Ralph La Forge

JUST MOVE AND MOVE OFTEN

HOW MUCH PHYSICAL ACTIVITY?
REALITIES OF PHYSICAL ACTIVITY AND EXPECTED BODY WEIGHT LOSS
HOW DO YOU GET THE PATIENT INVOLVED IN THE PLAN?
HOW ARE YOUR RECOMMENDATIONS IN CONCERT WITH NLA PART 1 & 2 RECOMMENDATIONS?
I have no disclosures
KEY POINTS ON PHYSICAL ACTIVITY AND WEIGHT LOSS

- ASSESS BASELINE PA: How physically active are you?
- How much physical activity for meaningful weight loss
- Weight loss vs fat loss
- Great Expectations: weight loss and exercise
- **Practical strategies to get your patients (and you) moving**
Physical activity vs. Fitness

Generalized physical activities irrespective of intensity

Total kcal/day/wk

Aerobic capacity “capacity and intensity driven”

Max VO2
How Physically Active Are You?

An assessment of level and intensity of physical activity

RAPA
### Rapid Assessment of Physical Activity

**Physical Activities** are activities where you move and increase your heart rate above its resting rate, whether you do them for pleasure, work, or transportation.

The following questions ask about the amount and intensity of physical activity you usually do. The intensity of the activity is related to the amount of energy you use to do these activities.

#### Examples of physical activity intensity levels:

<table>
<thead>
<tr>
<th>Light activities</th>
<th>Moderate activities</th>
<th>Vigorous activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- your heart beats slightly faster than normal&lt;br&gt;- you can talk and sing</td>
<td>- your heart beats faster than normal&lt;br&gt;- you can talk but not sing</td>
<td>- your heart rate increases a lot&lt;br&gt;- you can’t talk or your talking is broken up by large breaths</td>
</tr>
<tr>
<td>Walking Leisurely</td>
<td>Fast Walking, Aerobics Class, Strength Training, Swimming Gently</td>
<td>Stair Machine, Jogging or Running, Tennis, Racquetball, Pickleball or Badminton</td>
</tr>
<tr>
<td>Stretching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuuming or Light Yard Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>I rarely or never do any physical activities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do some <strong>light</strong> or <strong>moderate</strong> physical activities, but not every week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do <strong>light</strong> physical activity every week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do <strong>moderate</strong> physical activities every week, but less than 30 minutes a day or 5 days a week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do <strong>vigorous</strong> physical activities every week, but less than 20 minutes a day or 3 days a week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do 30 minutes or more a day of <strong>moderate</strong> physical activities, 5 or more days a week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do 20 minutes or more a day of <strong>vigorous</strong> physical activities. 3 or more days a week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do activities to increase muscle <strong>strength</strong>, such as lifting weights or calisthenics, once a week or more.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do activities to improve <strong>flexibility</strong>, such as stretching or yoga, once a week or more.</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

ID # ____________________________  
Today's Date ____________________
Scoring Instructions

RAPA 1: Aerobic

To score, choose the question with the highest score with an affirmative response. Any number less than 6 is suboptimal.

For scoring or summarizing categorically:

Score as sedentary:
1. I rarely or never do any physical activities.

Score as under-active:
2. I do some light or moderate physical activities, but not every week.

Score as under-active regular – light activities:
3. I do some light physical activity every week.

Score as under-active regular:
4. I do moderate physical activities every week, but less than 30 minutes a day or 5 days a week.
5. I do vigorous physical activities every week, but less than 20 minutes a day or 3 days a week.

Score as active:
6. I do 30 minutes or more a day of moderate physical activities, 5 or more days a week.
7. I do 20 minutes or more a day of vigorous physical activities, 3 or more days a week.

RAPA 2: Strength & Flexibility

I do activities to increase muscle strength, such as lifting weights or calisthenics, once a week or more. (1)

I do activities to improve flexibility, such as stretching or yoga, once a week or more. (2)

Both. (3)

None (0)
Based on known therapeutic effects of habitual physical activity, ACSM makes the following recommendations regarding exercise prescription of persons who are: overweight or obese: *

**Primary activity:** aerobic exercise

**Intensity:** 40-60% aerobic capacity (V02R)

**Frequency:** 5-7 days a week

**Duration:** 30-60 min/day and progressing to 300 minutes/week of mod. Intensity PA

* This amount of physical activity is consistent with recommendations for long-term weight control: 200-300 minutes/wk mod. PA or ≥ 2,000 kcal/wk. This volume may be accumulated with repeated exercise bouts of ≥ 10 minutes.
Public Health vs. Weight Loss Physical Activity Recommendations

**Public Health:**
150 minutes/week = 30 min/day x 5 days/wk

~1000 – 1,500 kcal/wk  (20-30K+ steps/wk)

**Weight Loss:**
200-300 minutes/week = ≥60 min/day x 5 or more days/wk

~2,000 – 3,000 kcal/wk  (40-60K+ steps/wk)

ACSM/AHA Public Health Guidelines 2007
ACSM Exercise Weight Loss Statement 2009
LaForge ACE MES Manual 2014
<table>
<thead>
<tr>
<th>Day</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>30-min walk (or 7 4-min walks at work)</td>
</tr>
<tr>
<td>Wednesday</td>
<td>30-min walk (or 7 4-min walks at work)</td>
</tr>
<tr>
<td>Friday</td>
<td>30-min walk (or 7 4-min walks at work)</td>
</tr>
</tbody>
</table>

1 weekend day: 2.5 hr+ *variable terrain walk-hike* (incorporate hills or rolling terrain)

**TOTAL weekly time:** 200 - 300 minutes or 2000-3000+ kcal, or ~40,000++ added pedometer steps/week*

* Think: ~100-120 or more calories (kcal) per walking mile – heavier people expend more calories per mile. Also think approximately 2000 steps per mile
Body weight loss and body fat loss are not the same thing
Anthropometric Measures
(skinfolds and waist circumference)

Lange calipers

Gulick tape
The most reliable skinfold site for reflecting changes in adiposity, including abdominal visceral adiposity, is the **subscapular** site with the tricep as an alternate site

Bray 1978  
Mensink 2003
Increasing physical activity can significantly reduce abdominal adipose tissue (including waist circumference) and improve insulin sensitivity without significant changes in body weight and/or BMI

Pandey A. Diabetes Care 2015;38:1494
Yates T et.al. Diabetes Care 2009;32:1404,
Velthuis MJ et.al. Menopause 2009;16:777
van der Heijden et.al. J Clin Endo Met. 2009;94:4292
Carey AL et.al. Exercise Mimetics, Diabetologia, 9/09
Hansen D Diabetologia 2009; 52:1789–1797
Despres JP SYNERGIE Trial EAS 2008
Misra A et.al., Diabetes Care 2008;31:1282-1287
Ekelund, U et.al. Diabetes Care 2007;30:2101
Dekker M Metabolism 2007;56:332
DiPietro L et. al. JAP 2006
Lee SJ & Ross JAP 2005;99:1220
Duncan GE Diabetes Care 2003;26:557
Ross R et.al. Relat Met Dis 2003;27:204
Mourier A et.al. Diabetes Care 1997;20:385
✔️ A large amount of evidence shows that exercise provides the best prevention and treatment for insulin resistance and type 2 diabetes

Hamilton 2014
Goodpaster 2003
Hawley 2004
Hooumard 2004
Helmrich 1991
Kraus 2004
Ross 2004
Laakosen 2005
Schulze 2005
LaForge 2006
Short 2003
Thyfault 2009
Slentz 2011
Chae 2012
Sluik 2012
Two key reasons we don’t lose the weight that we think we should in response to physical activity
**Net vs. Gross Caloric Cost of Physical Activity**

20-minutes of ADL ~ 25-30 kcal

20-minute 3 mph walk (1 mile) ~ 80-90 kcal

Net difference = ~ 50-60 kcal/mile

* At moderate walking speeds the *net* energy cost for walking one mile is ~60% of the gross cost
Variables That Determine Total Net Energy Expenditure in Response to an Exercise Program

**Energy Compensation**

Increased food intake (CHO, beverages) as a result of appetite stimulation

**Energy Conservation**

Decreased spontaneous physical activity as a result of “decreased energy”
“The modern world makes it very easy to out-eat exercise, and nearly impossible to out-exercise excessive eating”

David Katz
Yale University Prevention Research Center
1 scone = 140 - 500 calories
5-10 minutes
= 1.4 – 5 mile walk
25 – 90 minutes
Just move and move often!
Start by adding ~1000 kcal of physical activity per week

This is equivalent to ~9-10 miles/week of walking or ~20,000 pedometer steps
What is ~1000 kcal of Physical Activity?
Assumes 150-170 lb body weight (heavier individuals expend more kcal)

10 miles of walking at ~3 mph *
2.5-3 hours of continuous exercise at ~55-65% of maximum effort level
Three 45-50 minute aerobics classes
3-hour hike over variable terrain with 10 lb backpack
3 hours of cycling at 10-12 mph
3 sets of singles tennis
3 miles of freestyle swimming (women)
2.5 miles of free-style swimming (men)

* Note that you don’t have to do the above activities all at once but you can spread each out over the course of a week
Variable Terrain Walking
Neighborhood Circuit

H

\(~300+ \text{ kcal}\)

1 mile

R. La Forge/2012
Multi-intensity continuous aerobic exercise session
REDUCE SITTING TIME
Workplace EE

5 min/hr X 7 hrs

35 min @ 3-4 kcal/min

2000-2500 steps

100 – 140 kcal/day
(insulin sensitization – e.g., 10-15 mg metformin)
Systematic pedometry

Count your steps!
At least 3,000 steps at moderate+ intensity, over and above daily activities.

- 12,500+ steps/day: Highly Active
- 10,000-12,499 steps/day: Active
- 7,500-9,999 steps/day: Somewhat Active
- 5,000-7,499 steps/day: Low Active
- 2,500-4,999 steps/day: Limited Activity
- <2,500 steps/day: Basal Activity

Graded Step Index
Adapted from Tudor-Locke and Bassett, 2004 and Tudor-Locke et al., 2009

Pharmacology of Pedometry

Metformin (Glucophage)
Each step

**Liver**
- Increases Fatty Acid Oxidation (Ketogenesis)
- Decreases Cholesterol Synthesis
- Decreases Lipogenesis

**Skeletal Muscle**
- Increases Fatty Acid Oxidation
- Increases Glucose Uptake

**Pancreatic Islets**
- Modulates Insulin Secretion

**Adipocytes**
- Decreases Lipogenesis
- Decreases Lipolysis
Daily Step Rx:

6,000  3-5 yrs
10,000 Adults
12,000 6-19 yrs

"Every step you take
I'll be watching you."

- Sting

Colley R Med Sci Spts Ex 2012;44977
Prescription Form – Exercise Pedometry

Rx for Outpatient Exercise Pedometry

Patient name: ___________________________ Date: ___________________________

Therapeutic code: ___________________________

Order for following patient physical activity pedometer:

☐ Pedometer: Eagle 2720 pedometer

Rx: steps/day _____ steps/week/month _____ / _____

Other Rx: ___________________________

Patient instructions: See attached physical activity and pedometer guidelines

_________________________________________ M.D.

Referring provider/physician
Diverse types of daily physical activity
✓ Utilitarian-domestic activities add energy expenditure and reduce risk

Yardwork
Gardening
Housework
Painting, cleaning, shoveling, scrubbing, washing
Repair work
ADL’s
Diverse types of moderate exercise is also associated with lower incidence of diabetes and CVD mortality.

This includes such utilitarian activities as walking, gardening, climbing, and household/yard chores. Those who expend 1000 - 1500 kcal per week in such utilitarian activities may require very little additional exercise to lower diabetes and CVD risk.

Lakka TA. Et.al. NEJM 1994;330:1549
Fransson E. et.al. Scan J Pub Health 2003;31:324
Meisinger C et.al. Diabetologia 2005;48:27
Marcus B et.al. Circ. 2006;114: 2739
Holme I et.al. BMC Public Health 2007, 7:154
Household-Community Circuit Rx

- 2-minute rest/water break between stations
- Always start and end session with warm-up/cool down exercise as prescribed
- Do not continue exercise or go the next station if you experience chest discomfort, palpitations, dizziness or unusual fatigue

20 - 90 minutes

Name
Date
Rx:

R. La Forge/2012
The Gym Inside Your Door

Utilitarian household and yard chore circuit "workouts" that can be systematically and creatively organized into one productive workout expending 150-500 kcal. Prediabetes and diabetes-centric focus.
Conclusion

Just move
and move often !