The Exercise Prescription

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The Benefits of Exercise

• Relieves stress and tension
• Reduces anxiety and depression
• Maintain stable weight
• Control appetite
• Increases energy
• Improves sleep
The Benefits of Exercise

• Decreases risk for diabetes, improved glucose tolerance, reduced insulin needs
• Decreases constipation
• Improved balance and coordination
• Improves flexibility and strength
The Benefits of Exercise

Cardiovascular

- Lowers blood pressure
- Increases HDL cholesterol
- Lower minute ventilation
- Lower myocardial oxygen demand
- Increase exercise threshold for angina, ischemic ST-segment depression, claudication

ACSM Guidelines for Exercise Testing and Prescription 2000
Physical Activity and incidence of chronic diseases

- All cause mortality***
- Coronary artery disease***
  - Obesity***
  - Hypertension**
  - Stroke***
- Type 2 Diabetes**
- Osteoporosis**

*Few Studies
**5-10 Studies
***>10 Studies
Physical Activity and incidence of Cancers

- Colon***
- Rectal***
- Stomach*
- Breast**
- Prostate***
- Lung*
- Pancreas*

*Few Studies
**5-10 Studies
***>10 Studies

ACSM Guidelines for Exercise Testing and Prescription 2000
Relative Benefits of Interventions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking cessation</td>
<td>60%</td>
</tr>
<tr>
<td>Mediterranean diet</td>
<td>65%</td>
</tr>
<tr>
<td>Exercise/wt loss</td>
<td>50%</td>
</tr>
<tr>
<td>BP control</td>
<td>42%</td>
</tr>
<tr>
<td>Lipid control</td>
<td>25%</td>
</tr>
<tr>
<td>ASA</td>
<td>25%</td>
</tr>
<tr>
<td>Beta blocker for MI</td>
<td>18%</td>
</tr>
<tr>
<td>Tight BS control in DM</td>
<td>???</td>
</tr>
<tr>
<td>Control of TG/HDL</td>
<td>???</td>
</tr>
<tr>
<td>Vitamin/HRT</td>
<td>0</td>
</tr>
</tbody>
</table>

Courtesy Bob Sallis, MD, FACSM, FAAFP
The Risks of Exercise
Cardiovascular

- 1 death /396,000 person hrs of jogging
- Acute MI 2-6 times higher at 6 mets
- 1 death/ 2.8 million person hours (YMCA)
- 1 cardiac arrest /2.2 million person hours (YMCA)
- 38 fatal and 30 nonfatal events per 33 million participant hours
The Risks of Exercise Testing

- Death during or immediately after ETT
  - <0.01%

- Risk of acute MI
  - <0.04%

- Risk of complication requiring hospitalization (MI, arrhythmias)
  - <0.2%
Risk of exercise

Time

Risk of cardiac arrest

Exerciser

Non-Exerciser

Exercise
Risk of exercise

- Injury
- Overuse
- Exposure
  - Sun, heat
  - Smog
  - Insects/animals
  - Auto
  - Security
Who needs an evaluation?
Screening

• There are no guarantees

• ACSM Risk Stratification
  – Low—young*, asymptomatic, 1 or no risk factors
  – Moderate—older* or 2 or more risk factors
  – High—1 or more signs/symptoms, known CV, Pulmonary or metabolic dz

*45yo male, 55yo female

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Risk Factors

- Family history
- Cigarette smoker (within 6 months)
- Hypertension (>140/90 or on meds)
- Hypercholesterolemia
- Impaired fasting glucose
- Obesity
- Sedentary lifestyle
Signs and Symptoms

- Chest pain (or equivalent)
- SOB at rest or with mild exertion
- Dizziness or syncope
- Orthopnea or PND
- Ankle edema
- Palpitations or Tachycardia
- Intermittent claudication
- Know heart murmur
- Unusual fatigue or SOB with usual activities
## Recommendation for current medical exam (A) and physician supervision of ETT (B)

<table>
<thead>
<tr>
<th></th>
<th>Low Risk</th>
<th>Mod Risk</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(A) Exam</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>Not necessary</td>
<td>Not necessary</td>
<td>Recommended</td>
</tr>
<tr>
<td>Vigorous</td>
<td>Not necessary</td>
<td>Recommended</td>
<td>Recommended</td>
</tr>
<tr>
<td><strong>(B) ETT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submax ETT</td>
<td>Not necessary</td>
<td>Not necessary</td>
<td>Recommended</td>
</tr>
<tr>
<td>Max ETT</td>
<td>Not necessary</td>
<td>Recommended</td>
<td>Recommended</td>
</tr>
</tbody>
</table>

ACSM Guidelines for Exercise Testing and Prescription 2000
Definitions

- **Moderate** - 3-6 mets (brisk walk 3 to 4 miles/hour)
- **Vigorous** - > 6 mets
Think F I T T

- Frequency
- Intensity
- Type
- Time
Frequency

• Aerobic
  – 3 days a week to maintain fitness
  – 7 days a week to decrease weight

• Resistance
  – 2-3 times per week
Intensity

• Heart rate (traditional)
  – \((220) - \text{(your age)}\) = MaxHR
  – \((\text{Max HR}) \times (60\% \text{ to } 80\%)\) = training range %
Intensity

- **Heart rate**
  - \((220) - (35) = 185\)
  - \((185) \times (60\% \text{ to } 80\%) = 111-148\)
Intensity

- Heart rate (Karvonen)
  - (220) - (your age) = MaxHR
  - (MaxHR) - (resting heart rate) = HR
- Reserve
  - (HRR) x (60% to 80%) = training range %
- (training range %) + (resting heart rate) = (your target training zone)
Intensity

• Heart rate (Karvonen) 35 yo with RHR of 60
  – 220 - 35 = 185 (MaxHR)
  – 185 - 60 = 125 (HRR)
  – 125 x .6 = 75 (60% training percentage)
  – 125 x .8 = 100 (80% training percentage)
  – 75 + 60 = 135 (target training zone)
  – 100 + 60 = 160 (target training zone)
Intensity

• Heart rate (Traditional)
  – 111-148
• Heart Rate (Karvonen)
  – 135-160
# Intensity

<table>
<thead>
<tr>
<th>Age</th>
<th>Target HR Zone</th>
<th>Average Maximum Heart Rate</th>
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<tbody>
<tr>
<td>20 years</td>
<td>100-150 beats per minute</td>
<td>200 beats per minute</td>
</tr>
<tr>
<td>25 years</td>
<td>98-146 beats per minute</td>
<td>195 beats per minute</td>
</tr>
<tr>
<td>30 years</td>
<td>95-142 beats per minute</td>
<td>190 beats per minute</td>
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<tr>
<td>35 years</td>
<td>93-138 beats per minute</td>
<td>185 beats per minute</td>
</tr>
<tr>
<td>40 years</td>
<td>90-135 beats per minute</td>
<td>180 beats per minute</td>
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<tr>
<td>45 years</td>
<td>88-131 beats per minute</td>
<td>175 beats per minute</td>
</tr>
<tr>
<td>50 years</td>
<td>85-127 beats per minute</td>
<td>170 beats per minute</td>
</tr>
<tr>
<td>55 years</td>
<td>83-123 beats per minute</td>
<td>165 beats per minute</td>
</tr>
<tr>
<td>60 years</td>
<td>80-120 beats per minute</td>
<td>160 beats per minute</td>
</tr>
<tr>
<td>65 years</td>
<td>78-116 beats per minute</td>
<td>155 beats per minute</td>
</tr>
<tr>
<td>70 years</td>
<td>75-113 beats per minute</td>
<td>150 beats per minute</td>
</tr>
<tr>
<td>BORG Scale</td>
<td>Category-ratio Scale</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Very, very light</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Extremely weak</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Very light</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Very weak</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Fairly light</td>
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</tr>
<tr>
<td>12</td>
<td>Weak</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Somewhat hard</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Hard</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Strong</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Very Hard</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Very strong</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Very, very hard</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Extremely strong</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absolute maximum</td>
<td></td>
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</tbody>
</table>
Talk Test

• Should be able to talk but not sing
Every day:
- Take extra steps, walk the dog, take the stairs, park farther away

2-3 times/wk:
- Leisure activities
- Strengthen/stretch

3-5 times/wk:
- Aerobic activities-long walks, bike, swim
- Recreational sports

Every day:
- Take extra steps, walk the dog, take the stairs, park farther away
Type

- Aerobic-use large muscle groups for sustained time
  - Walk
  - Run
  - Bike
  - Swim
  - Hike
Type

• Strength, resistance
  – Free weights
  – Machine weights
  – Body weight
• Circuit training
  – Combines resistance with Aerobic
Time

• Warm-up- 5min
• Aerobic- 20-30 min
  -or-
• Strength- 20-30
• Stretching- 10-15 min
• Cool down- 5 Min
Time

- Can add up time throughout day
- Consider pedometer
  - 10,000 steps /day
- Hiking poles
- Play
Toys

- Pedometer
- Hiking Poles
- Heart Rate Monitor
- GPS
- iPod/Nike
- Balance Disc
- Resistance bands
iPod/Nike
Trekking Poles

Increase heart rate on average 10-15% more than normal walking.

Burn over 400 calories/hr normal walking about 280/hr.
# Exercise Prescription

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency</strong></th>
<th>Start 1 2 3 4 5 6 7 days per week</th>
<th>Advance 1 2 3 4 5 6 7 days per week in wks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intensity</strong></td>
<td>Talk test (Talk but can’t sing)</td>
<td>Max Heart rate 60% 80%</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Walk Run Bike Swim Resistance Stretch</td>
<td></td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>10__ 20__ 30__ 40__ minutes Steps per day_______</td>
<td></td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Physician**
The one

- Sit in chair with weight in hands
- Push weight out and then return to chest
- Stand up
- Press weight above head
- Raise up on toes
- Bring weight back down
- Sit down
- Repeat
Thank you

Any questions?
The End
Bibliography

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