

Strategies for Safer Living After Transplantation

Authors

Robin K. Avery MD, FIDSA, FAST

Professor of Medicine, Division of Infectious Diseases, Johns Hopkins

Sharon Fei-Hsien Chen, MD

Department of Pediatrics, Division of Infectious Diseases, Stanford University

Hayley Altman Gans MD

Department of Pediatrics, Division of Infectious Diseases, Stanford University

Rosemary Soave, MD

Weill Cornell Medical College, Cornell University

AMERICAN SOCIETY OF **TRANSPLANTATION**

1120 Route 73, Suite 200

Mount Laurel, NJ 08054

Phone: 856-439-9986

E-mail: info@myAST.org

Website: myAST.org

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INTRODUCTION

People who receive a new organ are always at higher risk for infections than people in general. This is because of the medicines that they take to prevent rejection of the new organ. These medicines that prevent rejection of the new organ (immunosuppressants) weaken the immune system and make it easier for germs to cause infections.

One of the main reasons to have a transplant is to help the recipient lead as full and healthy a life as possible. The new organ will help the person to return to school or work and to return to doing hobbies, if the person wishes to do so. However, some activities may have a higher risk of infection than others. Everyone is exposed to many kinds of germs every day. There are many sources of infection around us, including food, water, pets, and germs outside. Infections can be acquired by direct contact, by puncturing the skin, by breathing air, by drinking water or eating food, by contact with animals, by bites from insects or ticks, through sexual activity, and occasionally by other ways. Not all infections are preventable, but many of them are. Understanding ways to prevent infections and following what we call "Strategies for Safer Living", can help the person who received the new organ live a safer and more enjoyable life after the transplant. It is important for the organ recipient as well as family members and caregivers to engage in safer living to ensure the best outcomes.

WHAT TIMES ARE MOST RISKY FOR GETTING INFECTIONS?

When your body is impaired by disease or medical treatment it means it is harder to fight off all infections, even those due to germs that don't normally cause infections. There are certain times that are more risky than others. It is particularly important to be careful during the following times:

- The first 6 months after transplant
- Three months (or a time-period determined by your transplant team) after any treatment for rejection
- When the person's white blood count is low
- When recovering from another infection

HOW CAN YOU PREVENT INFECTIONS SPREAD BY DIRECT CONTACT?

Many germs are carried and spread on the hands. Washing your hands is one of the most important ways you can prevent infections.

- Wash hands with soap and water for about 20 seconds. Be sure to wash between fingers, around nails, and up to wrists. Then rinse and dry your hands with a clean towel.
- Gels and hand sanitizers may also be used to clean your hands. However, if there is visible dirt or soiling on the hands, or if there has been contact with an infection such as C difficile diarrhea or norovirus diarrhea, soap and water should be used instead of gels or hand sanitizers.
- Create a "culture of handwashing" within the family.
- Everyone who comes into your home should wash their hands.

You should wash your hands: This section pertains to the organ recipient, family members and caregivers:

- Before preparing food and before eating
- After going to the toilet
- After wiping your child's nose
- After blowing your nose, coughing, or sneezing
- Before and after visiting or taking care of sick friends or relatives
- Before and after touching wounds, even if you wear gloves to touch the wound
- After touching or cleaning up after pets and animals*
- After being outside, gardening, or touching plants or soil*
- After changing diapers*
- After touching items that have been in contact with human or animal feces (bedpans, bedding, toilets, litter boxes)*

*The person who received the new organ should not change diapers, clean up after pets, do gardening, and handle bedpans. If such activities have to be done by person who received the new organ, the person needs to follow the instruction list above about washing hands.

HOW CAN YOU PREVENT INFECTIONS SPREAD THROUGH MAKING A HOLE OR WOUND IN THE SKIN?

- Do not go barefoot outdoors or on rough surfaces.
- Wear shoes, socks, long pants and long sleeve shirts when doing yard work, gardening, farming, or when in parks or wooded areas. It is better to avoid gardening or farming.

- Do not get body piercings or tattoos.
- Do not use illegal intravenous (IV) or injected drugs.

HOW CAN YOU PREVENT INFECTIONS SPREAD THROUGH THE AIR?

Breathing can lead to infection if you are exposed to viruses or bacteria from another person. Exposure to bacteria or fungi from the environment around you, especially outside, can also cause infection.

- Avoid close contact with people who are coughing, sneezing, or who are sick. Tell family and friends not to visit if they are sick.
- All family members in the home who are sick should avoid close contact with the person who received the new organ until they are well.
- If a visitor becomes sick during the week after visiting the person who received a new organ, he or she should tell the person or the family
- For a person who received a new organ who has returned to school or daycare, or who has brothers or sisters in school or daycare, ask the teacher or school nurse to notify you if other children in the classroom are sick
- Family members and close contacts should sneeze or cough into a tissue or into their upper sleeve or elbow—not their hands.
- Encourage the person who received a new organ and other family members to avoid touching their face, eyes, and mouth.
- Avoid crowded areas like shopping malls, elevators, subways, crowded movie theaters, indoor playgrounds. These are areas where contact with people with respiratory illnesses is likely, especially during influenza outbreaks and cold season.
- Health care workers with colds or viral illnesses should not go to work until the problems go away, or wear a mask while at work.
- Avoid exposure to tobacco smoke, including e-cigarettes and vapor devices. Smoking and tobacco smoke can harm your lungs' ability to protect against infection
- Avoid smoking or vaporizing (vaping) the plant form of marijuana, which can contain harmful fungal spores, especially the fungus called *Aspergillus*.

- Avoid exposure to people with tuberculosis. Avoid contact with people in prisons, homeless shelters, or health care areas where exposure to tuberculosis might occur.
- If possible, avoid gardening, landscaping, farming, entering barns, areas with haystacks, dust-laden areas, or construction sites, where the air may contain fungal spores. If it is necessary to work in one of these areas, talk with your transplant team about ways to make your job safer. These may include wearing an N95 mask and gloves.
- To reduce your risk of fungal infections avoid the following:
 - Avoid decaying plant matter, hay bales, compost piles, and uncovered sand boxes.
 - Avoid breathing air with dust that may contain fungal spores, such as construction sites, woodworking, home remodeling projects, excavation sites.
 - Avoid caves and chicken coops where bird droppings may transmit fungal infections.

HOW CAN YOU PREVENT INFECTIONS SPREAD BY WATER?

Infections can occur from drinking dirty water or from swallowing water during activities such as swimming, diving, or boating. One of the main infections that can be spread through water is the parasite (bug) called *Cryptosporidium*. This bug is difficult to kill because it is unaffected by chlorine and other chemicals. *Cryptosporidium* can cause a severe watery diarrhea that lasts a long time in people who receive a new organ. To prevent this and other infections, it is recommended to:

- Avoid drinking or swallowing water from rivers, lakes, ponds, pools, or water rides at amusement parks.
- Avoid being in hot tubs because harmful bacteria can grow in hot tubs.
- Drink clean water. In general, drinking city tap water is safe unless there is a "boil water" advisory. If your city has this advisory water should be brought to a full rolling boil for one minute before drinking it.
- Avoid drinking well water if it is not tested regularly for germs.
- In general, it is not necessary to use only bottled water. However, if you travel to areas with poor sanitation, avoid tap water and ice cubes, as well as fresh vegetables that must be washed, such as lettuce.

- Some people use water filters. If you use a filter it is important to check which types are useful for people who receive a new organ. Not all water filters remove *Cryptosporidium*. Those tested and certified for *Cryptosporidium* removal should have the label “NSF 53” or “NSF 58” plus the terms “cyst reduction” or “cyst removal”. More details are available in the References at the end of this section.
- Avoid water that might be contaminated with human or animal waste.
- Avoid public pools or water parks for at least 2 weeks after having diarrhea.
- Clean up any pools of water in your home or basement quickly. This should be done by someone other than the person who received the new organ.
- Avoid water-retaining toys that children might use when taking a bath. Allow toys to dry in between baths, and wash toys once a week in the dishwasher.

HOW CAN YOU PREVENT INFECTIONS SPREAD BY FOOD OR BY PEOPLE WHO HANDLE FOOD?

Infections from foods are more and more common. In addition to infections from bacteria such as *Salmonella* and *Campylobacter*, norovirus (previously known as the “cruise ship virus”) has now become the most common infection from foods in the United States. These bacteria and viruses can cause a severe diarrhea that can last a long time in people who received a new organ. Soft cheeses, unpasteurized dairy foods, and other foods can carry harmful bacteria called *Listeria* that can cause an infection in the spinal fluid (a type of meningitis). In order to prevent infections from foods, it is recommended to:

- Avoid eating soft cheeses and unpasteurized dairy foods or unpasteurized juices.
- Avoid eating foods containing raw or partially cooked eggs. This includes soft-boiled eggs, cookie or cake dough that has not been cooked, some homemade dressings, mayonnaises, and sauces.
- Avoid eating raw or partially cooked meat, poultry, fish, and seafood. Avoid smoked seafood or partially cooked meat spreads or pate.
- Avoid raw seed sprouts, including alfalfa sprouts or mung bean sprouts.

- Avoid using dirty silverware, kitchen tools and cutting boards to prepare food. Wash all of these items with hot soapy water.
- Peel or carefully wash any vegetables or fruits. Do not trust labels that indicate that the contents are “pre-washed”.
- Foods that have been packaged before they are sold, such as hot dogs or sausages should be cooked again. All leftovers should be heated to steaming hot before eating them.
- Avoid public salad bars, food vendors on the street, and any restaurants that may not be clean.
- Avoid pot-luck meals, buffets, eating samples of food that you have not prepared, picnics where food is sitting out at room temperature, and other situations in which the preparation or handling of food may not have been up to the standards in the home of a person who received a new organ
- A person with diarrhea should not prepare food for the person who received a new organ, or others, until at least 2 weeks after the symptoms have gone away.
- People preparing food for the person who received a new organ should always wash their hands.

HOW CAN YOU PREVENT INFECTION FROM CONTACT WITH PETS AND OTHER ANIMALS?

Pets can provide important emotional benefits, companionship, protection, and other key functions for the person who received a new organ. However, there are risks of infection associated with certain animals, particularly with new pets. It is important to discuss infection issues with the veterinarian, who can provide very helpful information.

- A person who received a new organ should avoid getting a new pet for at least 6 – 12 months after transplant and when you are at risk of getting an infection.
- Avoid getting young pets since they are more likely to transmit infections.
- Avoid kissing pets, putting fingers in a pet’s mouth, or sharing food with pets.
- Avoid stray animals.
- If you are bitten or scratched by an animal get medical attention immediately.

- Avoid contact with animals with diarrhea, cough, or other infectious diseases. Contact a veterinarian (and your transplant team) if you have this type of contact.
- Keep pets healthy by feeding them food that is not contaminated or spoiled.
- Always wash hands after touching pets.
- Avoid reptiles, amphibians (snakes, turtles, lizards, iguanas), baby chicks and ducklings because of the risk of Salmonella and other infections.
- The linings of bird cages should be changed daily. This should be done by someone other than the person who received the new organ. Wear gloves when handling anything dirty with bird droppings.
- Avoid contact with monkeys, exotic pets, or wild animals.
- Someone other than the person who received a new organ should handle kitty litter, cleaning bird cages and aquariums, filling bird feeders, and cleaning up any animal feces. Avoid placing kitty litter in the kitchen or dining room.
- If you work with animals, talk with your transplant team about what is safe for you. Try to decrease the time when you are in contact with animals. When you are around animals wash your hands and use gloves and masks.
- Please consult your medical team if your pet needs immunizations, as some should be avoided. Your veterinarian should provide a list of needed immunization, frequency and what kind of vaccine they are so you can provide this information to your care team.

HOW CAN YOU PREVENT INFECTION FROM INSECT AND TICK BITES?

Mosquito bites can spread harmful infections. One harmful virus that can cause an infection in the brain is West Nile Virus. Tick bites can spread Lyme disease, Rocky Mountain spotted fever, ehrlichiosis, and other infections. All of these are potentially serious for a person who received a new organ. It is best to take measures to avoid insect and tick bites, especially during the spring, summer, and early fall months.

- A person who received a new organ should avoid going outside at dawn or dusk when mosquitoes are feeding.
- A person who received a new organ should apply insect repellent containing DEET for any outdoors activities during mosquito/West Nile Virus season.

- All items in which water can collect and where mosquitoes can breed, such as old tires, should be removed from the property of a person who received a new organ.
- A person who received a new organ who goes hiking or walking in tall grasses or wooded areas where ticks are common should wear protective clothing like long pants and long sleeve shirts and use insect repellent. The person should check the skin for ticks after returning inside.
- A person who received a new organ should be aware that ticks can also get inside houses by pets.

HOW CAN YOU PREVENT INFECTIONS SPREAD BY SEXUAL ACTIVITY?

Many infections can be spread by sexual contact. Some of this risk can be reduced by having only one or a few sexual partners. A person who received a new organ should:

- Always use condoms if the person has more than one sexual partner.
- Avoid exposure to feces during sexual activity.
- Stay up to date with vaccinations against hepatitis B and HPV (human papillomavirus). Refer to the section on vaccinations for more details.

WHAT VACCINATIONS SHOULD A PERSON WHO RECEIVED A NEW ORGAN HAVE BEFORE GETTING THE TRANSPLANT?

The time before a transplant is a critical time to update your or your child's vaccinations (shots) to prevent infections after transplant. Vaccinations work better when they are given before the person's immune system is weakened by the medicines taken to prevent rejection after receiving a new organ. Some vaccinations can only be given before transplant and therefore it is vital to take advantage of this important opportunity.

There are two types of vaccines:

- live vaccines (including chickenpox vaccine, the older shingles vaccine, rotavirus vaccine, and measles/mumps/rubella vaccine)
- non-live vaccines

Live vaccines cannot be given after transplant or for the 4 weeks before the transplant operation. If these vaccines are needed,

it is best to receive them earlier. Your Transplant Team can recommend which vaccines you need before your (or your child's) transplant.

- Children getting a transplant should receive a yearly influenza shot and all recommended childhood vaccines before receiving a new organ. Children may benefit from a schedule that allows for as many vaccines as possible to be given before the operation (Table 2).
- Adults who are waiting to receive a new organ should get shots for:
 - influenza vaccine every year
 - pneumonia vaccines (see below)
 - the hepatitis B vaccine series if not already immune to hepatitis B
 - hepatitis A vaccine if not already immune to hepatitis A
 - the Tdap vaccine (tetanus, diphtheria, and acellular pertussis)
 - a Td (tetanus-diphtheria) booster every 10 years, and
 - the papillomavirus (HPV) vaccine series up through age 26 if the person has not received it before.
- There is a new non-live shingles vaccine which is approved for people age 50 and over. How the new non-live shingles vaccine works in people who are waiting for a new organ and those who received a new organ is still being studied.
- The live vaccines MMR (measles-mumps-rubella) and varicella vaccine (chickenpox vaccine) should be given to adults waiting for a new organ if their blood tests show that they are not immune to these infections, if they are not on medicines that weaken the immune system, and if the operation to receive the new organ is not expected to happen in less than 4 weeks.
- The live zoster (shingles) vaccine may be given to adults age 50 and over before their transplant, if they are not taking medicines that weaken the immune system, and if the operation to receive a new organ is not expected to happen in less than 4 weeks.
- Live vaccines should be given more than 4 weeks before when the Transplant Team thinks the operation to receive a new organ is likely to happen. Live vaccines should not be given if

the operation is likely to happen within 4 weeks. Live vaccines should not be given if the person waiting for a new organ is already taking medicines that weaken the immune system.

- **Influenza vaccine**

People waiting to receive a new organ should receive a yearly influenza vaccine (flu shot). Influenza can be very severe in patients waiting for a new organ, and can also cause a person to miss a chance to receive a new organ if he or she is sick with influenza at that time.

- **Pneumococcal pneumonia vaccines**

Adults should receive up to 2 doses of the pneumococcal polysaccharide vaccine 5 years apart (which protects against 23 types of the bacteria called *Pneumococcus*), and 1 dose of the conjugated pneumococcal vaccine (Prevnar-13, which protects against 13 types of *Pneumococcus*). If both of these types of vaccine are needed, they should be given at least 8 weeks apart if the conjugated vaccine is given first. However, if pneumococcal polysaccharide vaccine is given first, the conjugated vaccine should be given after one or more years.

- **Hepatitis B vaccine**

Adults should receive the 3 dose series of hepatitis B vaccines if their blood tests show that they are not immune to hepatitis B. Patients on dialysis are given a higher dose of this vaccine so that it works better. This vaccine is available at many dialysis centers. The doctor will check blood tests to see if the vaccine has worked.

- **Tdap (tetanus-diphtheria-acellular pertussis) vaccine and Td (tetanus-diphtheria vaccine)**

Adults should receive one dose of Tdap vaccine if they have not had it in the past. Pertussis (whooping cough) can cause a severe lung infection in a person who received a new organ. A Td (tetanus-diphtheria vaccine) booster should be given every 10 years.

- **Human papillomavirus (HPV) vaccine**

Adults 26 years old and younger should receive the HPV vaccine series if they did not receive it as a child.

- Certain people who are at increased risk of bacterial meningitis due to the bacteria called "*Meningococcus*" should receive meningitis vaccine. This includes college freshmen and people who do not have a spleen. Your Transplant Team can tell you if you need to receive meningitis vaccine.

VACCINES YOU NEED AFTER RECEIVING A NEW ORGAN

Although vaccines may not work as well after the transplant, they are still important for preventing infections, particularly influenza and pneumonia, and other childhood preventable diseases. Vaccines that are NOT live are safe to give after transplant. Live vaccines (see above) are not given after transplant. Your Transplant Team can recommend which vaccines you need during your followup visits. Please see the AST Information Brochure on Travel for information about vaccines needed for international travel.

- For children; all non-live vaccines listed in table 2 should be completed after transplant if the initial series was not completed before transplant.
- Influenza vaccine (the non-live, injected form) should be given yearly after transplant. It may not work if given very early after a transplant, so some transplant teams wait 2 or more months to give this vaccine and other vaccines. If there is an influenza outbreak, however, the influenza vaccine may be given earlier than 2 months after the transplant.

- Pneumonia vaccines should be given if these were not updated before the transplant (See above for the two types of pneumonia vaccines). Children should receive these according to the recommended schedules (see the Reference list).
- If the hepatitis B vaccine series of 3 shots was not completed before the transplant, this should be completed afterwards.
- If the hepatitis A vaccine was not received before the transplant, and if the person who received a new organ is not already immune to hepatitis A, they can receive hepatitis A vaccine after the transplant.
- If the tetanus-diphtheria-acellular pertussis shot (Tdap) was not given before the transplant, it should be given afterwards. A Td (tetanus-diphtheria) booster should be given every 10 years.

The following tables summarize the vaccinations recommended for adults before and after transplant. This is a brief summary, and more details are available in the references at the end of this brochure.

Table 1

VACCINATIONS ADULTS SHOULD RECEIVE BEFORE TRANSPLANT

VACCINES	COMMENT, MINIMAL INTERVALS
Influenza (injected form; flu shot)	Yearly: starting at 6 months: 2 doses first year
Pneumococcal polysaccharide vaccine	Once after 2 years and 8 weeks after PCV13 repeat every 5 years
Pneumococcal conjugate vaccine	4 doses starting at 6 weeks 4 week interval between doses 1,2,3 8 week interval between doses 3,4
Hepatitis B	3-dose series starting at birth 4 week interval between doses 1,2 8 week interval between doses 2,3 and after 24 weeks of age

Table 1 (continued)

Hepatitis A	2- dose series starting at 6 months of age 4 week interval between doses 1,2
DTaP (diphtheria-tetanus-acellular pertussis)	5 dose series starting at 6 weeks 4 week interval between doses 1,2, 3 6 month interval for 4 th dose and after 12 months of age 6 month interval for 5 th and after 4 years Tdap booster at 7 years of age Td booster every 10 years
HPV (human papillomavirus) series	3 dose series starting at 9 years of age 4 week interval between doses 1,2 12 week interval between doses 2,3
Meningitis vaccine (meningococcal vaccine, type A,C,Y, W-135)	2 dose series starting at 9 months of age 12 week interval between doses 1,2

Table 2

VACCINATIONS CHILDREN SHOULD RECEIVE BEFORE TRANSPLANT: FASTER SCHEDULE (CONTINUED)

VACCINES	COMMENT, MINIMAL INTERVALS
Meningitis vaccine (meningococcal vaccine, type b)	4 dose series starting at 8 weeks of age 8 week interval between doses 1,2,3 8 week interval between doses 3,4 and after 12 months of age
Haemophilus influenzae type b conjugate vaccine	4 dose series starting at 6 weeks of age 4 week interval between doses 1,2,3 8 week interval between doses 3,4 and after 12 months of age
Varicella (Chickenpox) vaccine LIVE VACCINE	2 dose series starting 6 months of age and if more than 4 weeks away from the expected transplant date 4 week interval between doses 1,2

Table 2 (continued)

Measles/Mumps/Rubella (MMR) vaccine LIVE VACCINE	2 dose series starting 6mo and if more than 4 weeks away from the expected transplant date 4 week interval between doses 1,2
Polio Vaccine	4 dose series starting at 6 weeks of age 4 week interval between doses 1,2 4 week interval between doses 2,3 and after 6 months of age 4 week interval between doses 3,4 and after 4 years of age
Rotavirus vaccine LIVE VACCINE	3 dose series starting at 6 weeks and if more than 4 weeks away from the expected transplant date 4 week interval between doses 1,2,3

Table 3

VACCINES ADULTS SHOULD RECEIVE AFTER TRANSPLANT

VACCINES	COMMENT, MINIMAL INTERVALS
Influenza (injected, flu shot)	Yearly
Pneumonia (pneumococcal polysaccharide vaccine)	Two doses 5 years apart if not given pre-transplant
Pneumonia (pneumococcal conjugate vaccine)	Once, if not given pre-transplant
Hepatitis B vaccine	3-dose series; can complete after transplant if not completed before transplant and if not immune
Hepatitis A vaccine	2-dose series; can complete after transplant if not completed before transplant and if not immune
Tdap (tetanus-diphtheria-acellular pertussis)	Once if not received pre-transplant. Td booster every 10 years
HPV (human papillomavirus) series	If age 26 or younger and if not completed pre-transplant
Meningitis vaccine (meningococcal vaccine)	If at increased risk of exposure (college freshmen, person with no spleen) and if not completed pre-transplant
LIVE VACCINES NOT CURRENTLY RECOMMENDED after transplant	

Table 4

VACCINATIONS CHILDREN SHOULD RECEIVE AFTER TRANSPLANT

VACCINES	COMMENT, MINIMAL INTERVALS
Influenza (injected form; flu shot)	Yearly: starting at 1-3 months after transplant depending on timing (please consult care team)
Pneumococcal polysaccharide vaccine	Once after 2 years and 8 weeks after PCV13 repeat every 5 years: continue or series after transplant
All other vaccines	Complete or start the series after transplant
LIVE VACCINES NOT CURRENTLY RECOMMENDED after transplant	

WHAT VACCINATIONS CAN FAMILY MEMBERS OF THE PERSON WHO RECEIVED THE NEW ORGAN RECEIVE?

Family members and caregivers of a transplant patient should be up to date on all vaccines recommended for their age group. Each family member should receive an influenza shot once a year. This will help to create a circle of protection around the person who received the new organ. *Family members of people who receive a new organ, or anyone living in the home of the person who received a new organ, can receive ANY vaccines licensed in the US. This includes live vaccines.*

This point is a very commonly misunderstood, even by many physicians. This advice is a change from the instructions given by some centers in the past. There is no need to delay standard vaccinations for a child in the home of a person who received a new organ. There is also no need for a person who received a new organ to move out or avoid contact when a family member has received a live vaccine. This includes the measles-mumps-rubella vaccine, rotavirus vaccine, varicella (chickenpox) vaccine, and the live zoster (shingles) vaccine. If someone in the household who recently got a live vaccine gets a rash, the Transplant Team should be notified. A person who received a new organ should avoid changing diapers of children who have received the rotavirus vaccine for 4 weeks after the vaccine was given. He or she does not have to avoid being with the child. See the Infectious Diseases Society of America Guidelines section on household contacts for more details listed at the end of this brochure.

There are some rare exceptions. Oral polio vaccine should NOT be given to a family member of a person who received a new organ. Even though oral polio vaccine is no longer used in the United States, it is used in some other countries. People who receive the smallpox vaccine could spread it to other people they come in contact with. If a family member needs to receive smallpox vaccine, contact your Transplant Team.

WHERE CAN I GET MORE INFORMATION ABOUT INFECTION PREVENTION?

Your Transplant Team is an excellent resource for your questions about infection risk. For certain issues, your Transplant Team may refer you to a doctor who specializes in infectious diseases for people who receive a new organ. This specialist can make a more detailed evaluation and give you advice. It is always best to ask if you have any questions!

The topics of travel and vaccinations you might get when traveling are described in a separate patient information brochure.

THE FOLLOWING RESOURCES CAN PROVIDE ADDITIONAL INFORMATION ON THE TOPICS IN THIS BROCHURE:

- Avery RK, Michaels MG, and the AST Infectious Diseases Community of Practice. Strategies for safer living after transplantation. American Journal of Transplantation 2013; 13: 304-310.

- For information about different types of **water filters and Cryptosporidium** (a disease that causes watery diarrhea) go to https://www.cdc.gov/parasites/crypto/gen_info/filters.html
 - For information about **bottled water**, refer to the International Bottled Water Association website and go to <http://www.bottledwater.org>
 - For information on **food safety, safe cooking practices, and current food outbreaks** go to <https://www.foodsafety.gov/>
 - For information on **pet safety** go to <https://www.cdc.gov/healthypets/specific-groups/organ-transplant-patients.html>
 - For information on **immunizations** see AST ID Community of Practice Vaccination Guidelines website and go to <http://onlinelibrary.wiley.com/doi/10.1111/ajt.12125/full>
- **Links to the CDC Website for standard vaccination schedules for adults and children**
 - **Children from birth to 6 years of age vaccination schedule**
<https://www.cdc.gov/vaccines/parents/downloads/parent-ver-sch-0-6yrs.pdf>
 - **Children from 7-18 years of age vaccination schedule**
<https://www.cdc.gov/vaccines/who/teens/downloads/parent-version-schedule-7-18yrs.pdf>
- **Adult Immunization schedule**
<https://www.cdc.gov/vaccines/schedules/downloads/adult/adult-schedule-easy-read.pdf>
 - **Infectious Disease Society of America Clinical Practice Guideline for Immunization of the Immunocompromised Host** (see especially the sections on Household Contacts and on Solid Organ Transplant Recipients)
 - *Clinical Infectious Diseases*, Volume 58, Issue 3, 1 February 2014, Pages e44–e100 go to <https://doi.org/10.1093/cid/cit684>
- Or**
- <https://academic.oup.com/cid/article-lookup/doi/10.1093/cid/cit684>