



University of  
New Hampshire

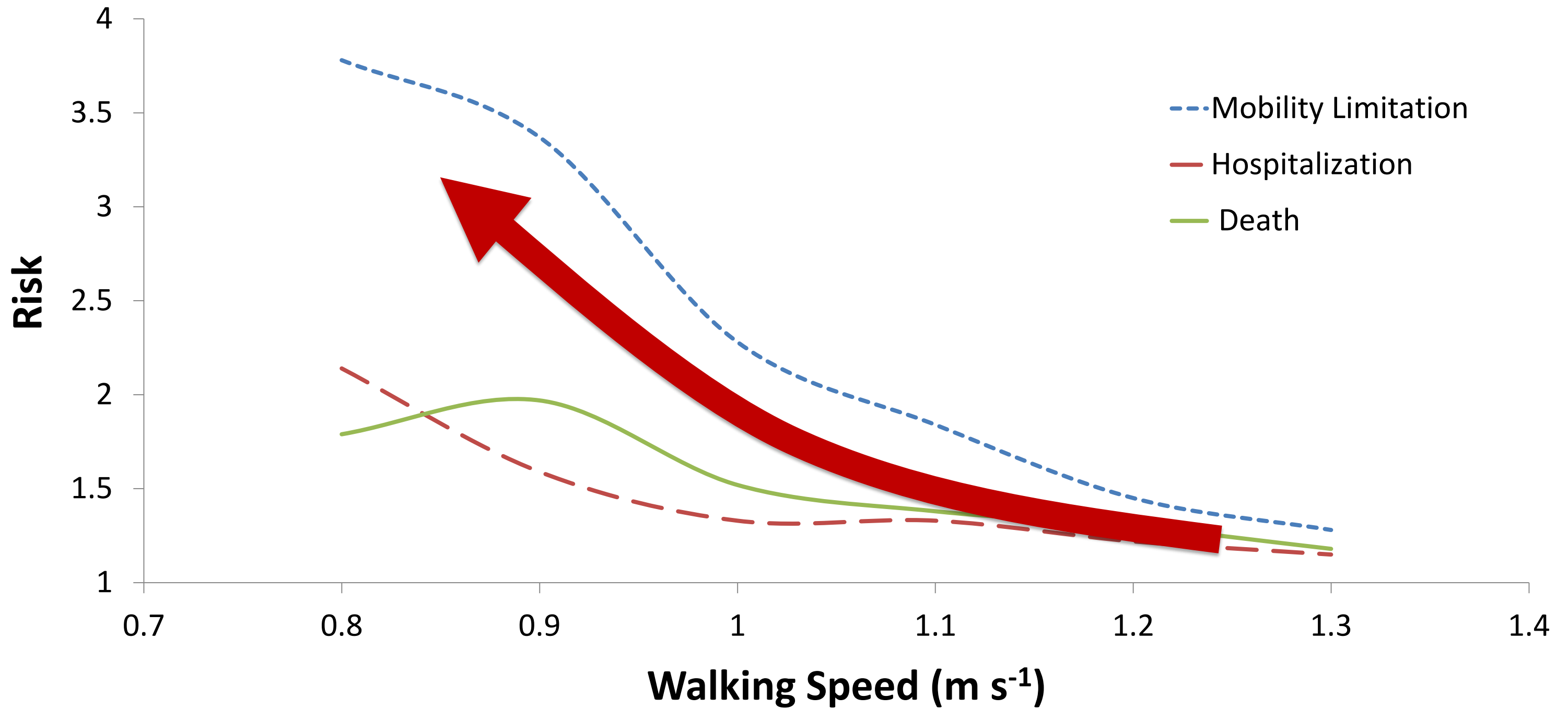
# Poor Muscle Strength Increases Walking Effort, Functional Limitation, and Sedentary Behavior in Older Adults

Dain LaRoche, Ph.D., FACSM

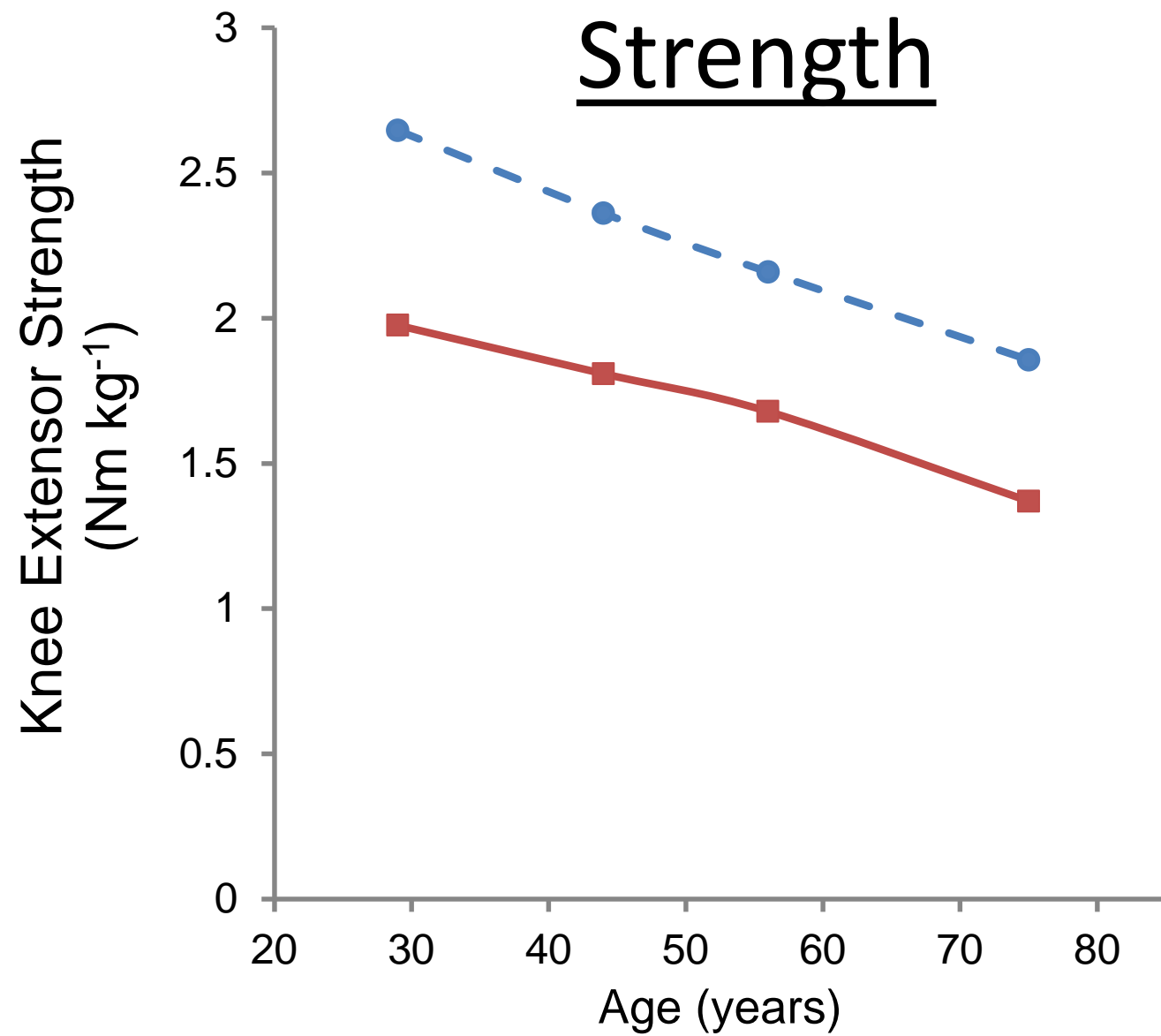
Associate Professor

Department of Kinesiology

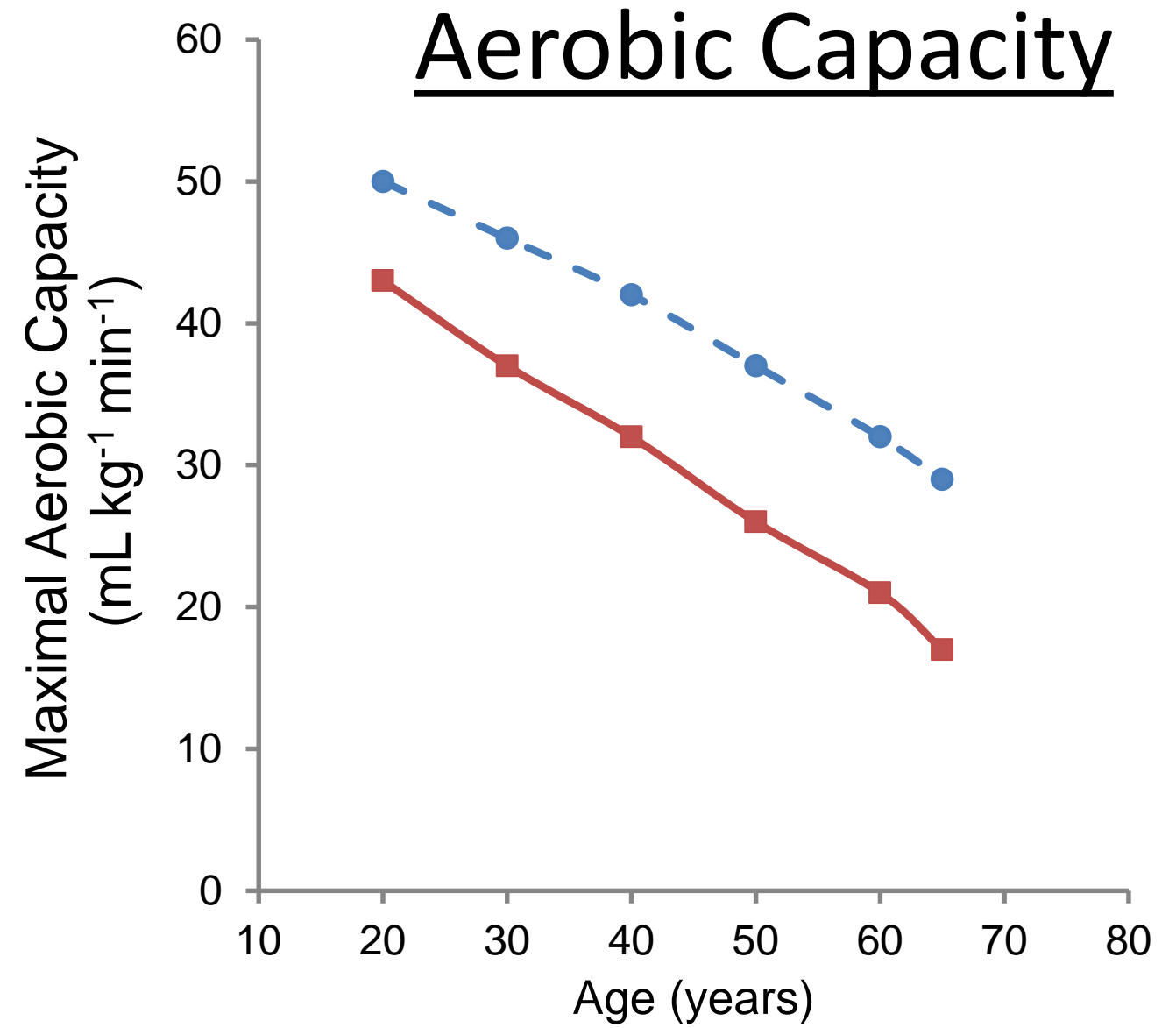
# Walking Speed: Functional Vital Sign



# Strength and Aerobic Capacity



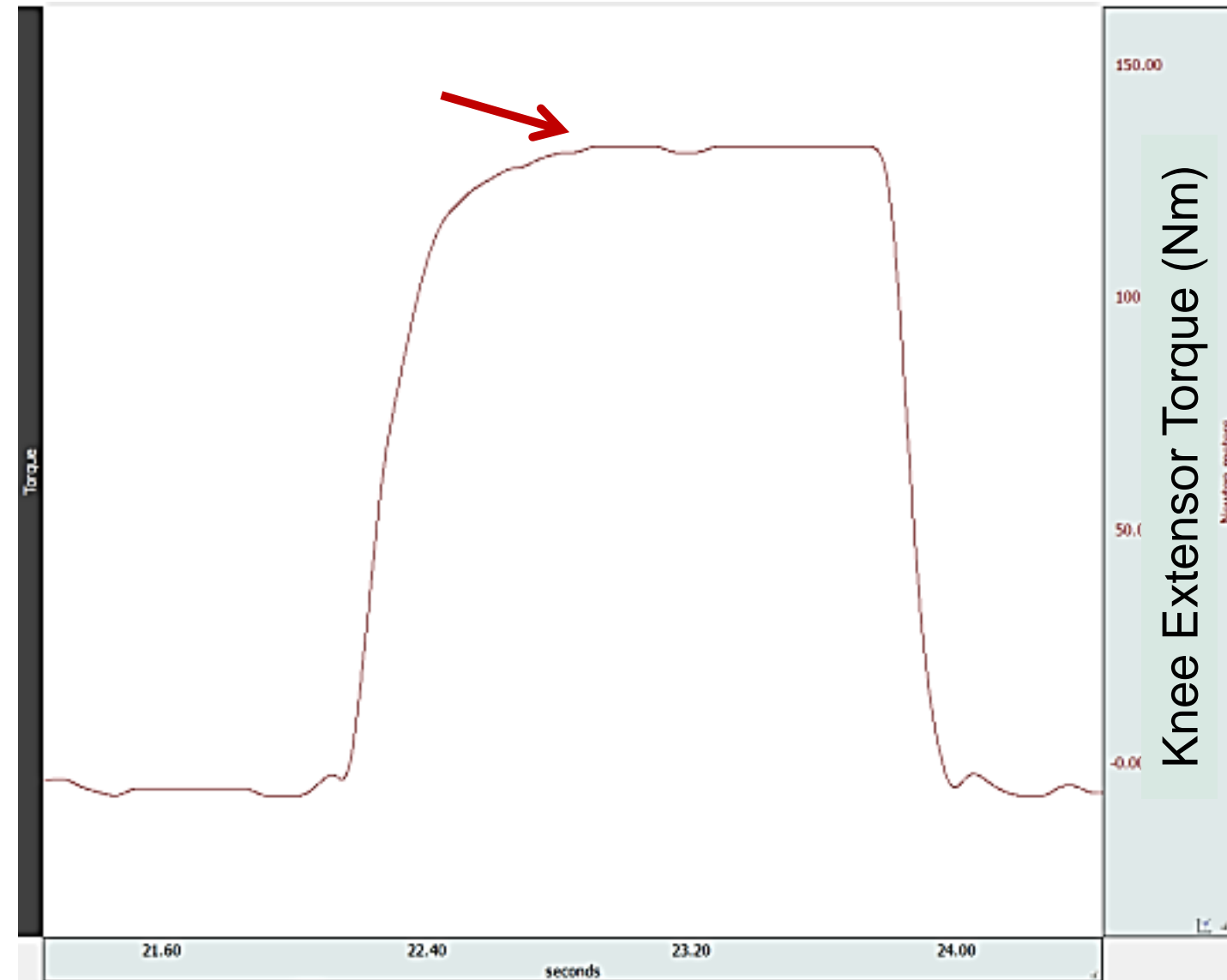
Lindle, 1997



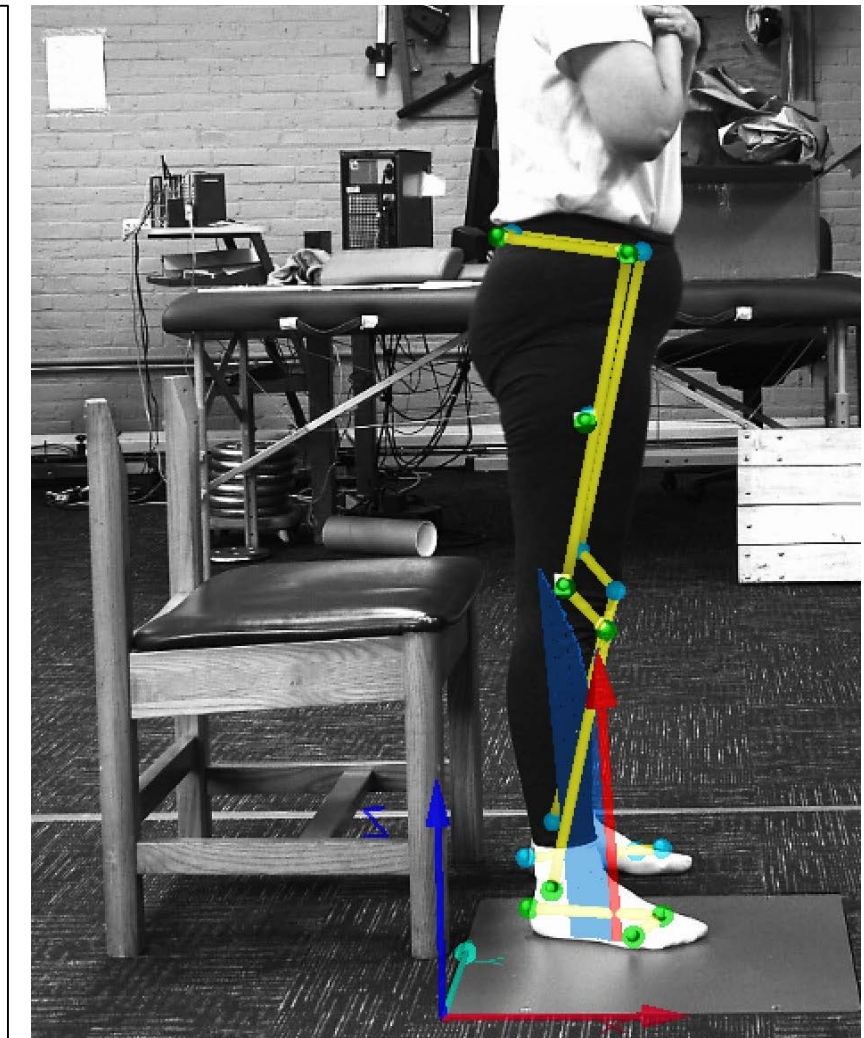
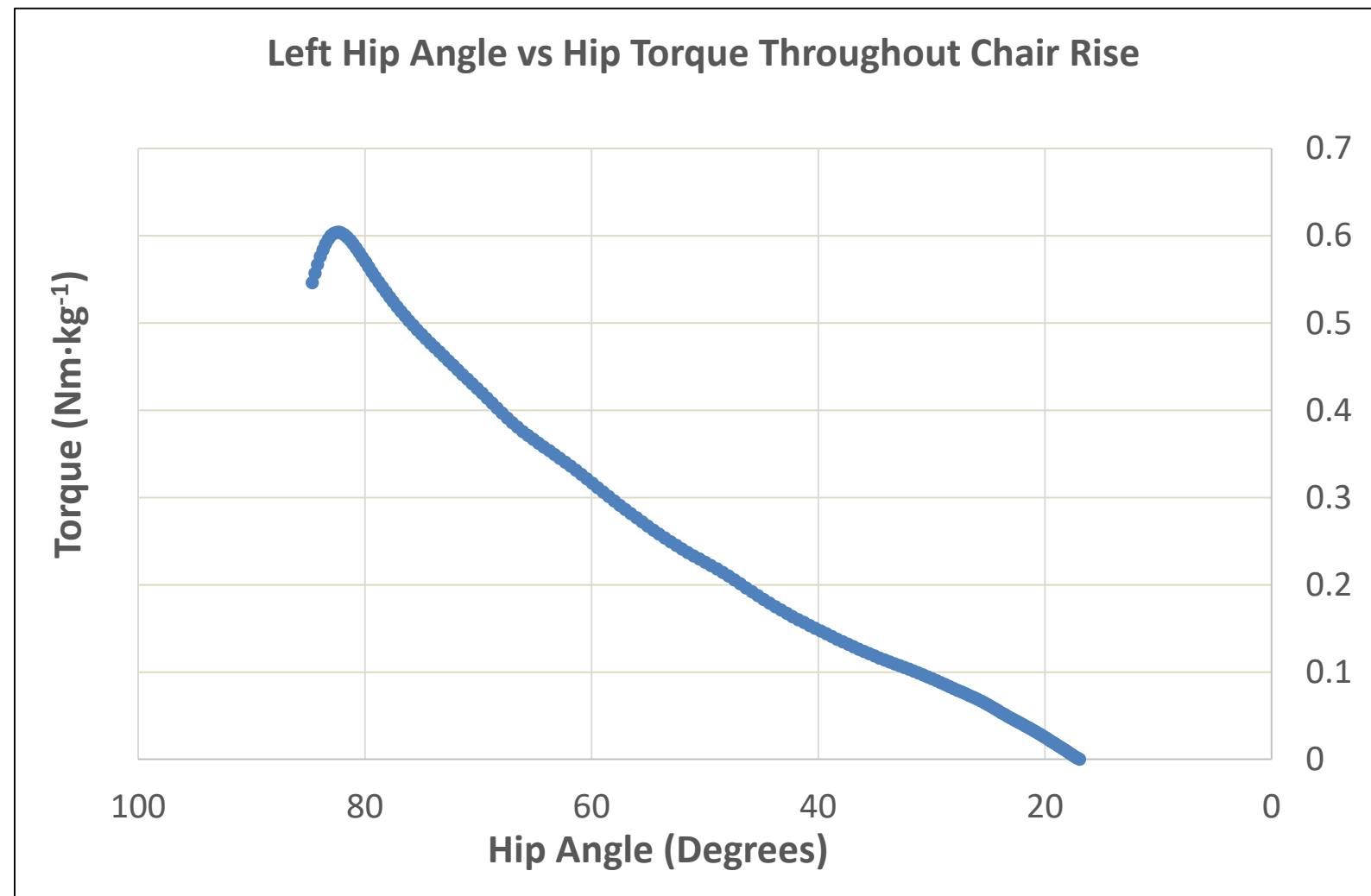
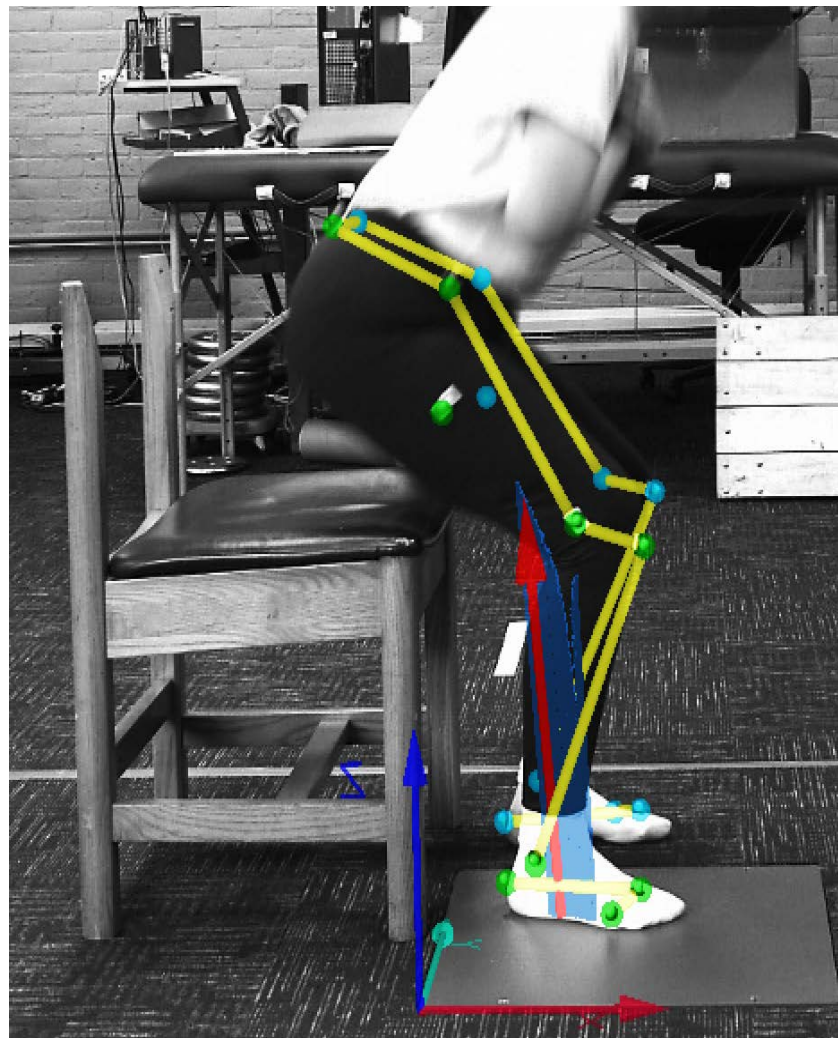
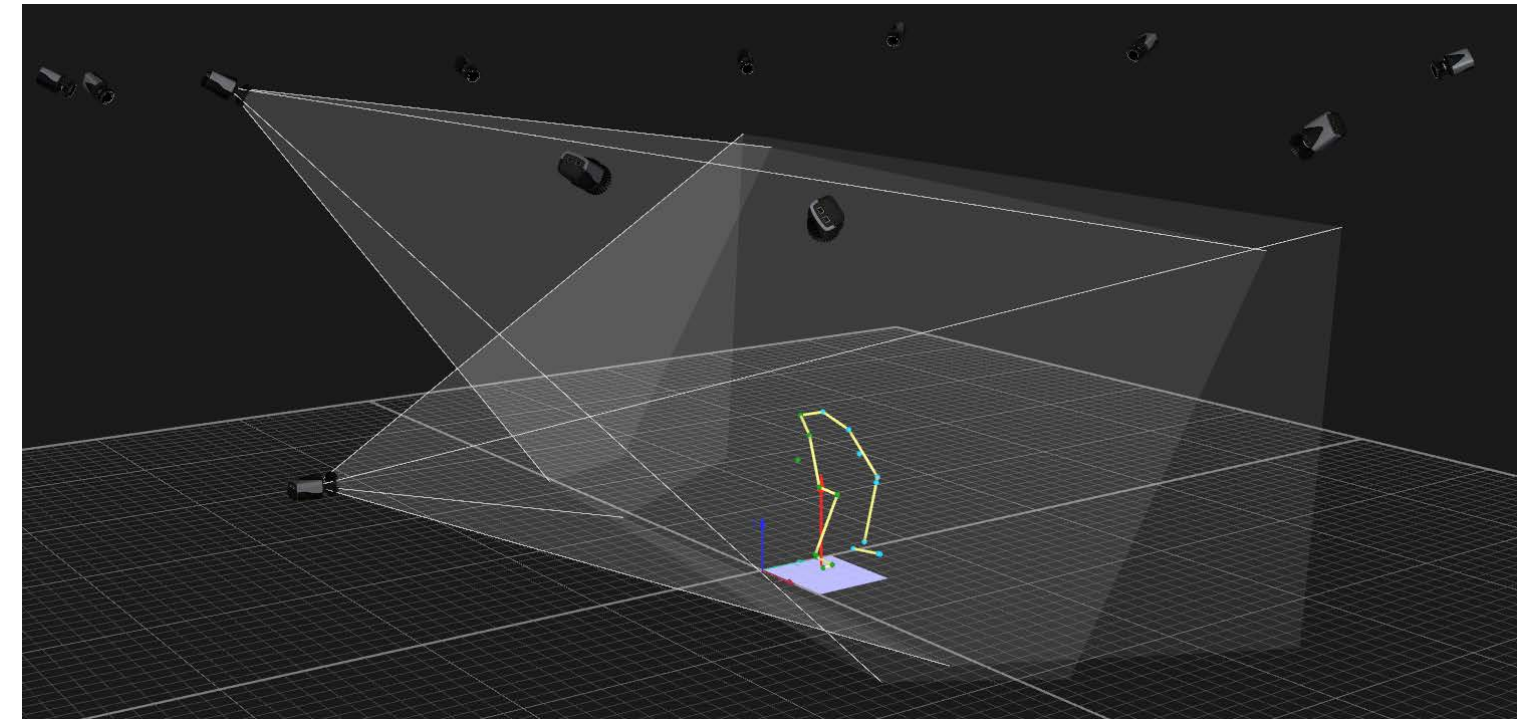
Jackson, 1996

Men Women

# Measuring Strength



# Functional Demand

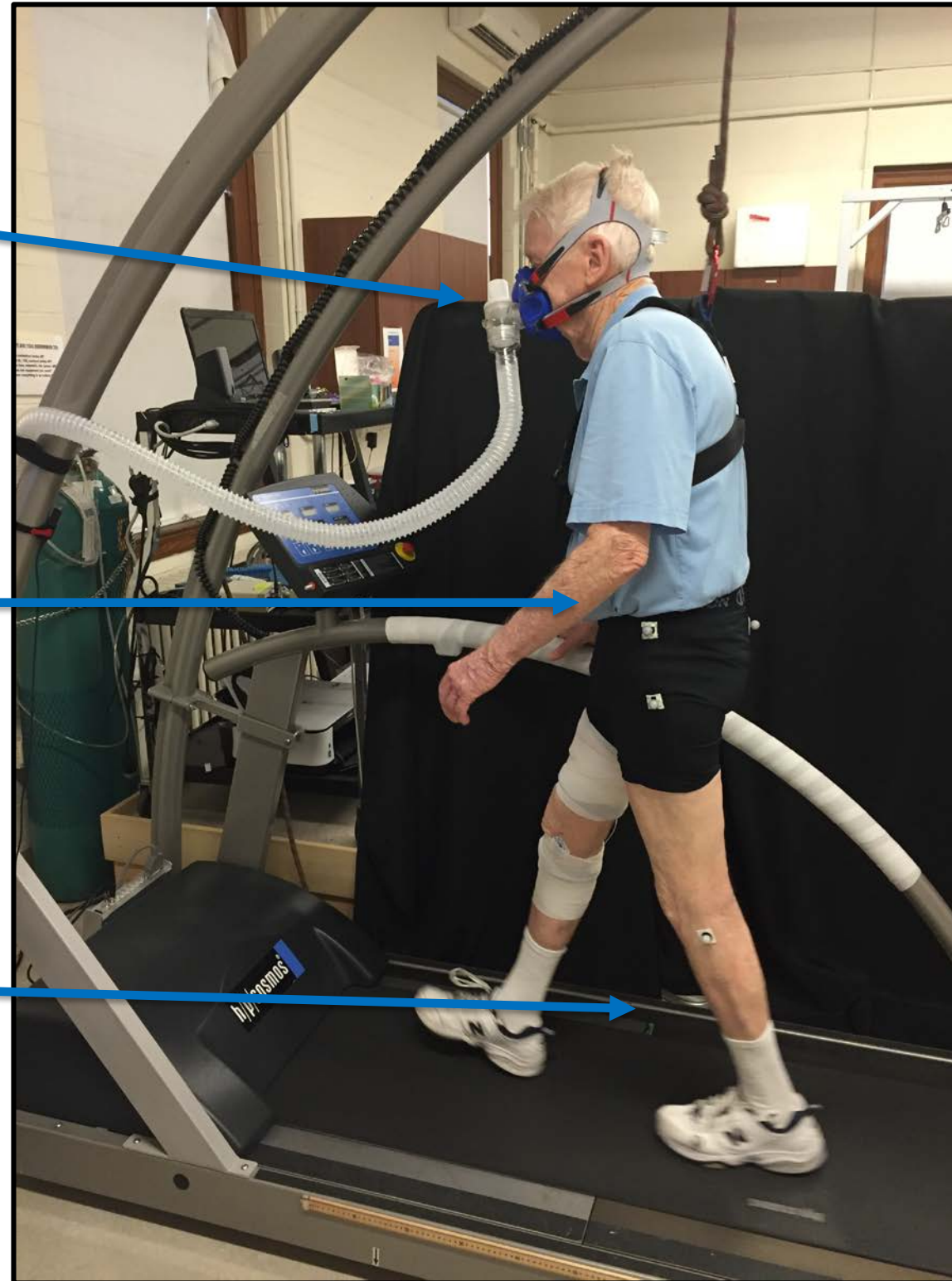


# Metabolic Cost

Metabolic and Ventilatory Cost

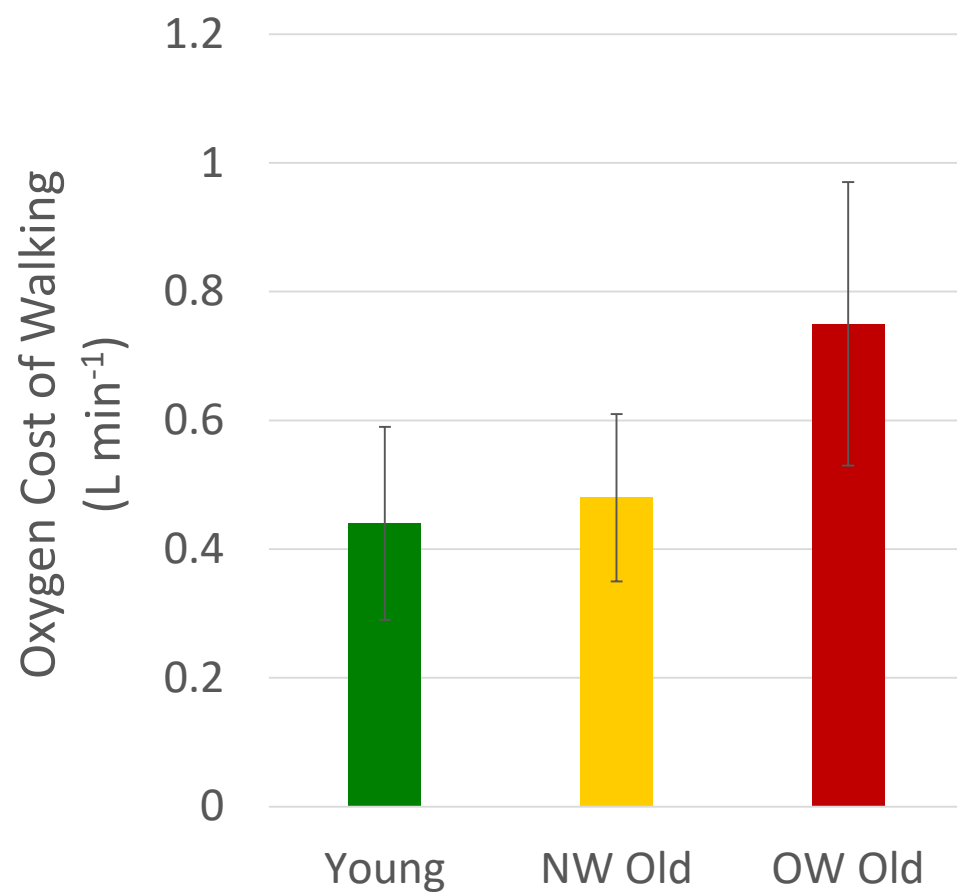
Young, Normal weight and Overweight Older Adults

Gait Mechanics



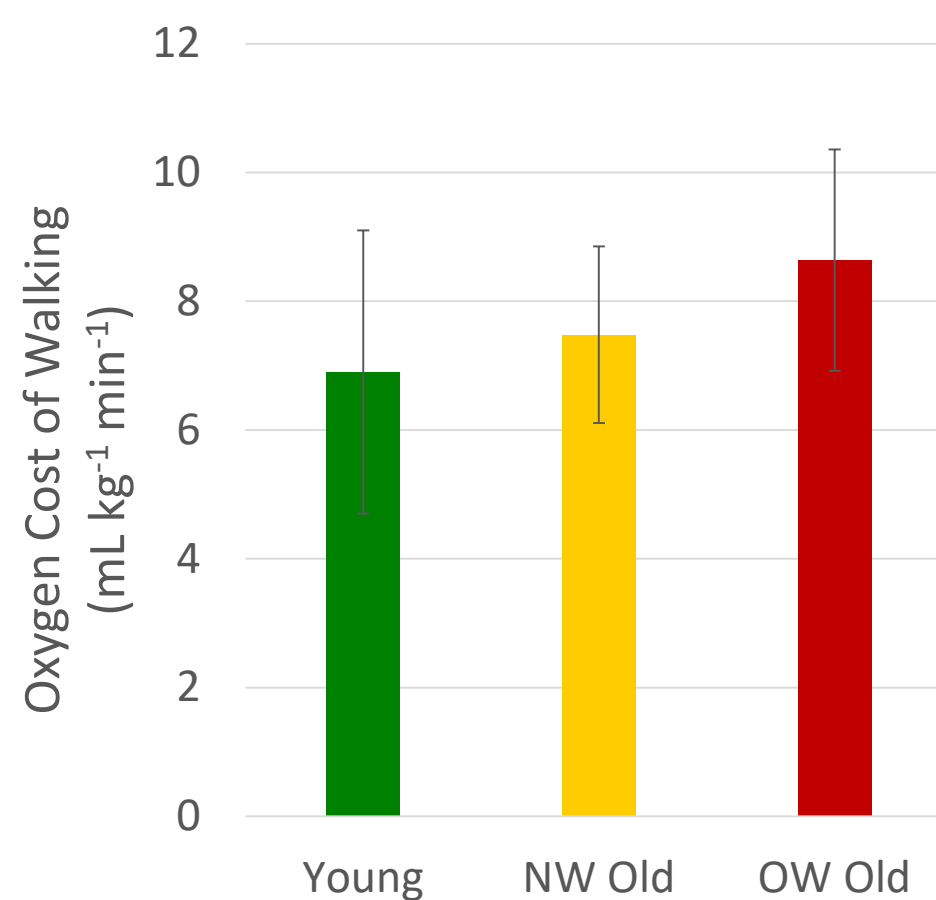
# Metabolic Cost

$\Delta = 56\%$ ,  $p < 0.001$



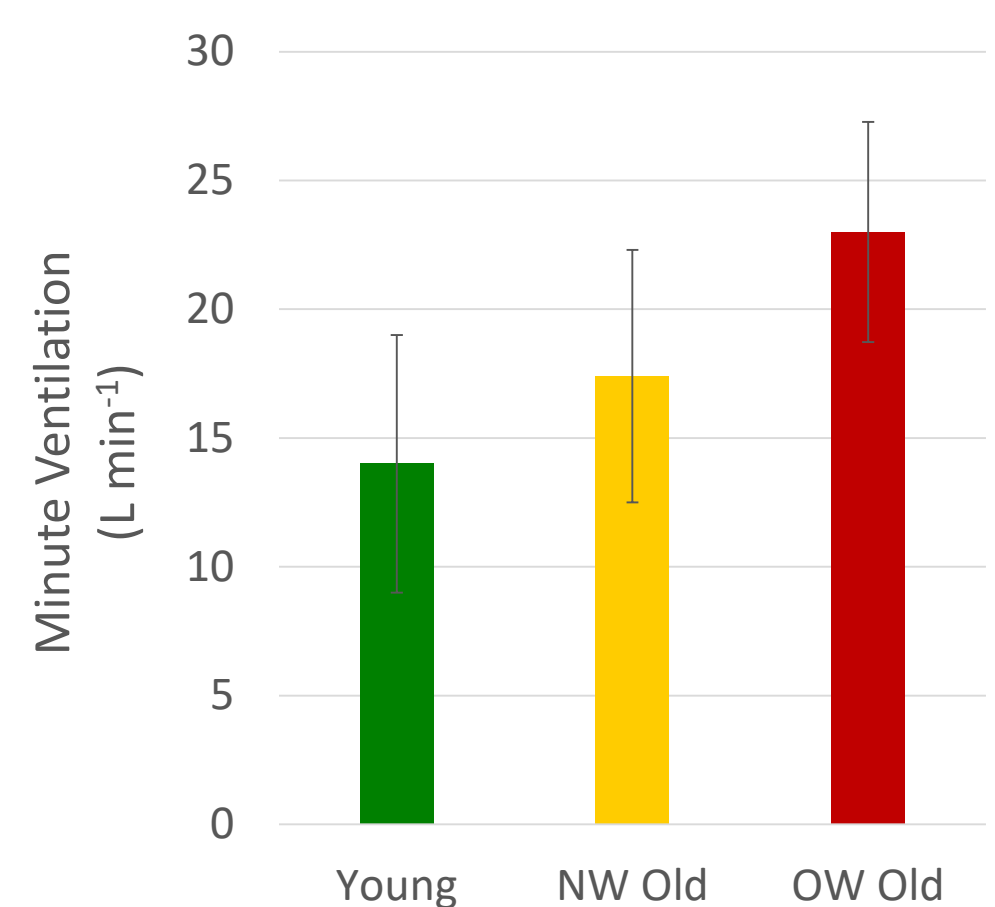
Absolute Energy Cost

$\Delta = 16\%$ ,  $p = 0.04$



Relative Energy Cost

$\Delta = 32\%$ ,  $p = 0.002$



Ventilatory Cost

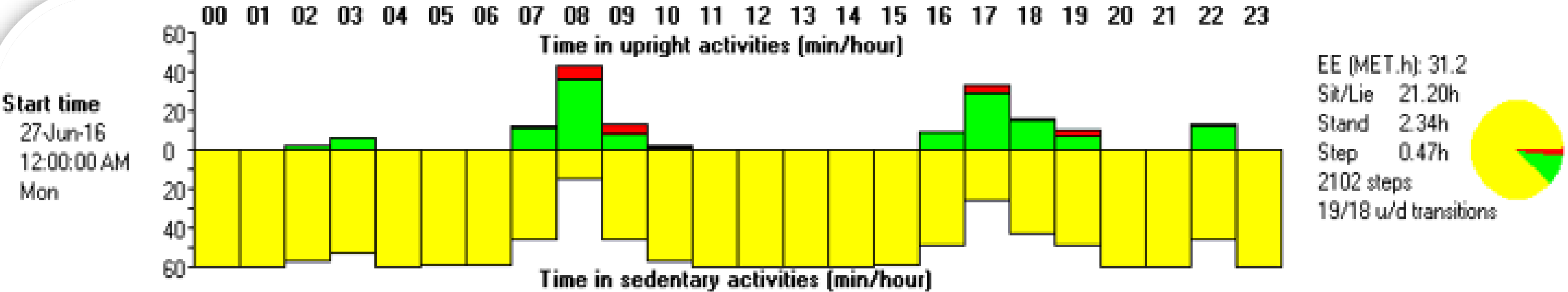
# Physical Activity and Sedentary Time



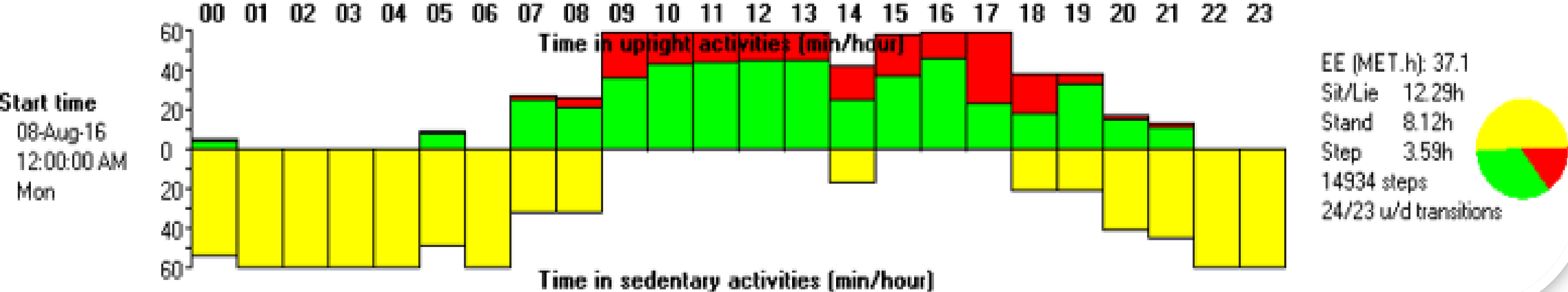


# Activity Examples

Sedentary  
Older Adult

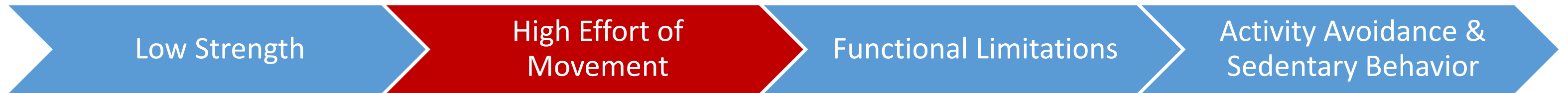


Active  
Older Adult



D.P. LaRoche, Melanson, E.L., Baumgartner, M.P., Bozzuto, B.M., Libby, V.M., Marshall, B.N. (2018) Physiological determinants of walking effort in older adults: Should they be targets for physical activity intervention? GeroScience. 40:305-315.

# Take Home Message



- Improving aerobic and strength capacities increases functional reserve
- Activities can be done at a lower relative effort
- Reduce risk for functional limitations and positively impact physical activity patterns of older adults