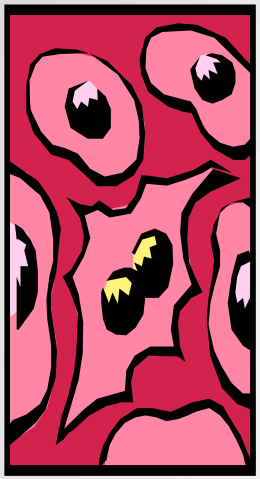
Transplant Medicine

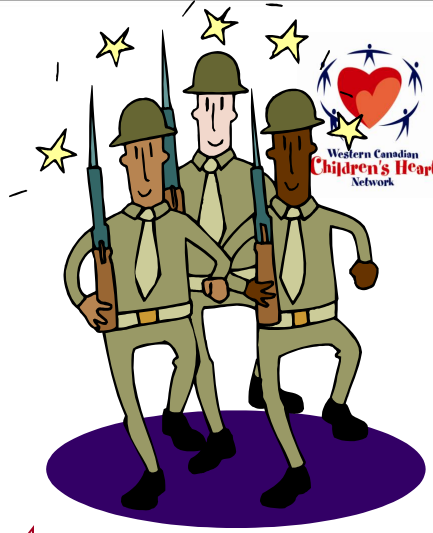
What you need to know to keep your child healthy after transplant

Provided by the UAH/Stollery Transplant Teams

The Battlefield

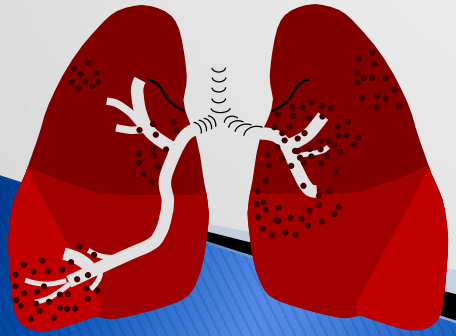
- Our bodies are constantly under attack by viruses, bacteria and other infectious agents. In the case of transplant the new heart is seen as a foreign invader.
- Our immune system is our defense system and is always on patrol to manage these invasions.

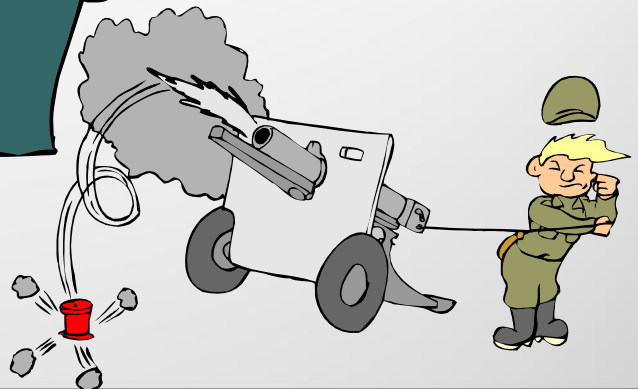




Invasion

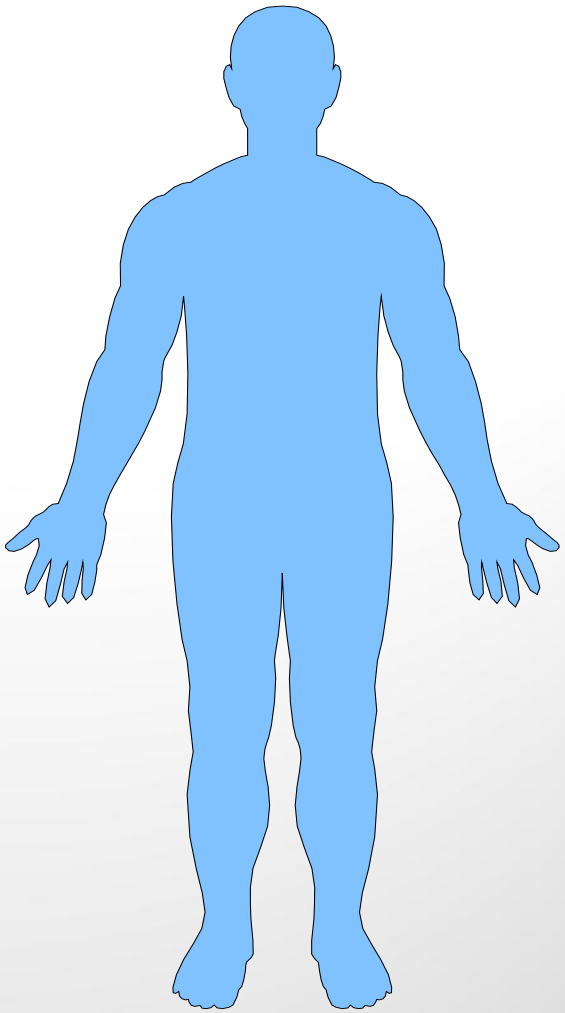
Defense





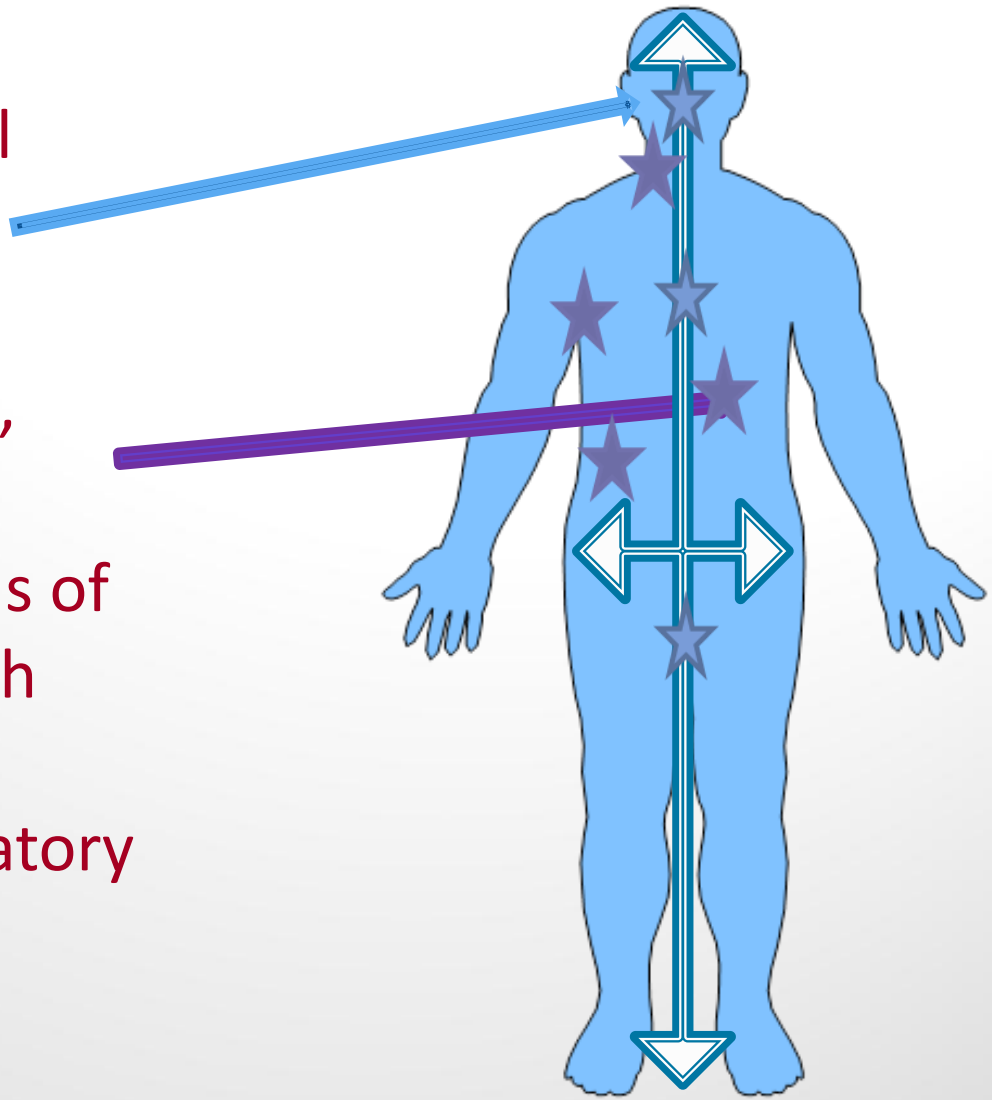
How Does the Immune System Work?

- Where is it?
- What does it do?
- What is impact for transplant patients?



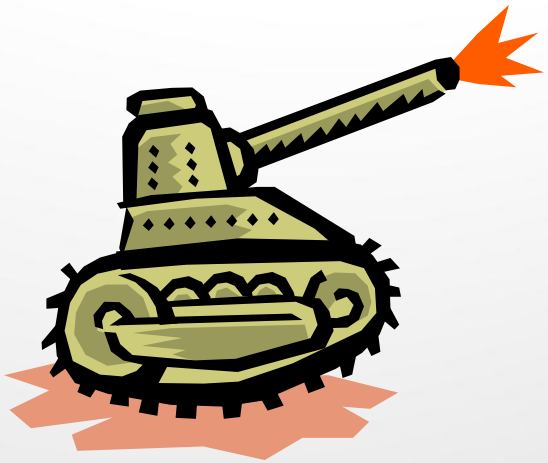
Where is it?

- Body structure: nasal hairs & sphincters
- Protective organs: spleen, lymph nodes, appendix, tonsils
- Cellular level: millions of cells circulate through the body via the lymphatic and circulatory systems



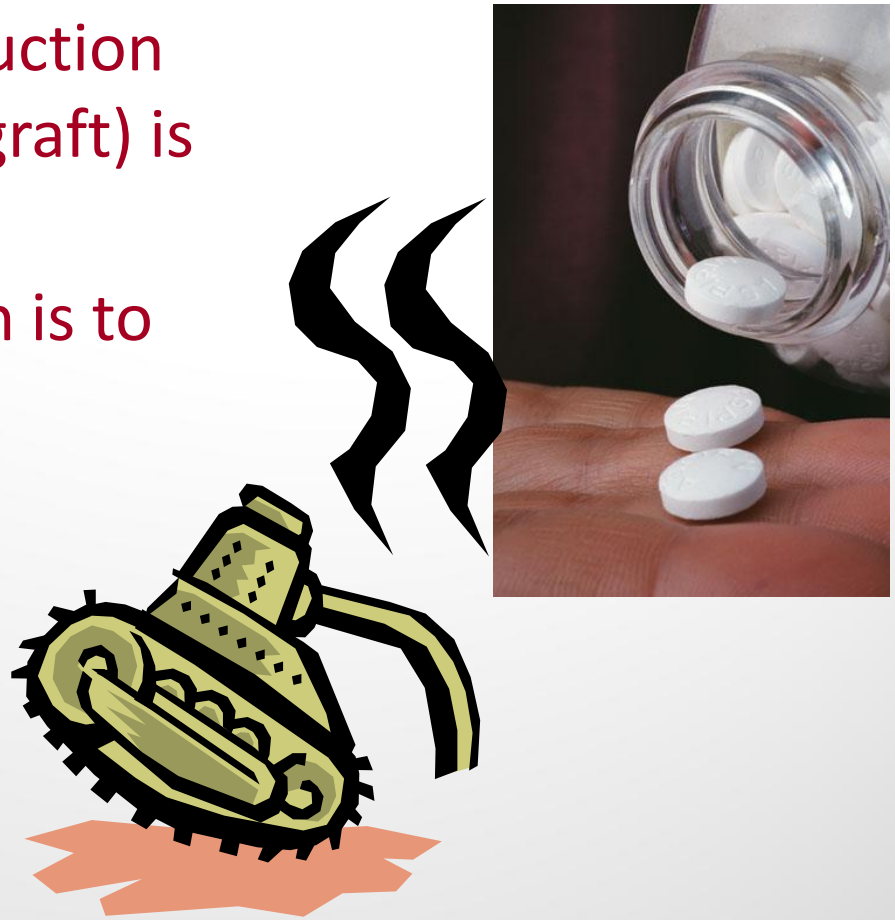
What does it do?

- Responds to foreign antigens in a coordinated and collective fashion
- Recognize, destroy and remember any foreign antigen



Impact on Transplant

- The Immune Systems destruction of the transplanted organ (graft) is called rejection
- Goal of immunosuppression is to change the body's normal response to prevent graft rejection



What is Immunosuppression?

- Anti-rejection medication used to stop the immune system from rejecting the transplanted organ
- Transplant recipients have poor immune systems on purpose
- Remedies that increase your immune system could cause rejection (Cold-FX, Echinacea) don’t take them!

Immunosuppression

- Your immune system stops you from getting infections and stops you from getting cancer
- Immunosuppression means you will get infections and are at risk for getting cancer, especially skin cancer

Tacrolimus (Prograf)

- Has been used since 1994
- Tacrolimus can cause kidney damage and diabetes
- Some people complain of headaches and tremors, will make seizures worse
- Stay on this drug forever

Mycophenolate Mofetil (Cellcept)

- A type of immunosuppression that is called antiproliferative similar to azathiprine and sirolimus
- Lowers rejection rates and some evidence that if helps decrease CAD
- Main side effect is diarrhea and stomach upset
- Stay on this drug forever

Corticosteroid (Prednisone)

- This steroid was one of the first anti-rejection drugs available for use in transplantation
- Powerful immunosuppression, great for acute rejection
- Side effects include high blood pressure, poor wound healing, high lipid levels, diabetes, increased number of infections like yeast and pneumonia, adrenal insufficiency
- Usually steroids are weaned by about six months post transplant

Safety Alert

- Get levels checked regularly as your child grows
- Take medication 12 hrs apart for best effect
- Avoid prolonged sun exposure
- Have moles checked yearly
- Pay attention to every fever
- Don’t start new medications or stop any of these ones without talking to the transplant team

What are Anti Microbials?

- Antibiotics, antifungals, antivirals
- Infections cause many complications after transplant
- Antibiotics in the operating room
- Antimicrobials of all types to prevent infection in the first few months after transplant

Cotriamoxazole (Septra/Bactrim)

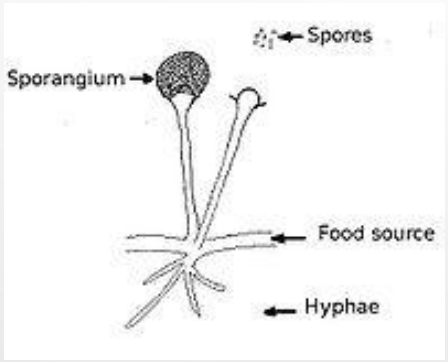
- Common antibiotic often used to treat ear and urinary infections
- Used after transplant to prevent PCP pneumonia
- Should be restarted when treating rejection
- If you are allergic to sulfa drugs you will be allergic to septra
- Can cause bone marrow suppression, high potassium, anorexia and headaches

Valganciclovir (Valcyte)

- Anti-viral agent used to prevent and treat CMV disease
- There is a resistant strain of CMV out there that this drug will not treat
- Most common side effect is bone marrow suppression

Fluconazole (Diflucan)/Nystatin

- Anti-fungal agents used to prevent fungal infections like athlete's foot and thrush
- Thrush is very common in infants and young children, especially if they are tube fed
- Side effects can be nausea, vomiting, diarrhea



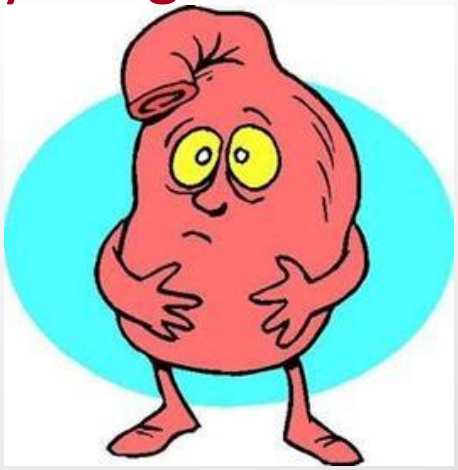
Types of fungus: smurfrooms, fungal mold and truffles

Furosemide (Lasix)

- To treat blood pressure and fluid overload
- Increases the amount you pee
- Don’t take before bed
  - Need twice per day, take at noon or right after school, otherwise pee all night
- Watch for dehydration

Omeprazole (Losec)/Lansoprazole (Prevacid)/Pantoprazole (Pantaloc)

- These medications help to limit some of the side effects of the medicines that are hard on the gut.
- Stop the acid producing pump in your gut



Enoxaparin (lovenox) Tinzaparin (Innohep)

- These medications are used to thin the blood and prevent clotting in the arteries and veins leading to the newly transplanted organ
- Can stop a clot from getting bigger
- This is an injection that is given just under the skin twice a day for enoxaparin or once a day for tinzaparin
- The major risk of these medications is unexpected bleeding

ASA-aspirin

- This is used as a very mild blood thinner when there is a low risk for blood clotting
- Can be hard on the stomach so take with food

Magnesium

- Tacrolimus decreases the absorption of magnesium
- The higher your tacrolimus level the more magnesium you may need
- Magnesium causes abdominal cramping and diarrhea
- More than 4-5 stools per day should be reported to the transplant team

Over the counter Medication

- The only medicines that the transplant team if comfortable with your child having without calling first is tylenol and gravol
- For cold medicines, allergy medicines, other pain relievers, or any other over the counter medicine please call your transplant nurse to get permission from the doctor

Prescription not required

Being in Conflict with your Child

- How to Con your Kid: Simple Scams for Mealtime, Bedtime, Bathtime--Anytime!
- A spoonful of sugar might not work but chocolate syrup might, or jam
- Develop a routine --a pleasant one
- Don’t mix with essential food or formula
- As they get older explain why it is important
- Get them on to pills as soon as they will tolerate

What to do about Missed Doses

- Sooner or later everyone misses a dose, just don't make it a regular event
- Having a routine makes missing doses more difficult
- Take as soon as you remember unless it is closer to the next dose than the one you missed, then just wait and take the next dose on time
- Review your routine, mechanisms for remembering/reminding your child, so it doesn't happen again

How can I remember?

- Setting an alarm on clock, watch, cell phone
- Texting your child with reminder, they have to text back
- Having medicine where the child is routinely in am and pm (bathroom, kitchen), take out in am put away in pm.

Vomiting Meds

- If the child vomits within 10 minutes give whole dose over (wait ½ hr to let tummy settle)
- Otherwise do not re-give meds as you may end up double dosing.

How important is being on time?

- 1.5 h off regularly scheduled time, rejection rate 1.2%
- 2.5 h off time = 14.3% rejection
- 4.3 h off time = 22.2% rejection

More Variability = More Rejection

Pills versus Liquid Medicine

- When your child is young they are usually on liquid medication, it is easy to swallow and we can give them the dose that is just right for their size
- By school age, age 6, they can usually swallow a pill. You must teach them how to do it.

Teaching a child to take Pills

- You have to start small, like a sprinkle, or a cake decoration
- Make a big fuss when they swallow it whole, just like you did when you were potty training
  - “wow, look who is a big boy/girl, mommy/daddy is so proud of you!”
- Work up to bigger items slowly, if they can swallow a smartie, they can swallow most pills.

Syringes to measure Medication

- There are many different sizes of syringes, make sure you are using the right one.
- Many people have received the wrong dose because of a simple error

www.bd.com/injection/

How to store medicines

- Medication must be stored at the right temperature and level of light
- There should be a label on the bottle with any special directions
- If the medicine is in a brown/teal bottle assume it cannot be exposed to light, if you draw it up into the syringe ahead of time, wrap it with aluminum foil to protect it.
- Be careful when traveling to store your medicine at the right temperature.

Traveling with Medication

- If you are traveling outside of Canada you will need a signed letter with a list of drugs and why your child is taking them
- Always take more medicine that you think you will need, just in case you are delayed in your travels, anti-rejection medicine is hard to find.
- When you fly carry your medicine with you
- Think about whether your medicine needs to be protected from light and temperature changes

Keep a list

- Check it twice
- Always keep a list of what medicine your child is on right now, the name of the drug, the dose and how often he or she takes their medicine.
- A doctor, nurse or pharmacist will need to know the mg dose of a drug not the mls.
- This is helpful in clinic, at the pharmacy or in an emergency. It is especially helpful when you are seeing a new doctor.

Pharmacies

- It is best if you only use one pharmacy to get all your medicine for the transplant patient.
- This means the pharmacy will have good records of all the medicines that your child is on when checking for drug interactions
- Always remind the pharmacist that your child is on anti-rejection drugs.

Poison Centre

- You can call the poison centre anytime you are concerned your child has taken too much medicine
- Keep the number close to your phone on your Emergency contacts list 1-800-332-1414
- When you are wondering about drug interactions (what drugs are safe to take together) call 1-888-944-1012

Questions?

Questions can be directed to your local Cardiology Clinic Nurse Coordinator:

Vancouver, BC:	(604) 875-2120
Edmonton, AB:	(780) 407-3592
Calgary, AB:	(403) 955-7858
Saskatoon, SK:	(306) 844-1235
Winnipeg, MB:	(204) 787-2410