

Infections

In order to protect your new kidney and/or pancreas 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 kidney and/or pancreas 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

Preventing Infections

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.
- 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 before your transplant and may bruise more easily.

- Practice good dental hygiene.
- Eat a healthy, well-balanced diet and follow safe food preparation guidelines.
(See **Nutrition/Dehydration** section.)
- Eat pasteurized foods.
- Limit your visitors for the first several weeks.
- If your visitors have cold or flu symptoms, ask them to return when they are well.
- 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 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.
- Stay away from public hot tubs, public whirlpools, public pools, saunas or steam baths. Germs tend to multiply in these areas.
- If you enjoy fishing, use caution with fish hooks, fish fins and fillet knives. Protective gloves should be worn when handling these items.
- You may keep your pets, but you should avoid handling animal waste. Do not clean bird cages, fish or turtle tanks or cat litter boxes. The feces of some animals contain parasites and can cause infections.

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Fish tanks can develop fungus and can be infectious. If you cannot avoid contact with pet waste, use excellent hand washing afterwards. Also, wash hands after petting animals. Keep pets' vaccinations up-to-date.

Care Of Your Incision

- Check your incision every day until it is healed for signs of infection such as redness, drainage, odor or increased pain. Call the Transplant Center if you notice any of these changes.
- You may shower as you normally do. Wash the incision daily with soap and water. Pat dry with a clean towel.
- Do not soak in the tub or swim until your skin incision is completely healed. This usually takes about one month.
- You may put a dry gauze dressing over the incision to absorb any drainage.
- Always wash your hands before and after treating your incision.

Viral Infections

During the pre-transplant workup, you were tested for previous exposure to CMV, herpes simplex virus (HSV), hepatitis viruses and HIV (AIDS virus). Having active viral hepatitis or HIV may 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 kidney and/or pancreas 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 average 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, valacyclovir (Valtrex), cytovene, acyclovir or ganciclovir for the first three to six 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

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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. You also may need to take intravenous medicine for treatment. You may even go home either taking an oral medication or IV medicine to fight the CMV.

BK Virus

BK is a strain of “polyoma” virus that commonly occurs before transplant in the average population, and the virus can be present but inactive. The BK (polyoma) virus can become active in the transplant patient as a result of the anti-rejection medications and can affect the transplanted kidney. The BK virus can injure the kidney and decrease function. It can also cause the kidney to fail. If a donor has had polyoma virus in the past, this can be passed to the transplant recipient.

Each time you come to the Transplant Center, we will ask for a urine test and a blood test. If the urine test is positive for the BK (polyoma) virus, the blood test will be done to confirm the presence of the BK virus in your system. If the blood test is positive, the transplant team will review the results, along with your other lab values, and determine if a kidney biopsy needs to be done. Physical symptoms of BK virus do not affect the transplant patient (no fevers or flu-like symptoms occur), but what can be seen is a gradual rise in BUN and creatinine.

By screening patients for the BK virus, it is the hope to detect and treat the virus before any changes in kidney function would be seen.

Treatment for BK virus that is causing the creatinine and BUN levels to rise, includes decreasing the anti-rejection medications and possibly giving an oral medication called leflunomide (Arava) or an IV medicine called Cidofovir. These are anti-viral agents that have been successful in the treatment of kidney transplant patients with BK virus. If treatment methods fail and BUN and creatinine levels continue to rise, you may need to re-start dialysis as a result of the BK infection. Failure of the transplanted kidney is rare but does happen. Early diagnosis and treatment is important.

Herpes Simplex Virus (HSV) Type 1 And 2

These viruses most often infect the skin, but they 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 lies inactive in your body and can reactivate periodically. The most common example of this is cold sores that occur in some people periodically. Most infections are mild, but sometimes they can be severe. Although there is no cure for HSV, it can be treated.

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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 around your mouth or genitals.

Precautions:

- Keep the areas around the sore 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 genital 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.

Varicella-Zoster (Chicken Pox)–(VZV)

Chicken pox may appear as a rash or small blisters and usually occurs in childhood,

resulting in immunity to further infection. However, the VZV virus does remain in the body for life and can recur as "shingles." Avoid anyone with active chicken pox, as it can cause a more severe infection in transplant recipients who were never exposed to the virus. Or, it may cause shingles in those who previously had chicken pox. Call your transplant coordinator immediately if you have been exposed and have not had chicken pox previously. Do not wait to see if you are going to get sick.

Herpes Zoster (Shingles)–(VZV)

Shingles is a reactivation of the varicella-zoster virus (VZV) that causes chicken pox 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 nerve pathways on the surface of the skin. Call your transplant coordinator immediately if you have this kind of rash.

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,

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swelling, tenderness or drainage. You may or may not have a fever. You should notify your nurse, or, if out of the hospital, call your transplant coordinator if symptoms appear. 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. Fever is the most common sign of a bacterial infection. If an infection is suspected, you will be asked to come to the Transplant Center 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 an appropriate antibiotic. It is very important to finish all of the antibiotic prescribed, even if you feel better before all the antibiotic is finished. Bacteria can become resistant to an antibiotic if all of the bacteria has not been killed. If the same infection recurs, the same antibiotic may not work for you.

Pneumocystis Carinii

Pneumocystis carinii (jirovecii) 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 two days a week for prevention. If you are allergic to sulfa, you may be given Dapsone or inhaled pentamidine.

Fungal Infections

Candida (Yeast)

Candida is a fungal infection that grows in moist areas of the body such as the mouth, groin, armpits 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 swallow liquid.” You will start this medicine after your transplant and continue for one month.

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. These infections 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.

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Aspergillosis

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. If that is not possible, 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 aspergillosis.

Histoplasmosis

Histoplasmosis is an airborne fungal disease that is found in bird droppings. You should avoid exposure to bird droppings.

Other Types Of Infection

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 litter boxes. In addition, be sure to garden wearing gloves, use good hand-washing techniques, thoroughly wash all fruits and vegetables and do not 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 to the transplant team if you have contact with a person suspected of having or has been diagnosed with TB.

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

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Live vaccines should be avoided. Live vaccines include 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 anyone for two weeks if that person has received any of the live vaccines. As a precaution, you should inform visitors – especially parents of young children and babies – of your increased susceptibility if any of them has had recent live vaccines.

Dental Exams

We recommend good routine dental care. Daily teeth and mouth care are important because your mouth can also be a source of infection. Wait three months after your transplant before scheduling a dental appointment except in cases of emergency. Taking antibiotics prior to a dental exam or a dental procedure is not necessary. However, there are many other medical conditions that do require antibiotics prior to seeing the dentist. Please contact your primary care physician or other specialty doctor prior to your dentist appointment to determine if you will need antibiotics before your appointment.

Urinalysis

A urinalysis is generally ordered with each clinic visit. If the urinalysis screen indicates that you may have a urinary tract infection,

the laboratory will complete a urine culture to determine if an infection is present and if the organism needs to be treated. It is important to do a “clean catch” when obtaining the specimen (see the following page for the correct steps to obtain a clean catch urine specimen). The reason for this screening is because the symptoms of a urinary tract infection may be so subtle that you will not know that you have an infection. Other times, a urinary tract infection may be present with symptoms of:

- Increased pressure and/or urgency to urinate
- Increased frequency to urinate
- Burning upon urination
- Low back or abdominal pain
- Blood in urine
- Fever

Preventative Measures For Urinary Tract Infections Include:

- Drink plenty of fluids; 8-10 glasses/day.
- Wear only undergarments with a cotton crotch.
- Do not use bubble bath.
- Women should cleanse front to back after voiding and bowel movements.
- Urinate before and after sexual intercourse.

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Procedure For Clean Catch Urine

Female

- 1) Remove all necessary garments.
- 2) Wash hands thoroughly with soap and water, rinse and shake off excess water. Do not dry hands at this time.
- 3) Separate labia (folds covering opening from which you urinate) with one hand. With the other hand, take a single cleansing towelette and cleanse the meatus (opening from which you urinate) and surrounding area using a downward stroke (front to back). Discard towelette in wastebasket.
- 4) Repeat with a second cleansing towelette, remembering to keep the labia separated throughout the entire procedure.
- 5) Begin to urinate in the toilet, then catch a stream of urine directly in the container. Avoid any contact with rim or inside of container.
- 6) Place the lid on the container tightly and wipe excess urine from the outside of the container. Place urine in plastic bag.
- 7) Wash hands.
- 8) Give urine sample to lab personnel.

Male

- 1) Remove all necessary garments.
- 2) Wash hands thoroughly with soap and water, rinse and shake off excess water. Do not dry hands at this time.
- 3) Hold foreskin back with one hand. With the other hand, take a single cleansing towelette and cleanse the meatus (opening from which you urinate) well, using a circular stroke from the center outward. Discard towelette in wastebasket.
- 4) Repeat with a second towelette remembering to keep the foreskin held back throughout the entire procedure.
- 5) Begin to urinate in the toilet, then catch a stream of urine directly in the container. Avoid any contact with rim or inside of container.
- 6) Place the lid on the container tightly and wipe excess urine from the outside of the container. Place urine in plastic bag.
- 7) Wash hands.
- 8) Give urine sample to lab personnel.