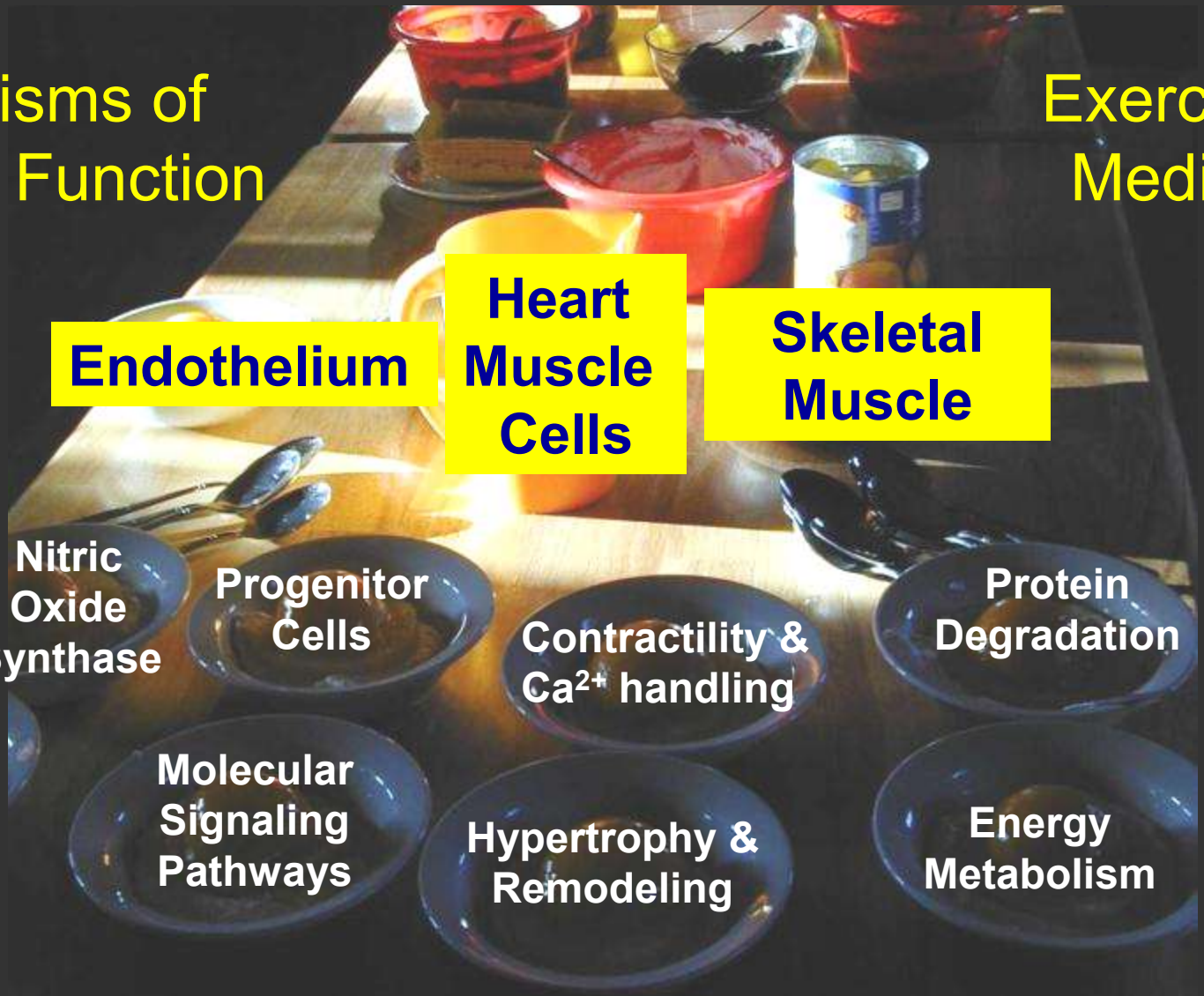
Cardiovascular Prevention and Rehabilitation

Basic and Translational Research

Mechanisms of Improved Function

Exercise in Medicine



Basic and Translational Research

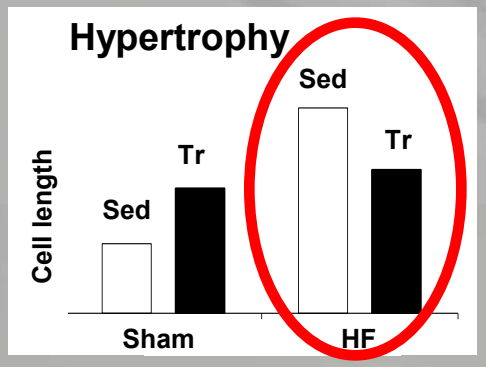
Exercise Models
- cellular / molecular mechanisms

Evidence-Based Training Programs For Defined Groups

- **Heart failure**
- **Coronary disease**
- **Metabolic syndrome**
- **Hypertension**

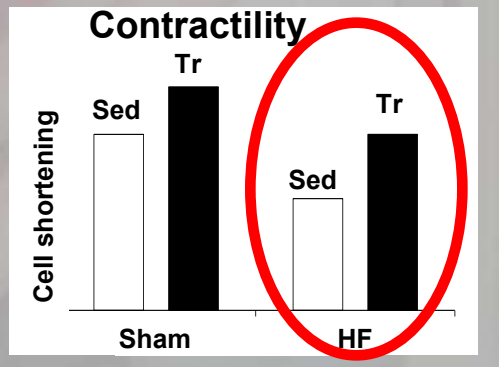
Working Hypothesis

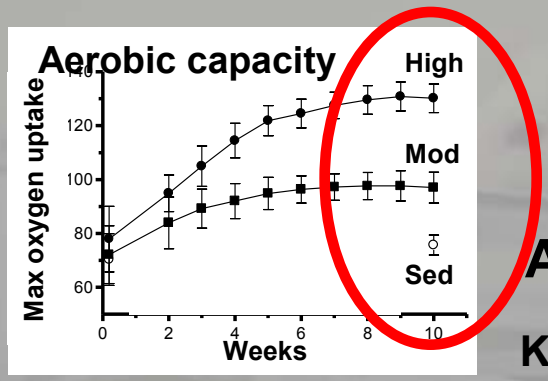
Training Effect in Heart Failure Depends on Exercise Intensity



Reduced Cardiac Hypertrophy and Increased Myocyte Contractility In Heart Failure

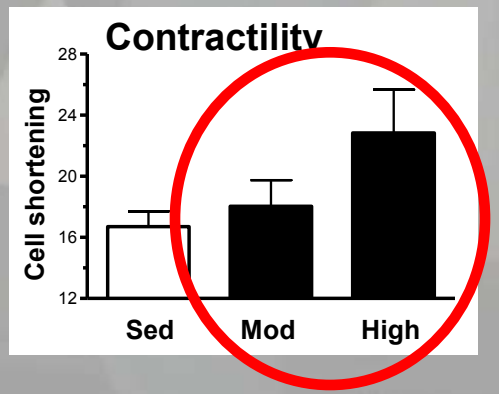
Wisløff U. 2002. Cardiovasc Res 54: 162-174

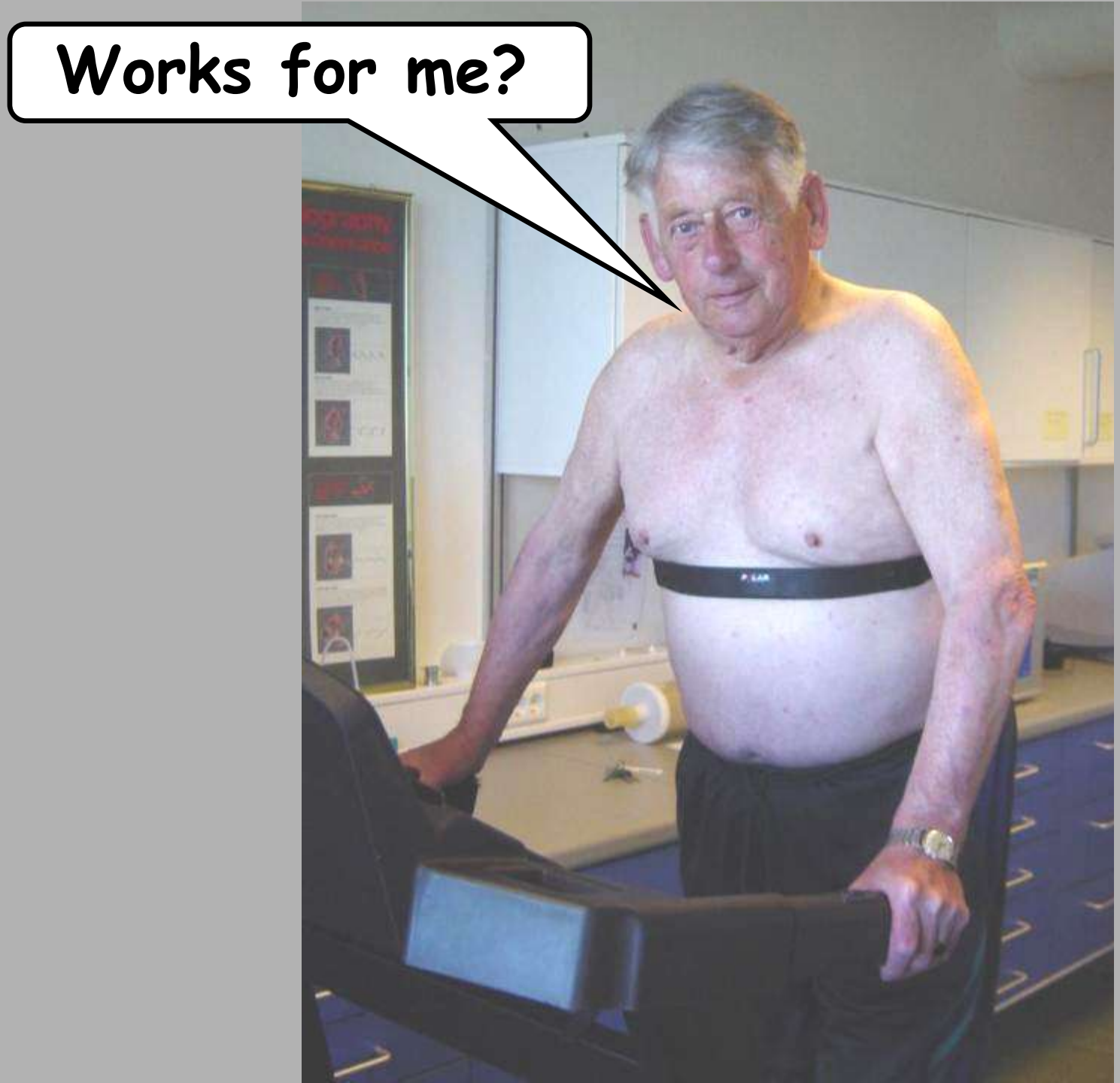




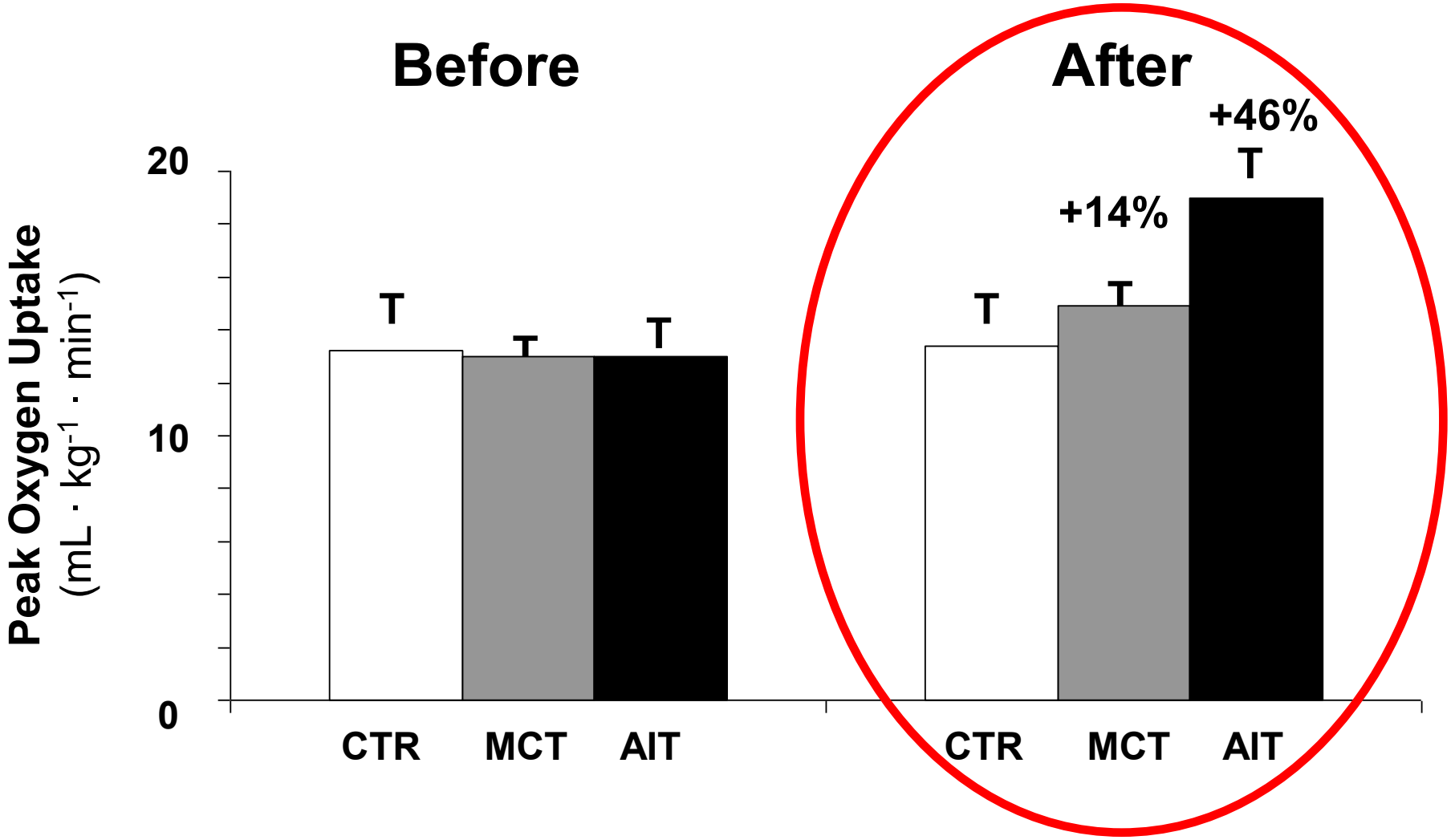
Larger Effetcs With High Versus Moderate Exercise Intensity on Aerobic Capacity and Contractiity

Kemi OJ. 2005. Cardiovasc Res 67: 161-72.




Works for me?

Aerobic Capacity – VO_{2peak}



Wisløff U. 2007. Circulation 115: 3086-3094

Myocardial Adaptation to Exercise
- Aerobic Interval Training

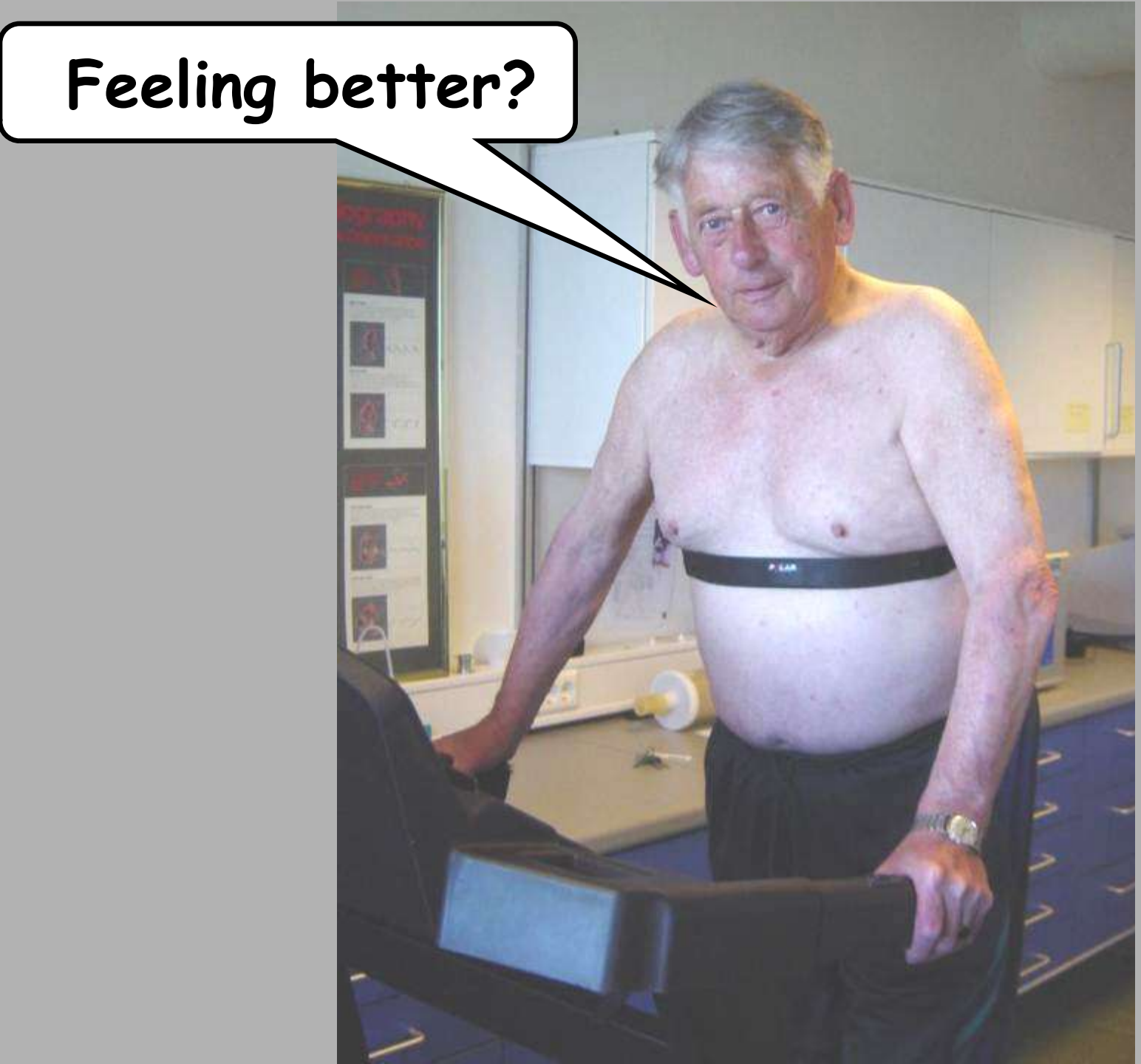
1. Higher aerobic capacity

2. Increased contractility and Physiological Hypertrophy or Reverse remodeling

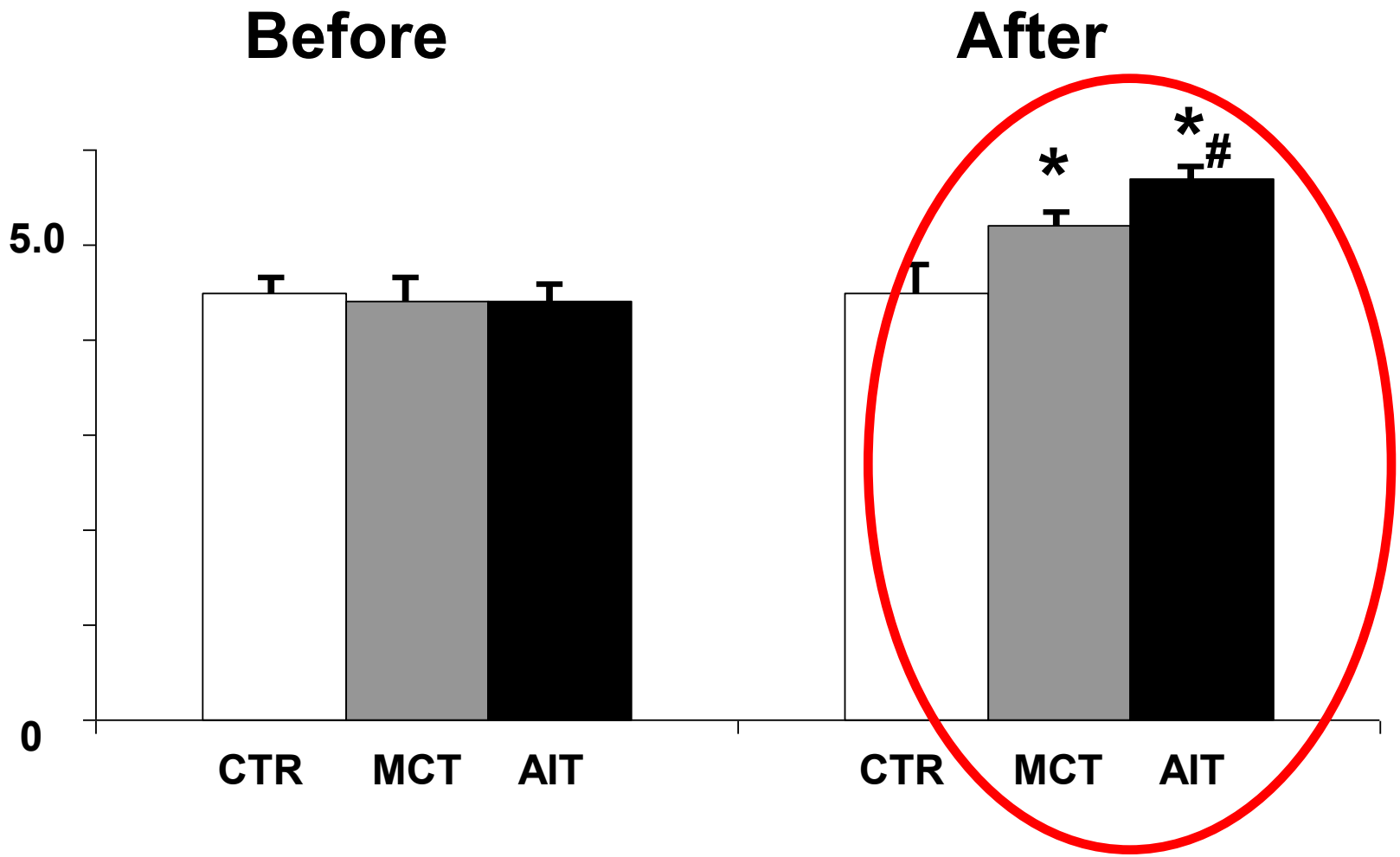
3. Enhanced endothelial function

4. Improved mitochondrial function and in skeletal muscle => glucose tolerance

5. Works in patients: Coronary artery disease, Heart failure, Metabolic syndrome, Hypertension


Feeling better?

Quality of Life – MacNew Global Score



Wisløff U. 2007. Circulation 115: 3086-3094

Multicenter Study: SMARTEX-HF

Study of Myocardial Recovery after Exercise training in Heart Failure

Randomized clinical trial with 3 arms

1. **Aerobic Interval Training** (program)
   versus usual care
2. **Moderate Continuous Training** (program)
3. **Regular Exercise** (recommendation)

Phase II type study – Establish clinical effects

- European multicenter (EACPR - Basic Science)
- 200 patients, NYHA 2-3, EF < 35

Assess reverse remodeling

- LVEDD ($VO_{2peak,}$ LVEF, BNP, QoL)

Assess safety and estimate clinical endpoints

- Mortality, CV hospitalization, worsening of HF

TranslatE Network Objectives

1. Identify Cellular and Molecular Mechanisms of Beneficial Outcomes of Exercise Training

2. Identify Optimal Exercise Intensity
   Establish Dose-Response relationship:
   Interval Training versus Moderate Intensity

3. Develop Evidence-Based Standards for Exercise Training in Heart Failure

4. Establish Sub-Studies of SMARTEX-HF and Experimental Studies

Cardiovascular Prevention and Rehabilitation

Basic and Translational Research

Mechanisms of Improved Function

Exercise in Medicine