

Medical Issues with Exercise

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Disclaimer

The presentation provides general information and advice for transplant patients. For specific medical guidance relating to health issues, please talk to your doctor or members of your transplant team.

Objectives

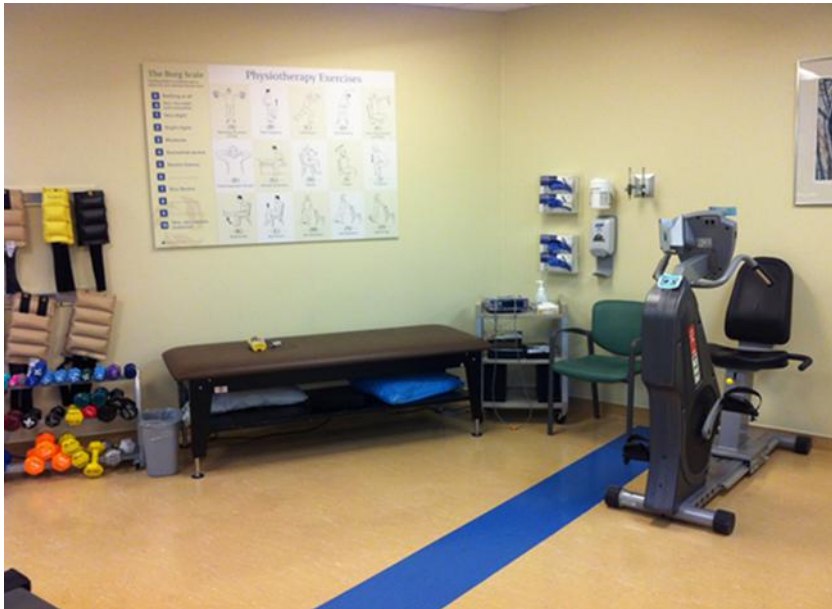
- 1) Review common medical conditions post-transplant and the benefits of exercise after transplantation.
- 2) Review immunosuppressive therapy and other medications that might be used in conjunction with your management as they relate to exercise training.
- 3) Discuss the symptoms to communicate to your health care team as they may relate to physical activity.

Solid Organ Transplantation

- Over the last 30 years, there have been many medical and surgical advances in solid organ transplantation contributing to an improvement in survival
- Attention is shifting towards improving medical conditions (i.e. cardiovascular disease, osteoporosis)
- **Physical activity** offers a good opportunity to improve cardiovascular risk factors and body composition

Objective # 1

- Review common medical conditions post-transplant and the benefits of exercise after solid organ transplantation



“Exercise as a medication to treat some of the medical conditions of transplant.”

Cardiovascular Disease

- **Cardiovascular disease post-transplant is common**
 - (Cardiac/Renal 40%, Liver 20%, and Lung 10%)
- **Increased cardiovascular disease possibly due to:**
Age, Physical inactivity pre-transplant & Immunosuppressive medications
- **Main cardiovascular risk factors:**
High blood pressure, Diabetes, & Cholesterol

Hypertension (High Blood Pressure)

- Occurs in 50-100% transplant recipients and increases with duration post-transplant
- **Multiple Risk Factors:** Age, Male Gender, Family history of CVD, Obesity, Kidney Dysfunction, and Immunosuppression
- **Why is blood pressure control important?**
Decreased graft survival, Kidney Failure, Cardiac Hypertrophy, Stroke, and Peripheral Vascular Disease
- Transplant team will want to control blood pressure medically, but **physical activity** is beneficial

High Cholesterol

- Common post-transplant: Cardiac (80%); Renal (60-70%); and Liver (45%)
- Affects blood vessels in the transplanted heart and leads to atherosclerosis in peripheral blood vessels
- Kidney recipients: associated with worsening renal function
- Transplant/Medical team will monitor and consider medications (i.e. Statins)

Diabetes and Metabolic Syndrome

- Diabetes in the post-transplant period is prevalent partly related to medications (steroids/cyclosporine)
- Dose-response relationship observed with steroids
- Diabetes often associated with other CVD risk factors
- **Metabolic Syndrome:** Obesity, High Blood Pressure, Cholesterol, Diabetes

Medical Benefits of Exercise Training

- Exercise training associated with improved **physical activity levels** and **quality of life** in transplant recipients
- Reduction in cardiovascular risk factors (blood pressure; body fat %)
- **Aerobic fitness**

Medical Benefits of Exercise Training

- No studies available to demonstrate cardiovascular and all-cause mortality improves with exercise training post-transplant
- Transplant recipients often excluded from exercise trials
- Good evidence in non-transplant populations:
 - Offset weight gain
 - Lower incidence of diabetes
 - Reduction in cardiovascular risk factors

Musculoskeletal Benefits with Exercise

- Muscle mass, strength and function reduced in the pre-transplant period
- **Multiple Factors:** Age, Physical Inactivity and Chronic disease
- **Post-transplant:** Muscle mass and strength can improve with exercise training in the early and late post-transplant periods

Improvement in Bone Health



- Osteoporosis common post-transplant (partly related to steroids)
- Bone Mineral Density has been shown to improve with exercise training
- Exercise is a good adjunct to routine medical therapy:
 - Bisphosphonates
 - Calcium and Vitamin D

Improvement in Mood/Quality of Life

- Quality of Life Benefits observed with exercise (most evidence in cardiac)
- Improved Energy Levels
- Anxiety/Depression

Objective # 2



Review immunosuppressive therapy and other medications that might be used in conjunction with your management as they relate to exercise training

Immunosuppressive Medications

- Corticosteroids (i.e. Prednisone)
- Calcineurin Inhibitors (i.e. Cyclosporine, Tacrolimus)

- Mycophenolate Mofetil/
Azathioprine

	Hypertension	Lipids	Diabetes mellitus
Cyclosporine	↑↑↑	↑↑	↑
FK506	↑↑	↑	↑↑
Steroids	↑	↑↑	↑↑↑
Sirolimus	NC	↑↑↑	NC
Mycophenolate mofetil	NC	NC	NC

NC, no contribution.

Management of Diabetes

- Insulin therapy frequently used in the post-transplant period
- Important to monitor for symptoms of hypoglycemia (increased insulin sensitivity with exercise)
- High blood sugar levels (avoid dehydration)
- Appropriate foot care

Other Medication Considerations with Exercise

- **NSAID (i.e. Advil): Ideally Avoid!**
 - Tylenol safer alternative post-transplant for pain control
- **Observe for dehydration/viral illness**
(Blood pressure medications, diuretics)
- **Muscle cramps/Rhabdomyolysis** *(Statins/Calcineurin Inhibitors)*

Other Medication Considerations with Exercise

- ***Anti-coagulants (i.e. Warfarin)***: Monitor levels with your medical team to reduce risk of bleeding
- ***Anti-fungal Agents (i.e. Voriconazole)***: Drug interactions
- ***Anti-viral agents (i.e. Acyclovir)***: Avoid Dehydration

Always a good idea to discuss these medications with your transplant team in regards to your physical activity level/hydration status.

Objective # 3



Review the symptoms to communicate to your health care team as they may relate to exercise training.

Symptoms to Communicate to Health Care Team

- Exercise is **Safe** in solid organ transplantation
- First several weeks post-transplant (check regarding wound healing and appropriate strength training)
- Start slow and progress your intensity!!
- Talk to your team about any contact sports you might want to pursue (football, ice hockey, etc.); *this might be contraindicated*

Symptoms to Observe

- Symptoms of angina/shortness of breath
- Osteoarthritis
- Muscle cramps out of keeping from usual discomfort post-exercise
- Balance concerns, neurological symptoms, or falls
- Light-headedness, syncope, or heart palpitations
- Avascular necrosis

Appropriate Hydration

- Exercise causes increased water loss through sweating and increased respiratory rate
- Staying hydrated through extra fluids is essential
- Consume approximately 500 mL of water for every 30 minutes of exercise but might need to follow fluid restriction guidelines, if applicable

Other Lifestyle Considerations

- Weight management
- Limiting alcohol consumption
- No smoking
- Controlling Blood pressure, Cholesterol, and Diabetes

Additional Precautions

- **Use sunscreen, a hat and protective clothing when exercising outside**
 - Immunosuppressive medications can cause sun sensitivity and increase risk of skin cancer
- **If working out at a fitness centre, clean the gym equipment with disinfectant wipes before using them**
- **Speak to your health care team regarding the use of swimming pools**

Summary

- There have been many medical and surgical advances in solid organ transplantation over the last 30 years
- With improved survival, there is increasing focus on medical conditions post-transplant: Cardiovascular disease, Body composition, Musculoskeletal Health, and Mental health
- Exercise is a good strategy for a number of medical health conditions!

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Funded by:



Dr. Dmitry Rozenberg receives research funding from:

- 1) **Vanier Graduate Scholarship**
- 2) **University of Toronto, Clinician Scientist Training Program**



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