



CATHOLIC MEDICAL CENTER

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**New England Heart  
& Vascular Institute**

Cardiac Rehabilitation

**Exercise &  
Heart health**

*Exercise is medicine.*

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*Meet the exercise physiology team.*



RISK  
FACTOR

# Controllable Risk Factors

*“Controlling what you can is the single best way to reduce the risk of heart disease.”*

# Controllable Risk Factors Of Coronary Artery Disease



- Smoking
- Blood cholesterol
- Blood pressure
- Diabetes
- Stress
- Sedentary lifestyle
- Obesity

*We can't control the genetic make-up of our family tree.*

# Smoking

## Smoking has many negative effects on our bodies

- Increases vasoconstriction
- Decreases available oxygen to tissues
- Increases plaque build-up in the arteries



# Blood Pressure

**Blood Pressure: The amount of force pressed against the artery walls**

- Acceptable: 130/80
- Ideal: 120/80
- Hypertension: 140/85 or greater



# Cholesterol

- HDL (“happy” or “high”) = carry cholesterol from other parts of body to liver for elimination
- HDL: men  $\geq 40$  mg/dl; women  $\geq 50$ mg/dl
- LDL: (“lousy” or “low”) = carriers of cholesterol to the arteries and can contribute to build up; LDL can the risk of heart disease
- LDL:  $< 70$ mg/dl



# Diabetes

**Poorly controlled blood sugar increases atherosclerosis (plaque formation in the arteries)**

- Blood sugar goals
  - Pre-meal 80-130 mg/dl
  - Bedtime 100-140 mg/dl
- Snack before exercise if blood sugar is low!
- HbA1c goal < 7% - check it regularly





# Stress Management

## Exercise is a great way to reduce stress

- Recognize personal stressors
- Identify priorities
- Set aside time for relaxation



# Obesity

## Obesity on its own is a risk factor and contributes to and other risk factors

- Increases risk of...
  - HTN
  - Dyslipidemia
  - DMT2





# Exercise: An Overview

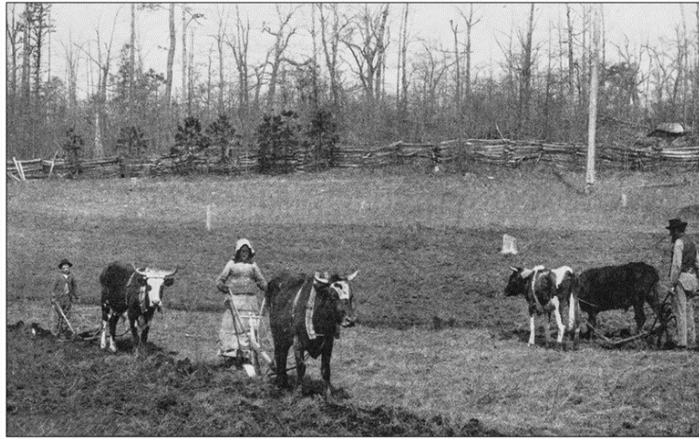
*“We are designed to move!”*

# The Human Body Has Over 600 Skeletal Muscles

*We are designed to move!*

## 200 YEARS AGO

- Our “Activities of Daily Living” (ADLs) were much greater in frequency and magnitude.
  - Chopping wood for heating and cooking
  - Hunting for food
  - Planting, tending and harvesting crops
  - Walking!! (To town, to work, etc.)
- We were using our bodies from “Sun up” to “Sundown”
- Our bodies adapted to meet the stress



## MODERN DAY

- Modern conveniences have made our lives easier.
- Though our technology has changed, human physiology has not changed with modern conveniences.
- Sedentary lifestyle
  - Remote controls
  - Cars
  - Internet
  - Electronic bikes

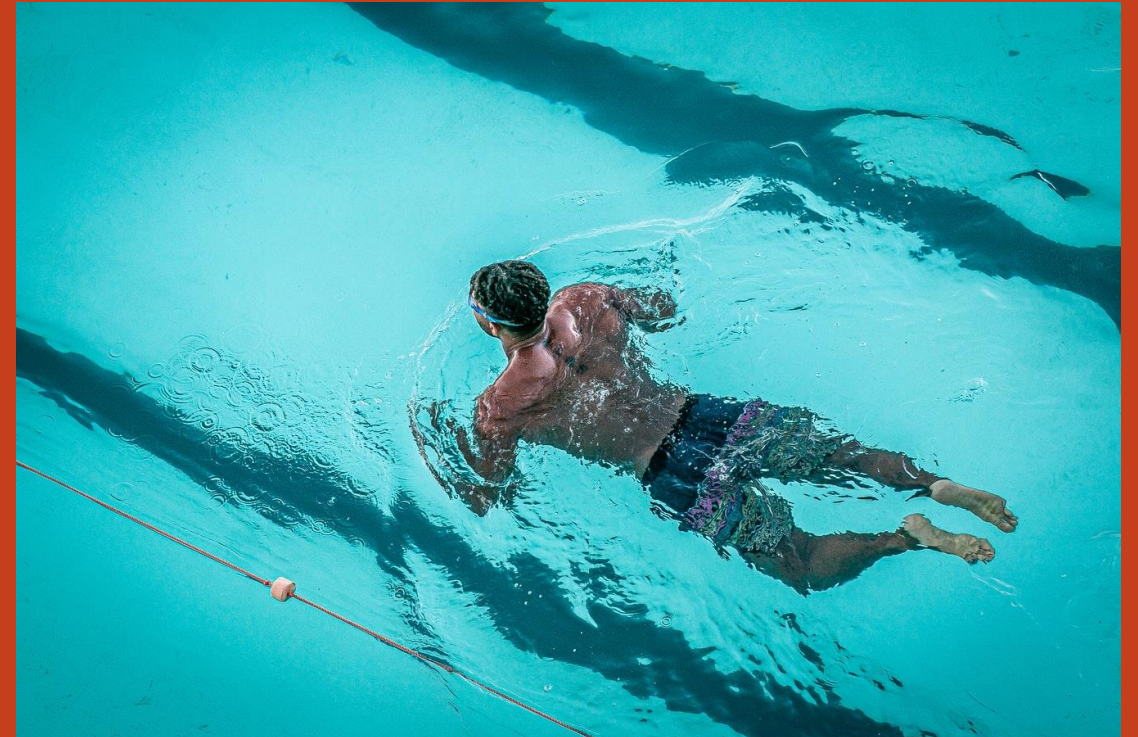
# Excuses, Excuses

We all have barriers to exercise...

- “I don’t have the time.”
- *“I have a bad back.”*
- *“I don’t have the money.”*
- *“I am really active at work/home.”\**

The trick is finding ways around these barriers

\* There is a difference between being active and intentional physical activity/exercise!



# Problem Solving

There are many different types of exercise. You are not just limited to the gym. However, when choosing the right exercise for you, a number of factors must be considered.

- Monetary
- Environmental
- Time
- Injury status/ orthopedic concerns
- Confidence



# What Is The Best Exercise?

The best exercises are the ones that you will actually do...

- Walking
- Cycling
- Rowing
- X-country skiing
- Swimming
- Elliptical

CONSIDERATIONS: Must use large muscle groups, weight bearing (if possible), can be performed for at least 20 minutes continuously, DOESN'T CAUSE PAIN, is *enjoyable*.



# Getting Started

There are a number of considerations and actions that must be taken into account when starting any exercise regimen.

- Physician approval
- Schedule exercise as part of your day
- Comfortable footwear & clothing
- SMART Goals
  - Specific Measurable Achievable Relevant Time-bound
- Gradual progression (10% rule)
- Challenge yourself and others
- Consider a long-term exercise routine
- Most importantly... MAKE IT FUN!!





# Guidelines

## Frequency:

- 4-6x weekly

## Intensity:

- RPE 11-13 (fairly light-somewhat hard)
- Your own target heart rate
  - Either R+30, R+50 OR acquired through stress testing

## Duration:

- 20-60 min



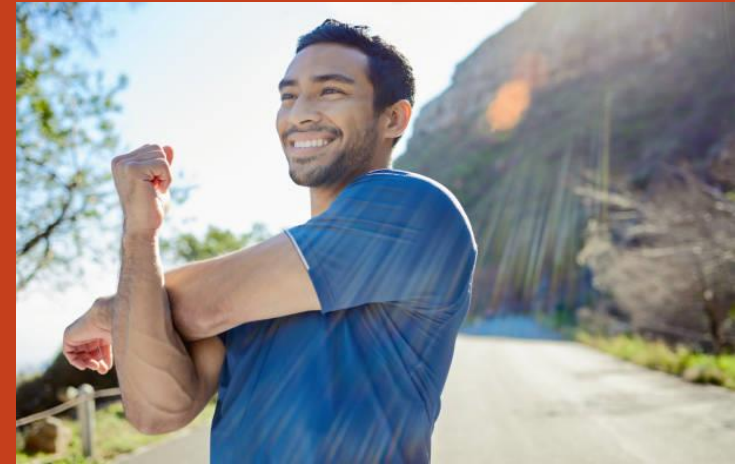
# Warm-up & Cool Down

- Warm-up:

- Prepares the body for exercise
- Dynamic and rhythmic
- Increases blood flow to working muscles
  - Decreases muscle stiffness
  - Decreases risk of injury
  - Increases performance

- Cool Down:

- Gradually slow exercise. Do not just come to a complete stop!
  - Slow, deliberate stretching
  - Allows for a gradual recovery of heart rate & blood pressure
  - Reduces the likelihood of dizziness/ other cardiovascular complications



# Warm Weather Guidelines

## Warm environments require special considerations:

- Earlier onset of fatigue
- Sweat more readily
- Attain target heart rate more quickly
- Change times of outdoor exercise/ workout inside

## Water requirements increase:

- Mainly to replace water lost as sweat and to increase blood pressure
- **General Guidelines:**
  - 64 fluid ounces/ day
  - 1:1 replacement per caffeinated beverage (tea, coffee, soda)



# Cold Weather Guidelines

## Cold environments require special considerations as well:

- Dress in layers
- “Pre-warming” device (scarf, mask, etc.) to cover nose & mouth
- Body takes longer to warm up
- May be harder to attain target heart rate
- Blood pressure increases

## Snow Shoveling:

- Snow shoveling is NOT aerobic
- It is considered *isometric* with heavy resistance
- Places added strain on the heart
- Combination of cold temperatures & heavy physical activity could precipitate *Angina*



# MET Level

## MET stands for “Metabolic Equivalent of Tasks

- Is an objective metric used to compare workload levels and track progress
- DOES NOT take surgical restrictions into account
- Cardiac Rehabilitation: The “amount of work” you are able to do within your target heart rate

Met Level	Physical Conditioning	Employment Tasks
< 3	Walking 2 mph	Desk Work
3-5	Walking 3 mph	Stocking Shelves
5-7	Walking 4 mph	Shoveling Dirt
7-9	Jogging 5 mph	Digging Ditches

# Listen To Your Body

**Exercise only within your current capabilities. Exercise should be challenging, but not painful.**

- Exercise within your target heart rate (R+30, R+50, ETT acquired)
- STOP exercise if you become dizzy, light-headed or nauseous
- Increase workload if safe to do so
- Avoid extremes in temperatures





# Types Of Fitness

*“It is important to consider all types of fitness to become a well-rounded, healthy individual.”*

# Endurance

Refers to the benefit of aerobic exercises which:

- Make your heart stronger
- Build endurance
- Build strength
- Improve circulation





# Strength

## Who needs strength training?

- Anyone and everyone who wants to be stronger!

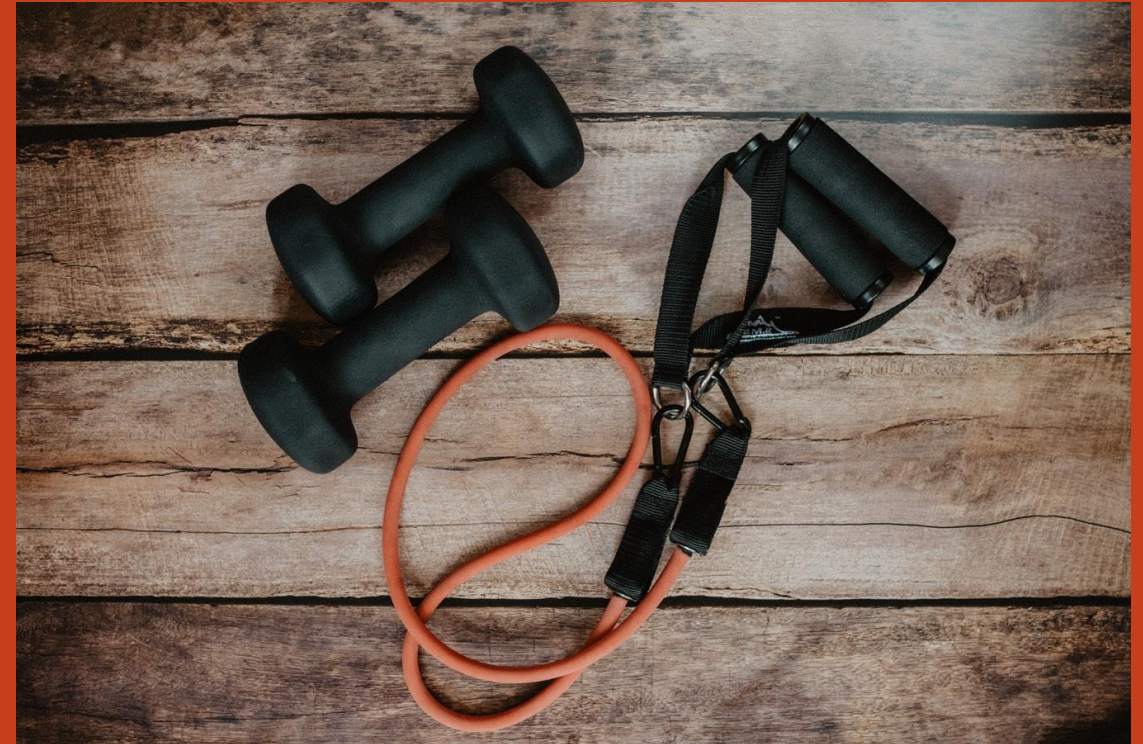
**You don't have to be a world-class athlete to benefit from strength training. Strength has many benefits that can be seen in daily living:**

- Carrying groceries
- Improving golf scores
- Returning to work
- Holding children/ grandchildren
- Pushing the lawnmower
- Maintaining independence



# Strength Training Guidelines

- 5-10 exercises using different muscle groups (total body)
- 10-15 repetitions for 1-3 sets, 2-3x weekly
- Be sure you are breathing as you lift/exert yourself
- Lift weights in a slow, deliberate manner (athletic, strong stance)
- Types of strength training include- Body weight exercises, barbells and circuit training
- Progress gradually



# Balance & Flexibility

**Often overlooked, but very important!**

- Reduce joint pain
- Increase Range of Motion (ROM)
- Make ADLs easier to complete

**As patients progress in the rehabilitation process, they can begin to work on these more advanced aspects of fitness.**

- Phase III / Community Wellness



# Overtraining / DOMS

- **Increased muscle soreness**
  - Okay for up to 1-5 days (DOMS)
  - Anything longer could indicate an injury to the muscle
- **Muscle swelling**
- **Increased fatigue**
- **Decreased exercise performance**
- **Exercise should NOT cause pain!**



# Benefits of Exercise

## Lipid management

- Increased HDL
- Decreased triglycerides

## Blood pressure control

- Reduced resting systolic & diastolic pressures

## Blood sugar control

- Reduced insulin needs
- Improved glucose tolerance

## Stress Management

- Decreased anxiety & depression
- Enhanced feelings of well-being
- Enhanced performance during work, recreational & daily living activities

## Body Composition

- Reduced total body fat
- Increased lean muscle mass

## Increased threshold for onset of symptoms:

- Shortness of breath
- Muscle fatigue
- Angina
- Claudication

## Improvement in cardiovascular fitness

The ability to do more with less strain



# Summary of Heart Healthy Exercise

## How Much?

- Enough to increase your breathing without making you out of breath

## How Often?

- Most days of the week

## How Long?

- Build up to one hour

## What Kind?

- Use large muscles
- Use as many muscle groups as you can





# CMC

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Where  
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