

Avoiding infections

In order to protect your new heart and prevent your body's immune system from rejecting it, you are taking "immunosuppressive medications." These anti-rejection medicines suppress your natural immune system (white blood cells that fight infection) so that the new heart is not seen as a foreign object by your body. However, these same important medications increase your risk for infection allowing normally harmless organisms to cause illness.

The types of infections that can occur include:

- *Viral*
- *Bacterial*
- *Fungal*
- *Other (toxoplasmosis)*

Viral infections

During the pre-transplant workup you were tested for previous exposure to cytomegalovirus (CMV), herpes simplex virus (HSV), hepatitis viruses and HIV (AIDS virus). Having active viral hepatitis or HIV would prevent you from being a candidate for a transplant. However, having infection with CMV or HSV is common. These viruses are acquired in childhood and stay dormant in the body for a lifetime. They can reactivate after a transplant, when you are on immunosuppressive medicine and cause illness.

CYTOMEGALOVIRUS (CMV)

CMV is a common infection following heart transplantation. You are at greatest risk in the first three months after transplant because of the high

doses of immunosuppressive medications. More than half of all Americans have had previous exposure to CMV, a benign illness, causing flu-like symptoms in the normal population. Reactivation of dormant or new infection with CMV can cause serious infection after transplant. Therefore, if you or your donor had prior CMV exposure you will be placed on valgancyclovir or acyclovir for the first three months in order to prevent serious illness from this virus.

Signs of CMV infection include:

- *Fatigue*
- *Fever*
- *Night sweats*
- *Aching joints*
- *Headaches*
- *Nausea*
- *Vomiting*
- *Diarrhea*
- *Shortness of breath*

You may simply "feel lousy." It is very important you call your transplant coordinator if any of these symptoms occur. If you develop an infection due to CMV you may need to be admitted to the hospital and you may need to take intravenous medicine for treatment. You may even go home either taking an oral agent or IV medicine to fight the CMV.

Infections, continued

HERPES SIMPLEX VIRUS (HSV) TYPE 1 AND 2

These viruses most often infect the skin but can also appear in other areas like the eyes and lungs. HSV Type 1 causes cold sores and blisters around the mouth. HSV Type 2 causes genital sores. HSV is an infectious disease and is transmitted by direct contact of secretions from an infected person to one who is not infected. Like CMV, once you have herpes it lays inactive in your body and can reactivate periodically. The most common example of this is cold sores that occur in some people from time to time. Most infections are mild, but sometimes they can be severe. Although there is no cure for HSV, it can be treated. Depending on the severity of the infection, the treatment is either by mouth (pill form), skin ointment and creams or intravenously. The medication name is acyclovir (Zovirax).

Symptoms of herpes include:

- *Tingling sensation before an outbreak*
- *Painful, fluid-filled sores in your mouth or genital area*
- *Fever may occur*

Report any pain with swallowing. Women should also watch for any unusual vaginal discharge. Contact your transplant coordinator right away if you think you may have HSV in the oral or genital region.

Precautions:

- *Keep the sore areas as clean and dry as possible.*
- *Wash your hands with soap and water after touching the sore.*
- *Wear loose-fitting clothing to avoid irritating the sores and spreading the virus.*
- *Avoid kissing or having oral sex with someone who has a cold sore.*
- *Avoid having intercourse with someone who has genital sores.*

HERPES ZOSTER (SHINGLES)–(VZV)

Shingles is a reactivation of the varicella-zoster virus (VZV) that causes chickenpox in childhood and then remains dormant in the body for life. It appears as a rash or small water blisters, usually very painful and most commonly on the chest, back or face. They run along the pathways of nerves on the surface of the skin. *Call your transplant coordinator immediately* if you have this kind of rash.

Infections, continued

Bacterial infections

Bacterial infections frequently occur after transplant. Bacteria are normally found throughout the body and on the skin. Normally these bacteria do not typically cause a problem; however, they may lead to infections because of the immunosuppressive medications you are taking. Immediately after surgery wound infections can occur and the incision site must be monitored closely for any signs of redness, swelling, tenderness or drainage. You may or may not have a slightly elevated fever. You should notify your nurse, or, if out of the hospital, call your transplant coordinator.

Bacterial infections can be caused by staph, strep, pseudomonas or other organisms. They can occur at any place in the body including lungs, bloodstream, urinary tract or incisions (as previously mentioned). Fever is the most common sign of a bacterial infection. If an infection is suspected you will be asked to come to the hospital to give blood, urine and/or sputum samples. When a bacterial organism is identified it is tested against a group of antibiotics to see which antibiotic is effective against the organism. You will then be started on that antibiotic. It is very important to finish all the antibiotic ordered for you even if you feel better before finished. Bacteria can become resistant to an antibiotic if all of the bacteria have not been killed. Next time you have the infection that antibiotic may not work for you.

Fungal infections

PNEUMOCYSTIS ASPERGILLOSIS

Pneumocystis is an unusual type of pneumonia that occurs in people taking immunosuppression medications.

Symptoms include:

- *Cough*
- *Fever*
- *Shortness of breath*

In general you just “don’t feel good.” For the first year after transplant you will take **Bactrim DS** three days a week for prevention. If you are allergic to sulfa you may be given **Dapsone** or inhaled pentamidine.

Aspergillus is a common environmental mold found in decaying vegetation and airborne dust. Aspergillosis may be contracted by breathing fungal spores in damp or dusty places such as old barns, construction sites, basements, attics, etc. These places should be avoided, or, if necessary, wear a face mask in those areas. The spores are present in mulch, and cow or horse manure. Even mowing grass will put you at risk for breathing in aspergillosis.

Infections, continued

CANDIDA (YEAST)

Candida is a fungal infection that grows in moist areas of the body such as the mouth, groin, arm pits or genital areas. When it is growing in the mouth it is called thrush and appears as white, patchy fuzzy areas on the roof of the mouth, tongue, throat, or esophagus. It can cause pain and tenderness and make swallowing difficult. It is treated and prevented with Nystatin “swish and spit.”

When candida occurs on the skin it can be treated with creams or lotions. Vaginal infections usually cause an abnormal discharge that may be yellow or white, lumpy, foul-smelling and often itchy and will be treated with vaginal cream, suppositories or oral medications.

If candida spreads inside the body it can become a more severe infection and may require intravenous treatment with a variety of oral and/or IV antifungal agents.

HISTOPLASMOSIS

Histoplasmosis is an airborne fungal disease that is found in bird droppings. You should avoid exposure to bird droppings, especially in enclosed areas, vegetables, stuffed animals, etc.

Other infections

TOXOPLASMOSIS

Toxoplasmosis is an infection caused by a parasite that is often found in cats that eat other small animals. People most often become infected from contact with cat feces. Because it can cause severe symptoms in someone with a weakened immune system you should not change the litter box. In addition, garden with gloves and have good hand-washing, wash all fruits and vegetables well, and don't eat raw or undercooked meat.

TUBERCULOSIS (TB)

Tuberculosis is an infection caused by *Mycobacterium tuberculosis*. It is contracted by breathing infected airborne droplets. TB is mainly an infection of the lungs. You may have received a skin test during the transplant evaluation process to determine if you have had previous exposure to TB.

Symptoms include:

- *Cough*
- *Coughing up blood*
- *Night sweats*
- *Shortness of breath*
- *Weight loss*
- *Chills*
- *Report immediately if you have contact with a person suspected of having or diagnosed with TB*

Infections, continued

Preventing infections

Because anti-rejection medications interfere with your body's defenses, you need to make sure to protect yourself from infection after your surgery by taking the following precautions:

- *Wash your hands carefully and frequently. **This is the single most effective way to decrease the spread of germs and to prevent infection.***
- *Keep your hands away from your face and mouth.*
- *Wash your hands after coughing or sneezing, and throw tissues into the trash immediately.*
- *Wear a mask in the hospital any time you are outside your room.*
- *Practice good dental hygiene.*
- *Take good care of your skin. No matter how small, carefully clean cuts and scrapes with soap and water. If you are taking prednisone your skin will not heal as quickly as in the past and may bruise more easily.*
- *Eat a healthy, well-balanced diet and follow safe food preparation guidelines. (See Food and Nutrition section)*
- *Limit your visitors for the first weeks.*
- *If your visitors have cold or flu symptoms ask them to return when they are well.*
- *Avoid crowds for the first three months. If you can't control how far you can go from other people, it is probably a crowd.*
- *If someone in your family becomes ill with a cold or flu, have that person follow normal precautions (using separate drinking glasses, separate towels,*

covering their mouth when coughing, frequent hand washing, etc.)

- *Keep your house clean and free of excess dust.*
- *Do not work in or visit any form of construction site. **Dust can cause fungal infections which may be harmful.** If visiting this type of area becomes necessary you must obtain permission from your transplant team and you **MUST** wear a mask.*
- *You may mow the lawn the first year but you must wear a mask. The mask is recommended lifelong when you mow. A lawnmower blows bacteria from the grass which can cause an infection.*
- *You may garden but you should wear garden gloves and a mask when gardening. Soil has many molds and fungi that can be sources of infection.*
- *Stay away from hot tubs, whirlpools, public pools, saunas or steam baths for one year. Germs tend to multiply in these areas. **NO lake swimming!***
- *If you enjoy fishing, use caution with fish hooks, fish fins and fillet knives. Wear protective gloves when handling these items.*
- *You may have pets but you should avoid handling animal waste and avoid contact with animals that roam outside. Do not clean bird cages, fish or turtle tanks or cat litter boxes. The feces of some animals contain parasites and can cause infections. Fish tanks can develop fungus and can be infectious. If you live alone and have no one to change the litter box, you may do it while wearing a mask and gloves.*

Infections, continued

IMMUNIZATIONS

Ask your transplant team when you may resume your vaccination schedule. Usually we recommend you wait at least six months.

We recommend:

- *Pneumonia vaccine every five years*
- *Flu shot yearly (not flu mist)*
- *Tetanus booster every 10 years*

Live vaccines should be avoided. Live vaccines include shingles, oral polio, measles mumps and rubella (MMR), yellow fever, smallpox and chicken pox. **Some live vaccines should not be given to household contacts.** Ask your transplant team before you or your family member needs to receive any vaccinations. **You should avoid contact with body fluids with anyone for two weeks after they have received any of the live vaccines.** This may require that you tell people who visit you; especially parents of young children and babies. If, as a parent, you have to change diapers during this time, you need to wear gloves.

DENTAL EXAMS

We recommend good routine dental care. Daily tooth and mouth care are important because your mouth can also be a source of infection. Wait three months after transplant before scheduling a dental appointment except in cases of emergency. **You may need to take antibiotics before dental procedures.** This is to protect your

transplanted heart from endocarditis, an infection of the inner lining or valves of the heart caused when bacteria from the mouth get into the blood stream. Your transplant doctor will provide you with a prescription for the appropriate antibiotics.

GASTROINTESTINAL OR URINARY PROCEDURES

From now on, anytime you are scheduled for a GI procedure such as colonoscopy or endoscopy you may need to protect your transplanted heart from endocarditis. This infection of the inner lining or valves of the heart can occur when bacteria from the gastrointestinal tract (GI) enters the blood stream. This is also true for any invasive procedures involving your urinary tract. It is very important to tell your transplant team so they can order the proper antibiotics prior to the procedure.

Infections, continued

WHEN TO CALL THE DOCTOR

You must monitor yourself and recognize the symptoms of infection and get treatment as soon as any of the following symptoms occur.

Be aware: Your immunosuppressive medicines can mask the usual signs of infection so make sure you call promptly. Don't wait!

Call your transplant team if:

- *Your temperature is two degrees higher than your "normal."*
- *You are experiencing sweats or chills.*
- *You "feel lousy" or have flu like symptoms.*
- *You have a skin rash.*
- *You have an area of pain, redness, tenderness or swelling.*
- *You have a wound or cut that won't heal.*
- *You have red, warm or draining sores.*
- *You are/have been around someone who is actively ill.*
- *You have a sore, scratchy throat or pain when swallowing.*
- *You have sinus drainage that isn't clear.*
- *You have a persistent or moist cough.*
- *You have nausea, vomiting and/or diarrhea.*
- *You have white patches in your mouth or on your tongue.*
- *You have trouble urinating – pain or burning, constant urge or frequent urination.*
- *You have bloody, cloudy or foul-smelling urine.*
- *You are short of breath*

Keep in mind you may not experience any of these signs but you may just not feel "normal!"

Remember – if you even "think" you're experiencing signs of infection, contact your transplant coordinator immediately.