Weight Loss and Weight Management: Current Theories and Best Practices

Presented by the
Western Region Public Health Training Center &
the Southwest Telehealth Resource Center
Welcome

WRPHTC region – Arizona, California, Hawai’i, Nevada, and the US Affiliated Pacific Island
SWTRC region – Arizona, Colorado, New Mexico, Nevada, and Utah
Fellow HRSA grantees
All other participants from the US & abroad
The purpose of the Weight Loss and Weight Management: Current Theories & Best Practices series is to explore and describe the components of a successful weight loss and management program for children and adults in family and community practice settings.
Learning Objectives

Upon completion of this presentation, the participants will be able to:

1. Identify the 3 levels of Physical Activity Guidelines that affect patients with obesity

2. Define NEAT and describe the difference and impact of moving from sedentary to light activity

3. List the Exercise Rx Top Ten
Criteria for successful completion:

- Attendance requirements
  - You must be present and logged into the webinar by 12:10 PM (Arizona time)
- Complete an online NURSING evaluation
  - Available online at: cne.nursing.arizona.edu/evaluations
- Deborah Horn has declared a financial relationship with Novo Nordisk, Takeda, Eisai. All other planners and presenters have no relevant financial relationships to declare.
Webinar Series

**Weight Loss and Weight Management: Current Theories & Best Practices**

This four session, interactive webinar series brings together national leaders in nutrition, exercise and bariatric medicine who will address what is needed to have a successful weight loss and management program for children and adults in family and community practice settings. The series will start with a presentation and discussion on dynamic energy balance, an important new perspective on what metabolic changes occur during weight loss and how these changes have to be taken into account as part of a weight loss program. The second session will focus specifically on exercise and energy expenditure and weight loss. The final two sessions will present pediatric and adult case studies to highlight the promoters and challenges that lead to successful patient care, in regards to weight loss and maintaining weight loss.
Webinar Tips & Notes

• Mute your phone &/or computer microphone
• Time is reserved at the end for Q&A
• Please fill out the post-webinar survey
• Webinar is being recorded
• Recordings will be posted on the SWTRC website (http://www.southwesttrc.org) and the WRPHTC YouTube channel (https://www.youtube.com/user/azphtc)
“Rethinking Energy Balance: Applying Science to Practice”

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**Board Certifications:** Preventive Medicine and Family Medicine

**Dual Master’s Degrees**

Exercise Physiology  
Public Health and Physical Activity
Weight Maintenance & Metabolic Health
Road Map

• “Results Typical”:
  The Guidelines for Physical Activity
  Setting your patient up for success!

• Physical Activity + Overweight/Obesity 101
  Quick tools to improve your approach to PA
  Mets and Obesity
  Anti-Sedentary Strategies
  Equipment and PA Tracking
  Winning with Muscle & Metabolism
5 Most Common Recommendations for PA

A. Wait until you are at your goal weight. Right now just focus on your diet
B. Walk 30 minutes per day 5 days per week
C. Take the stairs and Park your car farther away
D. Join a Gym
E. No Pain, No Gain

What’s your PA Rx for a patient with obesity?
How Much Physical Activity is Enough?

General Health Benefit
- Moderate aerobic exercise 150min/wk (About 30 minutes 5x/wk) + Strength Training

Prevent Weight Gain & Active Weight Loss
- 150-250 minutes per week
- 150-300 minutes per week

Prevention of Wt Regain
- 200-300 minutes per week
- 300-420 minutes per week

Success & Physical Activity

Change in Weight (kg) vs. Time (months)

Concomitant Behavior Therapy
- Weekly
- Biweekly
- Monthly

- ≤150 min/wk
- ≥150 min/wk
- ≥200 min/wk

*P<0.05

Look AHEAD Year 4: Success & PA

4-5 Mets for 60-70min/d  
Or  
Approx 420min/wk

Wadden TA. Obesity. 2011.
Does Exercise Improve Weight Loss after Bariatric Surgery?  
A Systematic Review

Kristine Egberts  Wendy A. Brown  Leah Brennan  Paul E. O’Brien

- 17 Observational Studies
- 3.62 kg greater mean wt loss
- 2.3x greater odds of unsuccessful wt loss if ↓ PA after surgery
- PA repeatedly an independent predictor of weight loss

Next Steps

- FFM preservation
  - (RYGB 31%, BPD 26%, Band 18% loss of FFM)
- Self reported questionnaires
- RCTs needed
- Optimal Rx unknown*

Excellent Review: King and Bond. Exerc Sport Sci Rev., Vol 41(1) 2013
Physical Activity Recs & Bariatric Surgery

**Pre-op**

ASMBS: Mild exercise  
20min/d, 3-4d/wk

AHA: Low-Moderate intensity  
PA at least 20 min/d, 3-4d/wk

**Post-op**

ASBMS/TOS/AACE:  
At least 30 min/d

IOM, HHS, ACSM, IASO: All agree that 150min/week is insufficient for the prevention of weight regain.

250-420min/wk  
60-90min/day

ASMBS/ACSM expert panel assembled to develop specific pre/post operative recommendations.


Only 22% of patients of Bariatric Surgical Centers accredited by the American College of Surgeons (ACS) Bariatric Surgery Center Network (BSCN) report having received postoperative exercise consultation.

Despite BSCN accreditation requirements to establish procedures for exercise counseling.

Exercise for Weight Maintenance

Physical Activity & Mets...What’s your intensity?
MET Categories

**Light** < 3 METs

Driving your automobile = 2

**Moderate** = 3-6 METs

Walking 4 mph, brisk pace = 5

**Vigorous** > 6 METs

Carrying 25-49pds upstairs = 8
Cardiorespiratory Fitness by Age & BMI

RPE Scale
Correlates with HR

Adapted from Borg RPE Scale
Gunnar Borg 1998
Physical Activity: Now or Later?

- Initial Activity > Initial Weight Loss
- At 12 mo., weight loss was similar.
- Physical Activity resulted in greater improvement in waist circumference and hepatic fat content

JAMA. 2010 October 27; 304(16): 1795–1802
Can we find more time to be active?

(2003–2006 NHANES survey)

3-8% of the day
Low frequency and volume in child and adult populations
Majority of studies on environmental and social influences have focused on MVPA

37-46% of the day

MVPA 0.4 hours
Light PA 5.7 hours
Sedentary 8.2 hours

46-59% of the day
Ubiquitous and high volume. New focus for research on environmental and social influences

MVPA 0.7 hours
Light PA 6.4 hours
Sedentary 6.5 hours

Youth (13-19yrs)

MVPA 1.1 hours
Light PA 5.2 hours
Sedentary 8.4 hours

Children (6-12yrs)

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Don’t just stand there……or maybe - Do!

Minimal intensity physical activity (standing and walking) of longer duration improves insulin action and plasma lipids more than shorter periods of moderate to vigorous exercise (cycling) in sedentary subjects when energy expenditure is comparable.
How can work spaces change?
Individual Strategies

**STAND UP**
- Set a timer (Outlook, Up, Phone)
- Stand up when someone enters the office or phone rings
- Stand up when someone else does

**SIT LESS**
- Predetermine “Standing Times” like after lunch, morning, last hour of day.
- Standing meetings

**MOVE MORE**
- Active lunch breaks
- Fill water bottle/pick up printing
- Use the stairs!
- “Let’s do a walk”
- Active transport errands
- Take a commercial break

**Think Outside the Treadmill**
- What interests you?
- Is there a way to make it less sedentary and more active?
- Can you do it and stand?
Engineering PA Back into Life
Realistic Resources
Low Risk, High Yield Physical Activity Tools
Chronic Disease Data Tracking

- Pedometers
- Accelerometers
- Smart Scales
- Data Tracking by phone/computer
- Platform Connectivity
Trainers/Physiologists

Highly Recommended:

- Graduate Level training
- ACSM, NSCA or ACE = Nat’l Certs
- CSEP Equivalents
- Subspecialized Certifications

Physical Therapists

- Key role in orthopedically complicated patients
- Revisit periodically
Expose Unexpected Barriers
Does your doctor visit look like this…….
In clinic, at home, on the road……
They will rise to the occasion!
Markers for Success

BMI

- Normal Weight: 18.5-24.9
- Overweight: 25.0-29.9
- Class I: 30.0-34.9
- Class II: 35.0-39.9
- Class III: ≥40

Percent Body Fat

- Essential Fat: W 10-13% M 2-5%
- Athletes: W 14-20% M 6-13%
- Fitness: 21-24% M 14-17%
- Acceptable: W 25-31% M 18-24%
- Obesity: W ≥32% M ≥25%

Waist Circumference Abdominal Obesity

- Men >40in (>102cm)
- Women >35in (>88cm)
Beyond BMI

- Weight, % Total Weight, % Excess Weight
- BMI
- Waist Circumference
- Body Composition
  - Percent Body Fat, Visceral Fat
  - Fat Free Mass or Skeletal Muscle Mass
- Edmonton Obesity Staging System
- Future Responder Biomarkers
Resting Metabolic Rate

- Regression Equations
  - Mifflin St Jeor – No more than +/- 10% in at least 70% of measurements
  - 9% overestimations, 21% underestimations
  - Horie-Waitzberg – specific to severe obesity

- Indirect Calorimetry
  - Inexpensive
  - Non-Invasive
  - Reimbursable

- Presurgical, Postsurgical intervals and at goal.

Horie et al Clin nutr 2008
www.an evidencelibrary.com
Main Influencers of FFM loss during calorie restriction

Heymsfield et al. Obesity Reviews 2014
Quarter FFM Rule

- “Approximately 1/4th of weight lost will be FFM.”
  - At best, quarter FFM is an approximation and appears to underestimate.

- Fat Free Mass loss is not constant but varies over time with larger changes observed earlier.
  - Diet related weight loss body composition differed between early and later phase of food restriction.

- Delta FFM/Delta W
  - FFM = majority in early phase (5-26 days)
  - FM = majority in late phase (300 days in patients with obesity)

- Initial FFM - The leaner the subject is the greater the FFM loss when placed in negative energy balance. (Forbes Rule)

Heymsfield et al 2011 and 2014
Keys & Brozek 1953
Grande 1961
### Moderators of Fat Free Mass

- **Physical Activity + no caloric restriction**
  - reduction in FM with no or small increases in lean tissues

- **Physical Activity + calorie restriction**
  - whether cardio or strength cuts FFM loss approximately in half.

- **Inactivity leads to FFM loss**

  **Low CHO**
  - < Low Glycemic
  - < Low fat

### Aging

- Disassociation of ΔFFM from ΔW in children with obesity during weight management and growth
- FFM loss = 1.5kg/decade
- “Considerable loss of FFM is expected...to attain the expected body composition at the lower BMI. 35-40% in men. 30-35% in women

Chaston et al 2006, 2007
Le Blanc et al 1992
Forbes et al 1999
Rapid weight loss results in significant FFM loss.

Increased FFM loss is related to negative clinical and nutritional outcomes.

Variation in tissue hydration and abnormal body geometry may affect results if using Bioelectrical Impedance
  - Overestimation of FFM
  - Underestimation of FM

Dexa Scans – gold standard, not feasible for repeated measures in clinical practice and table weight issues.

18% reduction in FFM following surgery places most patients in a state of cachexia.

Some researchers have reported that up to a 20% loss is “acceptable.

De Freitas et al reported that 20% of total weight lost following RYGB was FFM loss and corresponded to malnutrition.

Single frequency BIA is likely insufficient for monitoring Body composition changes in patients with obesity.

Ferreira et al. Nutrition 2013
Carey et al Obes Surg 2006
Waki et al AM J physiol 1991
Coppini et al Curr Opin Clin nutr Metabl Care 2005
Can we protect FFM during obesity treatment?

26yo male: 7 month Intensive Lifestyle Intervention + Anti-Obesity Medicine

- 37.4lbs = 13% TBW 32% EBW
- 0.9 lb of muscle mass loss = 2% of total weight loss was FFM.
- *25% FFM loss would have been >10x this.
Can we defend RMR & decrease visceral fat?

- 7 months of medical ILI + AOM.
- Initial RMR 2275kcal/d
- F/up RMR 2290kcal/d
- 25% reduction in Visceral fat.
Can we protect FFM during obesity treatment?

**Initial Body Composition**
- 58yo female: 11 month Intensive Lifestyle Intervention + Anti-Obesity Medicine
- 114 lbs = 43% TBW
- 110% EBW
- 5.5 lb of muscle mass loss = 4.8% of total weight loss was FFM.
- *25% FFM would have been 28.5lbs

**11 mo Follow-up Body Composition**
Can we protect FFM during obesity treatment?

- 11 mo of medical ILI + AOM
- Initial RMR 1973 kcal/d
- 7 mo RMR 1598 kcal/d
  58lbs of SMM
- 67% reduction in Visceral fat.
Physical Activity and Obesity
Treatment……

Constructing a whole new road!
Questions?

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Weight Loss and Weight Management Webinar Series

Next Webinar, Monday, October 12, 2015:

Pediatric Bariatric Case Study
Dr. Wendy Scinta
Medical Weight Loss of New York

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