Heart to Heart: May 23, 2015

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Are you a Ferrari or a Fiat? Exercise for Congenital Heart Patients

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Alberta Health Services

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Advice

Be As Active As You Can Be

The conditioning of your arms and legs is as important as the severity of your heart disease in determining your physical abilities.

Walking is the Best Exercise

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Lack of activity destroys the good condition of every human being, while movement and methodical exercise save it and preserve it.

Plato

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Ideal

Reality

"I used to be into bodybuilding, now I'm more into demolition."

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Benefits of Exercise

- **Boosts mental wellness**
- **Improves physical wellness**
- **Enhances immune system**
- **Reduces risk** of developing heart disease (weight, blood pressure, cholesterol)
- **Live longer**: each hour of regular exercise → gain about two hours of additional life expectancy

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American Heart Association®
Learn and Live

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Outline

- ***What should you do***: activity and exercise recommendations
  - **And why don't you?:** factors affecting participation
- ***What can you do***:
  - Understand effects of exercise on the heart
  - Understand demands of sporting activities on the heart
  - Determine an appropriate activity level
- ***What should you avoid***:
  - Recognize and acknowledge limitations to participation

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What is the recommended amount of physical activity for Canadians?

A. 60 minutes daily of moderate/ vigorous activity
B. 30 minutes daily, 7 days per week
C. 30 minutes 5 days per week
D. Don't know
E. It depends

What should you do?

Public Health Agency of Canada

- **Children and Youth**: 60 minutes daily
  - include vigorous intensity activities at least 3 days/wk

- **Adults**: 150 minutes weekly
  - Moderate to vigorous
    - Moderate: brisk walking, biking, swimming
    - Vigorous: aerobics, jogging, basketball

www.csep.ca/guidelines 2011

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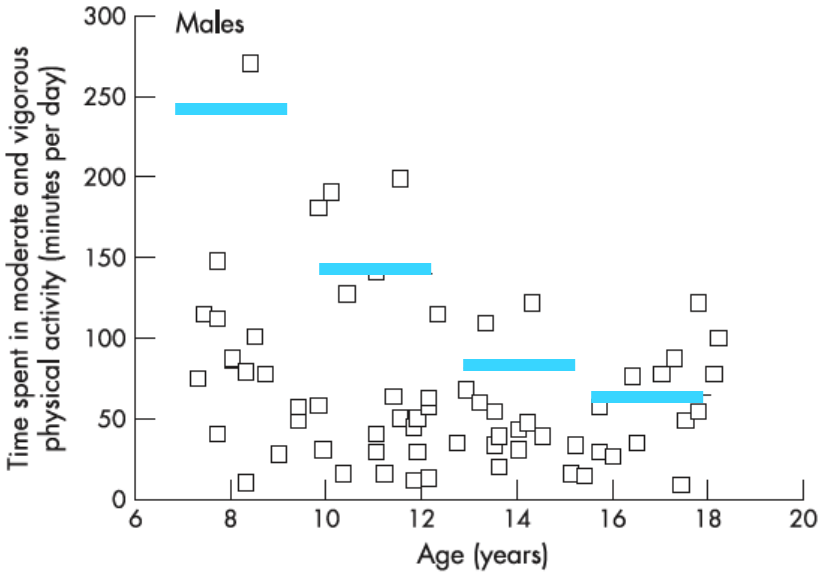
I meet the recommendations for physical activity:

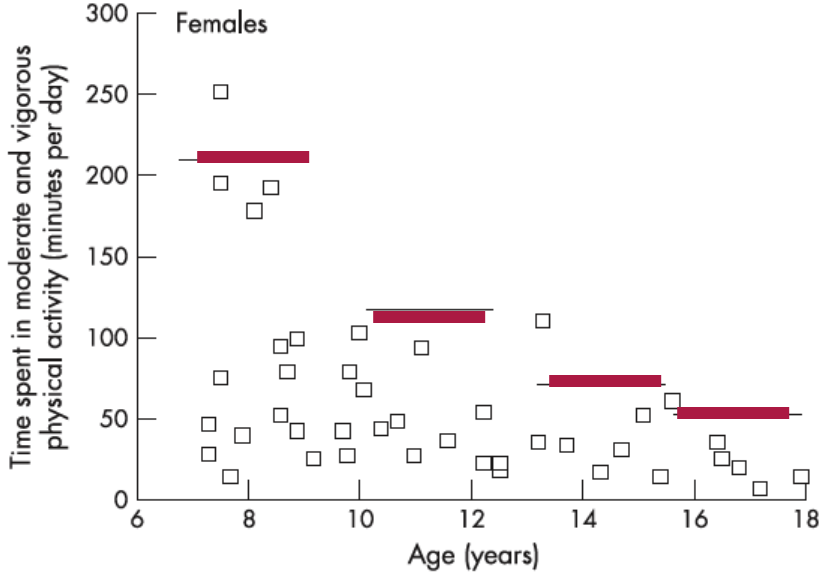
A. Never
B. Seldom
C. Sometimes
D. Often
E. Always

Activity Levels in Heart Patients Are Reduced Compared to Peers

Males



Females

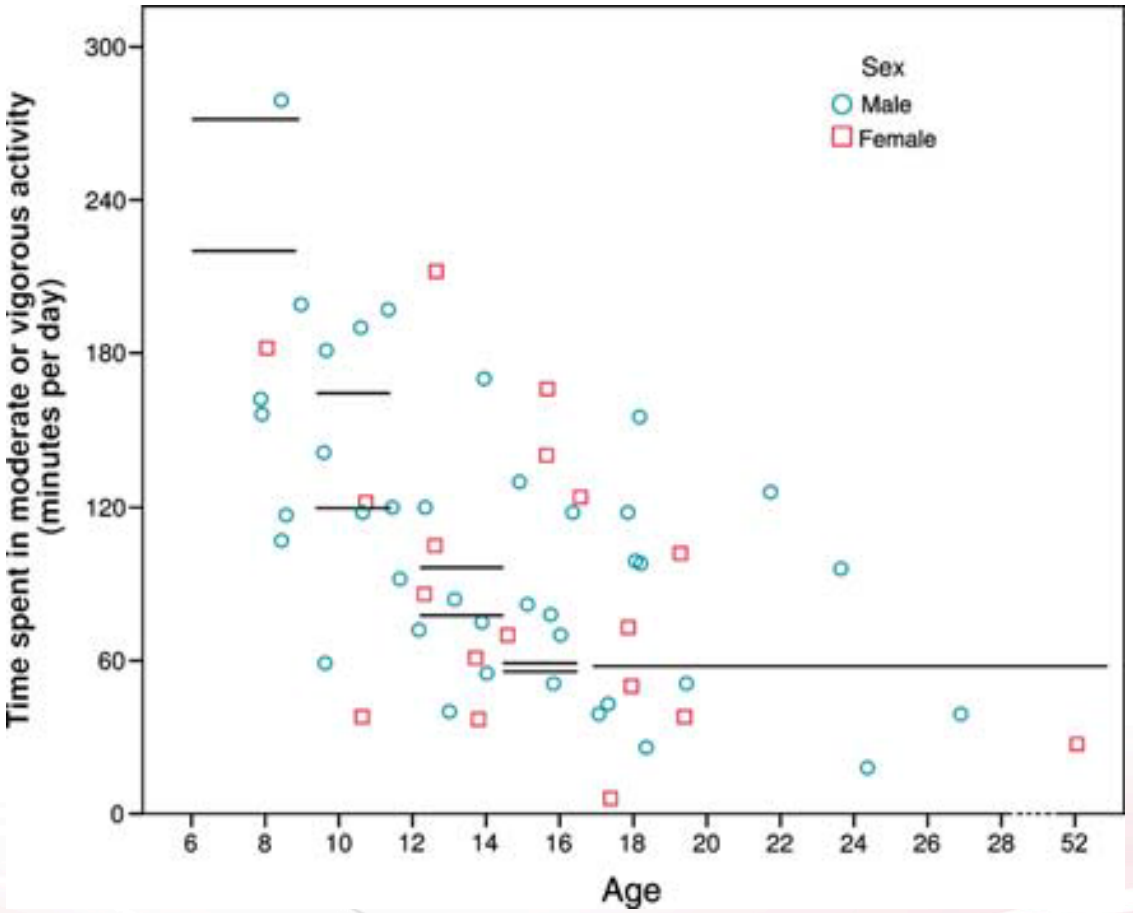


N= 147 Fontan patients
Age 7-18

McCrindle et al. Arch Dis Child 2000; 92:509-14

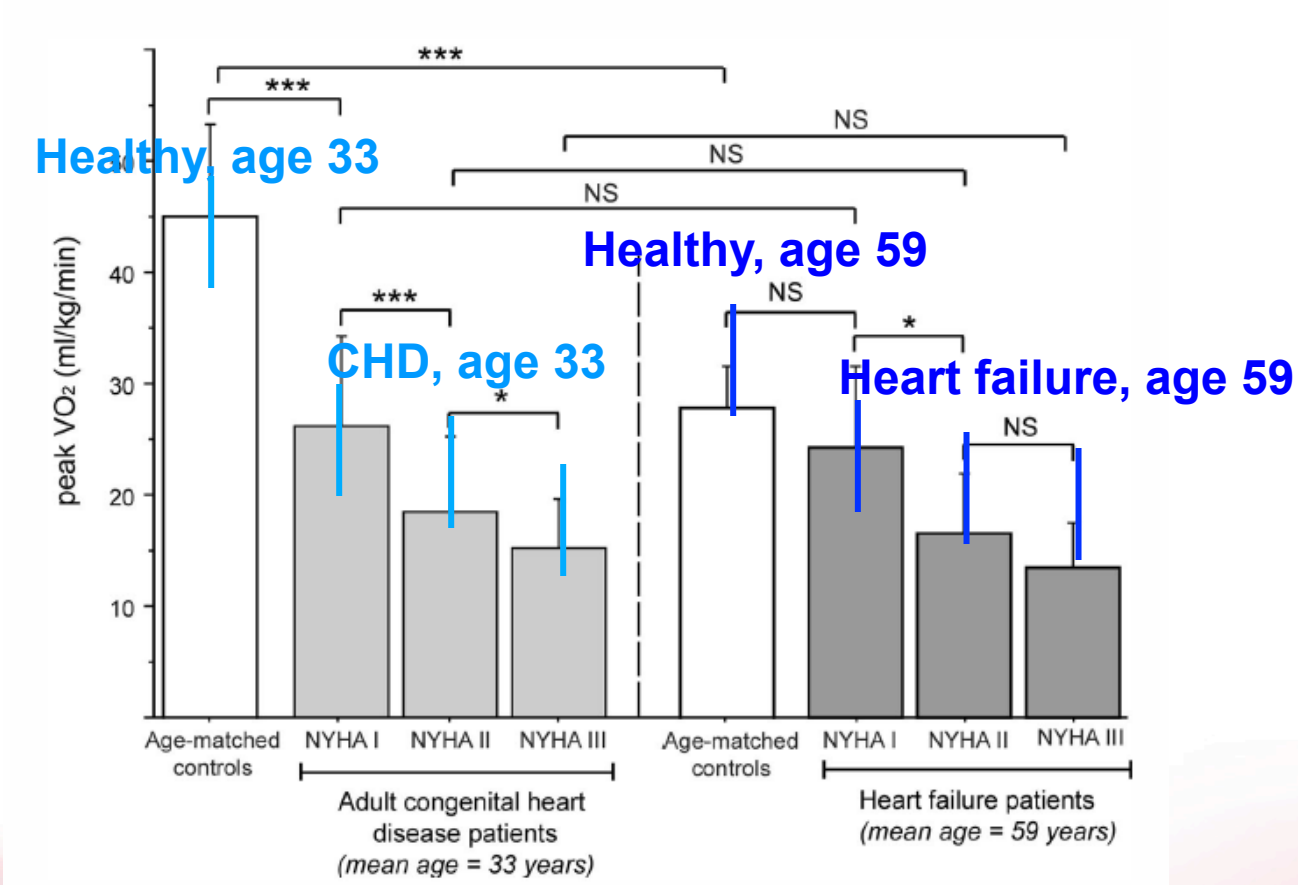
Activity Levels Decline With Age

- N=57 Fontan
- Age 8-52
- Accelerometer



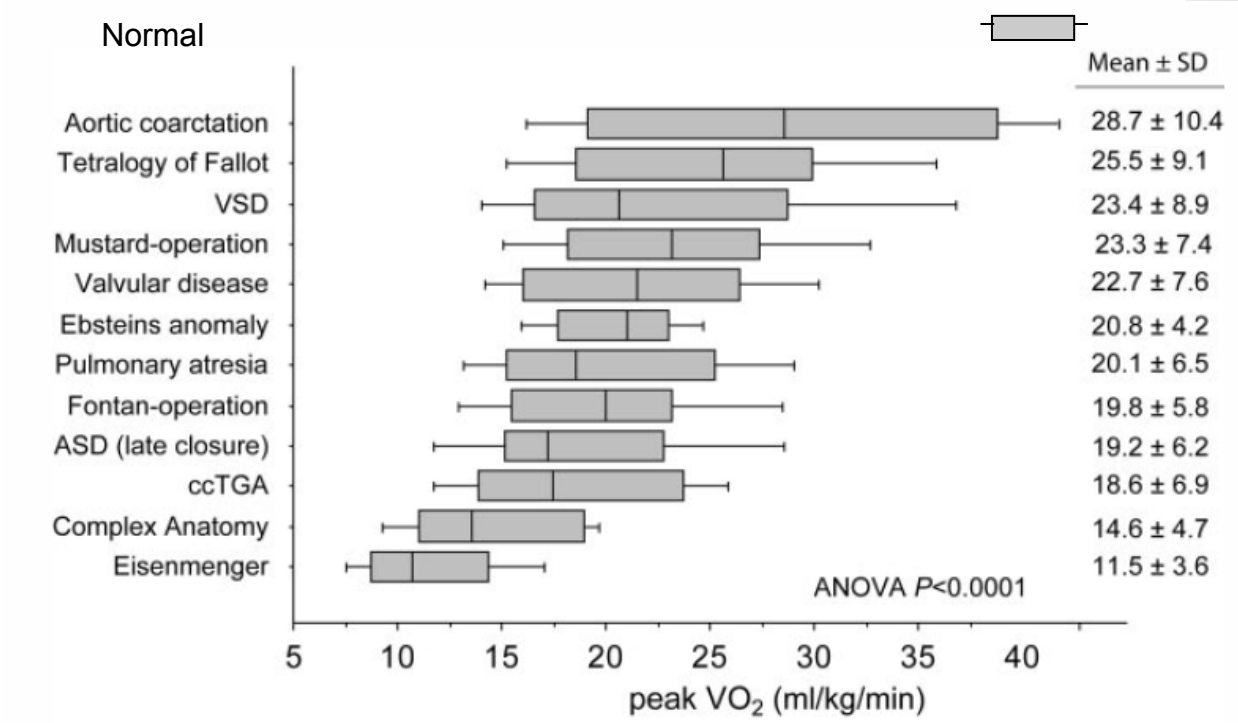
Muller et al. Eur Heart J 2009;30:2915

Congenital Heart Adults Have Impaired Exercise Capacity



Diller et al. Circulation 2005;112:828-35

Impaired Exercise Capacity Across All Forms of Heart Disease



Diller et al. Circulation 2005;112:828-35

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Which is the most important factor affecting activity levels in young cardiac patients ?

1. Severity of heart condition
2. Parental overprotection
3. Social stigma/ school factors
4. Belief in one's ability to participate
5. Medical advice to not participate

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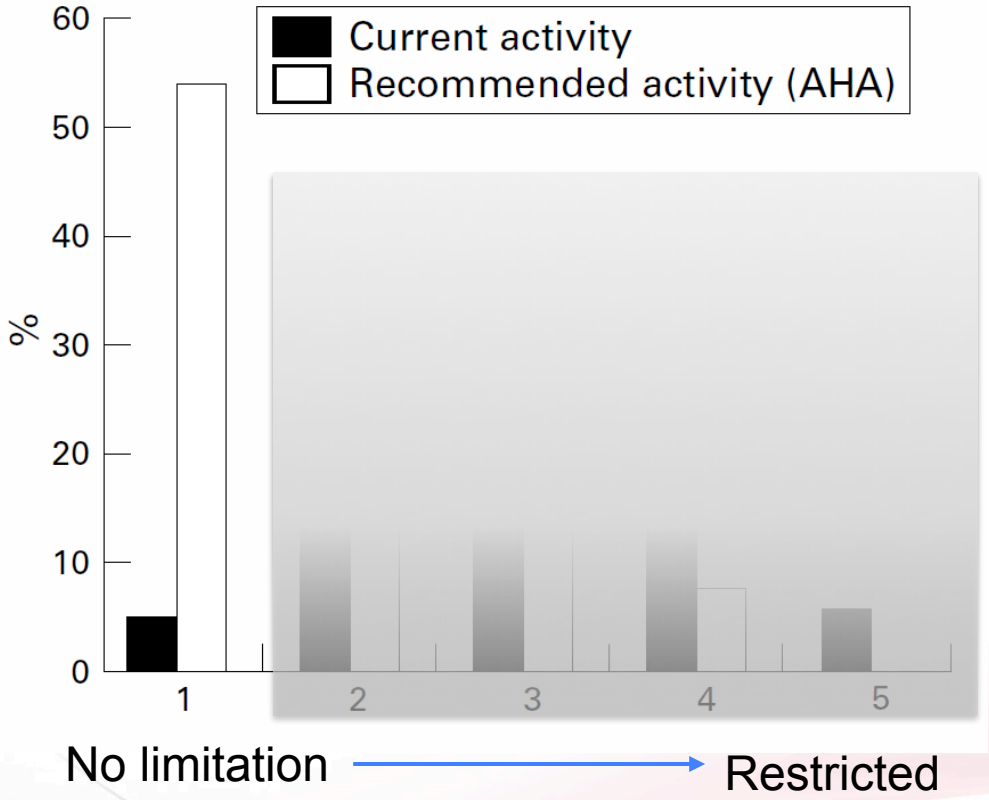
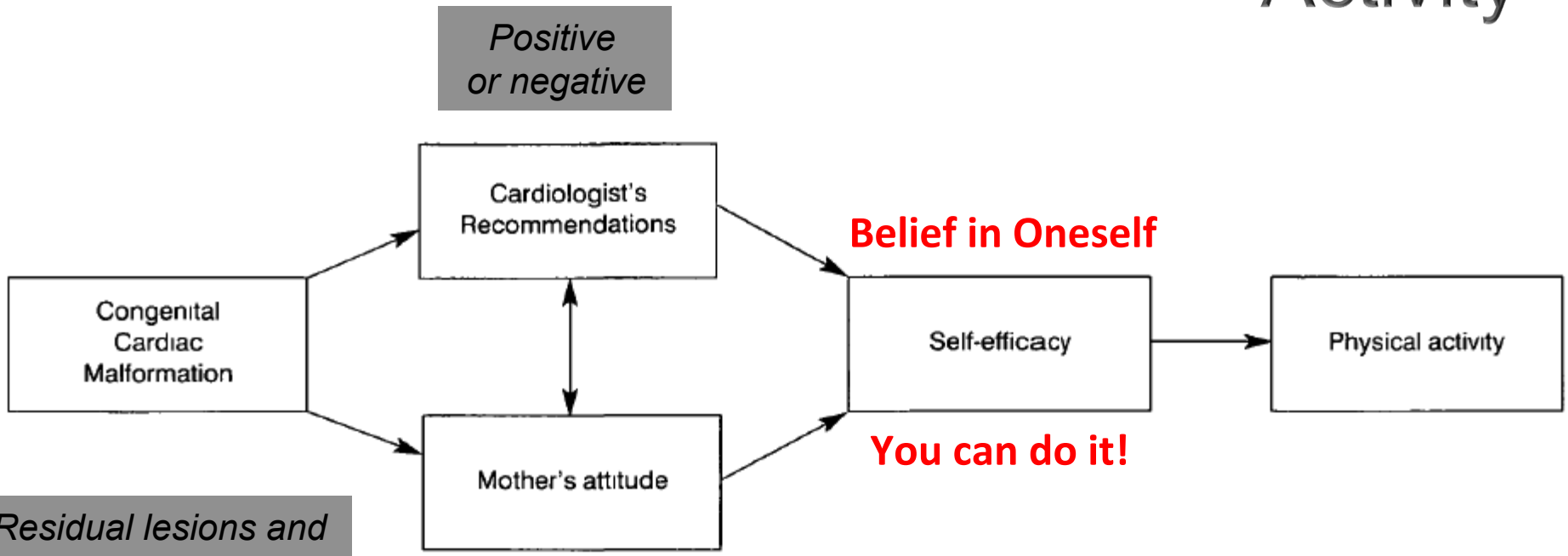
Young Heart Patients Limit Themselves

- 99 adult congenital heart patients
- Age 25 (11-51)
- Asked about current activity along a scale, compared to what would be medically recommended



Swan and Hillis, Heart 2000;83:685-687

Believe in Oneself is an Important Predictor of Physical Activity



Bar-Mor et al. Cardio Young 2000:10:561

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What Should You Do?

- **Rx**
  - **Children and Youth**: 60 minutes daily
  - **Adults**: 150 minutes weekly

  of moderate to vigorous intensity activity.

- **Rx**
  - **Walking is the best exercise**

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Walking is the Best Exercise

- **It's Easy**
  - Simple to start and safe.
  - Costs nothing.
  - Lowest dropout rate of any type of exercise.
- **It Works**
  - Studies show that for every hour of walking, life expectancy may increase by two hours.
  - Walking for as few as 30 minutes a day provides heart health benefits.
  - Single most effective exercise for heart patients.

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What Can You Do?

- Can I join boot camp?
- Can I climb mountains, back country ski, go mountain biking?
- Can I do SCUBA diving?
- Can I be on a competitive wresting team?
- Can I snow board?

Answer: *It depends.*

Regarding physical activity, I feel:

A. Very knowledgeable and have discussed it with a health care professional
B. Somewhat knowledgeable
C. Never thought about it
D. Unsure/no idea what physical activity restrictions, if any, apply to my heart condition.

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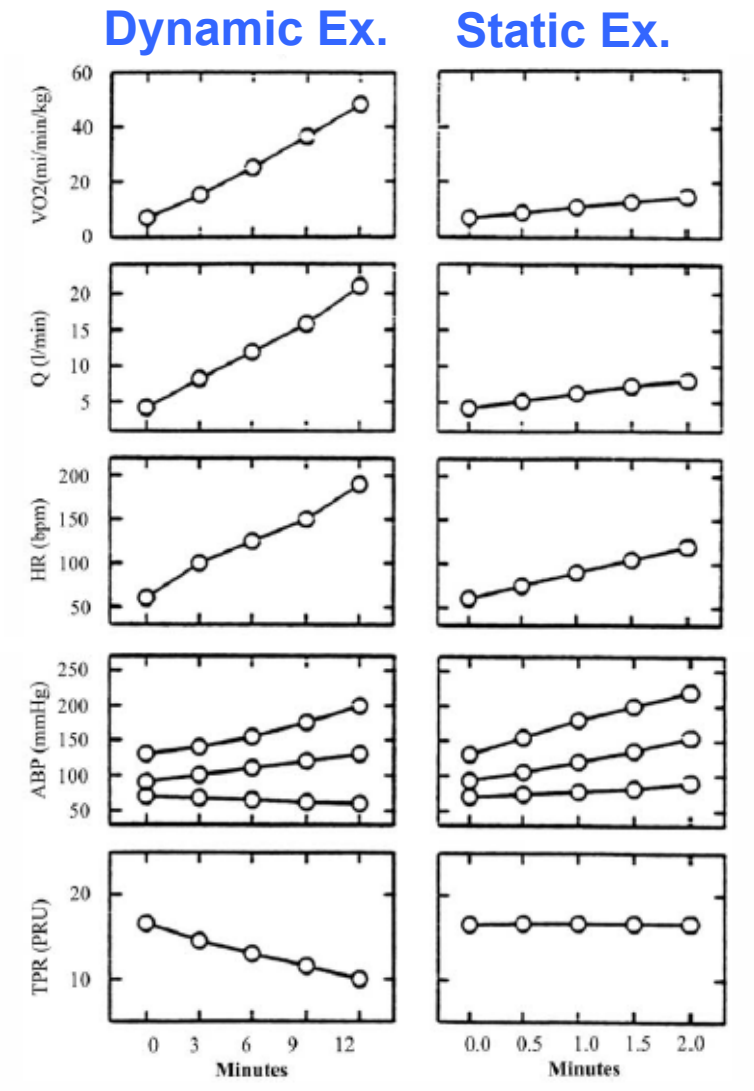
Exercise Puts Demands on the Cardiovascular System



Dynamic Exercise

- Eg. running, swimming
- Large muscle mass movem't
- Builds endurance
- Requires increases heart rate blood pressure, cardiac output

Static Exercise

- Eg. weight-lifting
- Large intramuscular forces
- Builds strength
- Increases blood pressure

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36th Bethesda Conference, JACC 2005;1364

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Exercise is a Stress on the Heart

- Dynamic exercise may not be tolerated if:
  - important obstruction at some level (aortic valve, left ventricle, pulmonary arteries)
    - Heart can't meet the demand of exercise → fainting, or worse.
- Static exercise related increase in blood pressure may stretch blood vessels or strain valves
  - aneurysm
  - important leakage

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What Can you Do? General Principles

- A walking program is fine for everyone
- If you have symptoms from your heart condition:
  - No competitive sporting activity
  - You and your cardiologist should consider Rx
- Discuss exercise and sporting participation with your cardiologist regularly

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Cardiologist's Perspective

- What is the nature of the heart condition?
- Does the patient have any symptoms?
- Echocardiogram: structure/function of the heart
- Exercise stress test to intensity equal to level of activity
- Consideration of the static and dynamic demands of exercise/sport

Matching Activity to the Patient

- **Patient Factors**
  - Heart condition
  - Level of participation
    - recreational
    - competitive
- **Exercise/Sport**
  - Training regimen
  - Demands
    - dynamic
    - static

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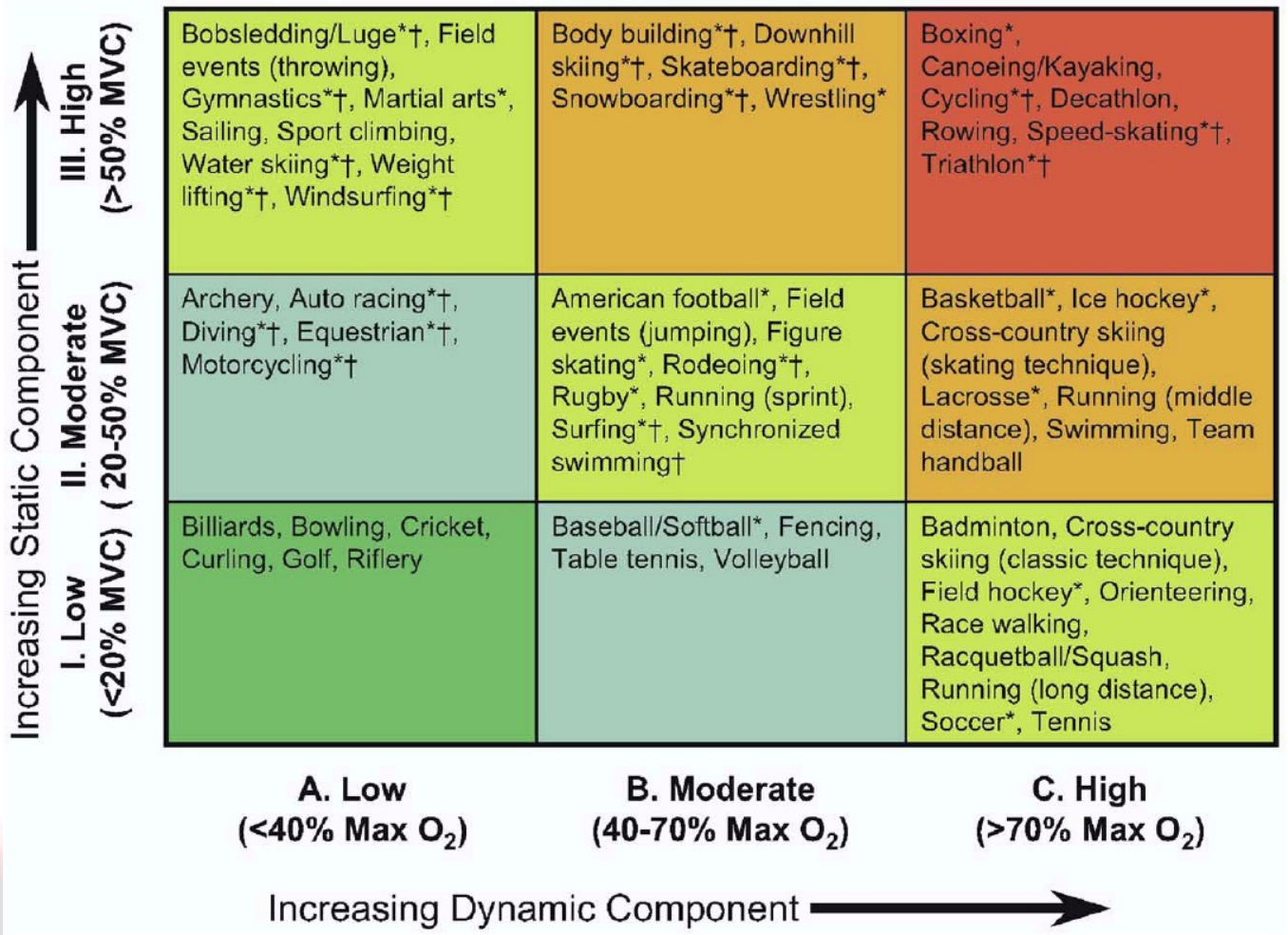
Classification of Sports



36th Bethesda Conference, JACC 2005;1364-7

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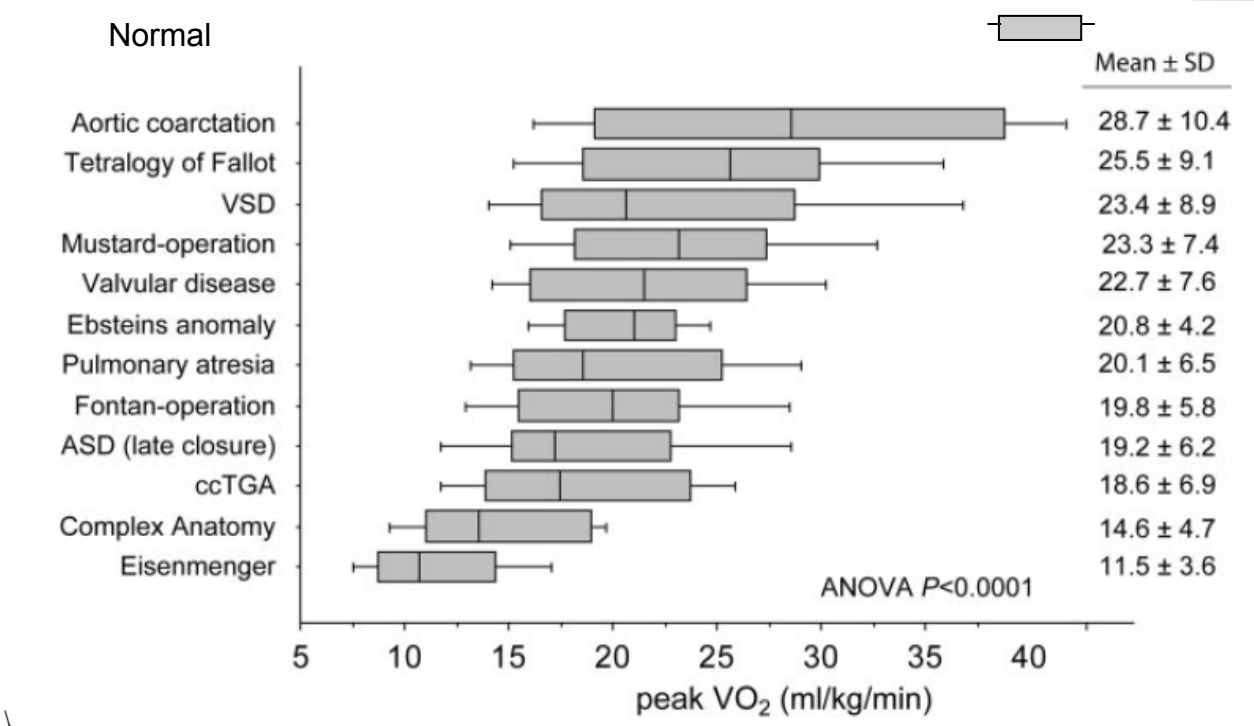
How to turn Smart Cars into Ferraris?



Diller et al. Circulation 2005;112:828-35

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The PhIT Trial: Physical Activity in Tetralogy

- We are looking for
  - patients with tetralogy
  - pulmonary regurgitation
  - able to exercise 3x weekly
- We will be studying the effects of
  - normal activity
  - aerobic exercise training
  - higher intensity interval training

- on the heart, exercise capacity and quality of life and long-term activity levels
- Contact Isabelle Vonder Muhll if interested

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What Should You Avoid?

- **Competitive Sports**
  - Not recommended if:
    - Symptoms
    - Moderate or severe obstruction in the heart
    - Severe leaking of a heart valve
    - Aneurysm (enlargement) of the aorta
      or high risk of developing aneurysm (Marfan's)
    - Taking blood thinners

What Should You Avoid?

- **Contact Sports and Sports with Fall Risk**

  (football, hockey, soccer, skiing, water skiing)

  – Not recommended if:
    - Recovering from open-heart surgery
    - Mechanical valve
    - Aneurysm (enlargement) of the aorta or high risk of developing aneurysm (Marfan)
    - Taking blood thinners

What Should You Avoid?

- **Weight lifting**
  - Not recommended if:
    - Aneurysm (enlargement) of the aorta
      or high risk of developing aneurysm (Marfan)
  - Repetitive light weights better than straining against heavy loads
    - How much weight can you lift: whatever weight can be done comfortably, without bearing down

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Summary

- **What you should do**: a modest amount of moderate to strenous activity
  - Most patients are not doing enough
  - Physical activity levels and exercise capacity are reduced in heart patients
  - Family, health care providers need to foster self-efficacy in heart patients

- **What you can do**: discuss exercise and sporting participation with your cardiologist regularly to understand what is safe for you

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The PhIT Trial: Physical Activity in Tetralogy

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