Treating Salivary Gland Cancer

If you've been diagnosed with salivary gland cancer, your cancer care team will discuss your treatment options with you. It's important to weigh the benefits of each treatment option against the possible risks and side effects.

How is salivary gland cancer treated?

Common treatment options for salivary gland cancer include:

- Surgery for Salivary Gland Cancer
- Radiation Therapy for Salivary Gland Cancer
- Chemotherapy for Salivary Gland Cancer
- Targeted Drug Therapy for Salivary Gland Cancer
- Immunotherapy for Salivary Gland Cancer

Common treatment approaches

Sometimes more than one type of treatment is used. Which treatment option(s) might be best for you depends on many factors, including the type, grade, and stage of the cancer; your overall health; the chances of curing the disease; the impact of the treatment on functions like speech, chewing, and swallowing; and your own personal preferences.

- Treatment Options by Stage of Salivary Gland Cancer

Who treats salivary gland cancer?

Depending on your situation, you may have different types of doctors on your treatment team:

- An **otolaryngologist** (also known as an *ear, nose, and throat*, or ENT doctor): a surgeon who treats certain diseases of the head and neck
- A **radiation oncologist:** a doctor who treats cancer with radiation therapy
- A **medical oncologist:** a doctor who treats cancer with medicines such as chemotherapy, immunotherapy, and targeted drug therapy·
- A **plastic surgeon**: a doctor who specializes in reconstructing or repairing parts of the body
- An **oral and maxillofacial surgeon:** a dental surgeon who treats diseases of the mouth, teeth, and jaws
- A **neurologist**: a doctor who specializes in diseases of the brain and nervous system

Many other specialists may be involved in your care as well, including physician assistants, nurse practitioners, nurses, nutrition specialists, speech therapists, physical therapists, swallowing specialists, occupational therapists, social workers, and other health professionals.

- Health Professionals Associated with Cancer Care

Making treatment decisions

It's important to discuss all your treatment options as well as their possible side effects with your family and your treatment team to make the choice that best fits your needs. If there's anything you don't understand, ask to have it explained.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- Questions to Ask About Salivary Gland Cancer
- Seeking a Second Opinion

Surgery for Salivary Gland Cancer

Studies have shown that people with head and neck cancer who are treated at facilities

that perform a lot of head and neck cancer surgeries, tend to live longer. Because of this and the complex nature of these operations, it's very important to have a surgeon and cancer center with experience treating these cancers.

Surgery is often the main treatment for salivary gland cancers. Your cancer will probably be treated with surgery if the doctor believes that it can be removed completely. That is, if it is **resectable***.* Whether or not a cancer is resectable depends largely on how far it has grown into nearby structures, but it also depends on the skill and experience of the surgeon. Choosing a surgeon who has treated many patients with salivary gland cancer gives you the best chance of having your cancer removed completely. This gives you the best chance of being cured.

In most cases, the cancer and some or all of the surrounding salivary gland will be removed. Nearby soft tissue may be taken out too. The goal is to have no cancer cells on the outside edges (margin) of the removed surgical tissue which contains the cancer. If the cancer is high grade (more likely to grow and spread quickly) or if it has already spread to lymph nodes, lymph nodes might be removed in an operation called a **neck dissection** (described below).

Before surgery, ask your surgeon:

- Exactly what will be done during the operation?
- What are the goals of the surgery?
- Are there are other options?
- Will the surgery change the way I look or the way my body works?
- What side effects can I expect?

Quit smoking

If you smoke, **quitting for good (before treatment starts, if you can) is the best way to improve your chances for survival.** Smoking during cancer treatment can increase the risk of side effects after surgery and is linked to poor wound healing and worse outcomes. Smoking after treatment can also increase the risk of the cancer coming back as well as the risk of getting a new cancer. It is never too late to quit[1].

Types of surgery for salivary gland cancer

The type of surgery will depend on which salivary gland is affected.

Parotid gland surgery

Most salivary gland tumors occur in the parotid gland. Surgery here is complicated by the fact that the **facial nerve** (which controls movement of the facial muscles, some ability to taste, the ability to make tears and saliva, and some aspects of sensation of the skin on the same side of the face) passes through the gland. For these operations, a cut is made in the skin in front of the ear and may extend down to the neck.

Most parotid gland cancers start in the outside part of the gland, called the superficial lobe. These can be treated by removing only this lobe, which is called a **superficial parotidectomy**. This usually leaves the facial nerve unharmed and does not affect facial movement, taste, or sensation.

If your cancer has spread deeper, the surgeon will remove the entire gland. This operation is called a **total parotidectomy**. If the cancer has grown into the facial nerve, it will have to be removed as well. If your surgeon has mentioned this surgery as a possibility, ask what can be done to repair the nerve and treat side effects caused when the nerve is removed. If the cancer has grown into other tissues near your parotid gland, these tissues might also need to be removed.

Submandibular or sublingual gland surgery

If your cancer is in the submandibular or sublingual glands, the surgeon will make a cut in the skin to remove the entire gland and perhaps some of the surrounding tissue or bone. Nerves that pass through or near these glands control movement of the tongue and the lower half of the face, as well as sensation and taste. Depending on the size and location of the cancer, the surgeon may need to remove some of these nerves.

Minor salivary gland surgery

Minor salivary gland cancers can occur in your lips, tongue, palate (roof of the mouth), mouth, throat, voice box (larynx), nose, and sinuses. The surgeon usually removes some surrounding tissue along with the cancer. The exact details of surgery depend on the size and location of the cancer.

Possible risks and side effects of salivary gland surgery

All surgery has some risks, including complications from anesthesia, bleeding, blood clots, and infections. These risks are generally low but are higher with more complicated operations.

Pain: For any salivary gland cancer surgery, the surgeon may need to cut through your skin or cut inside your mouth. Most people will have some pain afterward, but this can usually be controlled with medicines.

Damage to the facial nerve: If your facial nerve is damaged during surgery, you might lose control of your facial muscles on the side where the surgery was done. That side of your face may droop. You might also have trouble closing your eyes completely on that side which can lead to dry eyes. This might be treated with eye drops, eye patches, or artificial tears. If the injury to the facial nerve is related to retraction (pulling) of the nerve during surgery and/or swelling from the operation, the damage might heal over time and the facial nerve function usually returns over a few months. If the facial nerve does not start working after a certain period of time, there are some types of surgery that might help, such as nerve grafting. It is a good idea to ask about possible treatments for this side effect.

Frey syndrome: Sometimes, nerves cut during surgery grow back abnormally and become connected to the sweat glands of the face. This condition, called Frey syndrome or gustatory sweating, results in flushing or sweating over areas of your face when you chew. Frey syndrome can be treated with medicines or with additional surgery.

Trouble speaking or swallowing: Damage to other nerves in the face or mouth might cause problems with tongue movement, speech, or swallowing.

Change in how you look: Depending on the extent of the surgery, your appearance may be changed as a result. This can range from a simple scar on the side of the face or neck to more extensive changes if nerves, parts of bones, or other structures need to be removed.

It’s important to talk with your doctor before the surgery about what changes in appearance or other side effects you might expect. This can help you prepare for them. Your doctor can also give you an idea about what corrective options might be available afterward, such as **skin grafts**, **nerve grafts**, and **reconstructive surgery**.

Lymph node removal (neck dissection)

Salivary gland cancers sometimes spread to lymph nodes in the neck (cervical lymph nodes), and these may need to be removed as a part of treating the cancer. Surgery to remove lymph nodes might be called a **lymph node dissection**, **lymphadenectomy**,or **neck dissection**.

A neck dissection might be done if:

- Lymph nodes in the neck are enlarged (which may be felt or seen on a CT or MRI scan)
- A PET (positron emission tomography) scan suggests the lymph nodes may contain cancer
- The cancer is high grade[2] (looks very abnormal in the lab) or has other features that mean it has a high risk of spreading
- A biopsy of one of the abnormal lymph nodes in the neck shows cancer

The removed lymph nodes are looked at closely in the lab to see if they contain cancer cells. Taking out the lymph nodes can help ensure all of the cancer is removed. It can also be important for staging and deciding if more treatment is needed.

There are many types of neck dissections, and they differ in how much tissue is removed from the neck. The amount of tissue removed depends on the primary cancer's size and how much it has spread to lymph nodes.

- In a **partial** or **selective** neck dissection only a few lymph nodes are removed.
- For a **modified radical** neck dissection, most lymph nodes on one side of the neck between the jawbone and collarbone are removed, as well as some muscle and nerve tissue.
- In a **radical** neck dissection, nearly all nodes on one side, as well as even more muscles, nerves, and veins are removed.

This type of surgery is usually done through an incision (cut) across the side of the neck, but sometimes a longer incision going down the neck might be needed.

Possible risks and side effects of lymph node removal

The general risks of a neck dissection are much like those with any other type of surgery, including problems with anesthesia, bleeding, blood clots, infections, and poor wound healing. Most people will have some **pain** afterward , but this can usually be controlled with pain medicines.

Nerve damage: The most common side effects of any neck dissection are numbness of the ear, weakness when raising the arm above the head, and weakness of the lower lip. These side effects can happen when nerves that supply these areas are damaged during the operation. After a selective neck dissection, the nerve might only be injured

and can heal over time. Nerves heal slowly and the weakness of the shoulder and lower lip may go away after a few months. If a nerve is removed as part of a radical neck dissection or because of involvement with tumor, the weakness will be permanent.

After any neck dissection procedure, physical therapy can help improve neck and shoulder movement.

Sentinel lymph node biopsy

Sentinel lymph node mapping[3] and biopsy has become a common way to find out whether cancer has spread to the lymph nodes. It may be used in certain types of salivary gland cancer and can help keep you from needing a neck dissection. This procedure can find the lymph nodes that drain lymph fluid from the salivary gland where the cancer started. Since these lymph nodes are usually the first place cancer will go, they are taken out and checked for cancer during the surgery. If no cancer cells are found, the other lymph nodes can be left alone. If cancer cells are found in them, a more complex neck dissection is usually needed.

Sentinel lymph node biopsy should only be done at treatment centers by doctors with a lot of experience in the technique.

Supportive surgery

Feeding tubes

Sometimes, if salivary gland cancer has spread widely to nearby tissues, these cancers may keep you from swallowing enough food to stay well nourished. This can make you weak and make it harder to complete treatment. Sometimes the treatment, such as extensive surgery, can make it hard to eat.

A **gastrostomy tube (G-tube)** is a feeding tube that's put through the skin and muscle of your abdomen (belly) and right into your stomach. Sometimes this tube is placed during an operation, but often it's put in endoscopically. While you are sedated (using drugs to put you in a deep sleep), the doctor puts a long, thin, flexible tube with a camera on the end (an endoscope) down the throat to see inside the stomach. The feeding tube is then guided through the endoscope and to the outside of the body. When the feeding tube is placed through endoscopy, it's called a **percutaneous endoscopic gastrostomy, or PEG tube**. Once in place, it can be used to put liquid nutrition right into the stomach. As long as they can still swallow normally, people with these tubes can eat normal food, too.

PEG tubes can be used for as long as needed. Sometimes these tubes are used for a short time to help keep you healthy and fed during treatment. They can be removed when you can eat normally.

If the swallowing problem is likely to be only short-term, another option is to place a **nasogastric feeding tube (NG tube)**. This tube goes in through the nose, down the esophagus, and into the stomach. Again, special liquid nutrients are put in through the tube. Some people dislike having a tube coming out of their nose, and prefer a PEG tube.

In any case, the patient and family are taught how to use the tube. After you go home, home health nurses usually visit to make sure you are comfortable with tube feedings.

More information about Surgery

For more general information about surgery as a treatment for cancer, see Cancer Surgery[4].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[5].

Hyperlinks

1. www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html
2. www.cancer.org/cancer/salivary-gland-cancer/about/what-is-salivary-gland-cancer.html
3. www.cancer.org/treatment/understanding-your-diagnosis/tests/testing-biopsy-and-cytology-specimens-for-cancer/biopsy-types.html
4. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html
5. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html

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Radiation Therapy for Salivary Gland Cancer

Studies have shown that people with squamous cell cancers of the head and neck who are treated at centers that treat a lot of head and neck cancers with radiation, tend to live longer. Even though salivary gland cancers are rarely squamous cell cancers, they are not common and the operations tend to be complicated. Given this, it's important to go to a cancer center and radiation oncologist who have experience treating these cancers.

Radiation therapy uses high-energy x-rays or particles to destroy cancer cells or slow their growth. It can be used in many ways to treat salivary gland cancer:

Radiation therapy may be used:

- As the **main treatment** (alone or with chemotherapy) for some salivary gland cancers that can't be removed by surgery because of the size or location of the tumor
- As the **main treatment** (alone or with chemotherapy) or if a person can't have (or doesn't want) surgery
- **After surgery**, also called **adjuvant radiation**, (alone or with chemotherapy) to try to kill any cancer cells that might have been left behind to help lower the chances of the cancer coming back
- **To help with symptoms**, such as pain, bleeding, or trouble swallowing, in people with advanced salivary gland cancer

Chemoradiation (radiation given at the same time as chemotherapy) often works better than radiation alone, but it also has more side effects[1].

Radiation to this part of your body can cause problems for your teeth and gums, so **it's important to see a dentist before starting treatment**. A dentist can make sure your mouth is healthy before treatment. They might recommend that certain bad teeth be removed before you start radiation because they can increase your chance of infection. During and after treatment, your dentist can help check for and treat any problems that may come up, such as infection or tooth and bone damage.

Quit smoking before salivary gland treatment

If you smoke, it is important to quit. Smoking during radiation treatment can cause more side effects and a poor response to radiation, which can raise your risk of the cancer coming back (recurrence). Smoking after treatment also increases the chance of getting a new cancer. **Quitting smoking for good (before treatment starts, if you can) is the best way to improve your chances for successful treatment.** It is never too late to quit. For help, see How To Quit Using Tobacco[2].

External beam radiation for salivary gland cancers

External beam radiation therapy (**EBRT)**, is the type of radiation therapy used most often to treat salivary gland cancer. It focuses radiation from outside the body onto the cancer.

Before starting EBRT, a somewhat flexible but sturdy mesh head and neck mask might be made to hold your head, neck, and shoulders in the exact same position for each treatment. Some people might feel a bit confined while this mask is on and might need

to ask for medicine to help them relax during the treatment. Sometimes, the mask can be adjusted so that it is not too constricting. Discuss your options with your radiation oncologist. You might also be fitted for a bite block that you hold in your mouth during treatment.

Getting radiation treatment is much like getting an x-ray, but the radiation dose is stronger and aimed more precisely at the cancer. The procedure itself is painless and each treatment lasts only a few minutes. The setup time – getting you into place for treatment – often takes longer.

Types of external beam radiation therapy (EBRT)

There are more advanced EBRT techniques that help doctors focus and aim the radiation more precisely.

Three-dimensional conformal radiation therapy (3D-CRT) uses special computers to precisely map the location of the tumor. Several radiation beams are then shaped and aimed at the tumor from different directions, which makes it less likely to damage the normal tissues it passes through. The beams come together at the tumor to give a higher dose of radiation there.

Intensity modulated radiation therapy (IMRT) is an advanced form of 3D-CRT. It uses a computer-driven machine that moves around the patient as it delivers radiation. Along with shaping the beams and aiming them at the tumor from several angles, the intensity (strength) of the beams can be adjusted to limit the dose reaching the most sensitive nearby normal tissues. This may let the doctor give a higher dose to the tumor.

Proton beam radiation therapy focuses beams of protons instead of x-rays on the cancer. Unlike x-rays, which go through the patient and expose tissues to radiation both before and after they hit the tumor, protons only travel a certain distance, so the tissues behind the tumor are exposed to very little radiation. Even the tissues in front of the tumor see less radiation than the tumor itself. This means that proton beam radiation can deliver radiation to the cancer while doing less damage to nearby normal tissues. Because there are so many critical structures close by, proton beam radiation can be used to treat certain salivary gland tumors. Proton therapy can be a safe option in certain cases when using x-rays is not.

Proton therapy is not widely available in the United States. Proton therapy might also not be covered by all insurance companies at this time.

Fast neutron beam radiation uses a beam of high-energy neutrons instead of using x-rays. Neutrons are neutral particles in atoms. Some studies have suggested that this

type of radiation may be more effective, but it may also lead to more side effects. There is only one neutron therapy center in the United States at this time.

Treatment schedules for external beam radiation therapy (EBRT)

Standard EBRT for salivary gland cancers is usually given in daily fractions (doses) 5 days a week for about 6 to 7 weeks. But sometimes other schedules might be used:

- **Hyperfractionation** radiation is a slightly lower radiation dose given more than once a day (for example, twice a day for 7 weeks).
- **Accelerated fractionation** radiation is the standard dose of radiation given each day but over a shorter time (5 to 6 weeks) instead of the usual 7 weeks (for example, radiation is given 6 days a week over 5 weeks instead of the standard 5 days a week for 7 weeks).
- **Hypofractionation** radiation is a slightly higher radiation dose given each day to lessen the number of treatments (for example, a higher radiation dose is given each day for 6 weeks, not the standard 7 weeks).

Possible side effects of radiation therapy for salivary gland cancer

If you are going to get radiation therapy, it's important to ask your doctor about the possible side effects so you know what to expect.

Short-term side effects of radiation therapy

Radiation to the cheek, mouth, and throat area can cause several short-term side effects[3] depending on where the radiation is aimed and can include:

- Skin changes like a sunburn or suntan in the treated area
- Loss of taste
- Redness, soreness, or even pain in the mouth and throat
- Dry mouth
- Trouble swallowing
- Feeling tired
- Open sores in the mouth and throat
- Hoarseness

Often these go away over time after treatment ends.

Long-lasting or permanent side effects of radiation therapy

Poor nutrition and trouble swallowing: Many people treated with radiation to the salivary gland area have painful sores in the mouth[4] and throat that can make it very hard to eat and drink. This can lead to weight loss[5] and poor nutrition. The sores heal with time after the radiation ends, but some people continue to have problems swallowing[6]long after treatment ends because of the tightening of the muscles caused by radiation. **Ask your speech pathologist about swallowing exercises you can do to help keep those muscles working and increase your chance of eating normally after treatment.** Liquid feeding through a tube placed into the stomach might be needed. (See Surgery for Salivary Gland Cancer for more on tube feedings.)

Dry mouth: Damage to the salivary (spit) glands from radiation can cause a dry mouth[7]that doesn't get better with time. For most major salivary gland cancers, radiation is only given to the side of the face and neck with the cancer. This reduces the risk of serious long-term side effects, but in rare instances, both sides of your face and neck might need to be treated with radiation. This may damage other salivary glands, resulting in permanently dry mouth. This can lead to discomfort and problems eating and swallowing, as well as damage to the jaw bone.

The lack of saliva can also lead to tooth decay (cavities). People treated with radiation to the mouth or neck need to practice careful oral hygiene to help prevent this problem and see their dentist regularly. Fluoride treatments may also help.

Damage to the jawbone: This problem, known as **osteoradionecrosis of the jaw**, can be a serious side effect of radiation treatment. This is more common after tooth infection, extraction, or trauma, and it can be hard to treat. The main symptom is pain in the jaw. In some cases, the bone actually breaks. Sometimes the fractured bone heals by itself, but often the damaged bone will have to be repaired with surgery.

To help prevent this problem, people getting radiation to the mouth or throat area need to see a dentist to have any problems with their teeth treated before radiation is started. In some cases, teeth may need to be removed.

Lockjaw: Lockjaw, also knows as trismus, is a condition in which the mouth cannot open fully. This can be a serious side effect of radiation treatment. It happens because of scarring or damage to the muscles, joints, and tissue that help the jaw work. This can make it hard for people to chew their food well, speak properly, and can increase the chance of cavities. Not everyone who gets radiation for salivary gland cancer will have this side effect, but spotting the problem early can help people start treatment sooner and lower the chances that it will cause major troubles.

Hearing loss: The nerves or organs that help you hear can be damaged by radiation. You might be asked to see an audiologist (a person who specializes in hearing) to test your hearing before and after treatment to watch for any signs of hearing loss.

Thyroid problems: Radiation might damage your thyroid gland. Your doctor will do blood tests regularly to see how well your thyroid is working. Some people might need to take pills to replace thyroid hormone at some point if the thyroid gland is not working well.

Lymphedema: Some people treated with radiation therapy might be at risk of developing lymphedema[8] in the head and neck areas that were treated. These areas can become swollen and firm. This can be worse if the person also had surgery. Sometimes, medicines, physical therapy, or massage therapy might be helpful.

Damage to the carotid artery: Radiation to the neck area might increase a person's risk of stroke many years after treatment. This might be because of health problems that were already present before radiation such as narrowing of the artery or an increase in plaques both of which can decrease blood flow. People who smoke are also damaging their arteries. Because of this some doctors might order regular ultrasounds for you after treatment, to keep an eye on the arteries.

It's important to discuss the possible side effects of radiation therapy with your doctor before starting treatment, and to make sure everything is being done to try to limit these side effects as much as possible. If you do have side effects, there are ways to lessen many of them, so be sure to discuss any problems with your cancer care team.

More information about radiation therapy

To learn more about how radiation is used to treat cancer, see Radiation Therapy[9].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[10].

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html
2. www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html
3. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html
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Chemotherapy for Salivary Gland Cancer

Quit smoking before salivary gland cancer treatment

If you smoke, you should quit. Smoking during chemotherapy treatment can cause more side effects and can cause the chemo drugs to not work as well. It can give you a higher chance of getting an infection and is linked to worse outcomes. Smoking after treatment can also increase the risk of the cancer coming back and of getting another new cancer. **Quitting smoking (before treatment starts, if you can) is the best way to improve your chances of survival.** It is never too late to quit. For help, see How To Quit Using Tobacco[1].

How is chemotherapy used to treat salivary gland cancers?

Chemotherapy (chemo) is treatment with anti-cancer drugs that are given into a vein or by mouth. These drugs enter the bloodstream and reach almost all areas of the body. **Chemo is not often used to treat salivary gland cancers because, in general, it does not work well in these cancers** .

For people with salivary gland cancers, chemo is most often used:

- When the cancer has spread (metastasized) to distant organs
- If the cancer could not be controlled by surgery and radiation therapy

Chemo sometimes shrinks the tumors, but it's not likely to cure this type of cancer.

Chemoradiation is chemotherapy given at the same time as radiation. It is used to treat salivary gland cancer cells that are too small to be seen by the naked eye and have features that put them at high risk for coming back after surgery or salivary gland cancers that cannot be removed by surgery. There are not many studies to support chemoradiation in these instances for salivary gland cancer, so it is not routinely done.

Clinical trials are being done to look more at using chemoradiation to treat unresectable (cannot be removed by surgery) salivary gland cancers .

How is chemotherapy given?

Chemo drugs for salivary gland cancer are usually given by mouth or into a vein (IV) as an infusion over a certain period of time. This can be done in a doctor's office, infusion center, or in a hospital setting.

Often, a slightly larger and stronger IV[2] is required in the vein system for chemo. These IVs are known as central venous catheters (CVCs), central venous access devices (CVADs), or central lines. They are used to put medicines, blood products, nutrients, or fluids right into your blood. They can also be used to take blood for tests. There are different kinds of CVCs. The most common types are the port and the PICC line.

Chemotherapy is given in cycles: the drug or a combination of drugs is given on a set schedule, followed by a rest period. Common schedules of chemo cycles can be once a week, once every 3 weeks, or once every 4 weeks. The schedule depends on the drugs used. The chemo schedule repeats to start the next cycle.

Chemo drugs used to treat salivary gland cancer

Some of the chemo drugs used to treat salivary gland cancers include:

- Cisplatin
- Mitoxantrone
- Doxorubicin (Adriamycin)
- Epirubicin (Ellence)
- Cyclophosphamide (Cytoxan)
- Paclitaxel (Taxol)
- Docetaxel (Taxotere)
- Vinorelbine (Navelbine)
- Methotrexate

These drugs may be used alone, but are more often given in combinations of 2 or more drugs. Because salivary gland cancers are not common and because there are different types of salivary gland cancers, no large studies have been done to prove one chemo plan is better than the others. The best way to use chemotherapy to treat salivary gland cancer is not clear. New chemo drugs and combinations of drugs are being studied in

clinical trials[3].

Possible side effects of chemotherapy

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, like those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemo, which can lead to side effects.

The side effects of chemo depend on the type and dose of drugs given and the length of time they are used. Common side effects include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea or constipation

Chemo can affect the blood-producing cells of the bone marrow, which can lead to:

- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (from having too few red blood cells)

Along with the risks above, some side effects are seen more often with certain chemo drugs. For example:

- Cisplatin and paclitaxel can cause **nerve damage** (neuropathy[4]). This can sometimes lead to hearing loss or problems in the hands and feet such as pain, burning or tingling sensations, sensitivity to cold or heat, or weakness. In most cases, this gets better or goes away once treatment stops, but it can last a long time in some people.
- Cisplatin can also hurt the **kidneys**. To help prevent kidney damage, intravenous (IV) fluid is given before and after each dose.

You should report any problems you have while getting chemo to your medical team, so that they can be treated right away.

There are often ways to lessen these side effects, and they usually go away over time after treatment ends. Be sure to ask your doctor or nurse what can be done to help reduce side effects, and let them know when you do have side effects so they can be managed . For example, drugs can be given to help prevent or reduce nausea and vomiting. In some cases, the doses of the chemo drugs may need to be lowered or treatment may need to be delayed or stopped to keep the effects from getting worse.

More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see Chemotherapy[5].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[6].

Hyperlinks

1. www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html
2. www.cancer.org/treatment/treatments-and-side-effects/planning-managing/tubes-lines-ports-catheters.html
3. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
4. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nervous-system/peripheral-neuropathy.html
5. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
6. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html

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Targeted Drug Therapy for Salivary Gland Cancer

Targeted drug therapy uses medicines that target or are directed at proteins on cancer cells that help them grow, spread, and live longer. Recent research has shown that some salivary gland cancers make certain proteins or have gene changes that can be targeted with specific drugs to destroy cancer cells or slow their growth. Many of these drugs can be taken as pills and their side effects are different from those of chemotherapy[1] (sometimes less severe).

Some targeted drugs, for example, monoclonal antibodies, work in more than one way to control cancer cells and may also be considered immunotherapy[2] because they boost the immune system.

Drugs that target the androgen receptor

Hormone therapy[3] is a common treatment for prostate cancers and breast cancers and it has been found to be helpful in certain salivary gland cancers, too.

Some salivary gland cancers make a protein called an **androgen receptor** that helps cancer cells grow with hormones. **Bicalutamide (Casodex)** is a hormone drug (given as a pill) that attaches to this receptor (protein) to keep the cancer from growing. It is typically given with **leuprolide (Lupron, Eligard)**, another type of hormone therapy, that lowers the hormone levels in the blood so there are not many hormones left to attach to the androgen receptor. This also makes it hard for the cancer to grow. Leuprolide is injected or placed as small implants under the skin. To use this combined treatment, salivary gland cancers must be tested first in the lab for the androgen receptor. This hormone treatment is often given after chemotherapy has been tried.

Side effects of bicalutamide and leuprolide given together can include diarrhea, feeling sick to your stomach, liver problems, and tiredness.

Drugs that target HER2

Some salivary gland cancers make too much of a growth-promoting protein called HER2. Cancers with high levels of HER2 are called **HER2-positive**. Drugs that target the HER2 protein can often be helpful in treating these cancers, specifically **mucoepidermoid** and **salivary ductal carcinomas**.

Trastuzumab (Herceptin) is a monoclonal antibody[4], a man-made version of an immune system protein, which targets the HER2 protein. This drug only works if the cancer cells have too much HER2 protein, so they must be tested for HER2 before starting treatment. Trastuzumab is infused into a vein and is usually given along with paclitaxel or docetaxel (chemotherapy drugs).

If trastuzumab and a taxane chemotherapy combination has been tried and is no longer working, sometimes an antibody-drug conjugate (ADC) might be used. An ADC is a monoclonal antibody linked to a chemotherapy drug. In this case, the anti-HER2 antibody acts like a homing signal by attaching to the HER2 protein on cancer cells, bringing the chemo directly to them. **Ado-trastuzumab emtansine (Kadcyla or TDM-1)**, an ADC, has had favorable initial results in salivary gland cancers that are HER2 positive. This drug is given in a vein (IV).

Serious side effects of HER2 targeted drug therapy can include heart damage or heart failure.

TRK inhibitors

Some salivary gland cancers have changes in one of the *NTRK* genes. This gene change causes them to make abnormal TRK proteins, which can lead to abnormal cell growth and cancer. This gene change is more often seen in **secretory salivary gland cancers**.

Larotrectinib (Vitrakvi) and **entrectinib (Rozlytrek)** are drugs that target the TRK proteins. These drugs can be used first to treat advanced salivary gland cancers with *NTRK* gene changes.

These drugs are taken as pills, once or twice a day.

Common side effects of TRK inhibitors include muscle and joint pain, cough, dizziness, fatigue, nausea, vomiting, constipation, fever, abdominal pain, and diarrhea.

More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see Targeted Cancer Therapy[5].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[6].

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
2. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html
3. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/hormone-therapy.html
4. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html
5. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html
6. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html

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Immunotherapy for Salivary Gland Cancer

Immunotherapy uses medicines to boost a person's own immune system to recognize and destroy cancer cells more effectively. Immunotherapy typically works on specific proteins involved in the immune system to enhance the immune response. These drugs have side effects different from those of chemotherapy.

Some immunotherapy drugs, for example, monoclonal antibodies, work in more than one way to control cancer cells and may also be considered targeted drug therapy[1] because they block a specific protein on the cancer cell to keep it from growing.

Immunotherapy is used to treat some types of salivary gland cancer.

Immune checkpoint inhibitors for salivary gland cancer

An important part of the immune system is its ability to keep itself from attacking normal cells in the body. To do this, it uses proteins (or "checkpoints") on immune cells that need to be turned on (or off) to start an immune response. Salivary gland cancer cells sometimes use these checkpoints to avoid being attacked by the immune system. Drugs that target these checkpoint proteins, (called **immune checkpoint inhibitors**) can be used to treat some salivary gland cancers.

PD-1 inhibitor

Pembrolizumab (Keytruda) for salivary gland cancer

Pembrolizumab (Keytruda) is a drug that targets PD-1 (a protein on immune system T cells that normally helps keep them from attacking other cells in the body). By blocking PD-1, these drugs boost the immune response against cancer cells. This can often shrink tumors or slow their growth.

Pembrolizumab might be an option to treat some advanced salivary gland cancers, typically after other treatments have been tried or when no other good treatment options are available, and if the cancer cells have a **high tumor mutational burden (TMB-H)**, meaning the cancer cells have many gene mutations. The tumor cells can be tested for these gene changes.

This drug is an intravenous (IV) infusion, and is typically given every 3 or 6 weeks.

Possible side effects of immune checkpoint inhibitors

Side effects of these drugs can include fatigue, cough, nausea, skin rash, poor appetite, constipation, and diarrhea.

Other, more serious side effects occur less often.

Infusion reactions: Some people might have an infusion reaction while getting these drugs. This is like an allergic reaction, and can include fever, chills, flushing of the face, rash, itchy skin, feeling dizzy, wheezing, and trouble breathing. It’s important to tell your doctor or nurse right away if you have any of these symptoms while getting these drugs.

Autoimmune reactions: These drugs remove one of the protections on the body's immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

It's very important to report any new side effects to your health care team quickly. If serious side effects do occur, treatment may need to be stopped and you may get high doses of corticosteroids to suppress your immune system.

More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see Cancer Immunotherapy[2].

To learn about some of the side effects listed here and how to manage them, see Managing Cancer-related Side Effects[3].

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html
2. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html
3. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html

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Treatment Options by Stage of Salivary Gland Cancer

The treatment options for salivary gland cancer depend largely on the type[1] and stage[2] (extent) of the cancer. But other factors, such as the grade of the cancer (how likely it is to grow and spread); and a person's overall health, can also be important.

Since salivary gland cancers are rare and can be hard to treat, clinical trials[3] might be a good option to think about.

Stage I

These cancers are small and still just in the salivary gland. If you have stage I salivary gland cancer, your doctors will probably recommend surgery to remove the cancer and part or all of the salivary gland.

Radiation therapy might be advised after surgery if you have an intermediate- or high-grade cancer or an adenoid cystic carcinoma, if the cancer could not be removed completely, if the edges of the removed area have cancer cells (a sign that some cancer might have been left behind), or if the cancer is invading (growing into) nearby nerves.

Stage II

Stage II salivary gland cancers are larger but are still just in the salivary gland. They are also treated mainly with surgery, but it may be more extensive (covering a wider area) than for stage I cancers. The surgeon may also remove lymph nodes in your neck on

the same side to see if they contain cancer, especially if the main tumor is high-grade.

Radiation therapy may be given after surgery if your cancer is intermediate- or high-grade or an adenoid cystic carcinoma, if the cancer could not be removed completely, if the cancer is invading nearby blood vessels, lymph vessels, or nerves; if the removed lymph nodes have cancer; or if the edges of the removed tissue contain cancer cells. Chemotherapy might be given along with radiation in certain cases, but this combination treatment is still being studied.

Radiation therapy might be an option as the main treatment if surgery would result in serious problems with eating, speech, or appearance, or for people who refuse surgery. But it's not clear if this offers the same chance to cure the cancer as surgery, so not all doctors agree that this is a good approach for stage II cancers.

Stage III and IVA

These cancers are even larger and/or have started to grow outside the salivary gland into nearby structures. They might have also spread to lymph nodes in the neck on the same side as the cancer or both sides of the neck.

Doctors generally recommend extensive surgery (removing the salivary gland containing the tumor, nearby tissues, and lymph nodes in your neck on the same side) if it's possible. For low-grade tumors with no concerning features, this might be the only treatment needed if all of the cancer is removed. But in other cases, especially for high-grade tumors or adenoid cystic cancer, surgery is often followed by radiation therapy. Chemotherapy (chemo) may be added as well, but it's not clear how helpful this is. This is still being studied.

Radiation therapy (with or without chemo) may be used as the main treatment if surgery is not a good option (for example, if surgical removal of the cancer would cause serious problems with eating, speech, or appearance, or if someone is not healthy enough to have surgery).

Stage IVB

Stage IVB salivary gland cancers[4] are very hard to cure, particularly if the cancer has spread to distant organs.

Some of these cancers might be treated with surgery if the doctor feels all of the cancer can be removed. (This would be followed by radiation therapy and maybe chemo.)

But most often, radiation therapy is used as the main treatment to try to shrink the tumor(s) and relieve pain, bleeding, or other symptoms. Radiation might be combined with chemo. If the cancer has spread to other parts of the body, chemo ortargeted drug therapy might shrink or slow the growth of the cancer for a time and may help relieve symptoms caused by the cancer.

Because these cancers are rare and can be hard to treat, taking part in a clinical trial[5] is a good option.

Treatment of recurrent salivary gland cancer

Cancer is called **recurrent** if it comes back after treatment. Cancer can come back locally (in or near the same place it started) or distantly (spread to organs such as the lungs or liver).

If cancer returns after treatment, your choices depend on the location and the extent of the cancer as well as what treatment was used the first time. It's important to understand the risks and benefits and goals of further treatment – whether it's to try to cure the cancer or to help relieve symptoms.

If the cancer recurs locally and is thought to be resectable (able to be removed completely), surgery is usually the treatment of choice. This is often followed by radiation therapy if it wasn't given before.

If the cancer returns in the area where it started (local) but is not resectable, radiation therapy may be an option. Chemotherapy (chemo) might be used along with the radiation or by itself (especially if radiation therapy was already used the first time).

Salivary gland cancers that come back in distant parts of the body are usually treated with chemo or targeted drug therapy. In some cases, other treatments such as surgery or radiation might be used to help relieve symptoms from the spread of the cancer or to treat a small number of tumors that might be growing in certain organs like the lungs. If the cancer is growing very slowly, it may be watched and treated only if it starts to cause problems.

Hyperlinks

1. www.cancer.org/cancer/salivary-gland-cancer/about/what-is-salivary-gland-cancer.html
2. www.cancer.org/cancer/salivary-gland-cancer/detection-diagnosis-

staging/staging.html
3. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
4. www.cancer.org/cancer/salivary-gland-cancer/detection-diagnosis-staging/staging.html
5. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html

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