

# Exercise is Medicine



## The Challenge of Getting and Staying Fit

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# Learning Objectives

- 1) To **describe** the impact of exercise on the immune response.
- 2) To **prescribe** exercise routines for health benefits
- 3) To **ascr**ibe strategies to overcome deconditioning

## Websites:

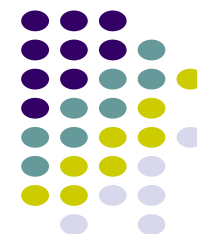
<https://bodyandhealth.canada.com/healthfeature/gethealthfeature/keeping-fit>

<https://www.fitnessblender.com/>

<https://csepguidelines.ca/>

# HOW CANADA STACKS UP

In 2014, 15 countries released a Report Card on Physical Activity for Children and Youth based on the Active Healthy Kids Canada Model. Here are the results:



OVERALL PHYSICAL ACTIVITY	ORGANIZED SPORT PARTICIPATION	ACTIVE PLAY	ACTIVE TRANSPORTATION	SEDENTARY BEHAVIOURS	FAMILY & PEERS	SCHOOL	COMMUNITY & THE BUILT ENVIRONMENT	GOVERNMENT STRATEGIES & INVESTMENTS
Mozambique <b>B</b>	New Zealand <b>B</b>	New Zealand <b>B</b>	Finland <b>B</b>	Ghana <b>B</b>	Australia <b>C</b>	England <b>A-</b>	Australia <b>A-</b>	Colombia <b>B</b>
New Zealand <b>B</b>	Australia <b>B-</b>	Kenya <b>C</b>	Kenya <b>B</b>	Kenya <b>B</b>	<b>Canada C</b>	Finland <b>B</b>	<b>Canada B+</b>	Finland <b>B</b>
Mexico <b>C+</b>	<b>Canada C+</b>	Mozambique <b>C</b>	Mozambique <b>B</b>	New Zealand <b>C</b>	Finland <b>C</b>	Australia <b>B-</b>	England <b>B</b>	Scotland <b>B</b>
Kenya <b>C</b>	Finland <b>C</b>	Nigeria <b>C-</b>	Nigeria <b>B</b>	Ireland <b>C-</b>	Kenya <b>C</b>	New Zealand <b>B-</b>	Finland <b>B</b>	South Africa <b>B</b>
Nigeria <b>C</b>	Ghana <b>C</b>	Finland <b>D</b>	Mexico <b>B-</b>	Colombia <b>D</b>	New Zealand <b>C</b>	<b>Canada C+</b>	Ireland <b>B</b>	Australia <b>C+</b>
England <b>D+</b>	Kenya <b>C</b>	Australia <b>INC</b>	England <b>C</b>	Finland <b>D</b>	Scotland <b>D-</b>	Kenya <b>C</b>	Scotland <b>B</b>	<b>Canada C</b>
Colombia <b>D</b>	South Africa <b>C</b>	<b>Canada INC</b>	Scotland <b>C</b>	Mexico <b>D</b>	Colombia <b>INC</b>	Mozambique <b>C</b>	United States <b>B-</b>	Kenya <b>C</b>
Ghana <b>D</b>	England <b>C-</b>	Colombia <b>INC</b>	South Africa <b>C</b>	United States <b>D</b>	England <b>INC</b>	Ireland <b>C-</b>	New Zealand <b>C</b>	Mexico <b>C</b>
Finland <b>D</b>	Ireland <b>C-</b>	England <b>INC</b>	New Zealand <b>C-</b>	Australia <b>D-</b>	Ghana <b>INC</b>	United States <b>C-</b>	Ghana <b>D</b>	Mozambique <b>C</b>
South Africa <b>D</b>	United States <b>C-</b>	Ghana <b>INC</b>	Australia <b>D</b>	<b>Canada F</b>	Ireland <b>INC</b>	Ghana <b>D</b>	South Africa <b>D</b>	Ghana <b>D</b>
Australia <b>D-</b>	Colombia <b>D</b>	Ireland <b>INC</b>	<b>Canada D</b>	Nigeria <b>F</b>	Mexico <b>INC</b>	Mexico <b>D</b>	Mexico <b>F</b>	England <b>INC</b>
<b>Canada D-</b>	Mexico <b>D</b>	Mexico <b>INC</b>	Ghana <b>D</b>	Scotland <b>F</b>	Mozambique <b>INC</b>	South Africa <b>D</b>	Mozambique <b>F</b>	Ireland <b>INC</b>
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Source: Active Healthy Kids Canada (2014). Is Canada in the Running? The 2014 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth. Toronto: Active Healthy Kids Canada.



# Exercise is Medicine

## Vital Sign

### Treatment

- Prevention
  - Treatment
  - Rehabilitation
- 
- ✓ Exercise needs a prescription & follow-up
  - ✓ Behaviour Change
  - ✓ Dose Response Model for Benefit



# Exercise and your Immune System: Boost or Bust ?

Time in History	Research Findings	Impact on Exercise Prescription
1900-1979	Focused on exercise-induced changes in basic immune cell counts and function	Acute and Chronic Illness improve with exercise.
1980-1989	Seminal Papers on High Intensity Exercise leading to Immune Dysfunction	Warning on high intensity exercise such as Marathoners.
1990-2010	Interactive Research with Nutrition, with Aging, with Inflammation	Dose specific exercise recommendations and integration with nutrition
2010 to present	Very specific cellular exploration such as lipodomics and mircobiomes	Discovery of the immune system interaction with other healthy body systems...Exercise and Body Type

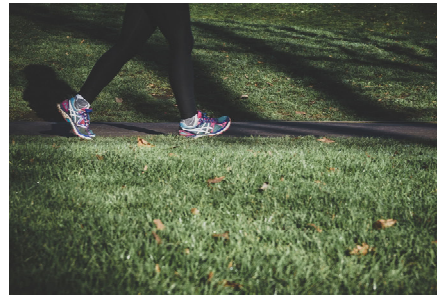
# Exercise and your Immune System: Boost or Bust ?

## Boost

- Increases white blood cells and delivers needed oxygen to the lungs and heart.
- Reduces the rate of infection and shortens the length of recovery

## Bust

- Prolonged intense exercise (high heart rate, greater than 90 minutes) depresses the immune response and is not advised if your goal is reducing infection



**Recommendation: Moderate exercise is best**

Light sweat, Warm glow, 30 minute work-out, 3 x week

# Recommendation

## BRIEF VIGOROUS



doesn't cause immune -  
suppressing effect



## MODERATE INTENSITY EXERCISE SESSION



can boost immunity



## PROLONGED VIGOROUS EXERCISE SESSION

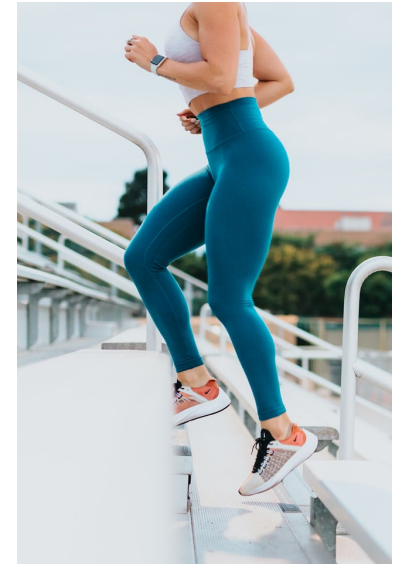


depresses the adaptive  
immune system





# Sum of all Part = Fitness





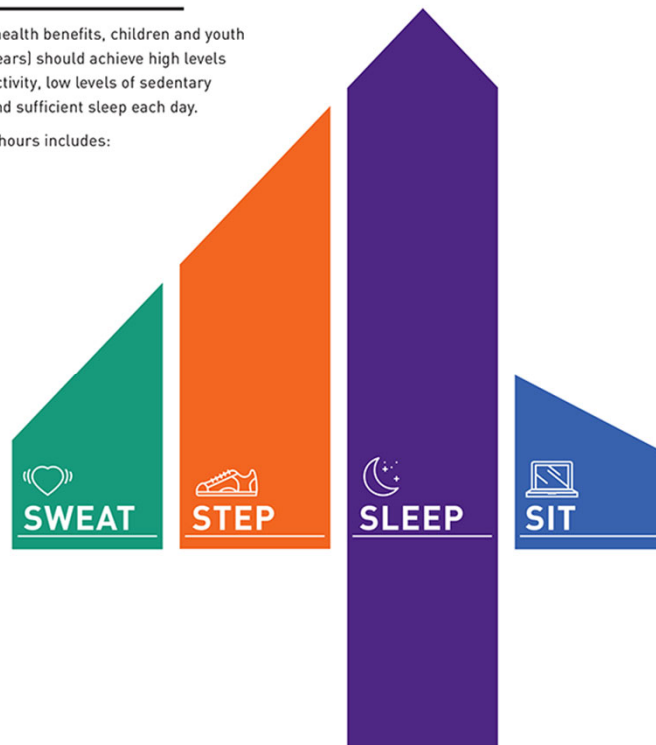
# Movement Guidelines



## GUIDELINES

For optimal health benefits, children and youth (aged 5–17 years) should achieve high levels of physical activity, low levels of sedentary behaviour, and sufficient sleep each day.

A healthy 24 hours includes:



Preserving sufficient sleep, trading indoor time for outdoor time, and replacing sedentary behaviours and light physical activity with additional moderate to vigorous physical activity can provide greater health benefits.

## SWEAT

### MODERATE TO VIGOROUS PHYSICAL ACTIVITY

An accumulation of at least 60 minutes per day of moderate to vigorous physical activity involving a variety of aerobic activities. Vigorous physical activities, and muscle and bone strengthening activities should each be incorporated at least 3 days per week;

## STEP

### LIGHT PHYSICAL ACTIVITY

Several hours of a variety of structured and unstructured light physical activities;

## SLEEP

### SLEEP

Uninterrupted 9 to 11 hours of sleep per night for those aged 5–13 years and 8 to 10 hours per night for those aged 14–17 years, with consistent bed and wake-up times;

## SIT

### SEDENTARY BEHAVIOUR

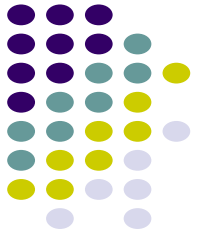
No more than 2 hours per day of recreational screen time; Limited sitting for extended periods.

Adults need  
at least  
**2 ½ hours**  
a week of physical  
activity.



**Vital**<sup>CDC</sup>signs<sup>®</sup>  
[www.cdc.gov/vitalsigns](http://www.cdc.gov/vitalsigns)

# Defining the Starting Point



Components	Inactive	Active
Frequency	2-3 x week	4-5 x week
Intensity	Light	Moderate-Intense
Time	5-15 minutes	20-60
Type	Low impact	Mixed Impact

# Deconditioning and Reconditioning

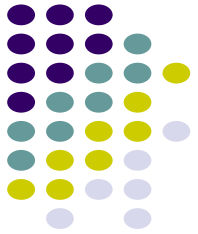
## What we Lose

- Muscle Strength
- Cardiovascular Capacity
- Lung Capacity
- Flexibility
- Balance
- Cognitive Coordination

## How to Use

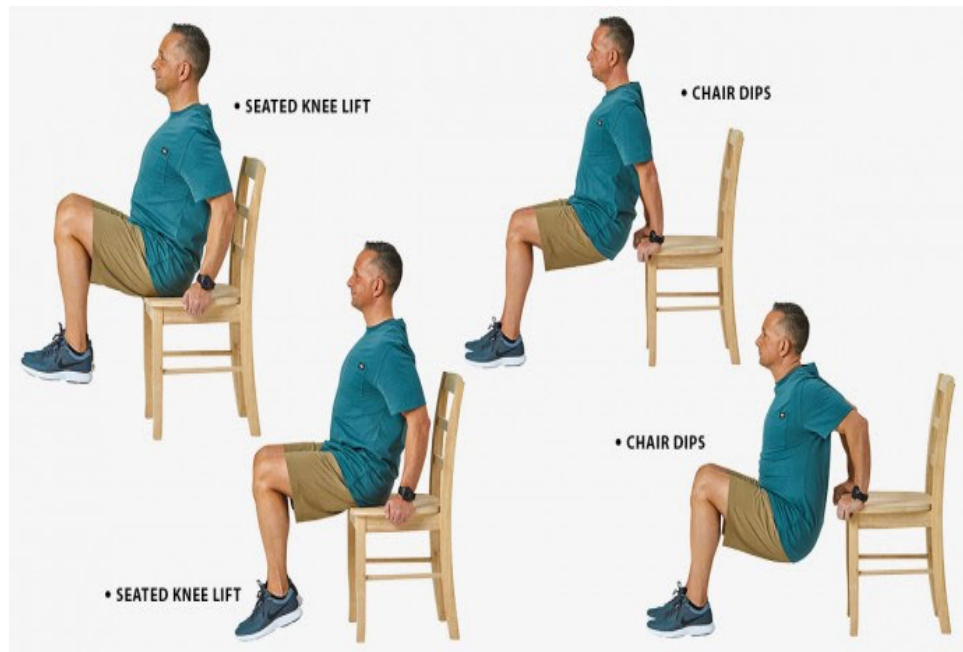
- Step count
- Intersperse activity
- 10% increase
- Activity Diversity
- Compliance
- Frequency

# Upper Body



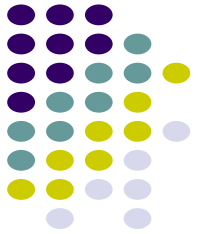
Muscle	Body Resistance	Weight Resistance
Biceps	Skipping	Arm Curls
Triceps	Chair Dips	Arm Extensions
Rhomboids	Shoulder Blade Retractions	Seated Rowing
Pectorals	Wall/Floor Push-ups	Bench Press/Fly's

# Home versus Gym Adaptation



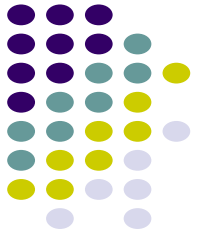


# Lower Body

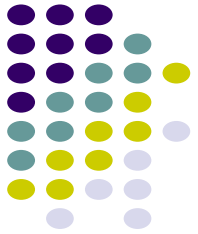


Muscles	Body Resistance	External Resistance
Hamstrings	Chair Balance	Leg Curls
Quadriceps	$\frac{1}{4}$ Squats	Leg Press
Abductors	Outer Leg Raises	Abductor Machine
Adductors	Inner Leg Raises	Adductor Machine

# Home versus Gym



# Summary



**“If you want something you’ve never had, you must be willing to do something you’ve never done.”**

*Thomas Jefferson*

1. Our bodies crave movement, we need to move.
2. Exercise and Activity have wide ranging benefit at all ages and stages.
3. Moderate exercise strengthens our immune response.
4. Start low, build slow, stay with it, set goals
5. Have FUN!

