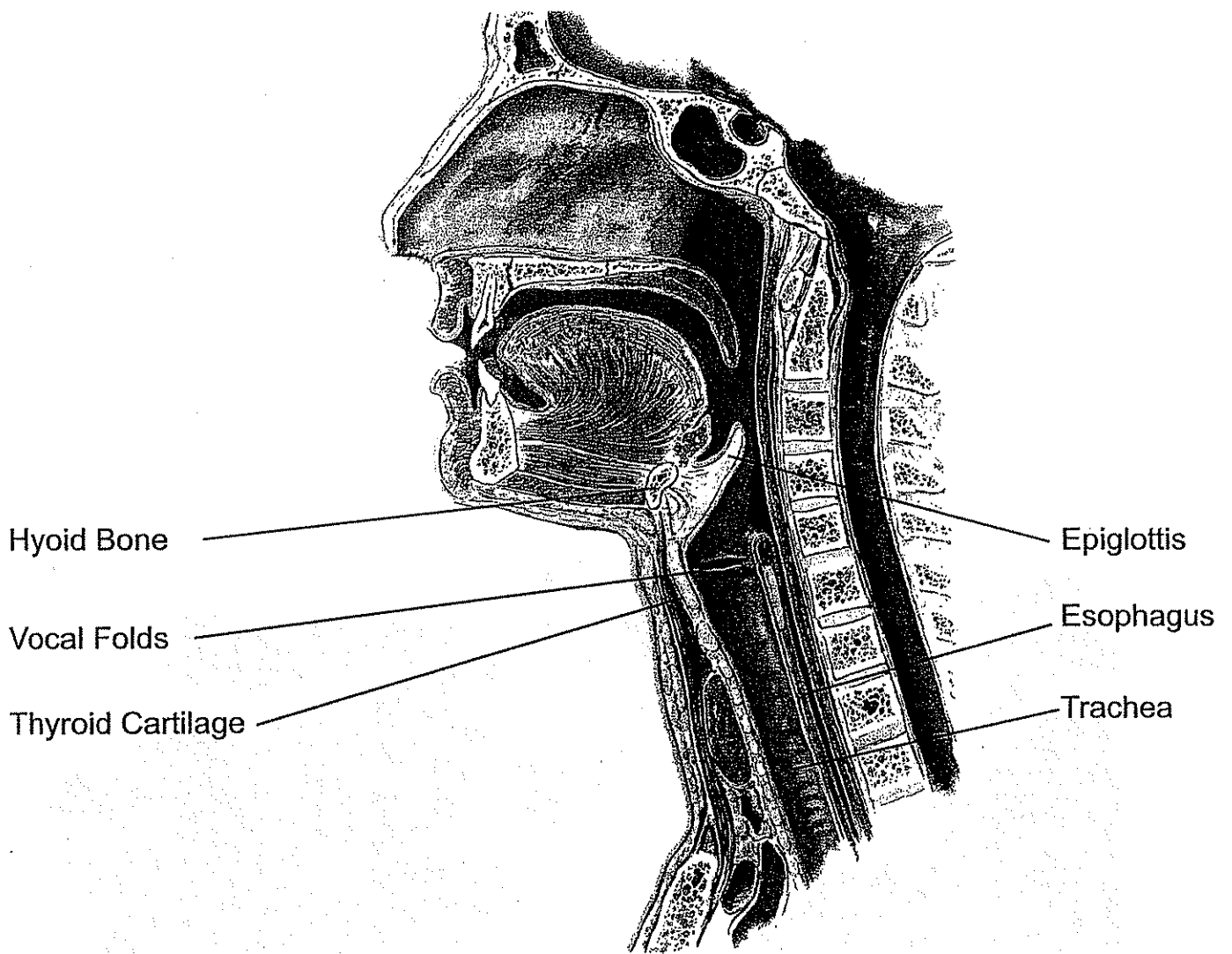
Desserts

Ice Cream
Popsicles
Sherbet
Custard
Pudding & yogurt
Frozen Jello, yogurt, or pudding pops
Cream pies
Cheesecake

Foods / Beverages to AVOID for Dry, Sore Throat

Pepper
Cloves
Tabasco sauce
Meat broths
Chili powder
Horseradish
Tomatoes & tomato sauces

Carbonated beverages
Nutmeg
Hot peppers
Curry
Citrus juices & fruits (oranges, lemons)
Salty foods
Any food that is hot, rough, dry, coarse, highly spiced, or acidic.



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