

Guide to Safe Travel after Transplant

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INTRODUCTION

In 2015, US residents made more than 73 million trips outside the United States. People whose body's defense system is weak, such as organ transplant recipients, make up 1–2% of all travelers seen in US travel clinics. Travelers are at increased risk for getting infections. The risk of infections is even higher when traveling to tropical and subtropical locations. Organ transplant recipients may get travel-related infections more easily because their body's defense system is weaker and vaccines are less effective. Infections may be more severe when they occur.

Good preparation can prevent infections.

The risk of acquiring infections depends on many things.

- the region visited
- the traveler's age and general health
- the length of the trip
- the type of recreational activities
- prevention measures before travel

This patient information brochure for transplant patients provides tips on how to prepare for travel to reduce the risk of infection. It is important to seek advice from your healthcare provider or a clinic specializing in pre-travel care prior to your trip. The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) offer general and country-specific information about risks related to travel.

Please visit the following sites for additional information:

- Centers for Disease Control and Prevention. Traveler's health <http://wwwnc.cdc.gov/travel/destinations/list/>
- World Health Organization. International travel and health. <http://www.who.int/ith/en/>
- The CDC's Yellow Book at: <http://wwwnc.cdc.gov/travel/page/yellowbook-2012-home.htm>

GENERAL TRAVEL PRINCIPLES/ PRECAUTIONS

Organ transplant patients should:

- Visit a travel health clinic prior to the planned trip, ideally two to three months before leaving the country
- Keep all prescribed medicines in their original bottles, bring extra medicine, and pack all medicine in carry-on bags
- Consider obtaining medical evacuation insurance for transport to a major medical center in case you become severely ill. Be aware that this insurance may be very expensive.
- Pack additional over-the-counter medicines such as pain killers, anti-allergy medications, and a first aid kit (more information at <https://wwwnc.cdc.gov/travel/page/pack-smart>)
- While on the plane, drink plenty of fluids, wear loose-fitting clothes, and stretch when you can. Travel for greater than 6 hours may increase the risk of a blood clot. Some patients may need to wear compression stockings.

WHAT SHOULD I ASK MY HEALTHCARE PROVIDER TO GIVE ME BEFORE I TRAVEL?

- a list of my medical conditions
- a list of prescribed medicines, including generic names
- prescriptions for an adequate supplies of my medicines
- results of my baseline EKG, if abnormal
- contact information for my transplant clinicians, and names of transplant centers in cities I will be visiting

IN WHAT SITUATIONS SHOULD I AVOID TRAVEL?

- Travelling to higher risk destinations in the first year after receiving a new organ and during times of organ rejection that require an increase in anti-rejection medicines. This is different for each type of disease. You can check the CDC and WHO websites for more information.
- Locations where non-sterile needles or equipment may be used
- Areas where blood products are in limited supply if you may need a transfusion

VACCINATIONS

Vaccines help the body's defense system fight infection. There are many vaccines that you may have received before the organ transplant that will help prevent infections. Additional vaccines may be necessary for your travel. There are some vaccines that you should not receive. These are sometimes called "live" vaccines. Family members of transplant recipients should not receive oral polio vaccine, nasal influenza vaccine, or smallpox vaccine, since germs from these vaccines may be spread to you.

Tips for making sure you are ready for travel:

- when possible, get vaccinations at least two to three months in advance of the planned trip
- receive vaccinations preferably from a dedicated travel clinic familiar with organ transplant patients
- general (routine) vaccinations should be up to date before you travel
- general vaccination information for travel can be found in the CDC's Yellow Book: <http://wwwnc.cdc.gov/travel/page/vaccinations.htm>
- information on local infectious diseases and vaccinations for specific destinations can be found here: <http://wwwnc.cdc.gov/travel/destinations/list.htm>
- AST ID Vaccination Guidelines for organ transplant patients can be accessed here: <http://onlinelibrary.wiley.com/doi/10.1111/ajt.12125/full>

WHAT VACCINATIONS MAY I NEED BEFORE TRAVEL?

• **Diphtheria/pertussis/tetanus**

Tetanus, pertussis, diphtheria are infections caused by bacteria that can easily be prevented by vaccination. The Advisory Committee on Immunization Practices (ACIP) recommends that adults aged 19-64 years who have not previously received a shot for tetanus, diphtheria toxoid, and pertussis vaccine receive a single shot of this vaccine (Tdap).

• **Hepatitis A**

The hepatitis A virus is spread by contaminated food or water and can cause nausea, vomiting, diarrhea and lead to liver damage. The risk for infection with Hepatitis A may be high in areas with poor sanitation. It is recommended to have two shots of the vaccine given 6 months apart before you travel. Sometimes gamma globulin is given to transplant patients, especially if travel is soon. This is because the vaccine does

not always work as well if the anti-rejection medicine is strong. Some doctors who specialize in travel medicine may give both the vaccine and gamma globulin.

• **Hepatitis B**

The hepatitis B virus is transmitted through blood and body fluids. It can cause liver damage and liver failure. A series of three-shots of this vaccine is recommended, but this not always practical before traveling.

• **Rabies**

Rabies is acquired by the bite of an infected animal, and results in death in most cases. Rabies in dogs is common in Asia, Africa, and South and Central America. The rabies vaccine is recommended for those traveling more than 30 days or if you are expecting frequent contact with animals. If you are bitten by a dog while traveling, it is important to seek medical care for additional rabies vaccinations. You should also consider seeing a doctor.

• **Japanese Encephalitis**

Japanese encephalitis (JE) is caused by a virus. This infection can cause headache, confusion, seizures and paralysis. There is no treatment for Japanese encephalitis. Lengthy travel in countries where JE is common increases risk of getting this infection. A vaccine can be given as two shots 28 days apart. Vaccination is recommended for those traveling more than 30 days to certain parts of the world, during peak seasons, and for travelers going to rural areas who are likely to engage in outdoor activities.

• **Meningococcus**

Infection with the germ *Neisseria meningitidis* can cause meningitis. This infection can cause headache, fever, and a stiff neck. The infection can be life-threatening, requiring urgent medical treatment. Vaccination can prevent the infection and is recommended in organ transplant patients. It is necessary for those traveling to the sub-Saharan Africa during December to June and for those traveling to Saudi Arabia for the Muslim pilgrimage of Hajj/Umrah.

• **Typhoid**

- It is the most common disease acquired during travel that can be prevented by vaccination. Typhoid is a bacterial infection (*Salmonella typhi*) that is transmitted through contaminated food. Infection results in fever, diarrhea, and abdominal pain. The typhoid vaccine is a single dose injection and is recommended to all travelers aged 2 years or older who are traveling to regions where typhoid is common.

- Transplant patients should not get the oral vaccine because it is a “live” virus vaccine.
- It is safe for transplant patients to get the injected vaccine.
- The correct food and water hygiene actions can also help prevent infection.

- **Yellow fever**

- Yellow fever (YF) is caused by a virus that is transmitted by a mosquito. No treatment is available for this disease. Symptoms of infection include fever, headache, body aches and jaundice. Yellow fever is common in South America and sub-Saharan Africa.

- The vaccine should not be given to organ transplant patients because it is a “live” virus vaccine.

- Organ transplant patients should avoid regions where yellow fever is common (see map in Appendix). If you cannot avoid travel in these areas, it is important to stay away from mosquitoes and to avoid travel during peak seasons for yellow fever transmission, July to October in rural West Africa and January to May in South America. If you are not vaccinated, you must travel with a Yellow fever Medical Contraindications to Vaccination on a yellow card (more information is available at <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever>).

- **Influenza A/B**

- Influenza A/B is a common viral infection that can be deadly in some cases. Symptoms include fever, chills, muscle aches, cough, congestion, runny nose, headaches, and fatigue. Influenza occurs year-round in tropical regions. For this reason you should receive an inactivated influenza vaccine every year.

- **The “live” influenza virus vaccine (a nasal spray) should not be given to organ transplant patients.**

- **Pneumococcus**

- Pneumococcal disease is a bacterial infection caused by *Streptococcus pneumoniae*.
- The bacteria spreads through contact with people and can cause ear infections, sinus infections, pneumonia, and infections of the brain. Two different types of vaccines (PCV13, PPVS23) are recommended for organ transplant patients.

TRAVELER'S DIARRHEA AND FOOD/WATER SAFETY

Up to 50% of all travelers experience stomach illness from eating and drinking food that is not clean. While the severity of most illness from eating or drinking during travel is mild, organ transplant patients are at risk for severe infection from bacteria and parasites. Diarrhea may lead to severe fluid loss and dehydration. This may affect the kidney function and interfere with anti-rejection medicines.

How can I protect myself from getting sick from eating and drinking?

Maintain good food safety practices to avoid infections. A summary of food and water precautions is available on the CDC website: <https://wwwnc.cdc.gov/travel/page/food-water-safety>

- Drinking bottled or boiled water is advised. Do not drink water from a faucet.
- Avoid ice unless it is made from boiled, bottled or purified water. Freezing does not kill the germs that cause diarrhea.
- Avoid rinsing your toothbrush with tap water.
- Avoid uncooked or partially cooked food.
- Avoid food from street vendors or market stalls.
- Cooked food should be eaten immediately and not be allowed to sit.
- Fresh fruits that can be peeled are considered safe. Raw fruits and vegetables (like salads) will put you at risk. Avoid garnishes on foods, uncooked vegetables, fruits or herbs.
- Unpasteurized milk products, including soft cheeses, may carry bacteria such as *Listeria* and *Brucella*. Avoid ice cream or other frozen products that may have been made or stored in a contaminated container.
- Foods with raw eggs, including Hollandaise sauce and mayonnaise, put travelers at risk for *Salmonella* infection.
- Fluid replacement is essential. Fluids can be replaced with clean water or oral rehydration solution. If diarrhea continues, please see a doctor to avoid severe dehydration.

Antibiotics for traveler's diarrhea (TD)

Antibiotics can prevent some cases of traveler's diarrhea, but antibiotics are not necessary for most travelers. Organ transplant patients should always carry an antibiotic to treat diarrhea. If you develop moderate or severe diarrhea during a trip, antibiotics

should be taken as prescribed by your doctor. This is usually for 3–5 days. The fluoroquinolone antibiotics (ciprofloxacin, levofloxacin) have been the most effective antibiotics for traveler’s diarrhea. However, some bacteria like *Shigella* and *Campylobacter* have become more resistant to these antibiotics. Other options include azithromycin and rifaximin. It is important to remember that there are risks with use of antibiotics, including allergic reactions, side effects and drug interactions. For example, azithromycin use may increase the concentration of anti-rejection drugs (calcineurin inhibitors such as tacrolimus). You may get sick from the same illness the antibiotic is meant to prevent, despite taking antibiotics.

MALARIA AND DENGUE

Mosquitoes, ticks, and other insects can transmit a number of infections. Vaccination and medicines can protect against several of these diseases, such as malaria, yellow fever, and Japanese encephalitis. However, infections spread by insects have vaccines or prevention medicines. Three examples are dengue virus, chikungunya virus, and zika virus. Therefore, strategies to prevent bites are important. If you are traveling to areas where these diseases are common, you should learn how to avoid insect bites.

The following measures can prevent insect bites:

- Repellents containing at least 25% DEET (N,N-diethyl-3-methylbenzamide) or picaridin
- Use of bed nets
- Well-screened rooms or air conditioning
- Protective clothing (long pants and shirtsleeves)
- Permethrin-impregnated clothing

Dengue fever

Dengue is caused by a virus. The infection may cause high fever, rash, and muscle and joint pain. In severe cases there is serious bleeding and shock, which can be life threatening. There is no vaccine or medicine that prevents dengue fever. Patients should avoid areas where dengue fever is common. Check the health map to see the countries where there are dengue fever outbreaks: <http://www.healthmap.org/dengue/en/>

Malaria

Malaria is caused by a bite from a mosquito infected with parasites. Infection can cause fever, chills, and muscle pain which can come-and-go. Some types of malaria may cause more serious problems, such as damage to the heart, lungs, kidneys, or brain, and even death. Before travelling, consult your health care provider about the need and type of malaria medication that is best for you.

Other resources:

- The CDC Yellow Book gives recommendations about travelling to specific countries: <https://wwwnc.cdc.gov/travel>
- Malaria can be prevented by taking certain medicines. Options can be found in the AST ID Guidelines Table 4 here: <http://onlinelibrary.wiley.com/doi/10.1111/ajt.12125/full>

WHAT HAPPENS IF I BECOME ILL AFTER RETURNING FROM MY TRIP?

Health problems related to traveling are common and can happen in over half of patients who visit developing countries. Most of these illnesses are mild. But, approximately 5 % of travelers will become sick enough to look for medical care. This is usually for diarrhea, fever, respiratory symptoms or skin lesions. Even with careful safety measures and being vaccinated before you travel, you can get infections while travelling that may not be apparent until weeks or even months after returning from the trip.

When seeking medical care after a trip, organ transplant patients should share the following information with their medical providers:

- Past medical history and medications
- Places you visited and how long you were there
- Types of lodgings during the trip (hotel, tent, native dwelling)
- Type of food and drink you had
- Whether you were bitten by bugs or animals
- Vaccination you have before your trip and prevention actions you took, including medicines you took, insect repellants used, etc.)
- Foods you ate, water you drank, any swimming in freshwater, sexual contacts, tattoos, and other activities
- Whether you were injured, went to a hospital or had medical care during travel

Fever in the returning traveler

Fever is a common symptom among returning travelers and can be a sign of serious illness. Most serious fever infections appear within the first month after returning from a trip. The list of causes for fever is long, but certain information can help the medical team more easily identify potential causes. It is important to discuss where you traveled, potential exposures (food, water, activities) and preparation for travel (vaccines, Malaria prophylaxis) with your healthcare provider.

Potential infectious causes of fever in the returning traveler are:

- Malaria
- Chikungunya
- Zika
- Dengue
- Intestinal infections
- Tickborne illness
- Schistosomiasis
- Histoplasmosis
- Leptospirosis
- Coccidioidomycosis
- Trypanosomiasis
- Filariasis
- Bartonellosis

The following symptoms when connected to fever require urgent attention from a healthcare provider:

- Skin rash
- Difficulty breathing or shortness of breath
- Persistent cough
- Bruising or bleeding
- Decreased level of consciousness
- Persistent diarrhea or vomiting
- Paralysis
- Jaundice

Sexually Transmitted Diseases

Sexually transmitted diseases (STDs) are acquired through genital, anal or mucosal contact and are an under-recognized cause of illness in travelers. Organ transplant recipients are at higher risk for severe or unusual problems. Some STDs (chancroid, antibiotic-resistant gonorrhea) may be more widespread in developing countries. Casual sexual relationships occur frequently during foreign travel and commercial sex attracts many foreign travelers. The following measures will help you reduce the risk of STDs during travel:

- Avoid unprotected sexual intercourse
- Avoid contact with commercial sex workers who may have high rates of STDs and HIV infection.
- Avoid trips for the purpose of sexual tourism
- Condoms should always be worn with sexual contacts outside of long-term monogamous relationships
- Avoid use of illicit drugs and excessive consumption of alcohol
- Sexual assault is a risk in many parts of the world. Do not travel alone, travel at night or in secluded or poorly-lit areas
- Seek rapid medical care at a reliable health care center with attention to HIV post-exposure prophylaxis if there is a concern for an STD

Reducing risk for other diseases

There are several infections that are more common in certain parts of the world that can cause severe illness in transplant patients. These include certain fungal infections that are acquired by breathing in (coccidioidomycosis, histoplasmosis, talaromycosis) and the parasitic infection leishmaniasis, acquired from the bite of an infected sandfly. Travelers to certain regions of the world should discuss specific preventative measures with a healthcare provider.

In many developing areas of the world, tuberculosis is common. It may be necessary to be tested to establish a diagnosis of tuberculosis in the past in transplant patients before to travel. This may be helpful in the evaluation and treatment of illness you get while traveling.

Medical and Transplant Tourism

Medical tourism is a term used to describe people traveling outside of their home country for medical treatment. Common procedures that US travelers pursue include orthopedic surgery, cosmetic surgery, cardiac surgery, cancer care and dentistry. There has been an increase in transplant tourism, when there is travel of the organ donor or recipient for purposes of organ transplantation. There may be significant risks associated with transplant tourism. Organs may not be matched to recipients adequately, or may come from unhealthy or infected donors. The evaluation of the donor and recipient before the transplant operation may be quite variable. Also, foreign medical centers may not provide appropriate medical records or education following the transplant. Medical tourism has been associated with infectious complications, including those caused by antibiotic-resistant germs not typically seen in the United States. If you are considering medical care overseas you should be aware

of these risks. If you return from travel and are ill, it is important to inform your healthcare provider of what medical procedures were performed and what medications were given.

APPENDIX Yellow fever zones¹

Transplant and other immunocompromised patients should not travel to yellow fever zones, shown here in yellow.



1 <https://wwwnc.cdc.gov/travel/yellowbook/2018/infectious-diseases-related-to-travel/yellow-fever>