UW Medicine
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Infections

Common infections in transplant patients

Transplant patients are more likely to get infections than other people because their immune systems are being suppressed with medicine. These medicines prevent rejection of the new organ. They also make it harder for the immune system to fight off viruses, bacteria, and other germs that cause illness.

Opportunistic Invaders

As a transplant patient, you are at a higher risk of getting all kinds of infections, such as colds, the flu, and others. You may not get these more often than you did before your transplant, but we know that transplant patients *are* more likely to get infections like these that are caused by germs called *opportunistic invaders*.

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Opportunistic invaders are germs, such as viruses or bacteria, that live in your body. Most of the time they are not active and do not cause infections. But, if they get the chance, or "opportunity," they will become active again and infect you when your defenses are down.

These infections are most common in the elderly and in people who have chronic (long-term) illnesses or a reduced immune system. If you take medicine to lower your immune system to prevent rejection, you are more likely to be affected by opportunistic invaders.

This chapter describes many of the opportunistic infections that transplant patients may get. There are 4 main types:

1. Viral
2. Bacterial
3. Fungal
4. Protozoal

We will also describe common infections, such as colds and the flu.

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Viral Infections

Viral infections can be either *primary* or *secondary*.

- A **primary infection** is when a virus causes an infection in a person for the first time. The virus then stays in your body, inactive (or *dormant*), waiting for a chance to make you sick again.
- A **secondary infection** is when the dormant virus becomes active again (*reactivates*) and causes another infection.

It is not clear what makes viruses reactivate, but we do know that people with reduced immune systems, chronic illnesses, or increased stress are at greater risk.

Only about 15% (15 out of 100) of people with healthy immune systems get secondary infections from dormant viruses that reactivate. In immunosuppressed patients, the rate is almost 100%. Secondary infections are usually less severe than primary infections. The immune system makes antibodies to the virus to fight the first infection, and these provide some defense against the virus if it reactivates.

The main viral infections that affect transplant patients all belong to the *herpes* family. They are:

- *Herpes simplex* virus (HSV), which causes cold sores and genital herpes
- *Varicella zoster* virus (VZV), which causes chicken pox and shingles
- *Cytomegalovirus* (CMV), which can cause a gastrointestinal infection, pneumonia, or an illness that is like *mononucleosis* (mono)

Herpes viruses are the most common cause of viral infections in transplant patients. There are several different kinds of herpes viruses.

Herpes Simplex Virus Type 1 and Type 2

Between 33 to 50% (33 to 50 out of 100) of all transplant patients will develop skin sores (*lesions*) caused by infection with a herpes simplex virus (HSV). Nearly 80% (80 out of 100) of all people have an HSV type 1 infection by age 25, so most of these are secondary infections.

- **HSV type 1** causes sores or lesions (cold sores) on the lips or mouth. Type 1 lesions can be spread to the genital area.
- **HSV type 2** causes lesions on the *genitals* (private parts). They look just like cold sores. Type 2 lesions can spread to the mouth and lips.

A test called a *tissue culture* is needed to find out which virus is causing the infection.

Both types of HSV infection are seen most often in the first 6 months after transplant. This is because you are on higher doses of immunosuppressive medicines at this time. They also occur quite often after treatment for rejection. Again, this is because of the higher doses of immunosuppressive medicines used to treat rejection.

Stress can increase your risk of secondary HSV infection.

Over time, your doses of immunosuppressive medicines will be lowered, so your chance of having an HSV infection will also go down.

Other factors that may lead to a secondary infection are stress, bacterial infections, illness, anxiety, friction or rubbing, and, in women, menstruation. Sunlight may also reactivate cold sores (HSV type 1).

Symptoms

There are 3 stages of a herpes infection:

- **Prodrome:** Symptoms include tingling, itching, numbness, or a prickly feeling on your skin. That area is likely to be *contagious* at this stage (you can pass the virus to another person).
- **Lesions:** Reddish areas turn into water-filled blisters. **Do NOT pop these blisters!** The liquid is full of viruses. These sores may last from 1 to 4 weeks. They are still contagious at this stage.
- **Scabs:** The sores will develop crusty scabs during this phase. They are probably not contagious at this point. It is important to keep them clean and dry to help them heal.

Spreading the Infection

Herpes simplex infections can be passed to other people at any time from the start of the prodrome phase until the start of the scabbing stage. The virus spreads when the infected skin comes into contact with another person's skin.

If you have cold sores on your mouth or lips (HSV type 1):

- Do **not** kiss anyone.
- Do **not** share your food or drinks with anyone.
- Do **not** place or store your toothbrush, razor, tweezers, comb, brush, or other personal care items near anyone else's.
- **Do** use a disposable razor.
- When the outbreak is over, use a new toothbrush, comb, razor, and other items.
- Use boiling hot water to clean your tweezers.

If you have genital sores (HSV type 2):

- Do **not** have sexual contact that would cause the lesions to come into contact with your partner. Condoms are not good protection against a herpes infection.
- To prevent spreading sores around your own body, **always dry the affected areas last**. Do not dry them with a bath towel and then use the towel to dry other parts of your body.

- Any time you touch an affected area, wash your hands carefully before you touch any other part of your body or someone else's body.

Treatment

If you have any symptoms that you think might be herpes simplex lesions, call your transplant team. Your lesions will be tested for an exact diagnosis, to see if they are caused by HSV type 1 or type 2, or by another virus.

Your treatment will depend on how long it has been since your transplant, the severity of the infection, and how many times you have had HSV infections in the past (if at all). You will be given a medicine called *acyclovir*, either as pills or as a liquid through an IV. In some cases, you may be given acyclovir cream to put directly on the affected area.

Keep the sores clean and dry. Do **not** use any other medicines *of any kind* to treat these lesions unless we give you a prescription for them.

Do not re-start acyclovir treatments on your own if you get another infection. Call your transplant team and tell them about your symptoms.

Varicella Zoster Virus Infections

Varicella zoster virus (VZV) is a very common virus. It is the organism that causes both chicken pox and shingles.

The 1st time someone is infected with the *varicella* (ver-ih-**sell**-uh) *zoster* virus (VZV), they get chicken pox. This is the primary infection. The secondary infection of VZV is called *shingles*.

Chicken Pox

Chicken pox (primary VZV) is a very contagious disease. Most people get it when they are children if they have not had the vaccines to prevent it. It is very common and usually not very serious. As a childhood disease, chicken pox mainly affects the skin, mouth, and throat. Most children get better in 7 to 10 days. Adults who get chicken pox often have a more serious case of the illness, and it takes much longer for them to recover.

In transplant patients, chicken pox as a primary infection can be a very serious disease. Immunosuppression allows the virus to spread to many different body organs. Very rarely, transplant patients who had childhood chicken pox may reactivate the virus or get infected with a different strain of the virus (from a child or grandchild, for instance). This can lead to a new case of chicken pox.

Because this infection can be severe (including a serious viral pneumonia), transplant patients must take special care to avoid contact with anyone who is thought to have chicken pox.

There are 3 stages of a chicken pox infection:

- **Prodrome:** This stage has symptoms similar to a cold or the flu. Fever, loss of appetite, and general flu-like symptoms last for 1 or 2 days. The person is contagious at this point.

- **Rash:** Small, blister-like sacs filled with fluid appear on the chest, back, and belly. The rash will then spread to the face, arms, legs, and the inside of the mouth. After a few days, the sacs burst and start to scab over. The person is still contagious at this stage.
- **Crusting-over:** No new blisters appear at this point. All sores are in the final stages of healing or scabbing over. It takes about 7 to 10 days from the time the first symptoms appear to get to the healing stage. The person is no longer contagious at the crusting-over stage.

Spreading the Infection

Primary VZV infections are spread by getting close (usually within about 1 foot or less) to someone who is in the prodrome or rash stage of chicken pox.

Once you have been exposed to chicken pox, it takes between 10 and 21 days before you start to show any symptoms.

Treatment

Transplant patients who have not had chicken pox and are exposed to it must be treated within 48 hours. They are given a shot of a medicine called V-ZIG (varicella zoster immune globulin). V-ZIG helps protect you for about 3 weeks. It cannot ensure that you will not get chicken pox, but it may help make your illness less severe.

If you do get chicken pox, expect to stay in the hospital for at least 14 days. You will be given a medicine called acyclovir through an IV.

Shingles

Shingles is also a form of VZV infection. It is the secondary VZV infection. After a person has had chicken pox, the virus may stay in their body and be inactive for many years. If the virus settles in the nerve roots of the spinal column and then reactivates, the result is a case of shingles.

There are 3 stages of a shingles infection:

- **Prodrome:** The main symptom is severe burning or tingling pain in the affected area of skin. This stage may last for several days.
- **Rash or lesions:** Small, blister-like sores appear over the affected areas. The person may continue to feel sharp, knife-like pain in the affected areas for several weeks, or even longer. Fluid from the sores can pass the virus to another person.
- **Scabbing:** No new sores or blisters appear at this point. All of the sores are in the final stages of healing or scabbing over. At this point, the person is no longer contagious.

Spreading the Infection

Shingles are very contagious if the fluid from a burst lesion touches another person.

Treatment

The best treatment for shingles is acyclovir given through an IV. Some transplant patients will be admitted to the hospital to start IV treatment. If the case is mild, large doses of acyclovir pills may be enough to treat the illness.

Cytomegalovirus Infection

Cytomegalovirus (CMV) is the single most important type of virus that affects immunosuppressed patients. There are many different strains of CMV that cause widespread infection.

Almost 80% (80 out of 100) of all people have been infected with *cytomegalovirus* (**sigh**-toe-meg-ah-loe-*vigh*-rus) (CMV) by the time they are 25 years old. For most people, CMV infections do not cause any symptoms, or they may be like having a mild flu. But, 75% to 95% of transplant patients (75 to 95 out of 100) do have physical symptoms of CMV infection.

CMV infections occur most often during the first 4 months after transplant or after a period of treatment for rejection. This is because your doses of immunosuppressive medicines are higher during these times. The infection can be detected with tests done in a laboratory.

There are 3 common patterns of CMV infection in transplant patients. Each of them can result in symptoms of infection.

- **Primary CMV** infection occurs after transplant when the patient who has not had a CMV infection in the past gets an inactive CMV virus from an infected donor. The virus is activated when the transplant patient starts taking immunosuppressive medicines.
- **Secondary CMV** infection occurs when the transplant patient has already been infected with CMV. As noted above, about 80% of all people have had a CMV infection. When the patient begins taking immunosuppressive medicines, their own virus is reactivated. Almost all patients who had a CMV infection before getting a new heart will reactivate the virus after the transplant. But, only about 20% (20 out of 100) of these people have actual symptoms of illness.
- **Reinfection** is the 3rd type of CMV infection that can happen after transplant. It occurs when patients who had a CMV infection before transplant become infected with an inactive virus of a different strain from their donor. We do not know how often this happens, or how the infection progresses. This is partly due to the fact that it is very hard to tell which virus (the transplant patient's own virus or the new virus from the donor) is causing the infection.

Symptoms

Fever is the main symptom of a CMV infection. The fever usually goes up and down over a 24-hour period. This may go on for days or even weeks. When the fever *spikes* (gets high), all the other symptoms also get worse. Chills may come before or after these fever spikes.

Other symptoms include fatigue, headache, muscle and joint aches, upset stomach, loss of appetite, and diarrhea.

A serious CMV infection may lead to CMV pneumonia. Call your transplant team if you have shortness of breath or a cough.

Spreading the Virus

CMV is spread by intimate contact with an infected person. This includes everything from sharing saliva to sexual intercourse.

CMV is not likely to be spread by shaking hands or being in the same room with an infected person. Good hand washing and wearing a mask should be enough to protect you from infection.

Treatment

All patients are given an anti-viral medicine called valcyte for 100 days after their transplant. This is to try to delay or prevent the onset of a CMV infection.

Patients who are diagnosed with symptoms of CMV infection are given valcyte for longer than 100 days. Your transplant doctor and an infectious disease specialist will work together to treat your CMV. You will have weekly blood draws while you are being treated for a CMV infection.

Recovery from a CMV infection may take several weeks, or even several months. You may have stretches of time where you do not have any symptoms, then a period where you become ill again. Please call your transplant team if you are in a cycle of symptoms. This is especially important if you have a fever.

Be patient with your recovery from a CMV infection. If you feel tired, get lots of rest. Let your body tell you what it can and cannot do. Try not to overdo activity or exercise. Keep in mind that this is one infection that you cannot just "snap out" of.

The Epstein-Barr virus (EBV) is another member of the herpes family. It is a common cause of infection in transplant patients. EBV causes an illness called mononucleosis, or "mono." Epstein-Barr virus can appear as either a primary or secondary infection.

Epstein-Barr Virus Infection

Primary Epstein-Barr virus (EBV) infections in transplant patients can have some very serious effects. The most important one is an increased risk of *lymphoma* (lim-**foh**-muh). Lymphoma is a type of cancer that affects the *lymphatic system*, a part of the circulatory system that helps your body fight off disease.

Epstein-Barr virus infection is also known as *mononucleosis*, or "mono."

Symptoms

The symptoms of both primary and secondary EBV infections are very similar to symptoms of a CMV illness. EBV symptoms include fever and chills, nausea, pain in the belly, loss of appetite, a sore throat, and swollen lymph nodes in the neck. Usually, primary EBV infections cause a more severe illness than secondary infections.

Spreading the Virus

EBV is spread through close physical contact with an infected person. Several large studies have proven the old saying that mono is the "kissing disease" to be true. It is important that transplant patients avoid people with EBV infections.

Treatment

If you do get an EBV infection, the main treatment is to lower the doses of your immunosuppressive medicines. This will let your immune system help fight off the illness. Anti-viral medicines such as acyclovir, valcyte, or ganciclovir do not seem to have much effect on EBV.

Bacteria cause about 40% of infections in transplant patients. They often happen soon after transplant, while you are still in the hospital, but they can also happen any time afterward. Three of the most common bacterial infections are nocardiasis, legionellosis, and listeriosis.

Bacterial Infections

Nocardiasis

Nocardiasis (noh-kar-**die**-uh-sis) is a type of opportunistic infection that is common in people with weakened immune systems. *Nocardia* bacteria live in soil, and infection most often happens when you inhale them. Lungs are the usual site of nocardiasis infection.

Symptoms

There are many possible symptoms of a nocardiasis infection. The most common are:

- Fever
- Night sweats
- Loss of appetite
- Cough

Call your transplant team about any antibiotic or medicine that is prescribed by any provider who is not part of your transplant team.

Treatment

Nocardiasis is treated with a long-term course of antibiotic pills. This is usually very effective if treatment is started soon after you become infected.

Legionellosis (Legionnaire's Disease)

Legionellosis (*lee*-jon-ell-**oh**-sis) is a lung infection that occurs in about 2% (2 out of 100) of heart transplant patients. *Legionella*, the germ that

If you are given a course of antibiotics to treat an infection, it is important to finish the medicine. Even if you are feeling better, you must take all of it. Otherwise, the bacteria may only be weakened, not eliminated, and can cause further infection.

causes the illness, lives in both soil and water. But, it may also travel through the air, so it can be inhaled. Once it is in the lungs, the infection causes a type of pneumonia.

Some sources of legionella are air conditioners, water condensers, portable water sources (such as tanks or barrels), and areas where large amounts of soil have been dug up or disturbed, such as construction sites or crop fields. There are no known cases where one person has passed the infection directly to another person.

Symptoms

Symptoms of legionellosis can vary widely from person to person. Some of the most common symptoms are:

- A vague sense of not feeling well ("malaise")
- Fever
- Muscle aches
- Headaches
- Diarrhea
- A dry cough

Legionellosis can occur in other parts of the body besides the lungs, but this is rare. If you have a legionella infection somewhere besides the lungs, you may have any of the symptoms above, except for the cough.

Treatment

Legionellosis can be treated with many different antibiotics. The length of time you will need to take them will depend on the type of medicine and how severe the infection is.

Listeriosis

Listeriosis (lis-tere-ee-**oh**-sis) is caused by a bacterium called *listeria*. About 75% (75 out of 100) of listeria infections show up as a kind of *meningitis* (men-in-**jigh**-tis). This is an illness where the lining of the brain and spinal cord are inflamed. Most times, listeria meningitis occurs in children under 1 year old or in adults over age 55. But, patients with a lowered immune system are also at a greater risk of getting the infection, no matter what their age.

Listeria usually enters the body in food that is contaminated with the bacteria. The most common sources are raw or undercooked poultry, fresh salads, soft cheeses, and milk products. There are no known cases where one person has passed the infection directly to another person.

Symptoms

There are many symptoms of listeria meningitis. The most important are:

- Headaches
- Fever
- More irritability (feeling cranky)
- Personality change
- Being forgetful

Treatment

Treatment involves high doses of antibiotics for up to several months. Like all infections that occur in immunosuppressed patients, successful treatment depends on detecting the illness early and starting treatment right away.

Fungal infections account for about 10% of infections commonly seen in transplant patients. Fungal spores are normal airborne particles. They are just about everywhere.

Fungal Infections

Fungal spores that cause infections are most often found around construction sites or near farms, where there are compost piles and bird or chicken droppings. Being in these types of places on a regular basis can increase your risk of getting a fungal infection.

Here are 3 common fungal infections that occur in transplant patients, along with their symptoms and treatments:

Candida Infections

Candida is a type of yeast spore that normally lives in your stomach and intestines (the *gastrointestinal tract*). It also lives in the female genital tract. Candida infections that spread through the body can lead to a serious or even life-threatening illness for a transplant patient. The most common sites for candida infection are the mouth (also called “thrush”), fingernails, toenails, and skin. In women, spores that live in the vagina can cause infections as well as other symptoms. These may last for quite some time and come back often.

Symptoms

Because there are several sites for candida infection, there are different groups of symptoms.

- Infection in the mouth:
  - White patches on the tongue or inside the mouth
  - Slight burning sensation in the mouth
  - Sores in the mouth or on the tongue

All medicines that are used to treat fungal infections will interact with your anti-rejection medicines. You will need frequent blood draws to monitor anti-rejection drug levels and other body functions.

- Infection of the skin or nails:
  - Itching or burning sensation
  - Scaly patches on skin
  - Thickening or yellowing of fingernails or toenails
- Infection of the genitals:
  - Itching or burning feeling
  - Thick, white "cottage cheese" discharge
  - Bad odor
  - Pain or discomfort during urination

Treatment

Transplant patients are usually given an antifungal medicine to prevent candida infection soon after the transplant surgery. A very common drug that is used is clotrimazole. It is given in the form of *troches* (lozenges) that dissolve in the mouth. Another is nystatin liquid, which is swished in the mouth and swallowed. These are more fully described in the appendix, *Medicines*. Ongoing or active candida infections can also be treated with other antifungal drugs.

Aspergillosis

Aspergillosis (ass-per-jill-**oh**-sis) is caused by a type of mold called *aspergillus*. This mold can grow on almost any organic material, such as dead leaves, compost, etc. It usually enters the body when it is inhaled into the lungs. Once there, it can cause a form of pneumonia.

Symptoms

Symptoms of aspergillus pneumonia may include:

- Fever
- Cough that brings up phlegm or mucus, which may have spots of blood
- Wheezing
- Pain in the chest and sides

There may also be other symptoms. In transplant patients, lung infections are often diagnosed with a chest X-ray rather than based on symptoms.

Treatment

Treatment for aspergillosis must take place in the very early stages of the infection. The patient is given high doses of an antifungal medicine. The preferred medicine is called Amphotericin-B, which is given through an IV. Treatment lasts for several months.

Cryptococcosis

Cryptococcosis (**krip**-toe-kah-*koh*-sehs) is caused by a yeast-like fungus called *cryptococcus*. The spores of the fungus are found in the soil and in pigeon droppings.

Cryptococcosis can occur in healthy people, but it is usually seen in immunosuppressed patients. Infection occurs when the spores are breathed into the lungs. The most common sites of cryptococcal infection in transplant patients are the lungs and spinal cord. In the lungs, it causes a type of pneumonia. When it infects the spinal cord, it leads to a form of meningitis.

Symptoms

Symptoms of cryptococcal **pneumonia** include:

- Chest pain
- Fever
- Cough

Symptoms of cryptococcal **meningitis** may include:

- Headaches
- Nausea
- Reduced mental awareness
- Unsteady or staggering walk
- Blurry vision

Treatment

Treatment is the same for both types of cryptococcal infections. High doses of antifungal medicine such as Amphotericin-B are used to treat these illnesses. As with any other infection in transplant patients, it is very important to begin treatment as early as possible for the best results.

Protozoan Infections

Protozoan infections make up about 10% of the infections most often seen in transplant patients. Protozoa are tiny, single-celled organisms, such as the amoeba and certain kinds of simple plankton.

Most *protozoa* (1-celled animals) do not cause diseases in humans, but some protozoa cause very common infections worldwide. The 2 protozoan illnesses most often seen in transplant patients are:

Pneumocystis Carinii

Pneumocystis carinii (noo-moh-**sis**-tiss care-**in**-eye) is an opportunistic invader that usually lives in the lungs, waiting for the chance to infect you. It causes pneumonia. Pneumocystis pneumonia is the most common type of pneumonia that affects transplant patients. It is easily treated if it is diagnosed early. But, if it is not treated, it can be fatal.

There are also several types of protozoan illnesses that you can catch from drinking unclean water. If you go on a hike or camping trip, be sure to bring a water sterilization kit, or plenty of clean, bottled water – never drink directly out of rivers, lakes, or streams.

Some outbreaks of pneumocystis pneumonia in hospitals and medical centers are due to person-to-person infection. But, pneumocystis infection in transplant patients usually occurs from a past infection being reactivated, not by catching the infection from another person.

Symptoms

The symptoms of pneumocystis pneumonia almost always include:

- Shortness of breath
- A non-productive, or dry, cough
- Fever and chills
- Night sweats
- Weight loss

Treatment

Treatment of pneumocystis pneumonia begins with prevention. Most transplant patients receive a daily dose of a medicine called sulfamethoxazole/trimethoprim (also called SMZ/TMP, Bactrim, or Septra). Sometimes the treatment is an inhaled medicine that is given once a month. If pneumocystis pneumonia occurs, then the dose of these medicines is increased. Preventing the illness has been very successful in most transplant patients.

Toxoplasmosis

Toxoplasmosis (tock-so-plaz-**moh**-sis) is caused by a protozoan parasite called *toxoplasma*. These parasites usually live in animals in the cat family, especially in pet cats. In healthy people, toxoplasmosis does not usually cause symptoms, and it goes away without any treatment.

But, in immunosuppressed patients, toxoplasmosis is an opportunistic infection that can lead to serious and widespread disease. While it can affect any organ system, it most often affects the *central nervous system* (the brain and spinal cord) in transplant patients.

The life cycle of toxoplasma is complex. It begins when the organism enters a cat's digestive system. The parasite is called an *oocyst* at this point. It grows in the cat's intestines and gets out of the cat's body through its droppings (stool).

The parasite then moves into the soil where it is eaten by birds, mice, cattle, or other animals. In this stage, the organism develops into another form called a *tissue cyst*. Once it gets to the tissue cyst phase, it can stay inactive in the host animal's tissues for the rest of the host animal's life. But, it can reactivate at any time.

How the Disease Is Spread

Toxoplasmosis infection in humans can occur in 2 ways:

- By eating raw or undercooked meat from an infected animal, such as beef, chicken, or lamb
- By exposure to cat droppings that contain the parasite, often while cleaning out a pet cat's litter box

Symptoms

Symptoms of toxoplasmosis infection in immunosuppressed patients may vary widely from person to person. They often involve the central nervous system. Fever and changes in coordination (such as unsteady walking or problems holding or grasping objects) are very common.

Treatment

Treatment of toxoplasmosis infection is with high doses of antibiotics. The best treatment, though, is prevention.

Here are ways to reduce your chances of getting a toxoplasmosis infection:

- If you have any pet cats, they should be tested for toxoplasma before your transplant. Have them treated if the test comes out positive.
- Avoid ANY contact with any cat droppings. If you have cats, someone else will need to clean out their litter boxes.
- Do not eat any raw or undercooked meats.
- Do not leave any food sitting open to the air. Uncovered food, including pet food, can get infected by flies or cockroaches.

Not all infections that transplant patients get are caused by opportunistic invaders. Ordinary "run-of-the-mill" infections and illnesses, such as colds and the flu, can also affect transplant patients.

Other Common Infections

Common Cold or Upper Respiratory Tract Infection (URI)

The common cold can be caused by many viruses. Only about a third of the colds that affect people can be traced back to one virus. The common cold cannot be treated with an antibiotic, but you should be seen by the transplant team to make sure you do not have a more serious infection.

- **Any time you have a fever, shortness of breath, or cough, tell your transplant team.**
- **If you have a cold that lasts more than a few days, make an appointment with your doctor.**

Even if you are trying to fight off "just a cold," you can help your immune system. These things will not cure your cold, but they will help you recover faster:

To help you recover from a cold, drink 6 to 8 glasses of water a day.

- Rest.
- Eat healthy foods.
- Drink 6 to 8 glasses of water a day.
- Avoid other people who are ill.

Influenza (Flu)

Influenza is a viral infection of the lungs and bronchial tubes. New types of flu appear each year. Most times, the flu lasts from 2 to 7 days.

Symptoms

If you have any flu symptoms, call your transplant team. As with the common cold, we need to make sure you do not have a more serious infection.

Common symptoms of the flu are:

- Fever
- Chills
- Sore throat
- A runny nose
- Headache
- Cough
- Muscle aches
- Nausea and vomiting

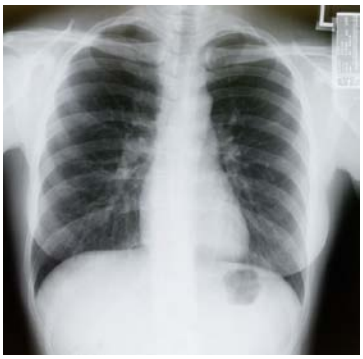
Respiratory (Lung) Infections and Pneumonias

Respiratory or lung infections and pneumonias are common after transplant. They can be a very serious threat to your health. They are caused by viruses, bacteria, fungi, or protozoa.

Symptoms

If you have any symptoms of lung infection and pneumonia, call your transplant team. We want to start treating you right away. Symptoms include:

- A dry, hacking cough, or a cough that brings up yellow or green sputum
- Fever
- Shortness of breath
- Pain in your chest when you breathe or cough



You will have chest X-rays on a regular basis after transplant to screen for lung problems.

Most lung infections and pneumonias will have at least some of these symptoms, but some opportunistic infections do not show any symptoms at all until the illness is quite far along. Chest X-rays are done on a regular basis after transplant to screen for lung problems, including infections.

Treatment

Treatment of lung infections and pneumonias depends on what is causing the illness. If you report symptoms to the transplant team early, it will help us make a quicker diagnosis and we will be able to start the right treatment faster. Many, but not all, lung infections and pneumonias are treated with antibiotics.

Urinary Tract Infections

Transplant patients often get urinary tract infections (UTIs). UTIs are most often caused by bacteria and fungi.

Symptoms

Symptoms of a UTI include:

- Fever
- Urine that is cloudy or tinged with blood
- Pain or burning when you urinate
- Having a hard time starting a urine stream
- A feeling of pressure over your bladder area
- Urinating often, but feeling like you have not emptied your bladder
- Urine that has a foul or very strong odor
- Pain in the right or left side (or both sides) of your back between your ribs and hip bones

Diagnosis and Treatment

Most times a urine sample reveals what kind of germ is causing the UTI. UTIs can be very easy to treat if they are diagnosed and treated early. But, if the symptoms are ignored and treatment is not started, the infection may travel to the kidneys, or even into the blood. This can lead to a very serious illness.

If you think you have a UTI, tell your transplant team right away.

Wound or Skin Infections

Skin sores and lesions are a common sign of infection, especially in immunosuppressed patients. Any new mole, rash, or irritation of your skin should be reported to your transplant team.

Rinse any cut or scrape with clean, cold water for several minutes.

Minor, everyday accidents can also cause a cut or scrape. Rinse any cut or scrape with clean, cold water for several minutes. This will wash the area and help slow any bleeding. Clean the wound with hydrogen peroxide and wrap it with a sterile gauze bandage. Keep it dry and clean until it forms a scab.

Call your transplant team if the area of your wound is:

- Red
- Swelling
- Painful
- Tender to the touch
- Warm
- Draining pus

Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns.

Cardiology Clinic: Weekdays 8 a.m. to 5 p.m., call 206-598-4300.

After hours and on weekends and holidays, call 206-744-2500. Say you are a heart transplant patient. A nurse will assess your problem and help you.

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