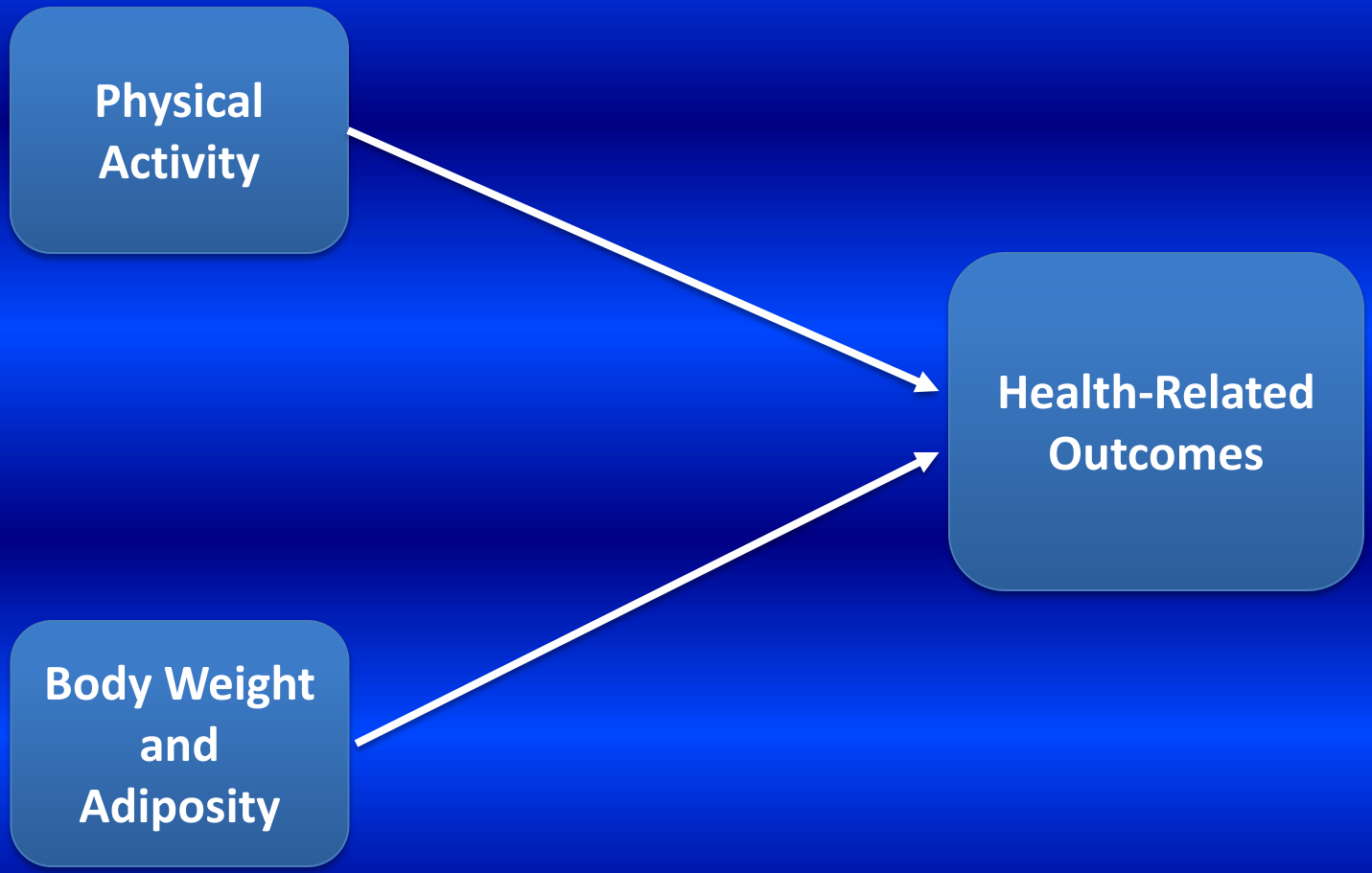
Physical Activity and Obesity – State of the Science

Physical Activity: Implications for Weight Loss Maintenance and Related Health Outcomes

John M. Jakicic, PhD
University of Pittsburgh
Department of Health and Physical Activity
Physical Activity and Weight Management Research Center

Should the Focus be on Physical Activity or Obesity?



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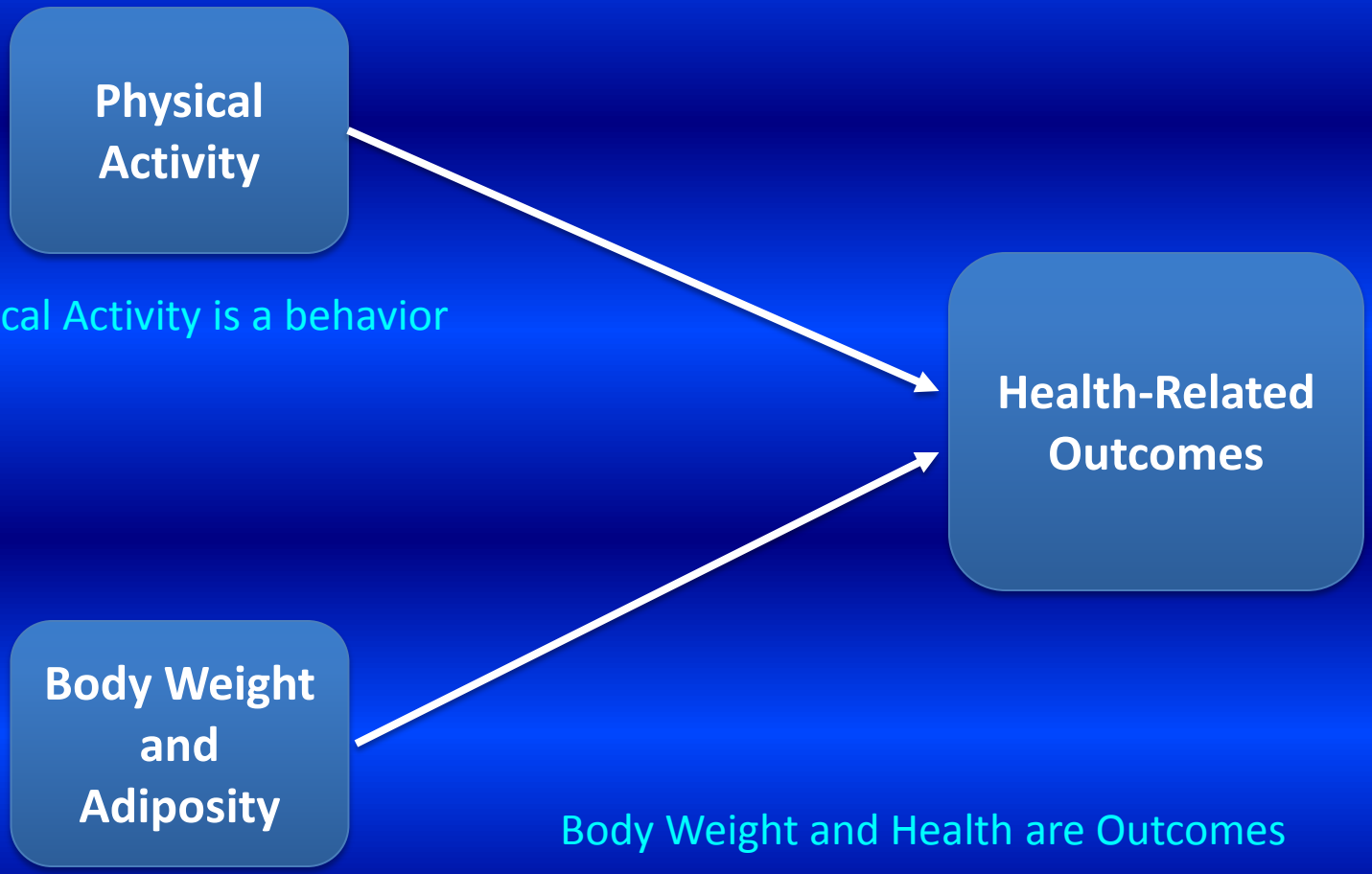
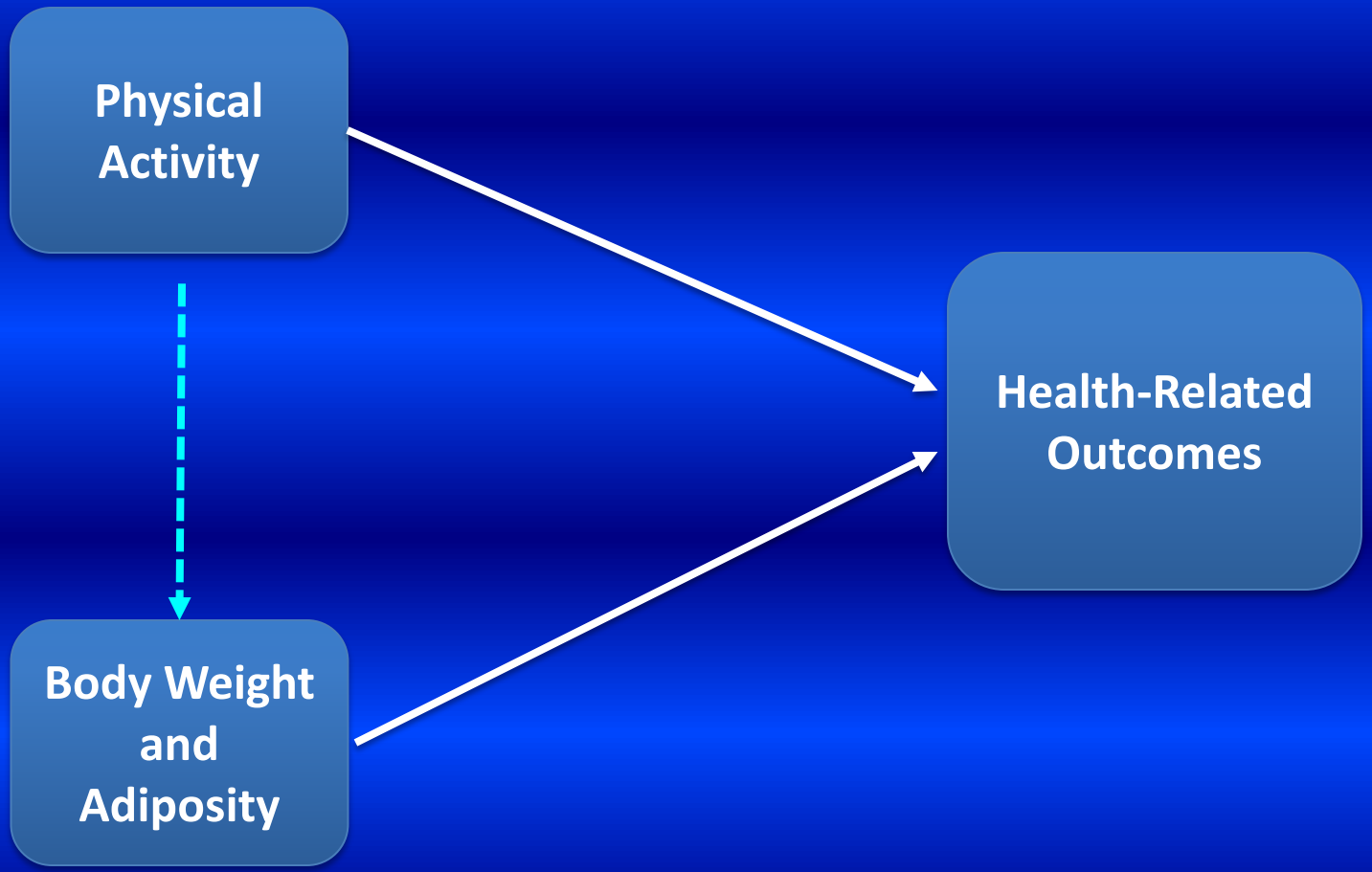
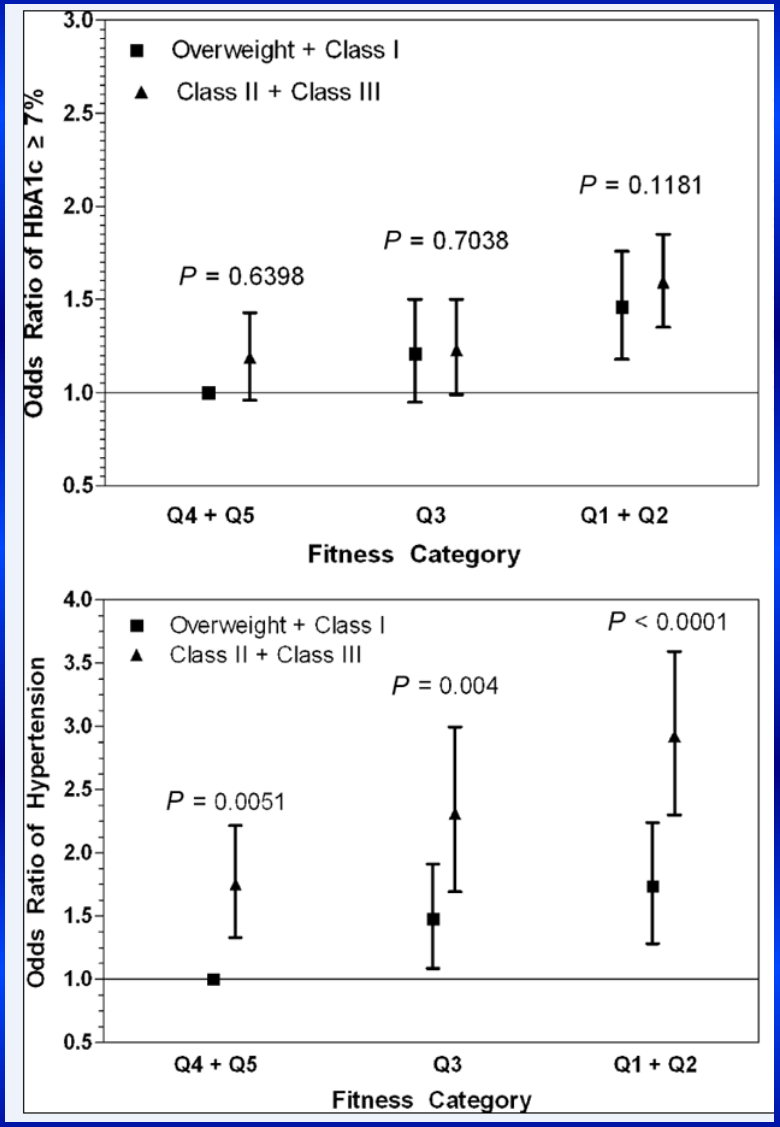


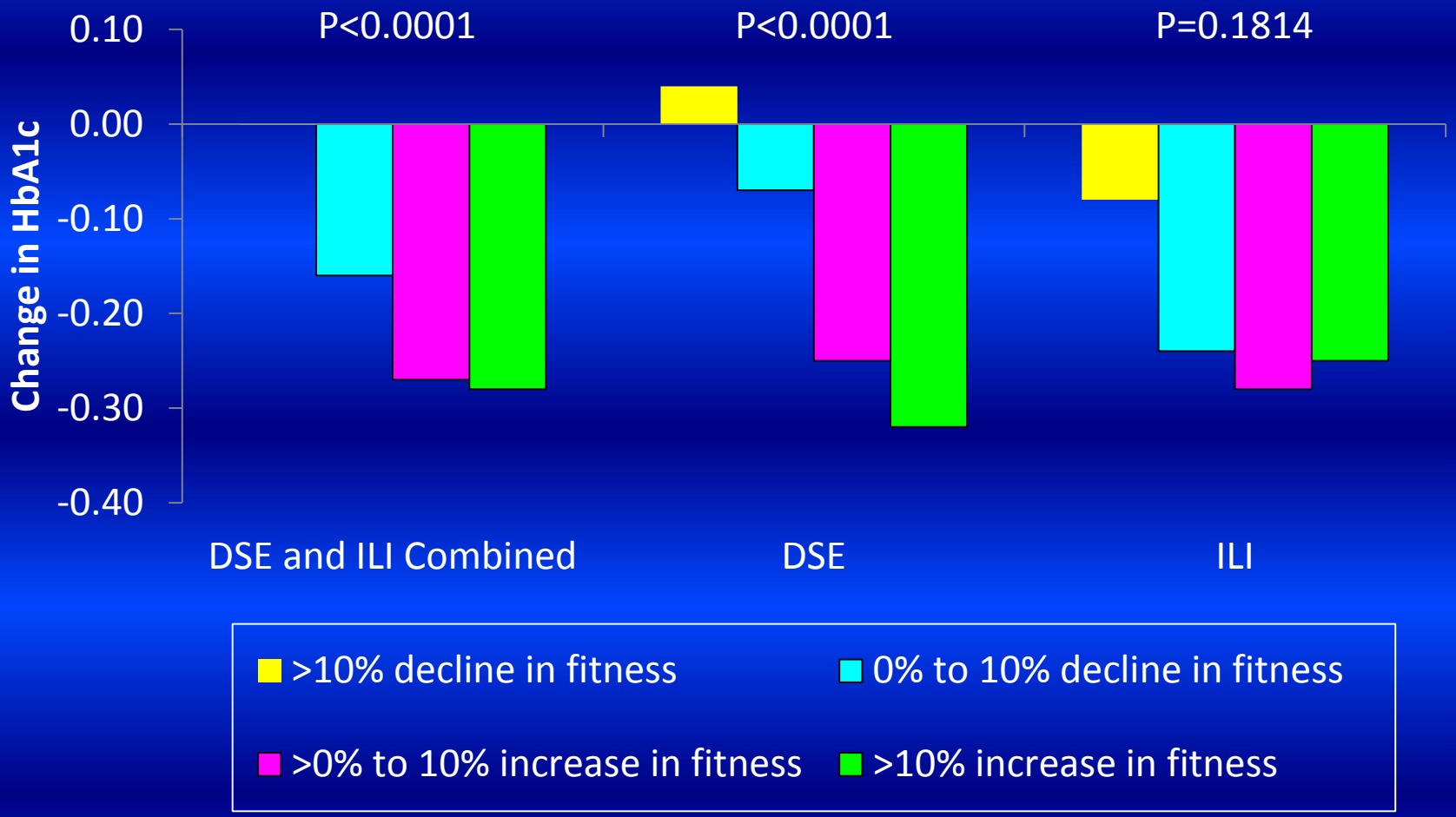
Should the Focus of Physical Activity on Health disregard the potential impact on body weight and adiposity?





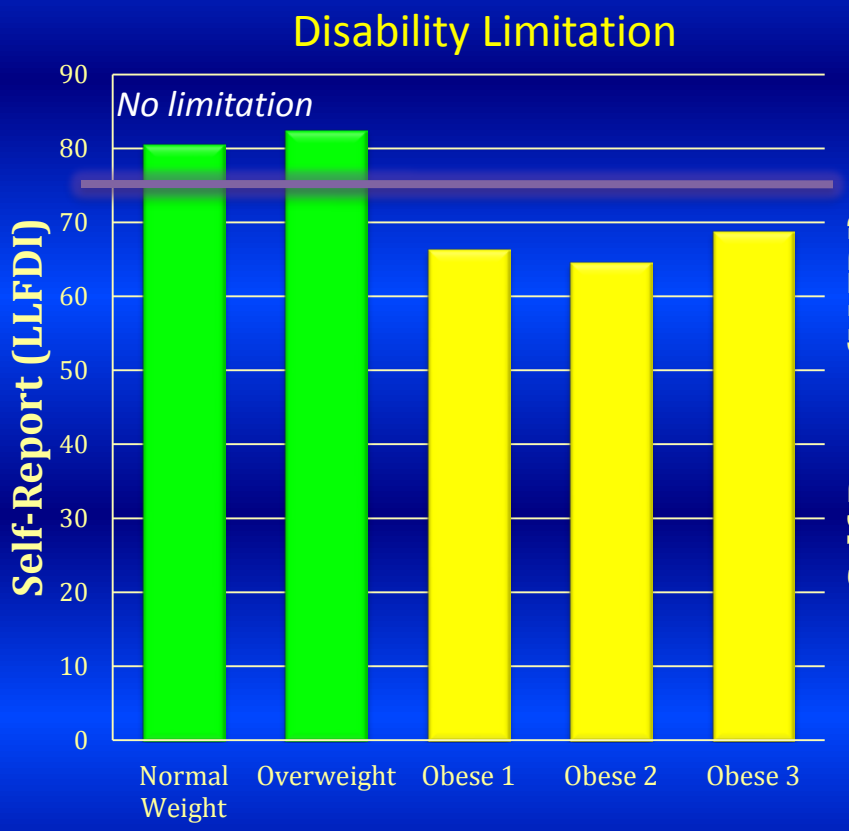
Wing RR, Jakicic JM, Neiberg R, Lang W, Blair SN, Cooper L, Hill J, Johnson K, Lewis C. Fitness, Fatness, and Cardiovascular Risk Factors in Type 2 Diabetes: Look AHEAD Study. *Med Sci Sports Exerc.* 2007; 39(12): 2107-2116.

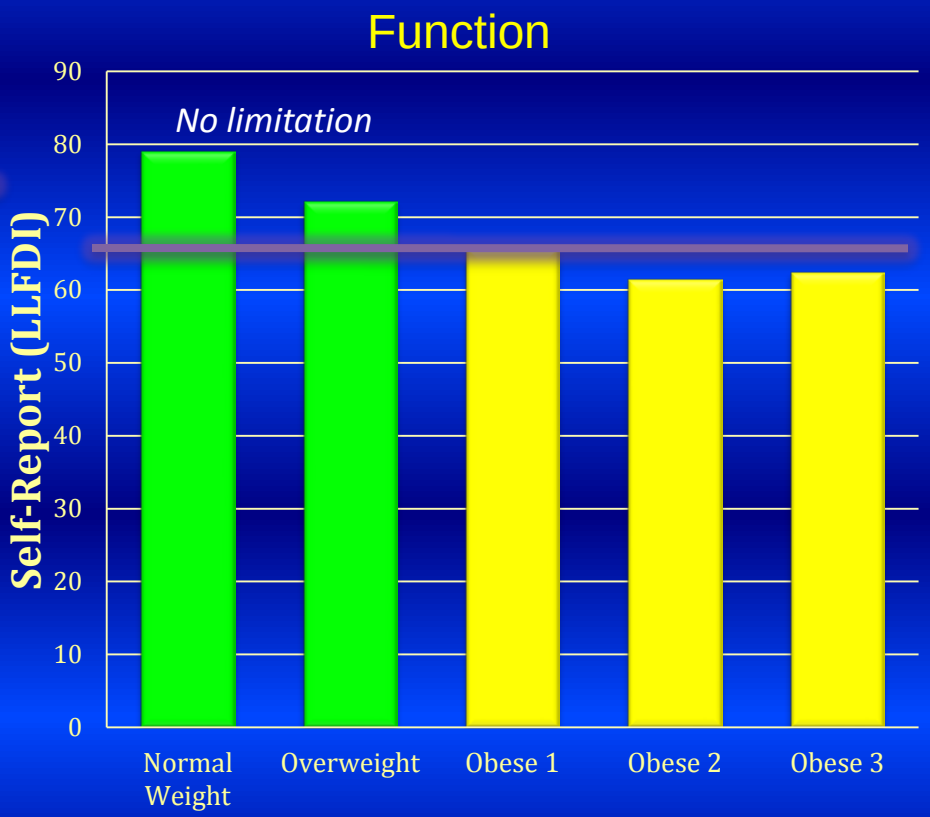
4-Year Change in HbA1c by 4-Year Percent Change in Fitness Adjusted for Age, Gender, Weight Change and Diabetes Medication Use



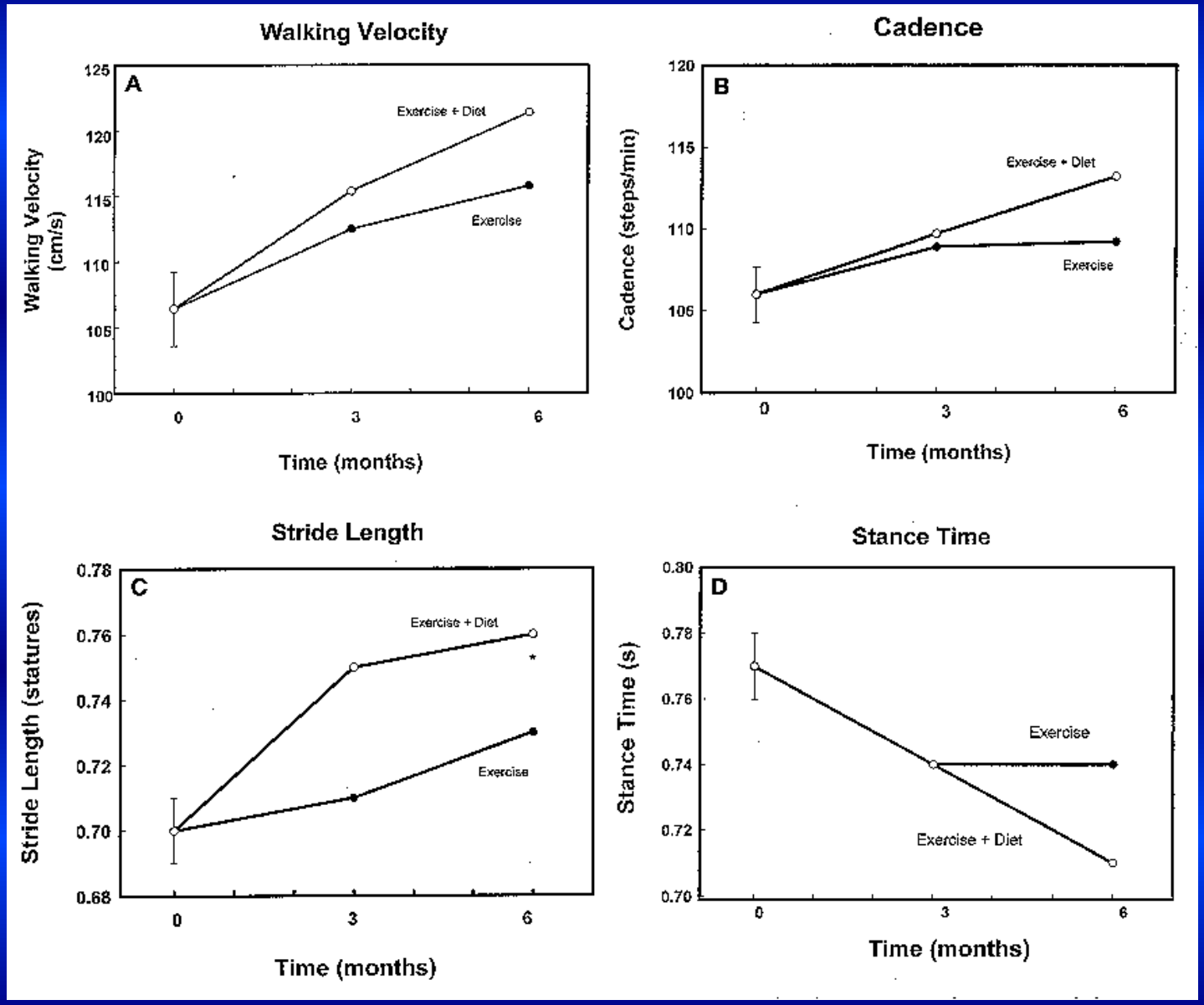
Jakicic JM, Egan CE, Fabricatore AN, Gaussoin SA, Glasser SP, Hesson L, Knowler WC, Lang W, Regensteiner JG, Ribisl PM, Ryan DH for the Look AHEAD Research Group. Four-year change in cardiorespiratory fitness and influence on glycemic control in adults with type 2 diabetes in a randomized trial: the Look AHEAD Trial. *Diabetes Care*. 2013; 36(5): 1297-1303. PMID: 23223405

Self-Report and Physical Function



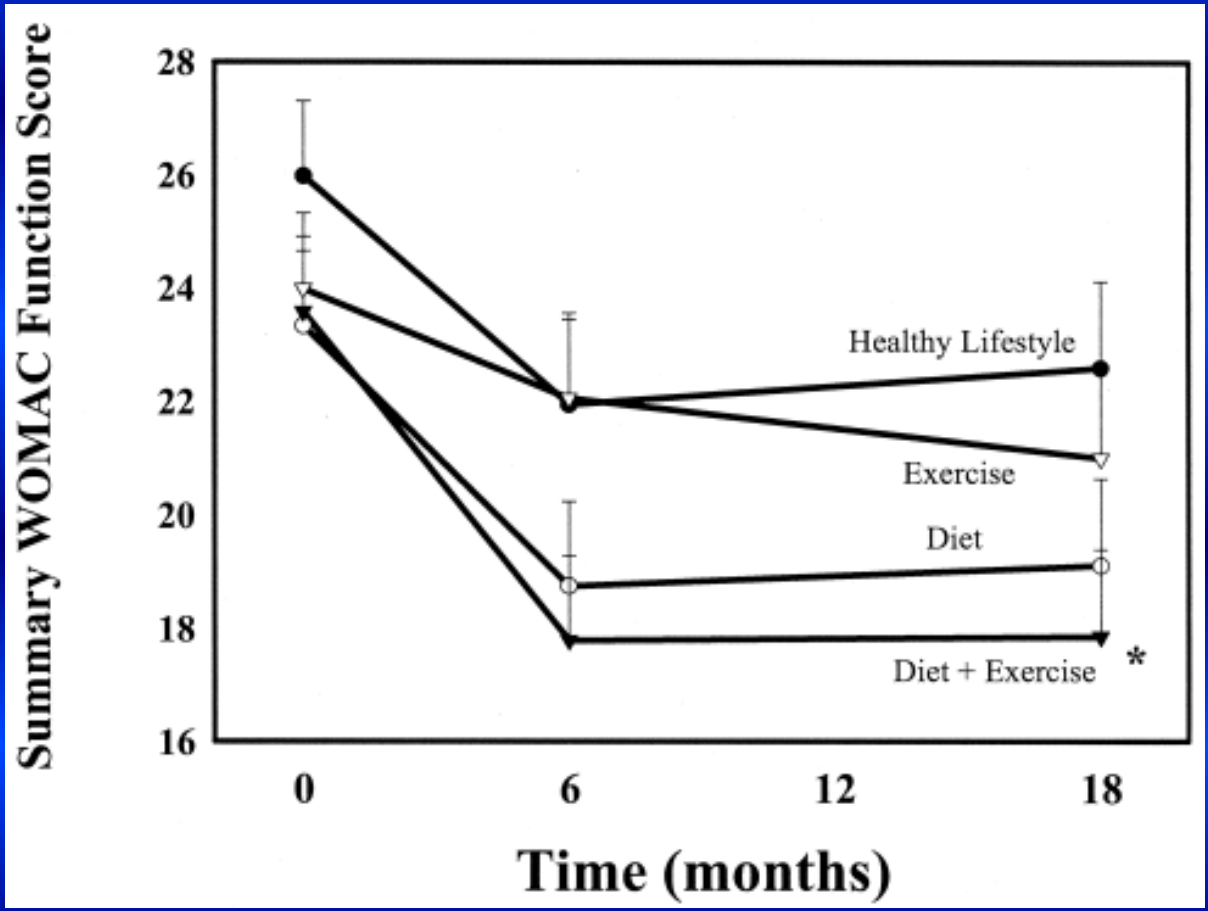


Hergenroeder AL et al, 2009



Messier SP et al. Exercise and weight loss in obese older adults with knee osteoarthritis: a preliminary study. JAGS. 2000

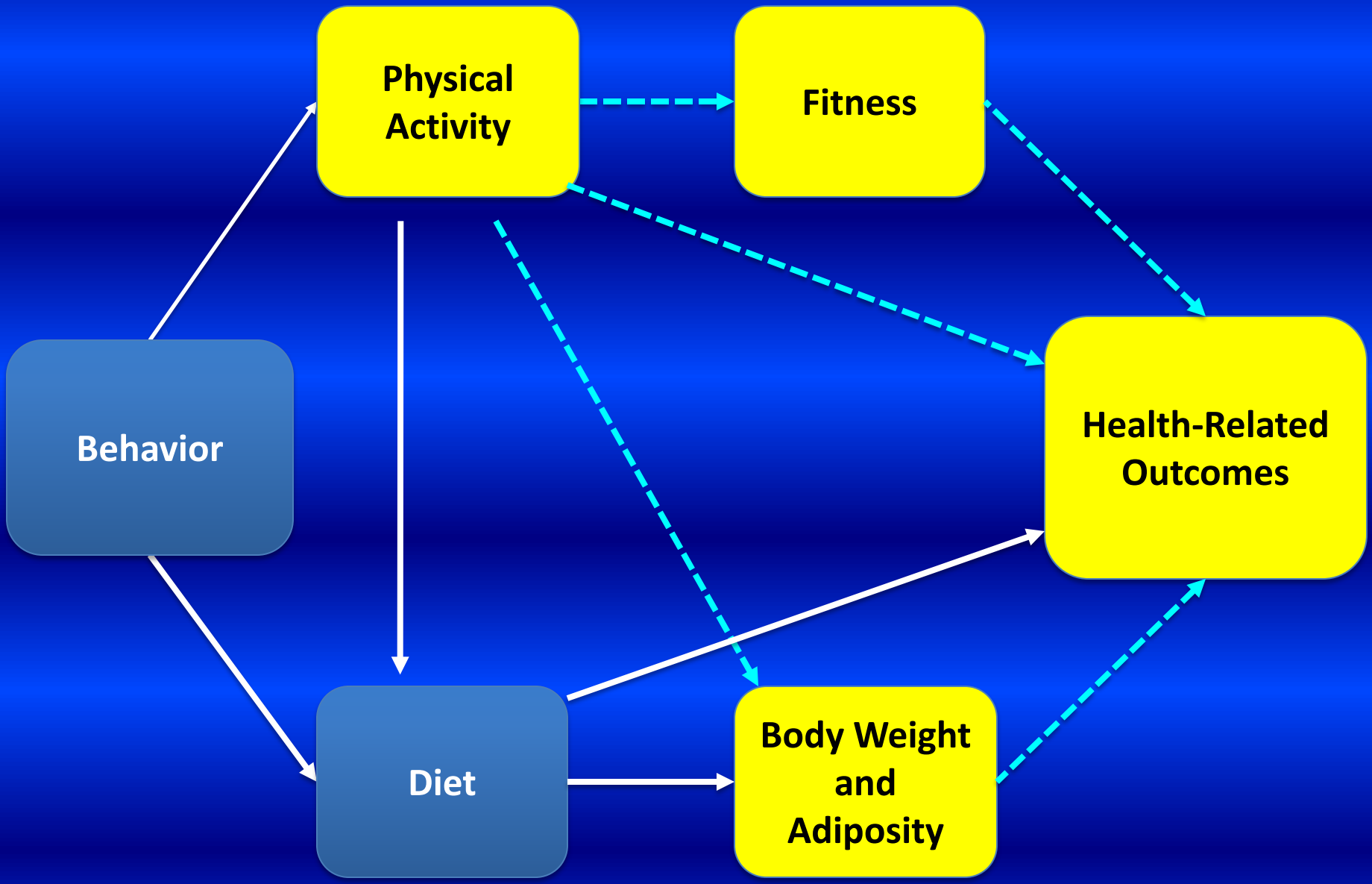
Weight Loss with Diet and Exercise in Older Adults with Knee OA



Mean ± SEM unadjusted Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) physical function summary scores across the 18-month intervention period. = $P < 0.05$, diet plus exercise group versus healthy lifestyle group.

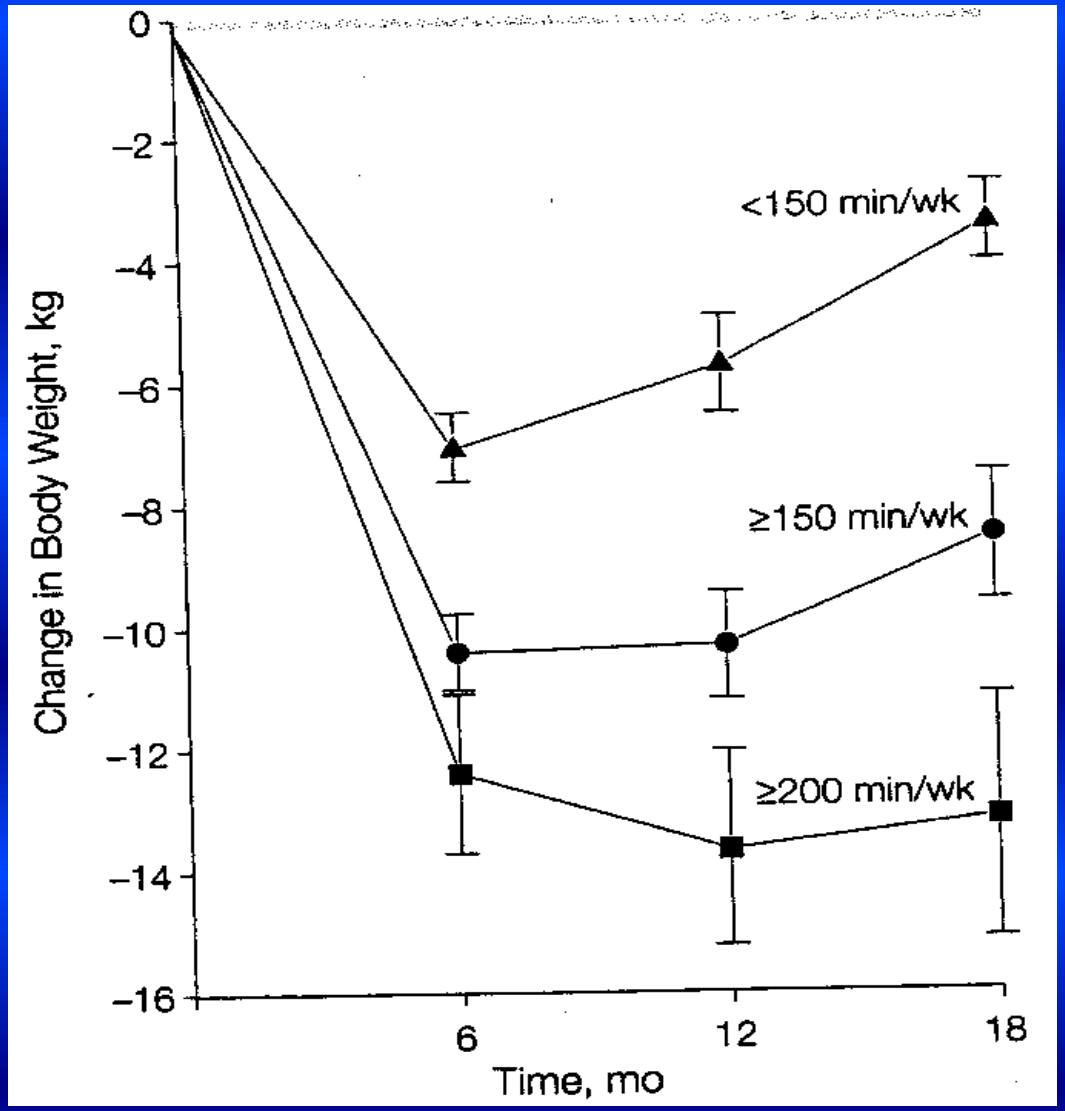
Messier SP et al. 2004

Pathway for physical activity to influence Health (including Body Weight)



What is the Long-Term Impact of Physical Activity in the Management of Body Weight?

Dose of Exercise and Long-Term Weight Loss



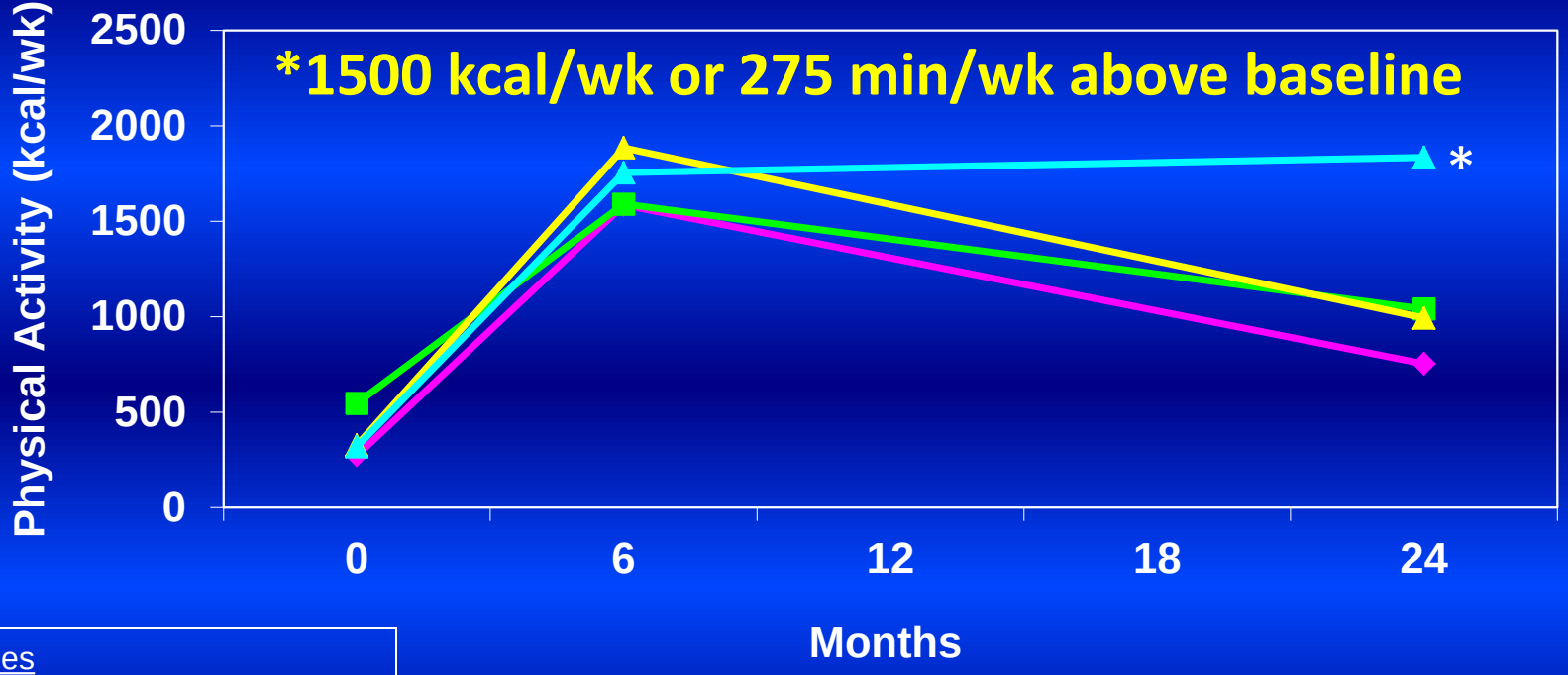
110 min/wk

175 min/wk

280 min/wk

Jakicic, et al. JAMA. 1999

Physical activity (0, 6, and 24 months) for categories of 24-month weight loss (N = 170).



P-Values
Group Effect = 0.09
Time Effect = <0.001
Group X Time Effect = ≤0.001

Jakicic, et al. Arch Int Med. 2008

What is the Long-Term Impact of Physical Activity in the Management of Body Weight?

OBJECTIVELY MEASURED PHYSICAL ACTIVITY

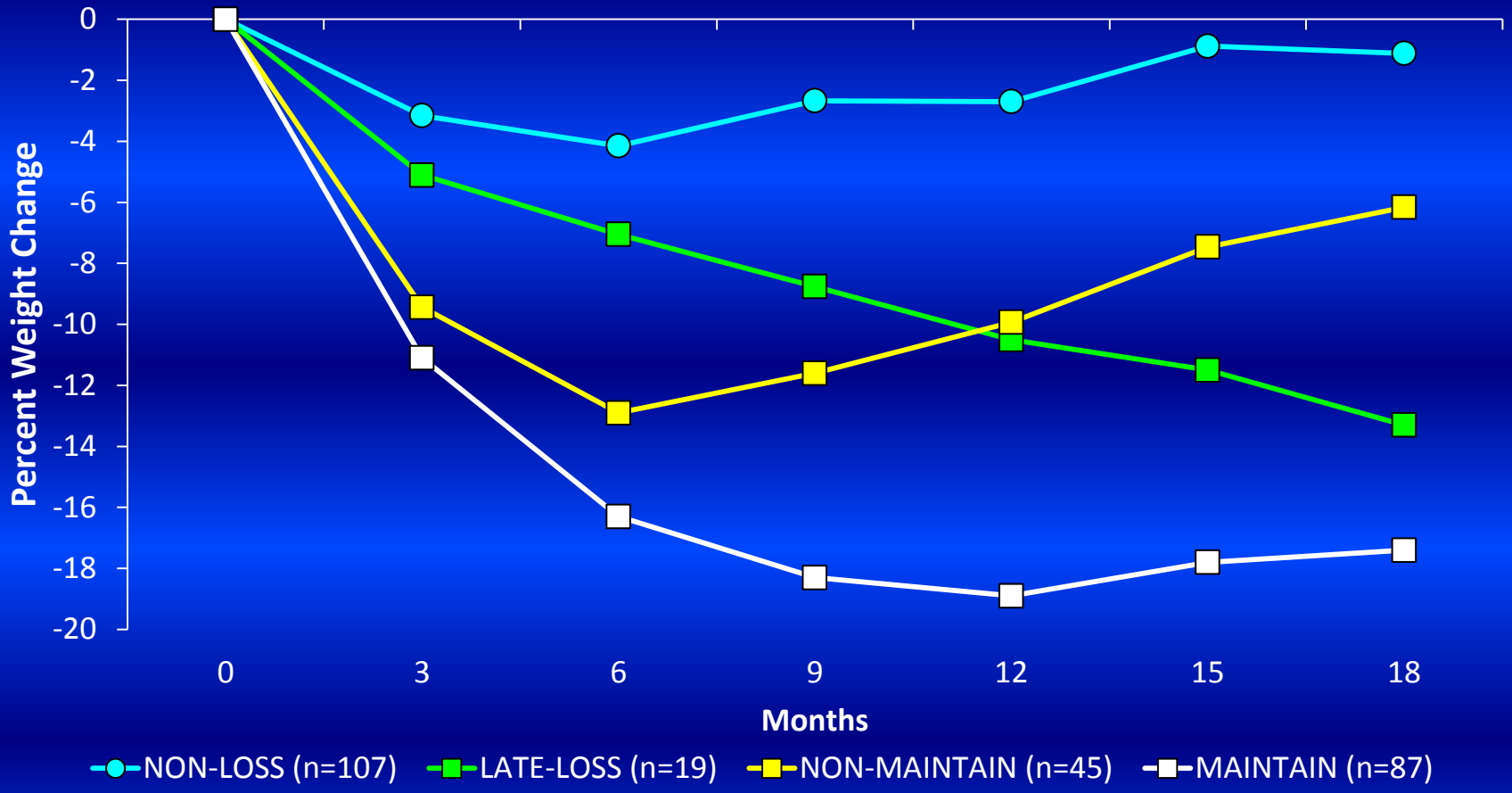
Subjects Grouped based on Weight Loss Achieved and Maintained

	≥10% Weight Loss at 6 Months	≥10% Weight Loss at 18 Months
Non-Loss (n=107, 41%)	No	No
Late-Loss (n=19, 7%)	No	Yes
Non-Maintain (n=45, 17%)	Yes	No
Maintain (n=87, 34%)	Yes	Yes

Jakicic et al. *Obesity*. 2014

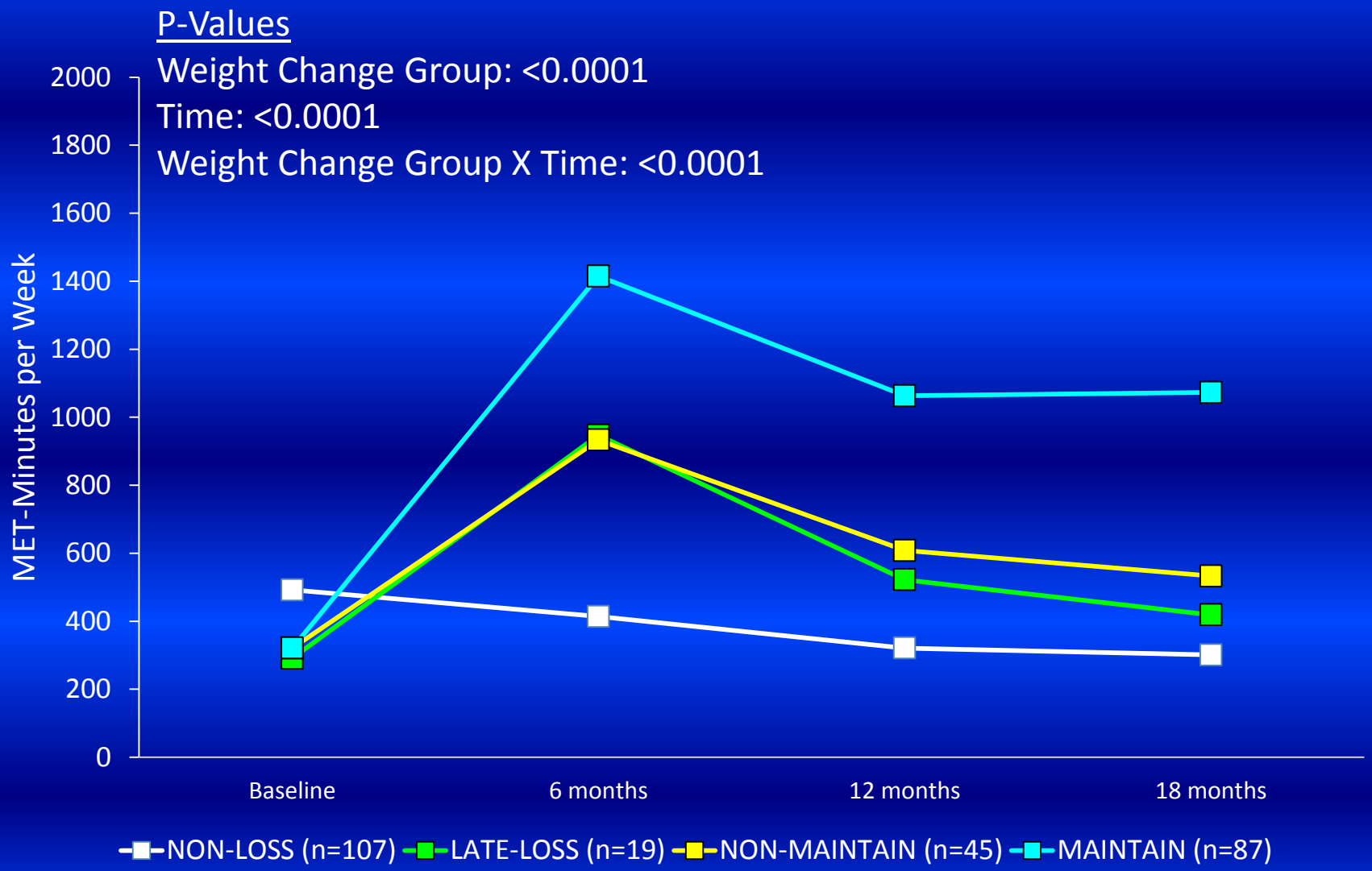
% Change in Body Weight by Group

P-Values
Weight Change Group: <0.0001
Time: <0.0001
Weight Change Group X Time: <0.0001



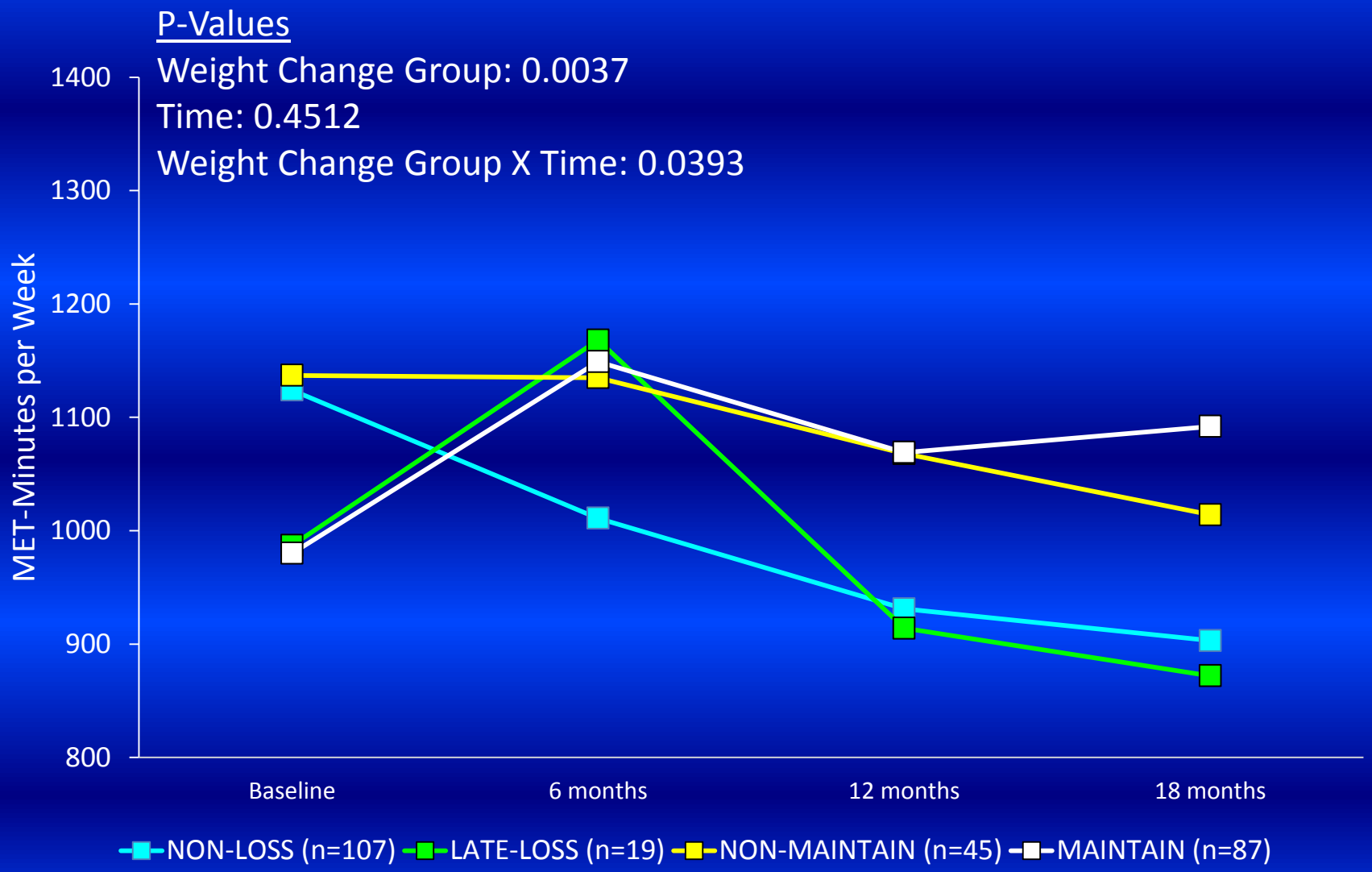
Jakicic et al. *Obesity*. 2014

Change in Moderate-to-Vigorous Intensity Physical Activity (bouts ≥10 minute in duration) by Weight Loss Pattern



Jakicic et al. *Obesity*. 2014

Change in Moderate-to-Vigorous Intensity Physical Activity (bouts 1 to <10 minute in duration) by Weight Loss Pattern



Jakicic et al. *Obesity*. 2014

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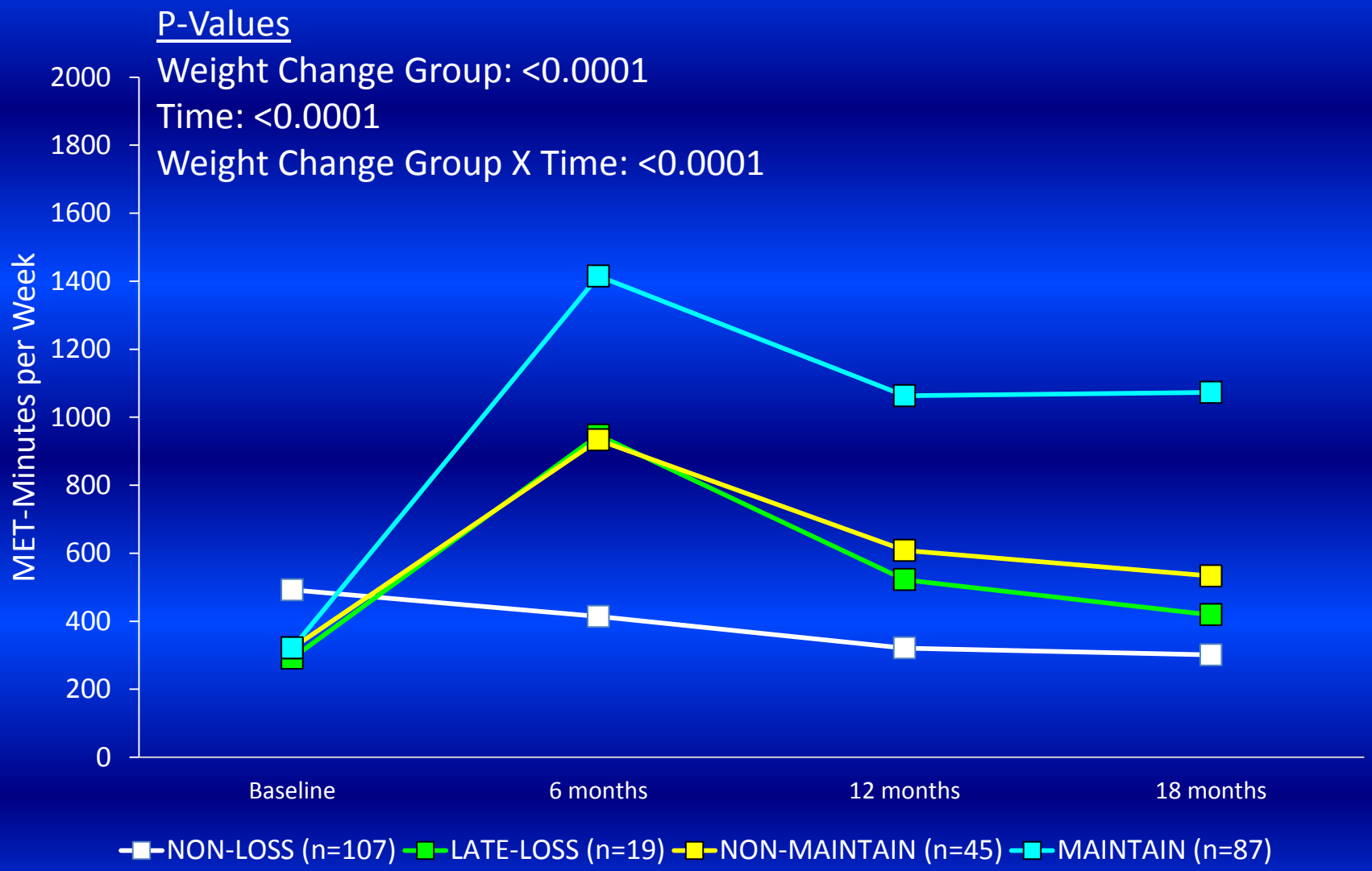
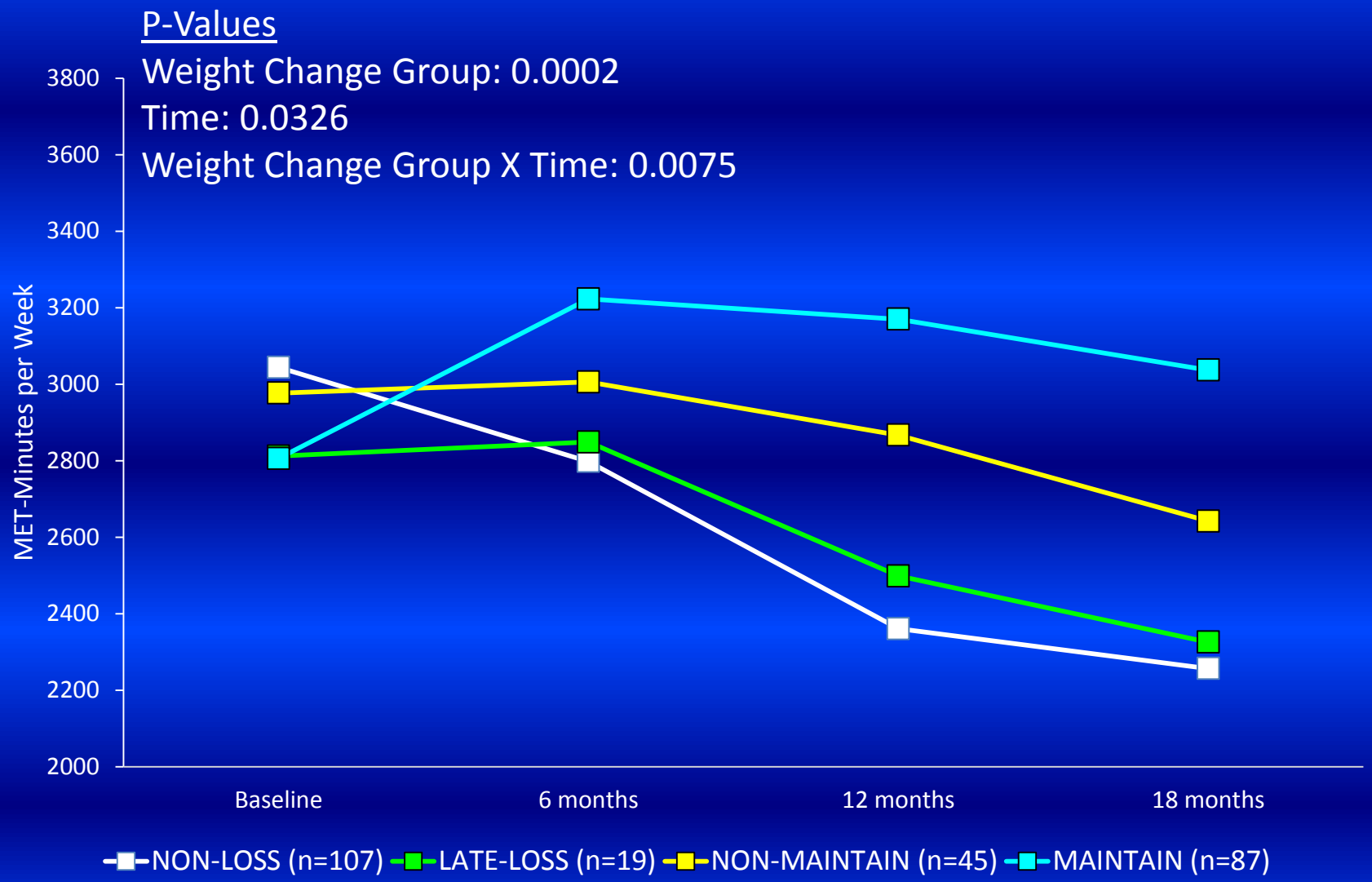


Jakicic et al. *Obesity*. 2014

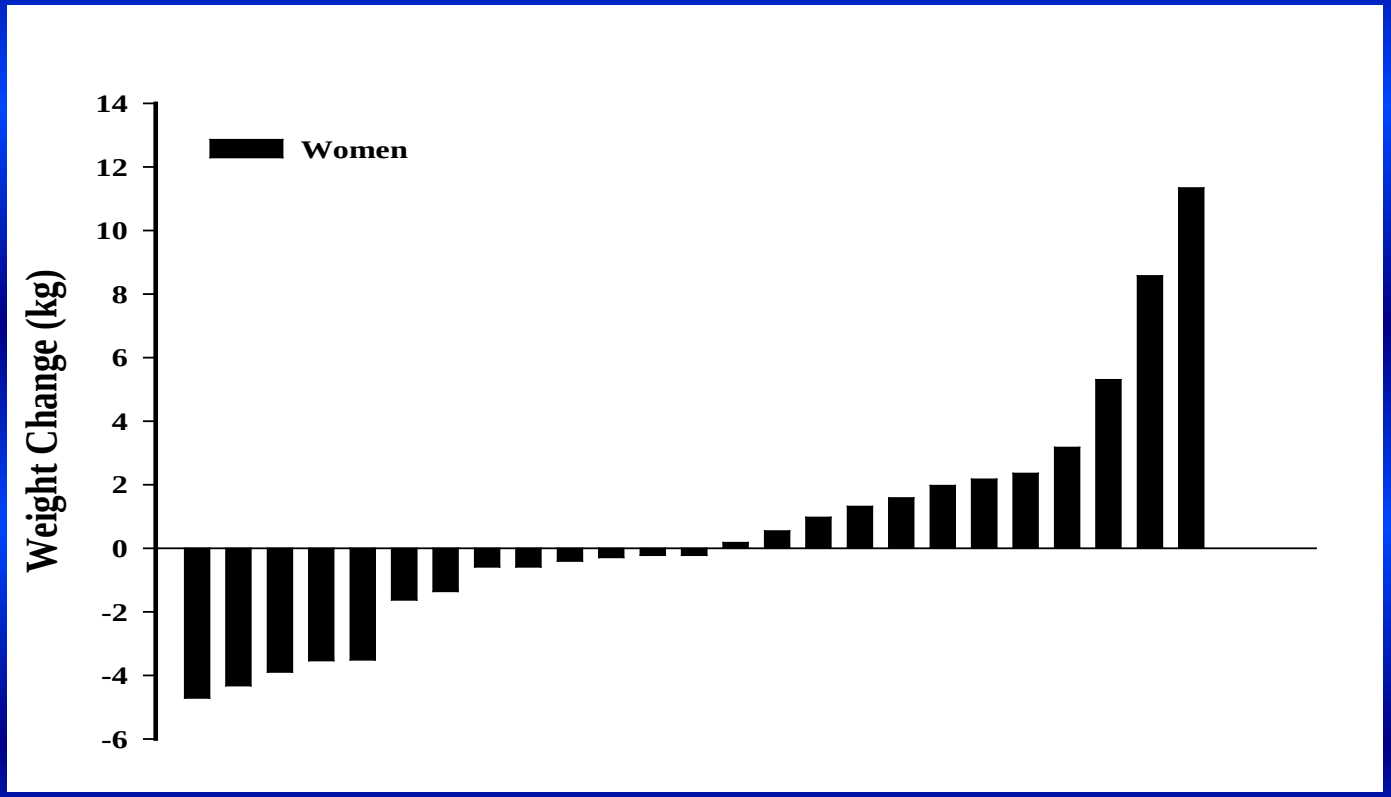
Change in Light Intensity Physical Activity by Weight Loss Pattern



Jakicic et al. *Obesity*. 2014

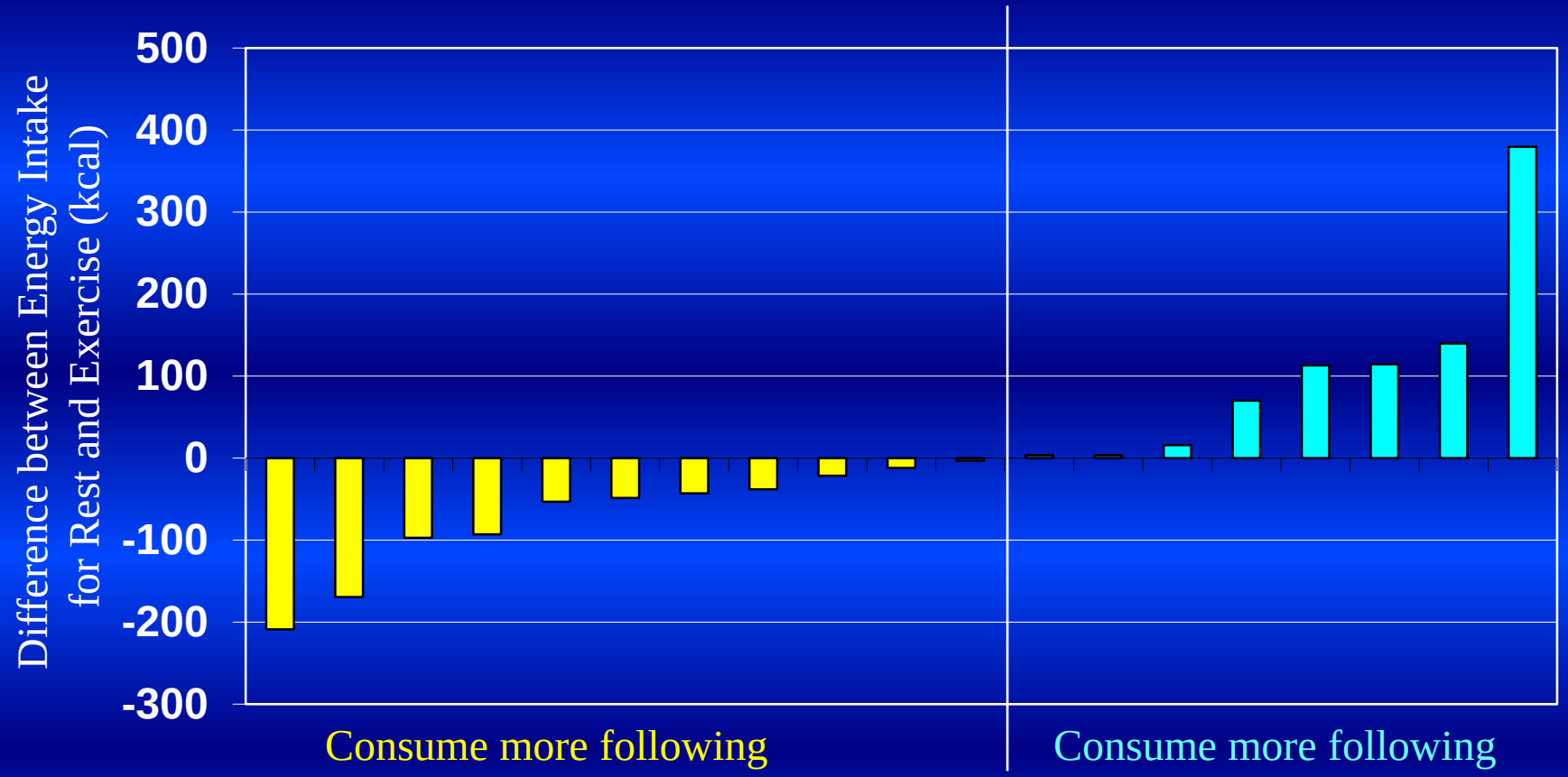
Weight Variability in Response to Physical Activity

Mid-West Exercise Study
Responders and Non-responders (Women)



Donnelly et al.

Difference in Individual Energy Intake Following Rest and Exercise



Adapted from Unick et al. *Appetite*

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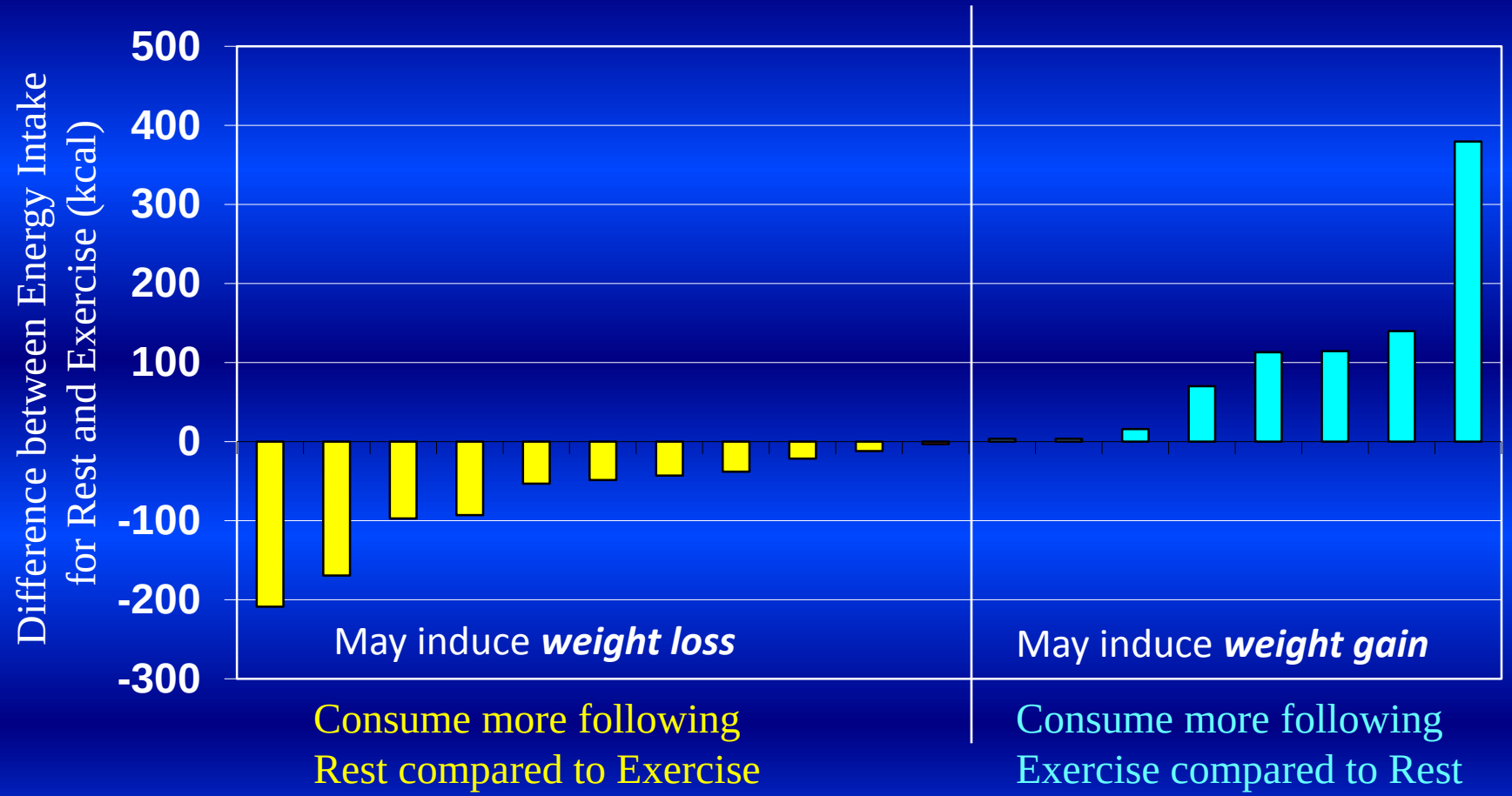

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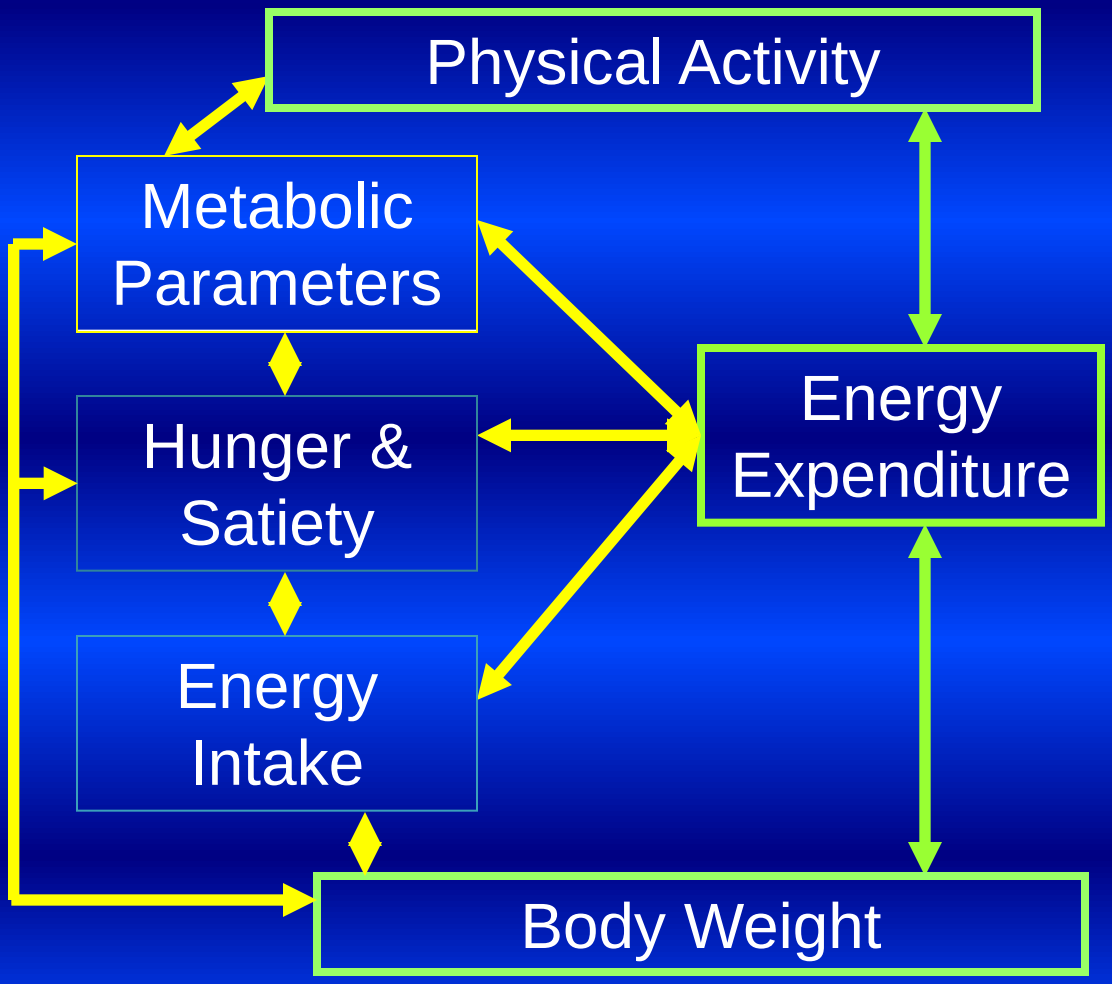
Potential Mechanisms through which Physical Activity Energy Expenditure Influences and Energy Intake and Body Weight



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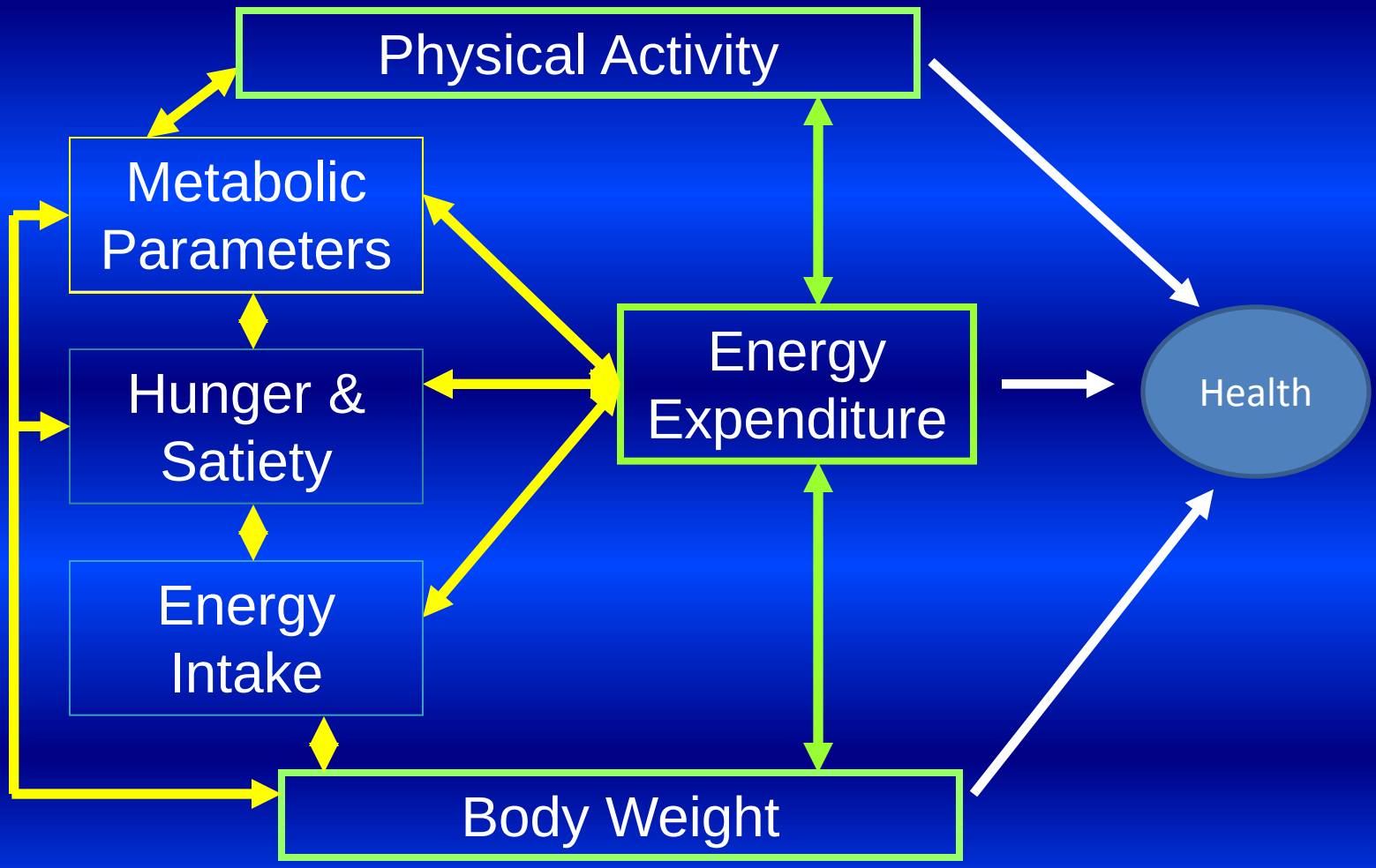


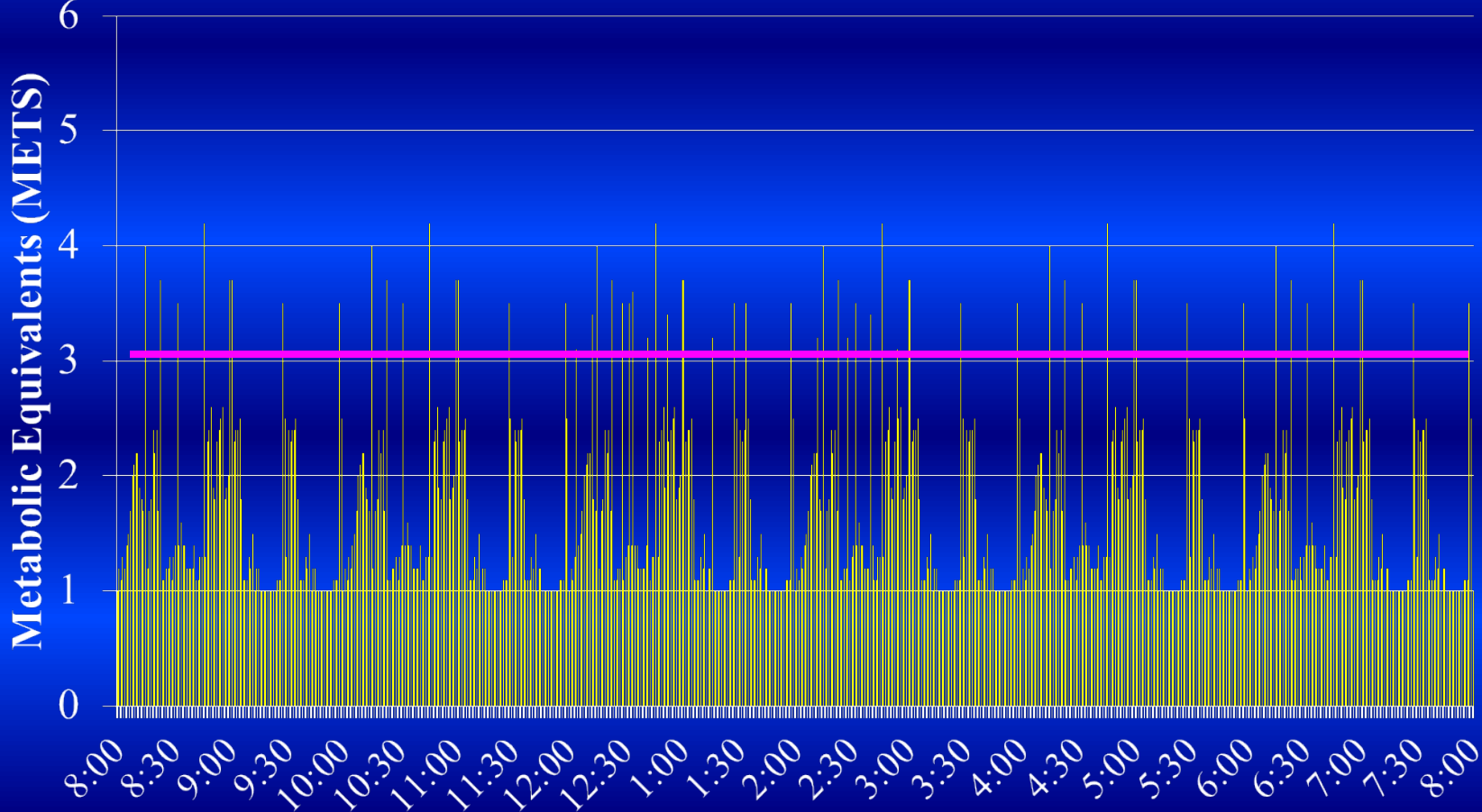
Are the “Dynamics” of Energy Balance Influenced by:

Total Daily Physical Activity and Energy Expenditure

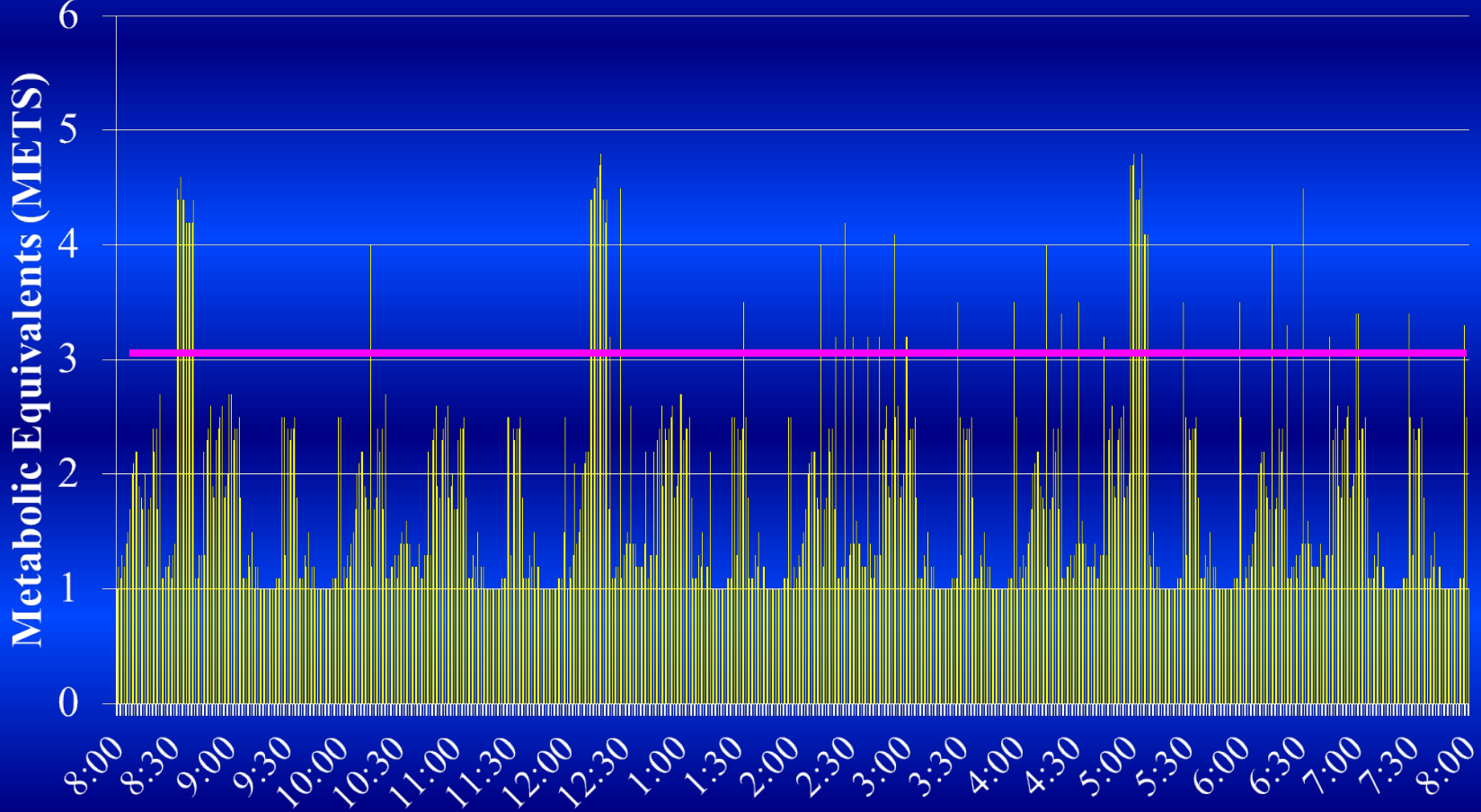
OR

The Pattern of Total Daily Physical Activity and Energy Expenditure?

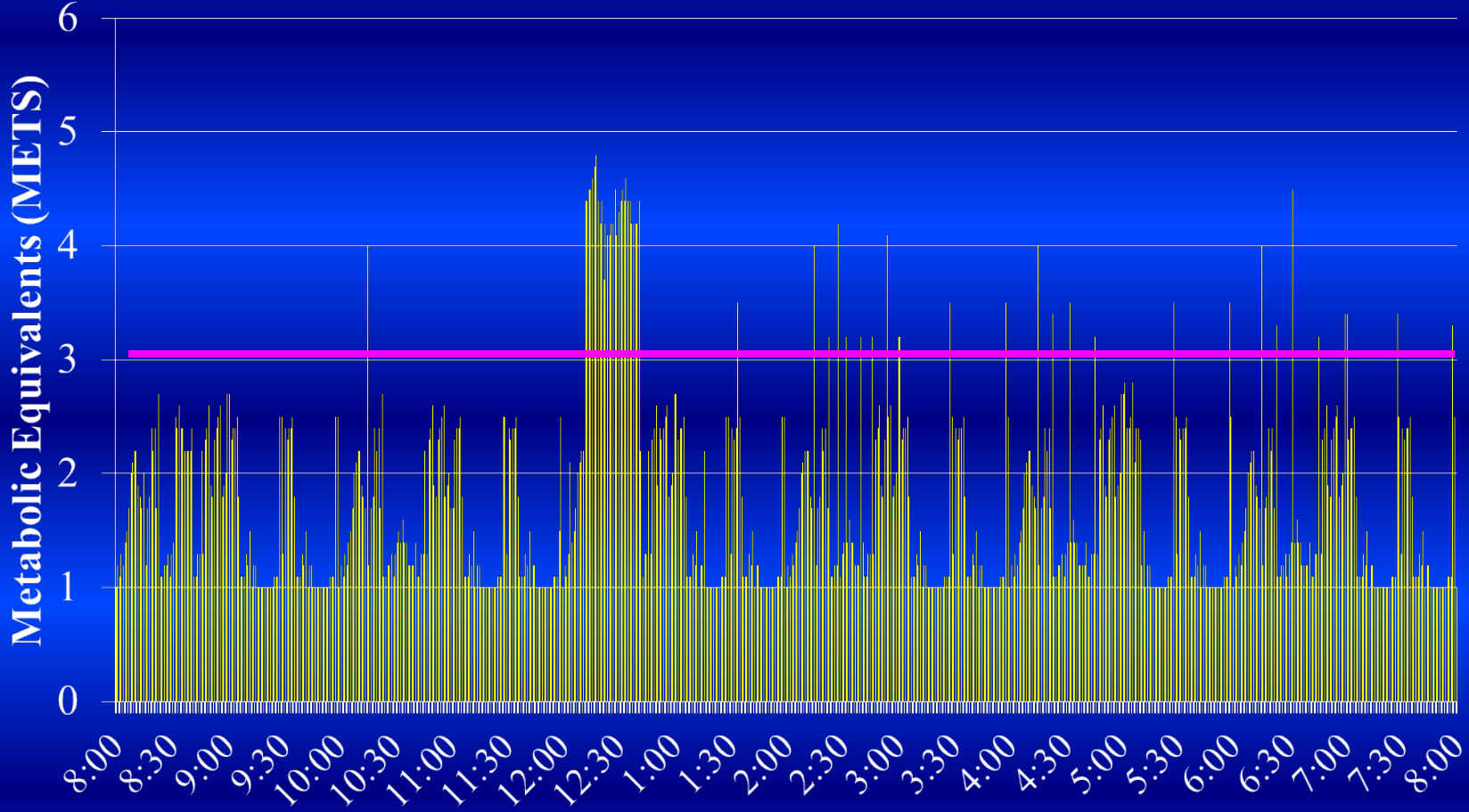
Energy Expenditure Pattern



Energy Expenditure Pattern



Energy Expenditure Pattern



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University of Pittsburgh

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National Institute for Digestive and Diabetes and Kidney Diseases
National Institute for Aging

Co-Investigators and Staff

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