It's Time We “FITT” Exercise into DSME/S: Meeting Patient’s Health Needs through Effective Exercise Counseling

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Director Diabetes Exercise Center
Marshall University, WV
Lead Exercise Physiologist Diabetes Training Camp

Outline
- Brief overview of the benefits of regular exercise for diabetes health
- Discuss brief behavioral assessment tools to understand your patient’s barriers to being active
- Describe the FITT principle of exercise programming
- Examine different tracking strategies for sustainable outcome measures

No Conflicts to Disclose

Quote from a T1DM
- POD Cannula came out at some point overnight. Woke up at 6:30am high (218mg/dl) and going higher. What’s a fella to do?
  Run 10 miles!!!!!
  Ended run at 80 and didn’t have to worry about fueling the entire time. Now I am going to stay a massive breakfast. Exercise truly is the best medicine to give Type 1 the double @#!?! $#?.
Exercise and Diabetes

Acute:
- Can improve insulin action by as much as 15-25%
- Mainly due to increases in GLUT 4 content and transport

Chronic:
- Can improve insulin sensitivity by as much as 60% aerobic (20% RT)
- Due to:
  - Increased type 1 fibers (aerobic)
  - Increased capillary perfusion
  - Increased glycogen storage needs and capacity
  - Increased calcium influx into muscle cells

Comparison of the Reductions in HbA1c levels with different modes of treatment

Non-Insulin Pharmacotherapy

<table>
<thead>
<tr>
<th>Drug Classification</th>
<th>Average HbA1c Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biguanides/TZDs</td>
<td>-1.0 to -2.0%</td>
</tr>
<tr>
<td>Sulfonylureas/</td>
<td>-0.5 to -2.0%</td>
</tr>
<tr>
<td>Meglitinides</td>
<td>-0.4 to -0.5%</td>
</tr>
<tr>
<td>GLP-1</td>
<td>-0.5 to -1.0%</td>
</tr>
</tbody>
</table>

Physical Activity

<table>
<thead>
<tr>
<th>Mode of Exercise</th>
<th>Average HbA1c Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobic Exercise</td>
<td>-0.67 to -0.89%</td>
</tr>
<tr>
<td>Resistance Exercise</td>
<td>-0.64%</td>
</tr>
</tbody>
</table>

Exercise and Pharmacotherapy

Proportion of DSE and ILI Participants who initiate or terminate use of meds for DM, HTN, HLD

PA Levels and Diabetes

- **39%** are considered regularly active

- Ages 60 years and older are 2-3x more likely to report *inability* to walk ¼ mile, climb stairs, or do housework

Receive less support, education and encouragement for physical activity compared to other aspects of diabetes care

Exercise IS Medicine

Taking A Regular Dose of Exercise

Decreases

- Body fat ↓
  - may lower how much insulin or diabetes pills you need to take
- Blood pressure ↓
  - 3 to 11 mmHg of SBP
  - 3 to 8 mmHg of DBP
- Cholesterol-total and LDL ↓
  - LDL ~ 5% mean reduction
- Triglycerides ↓
  - 12% mean decrease

Increases

- Muscle mass ↑
- Bone mass ↑
- Good cholesterol (hdl) ↑
  - 2-8 mg/dl (4% mean increase)
- Quality of Life ↑
  - Mobility
  - Balance
  - Mood
  - Energy levels
  - Independence

Exercise IS Medicine

We are reaching a point where NOT prescribing or counseling on physical activity should be considered patient neglect?
Percent of Adults 18+ whose Provider recommended Exercise: by chronic disease and year in the U.S.

Reducing Clinical Inertia of PA: Realize your Messages of PA

Activities of Daily Living (ADLs)
The basic tasks of everyday life such as:
- Eating, bathing, vacuuming, gardening, washing the car, etc.
ADLs may help sustain a minimum level of:
- Mobility
- Calorie burn
- Strength and flexibility

Exercise Therapy
A structured, measurable plan of action aimed to induce:
- Cardiorespiratory Fitness
- Muscular strength and endurance
- Flexibility or balance/ agility
- Improvements in body composition

Time Counseling on Physical Activity

Reducing Clinical Inertia of PA

1. Physical Activity Assessment
Clinicians and their healthcare team assess physical activity levels during every patient visit.

2. Physical Activity Prescription
Utilization of simple, fast, and effective tools for prescribing physical activity in the right “dose” for the prevention, treatment and management of chronic medical conditions.

3. Referral to a Physical Activity Network
Providing a list of programs, places, and professionals that offer the patient a selection of options that meet their individual needs and personal preferences to fit their physical activity prescription.

www.exerciseismedicine.org

Common Patient/Provider Scenario

Provider
- Gives general exercise advice (walk more, use the stairs, park farther away)
- No evaluation/progress measures
- De-values exercise counseling

Patient
- Not seeing results
- Loses interest
- Becomes sedentary
- De-values exercise as treatment

Assessing Exercise Behaviors and Perceptions
Counseling on Exercise Behaviors

When a patient seems unmotivated to change or to take the sound advice of practitioners, it is often assumed that there is something the matter with the patient and that there is not much one can do about it. These assumptions are usually false. No person is completely unmotivated.

Miller and Rollnick

Health Belief Model

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
<th>Potential Change Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Susceptibility</td>
<td>Believe they are susceptible to disease</td>
<td></td>
</tr>
<tr>
<td>Perceived Severity</td>
<td>Believe the condition has serious consequences</td>
<td></td>
</tr>
<tr>
<td>Perceived Benefits</td>
<td>Believe that taking action would reduce their susceptibility or severity of the condition</td>
<td></td>
</tr>
<tr>
<td>Perceived Barriers</td>
<td>Believe the costs of taking action (barriers) are outweighed by the benefits</td>
<td></td>
</tr>
<tr>
<td>Cues to Action</td>
<td>are exposed to factors that prompt action</td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>are confident in their ability to successfully perform an action</td>
<td></td>
</tr>
</tbody>
</table>

Educational Influence

Counseling Influence

Stages of Change

- Precontemplation: may not know benefit of exercise on health condition
- Contemplation: knows it is beneficial but weighing the pros and cons of starting
- Preparation: buying walking shoes, joining a gym, talking to an exercise physiologist
- Action: starting regular exercise (maybe not 150 minutes)
- Maintenance: achieved goals and preventing relapse (obtaining 150 minutes)

Sample Questions to assess Patient Perceptions of Exercise

<table>
<thead>
<tr>
<th>Construct</th>
<th>Sample Questions to assess Patient Perceptions of Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Susceptibility</td>
<td>Do you believe that you are at risk for developing Diabetes?</td>
</tr>
<tr>
<td>Perceived Susceptibility</td>
<td>Do you believe that you are at risk for a stroke?</td>
</tr>
<tr>
<td>Perceived Severity</td>
<td>Do you believe that your blood sugar levels will result in amputation?</td>
</tr>
<tr>
<td>Perceived Severity</td>
<td>Do you believe that your HTN will cause a stroke?</td>
</tr>
<tr>
<td>Perceived Benefits</td>
<td>How important do you believe exercise is for controlling your body blood sugar?</td>
</tr>
<tr>
<td>Perceived Benefits</td>
<td>How likely do you think exercise will prevent future complications from your diabetes?</td>
</tr>
<tr>
<td>Perceived Barriers</td>
<td>What do you feel gets in the way of managing your diabetes or gets in the way of exercising?</td>
</tr>
<tr>
<td>Perceived Barriers</td>
<td>Do you feel the expense of a gym membership is not worth the potential benefits of exercise?</td>
</tr>
</tbody>
</table>
Use of Scales to determine readiness to change

**IMPACT**
On a scale of 0 to 10, with 10 being very important, how important is it for you to change?


<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not at all</td>
</tr>
<tr>
<td>1-2</td>
<td>Somewhat</td>
</tr>
<tr>
<td>3-5</td>
<td>Very</td>
</tr>
</tbody>
</table>

**CONFIDENCE**
On a scale of 0 to 10, with 10 being very confident, how confident are you that you can change?


<table>
<thead>
<tr>
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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
<td>3-5</td>
<td>Very</td>
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</tbody>
</table>

Sample Pros/ Cons

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;me and my family enjoy being around watching TV together&quot;</td>
<td>&quot;I feel like I don't have any energy and I know a sedentary lifestyle affected the health of my father before his death.&quot;</td>
</tr>
<tr>
<td>&quot;playing on my computer helps me to cope with stress&quot;</td>
<td>&quot;All my family members would not understand and may isolate me&quot;</td>
</tr>
<tr>
<td>&quot;I guess exercising will help me avoid a heart attack like my dad had&quot;</td>
<td>&quot;I don’t like people watching me exercise&quot;</td>
</tr>
<tr>
<td>&quot;I would be a better father and role model for my kids if I were more fit allowing me to play with them&quot;</td>
<td>&quot;everyone has an opinion about what type of exercises I should do but I don’t like those things&quot;</td>
</tr>
</tbody>
</table>

Common Barriers reported by Patients


<table>
<thead>
<tr>
<th>Problem</th>
<th>% Endorsed</th>
<th>Example Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t have time</td>
<td>69</td>
<td>Discuss mods to FITT, Examine priorities/goals, Motivational interviewing</td>
</tr>
<tr>
<td>I don’t have energy</td>
<td>59</td>
<td>Discuss mods to FITT, Regulate intensity levels, Motivational interviewing</td>
</tr>
<tr>
<td>I’m just not motivated</td>
<td>52</td>
<td>Discuss attitudes and outcome measures, Tailored FITT</td>
</tr>
<tr>
<td>I don’t know how to exercise</td>
<td>29</td>
<td>Build self efficacy with demonstration and doing</td>
</tr>
<tr>
<td>It’s not safe for me to exercise</td>
<td>24</td>
<td>Assess exercise opportunities in the environment</td>
</tr>
<tr>
<td>I’m sick or hurt</td>
<td>23</td>
<td>Examine social support structures, Exercise childhood/times of injury</td>
</tr>
<tr>
<td>There is nowhere for me to exercise</td>
<td>21</td>
<td>Develop social support (family system), Identify solo activities that can be enjoyed</td>
</tr>
</tbody>
</table>

Common Barriers reported by Patients (cont)


<table>
<thead>
<tr>
<th>Problem</th>
<th>% Endorsed</th>
<th>Example Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel awkward when I exercise</td>
<td>23</td>
<td>Build self efficacy with demonstration and doing</td>
</tr>
<tr>
<td>I don’t know how to exercise</td>
<td>19</td>
<td>Build self efficacy with demonstration and doing</td>
</tr>
<tr>
<td>I don’t want to get hurt</td>
<td>19</td>
<td>Evaluate FITT, Determine self efficacy and limitations</td>
</tr>
<tr>
<td>I’m not sure of the exercise</td>
<td>18</td>
<td>Assess exercise opportunities in the environment</td>
</tr>
<tr>
<td>My family needs me; I can’t leave them to exercise</td>
<td>16</td>
<td>Assess social support structures, Exercise childhood/times of injury</td>
</tr>
<tr>
<td>There is no one to exercise with me, I won’t exercise alone</td>
<td>14</td>
<td>Develop social support (family system), Identify solo activities that can be enjoyed</td>
</tr>
</tbody>
</table>

Using a Decisional Matrix (Likes/ Dislikes)


<table>
<thead>
<tr>
<th>Thinking About The Costs and Benefits of Change</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STAY THE SAME</strong></td>
<td>MAKE SOME IMPROVEMENT</td>
</tr>
<tr>
<td><strong>BENEFITS</strong></td>
<td></td>
</tr>
<tr>
<td>1 like</td>
<td>1 will like</td>
</tr>
<tr>
<td>2 like</td>
<td>2 will like</td>
</tr>
<tr>
<td>3 like</td>
<td>3 will like</td>
</tr>
<tr>
<td>4 like</td>
<td>4 will like</td>
</tr>
<tr>
<td>5 like</td>
<td>5 will like</td>
</tr>
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</table>

Costs: I don’t like: I won’t like

Create some ideas and reflections for each of the first boxes above. This will help clarify your thoughts about what you want to do next.
Self Efficacy
Goal Setting
Outcomes Expectations

MOTIVATION

Physical Activity Levels following Rx or Verbal Advice

SMART GOALS
- tangible evidence that you have accomplished the goal
- How are you going to achieve the goal
- creates a practical sense of urgency

Exercise more to help lose weight

<table>
<thead>
<tr>
<th>Draft goal</th>
<th>Exercise more to help lose weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific</td>
<td>Clearly defined what you will do (how, what)</td>
</tr>
<tr>
<td>Measurable</td>
<td>Tangible evidence that you have accomplished the goal</td>
</tr>
<tr>
<td>Achievable</td>
<td>How are you going to achieve the goal</td>
</tr>
<tr>
<td>Relevant</td>
<td>Challenging but achievable</td>
</tr>
<tr>
<td>Time Bound</td>
<td>Creates a practical sense of urgency</td>
</tr>
</tbody>
</table>

Getting your Patients Active

The patient’s mindset is critical to successful participation in physical activity

HOWEVER!

The educator’s mindset toward his/her patient’s capabilities (and their own for that matter) is also quite important
Getting your patients active

**DO:**
- Realize their abilities to participate in exercise
- Realize their willingness to participate in exercise
- Realize their barriers
- Help guide them in the right direction toward an effective plan while considering the above OR seek referrals

**DON'T:**
- Fool them or let them fool themselves about how much activity they are actually getting or what they say they will do will be effective (i.e. I will start taking the stairs)
- Discourage them from starting any activity plan because you think it won’t be as beneficial a mode compared to another mode (unless you fear it is unsafe)

### Common Barriers reported by Patients

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<td>Discuss modes to FITT, regulate intensity levels, motivational interviewing</td>
</tr>
<tr>
<td>I’m just not motivated</td>
<td>52</td>
<td>Discuss attitudes and outcome measures, validated FITT, discuss positive reinforcements, discuss perceived susceptibility to disease and benefits</td>
</tr>
<tr>
<td>It costs too much</td>
<td>37</td>
<td>Examine alternative locations/equipment</td>
</tr>
<tr>
<td>I'm sick or hurt</td>
<td>29</td>
<td>Discuss maintenance or relapse prevention</td>
</tr>
<tr>
<td>There's nowhere for me to exercise</td>
<td>30</td>
<td>Assess opportunities in the environment</td>
</tr>
<tr>
<td>I feel awkward when I exercise</td>
<td>29</td>
<td>Assess self efficacy, discuss alternative settings/times</td>
</tr>
<tr>
<td>I don't know how to exercise</td>
<td>29</td>
<td>Build self efficacy with demonstration and doing</td>
</tr>
<tr>
<td>My family needs me, I can't leave them to exercise</td>
<td>29</td>
<td>Assess social support structures, examine childcare/ time of day issues</td>
</tr>
<tr>
<td>There is no one to exercise with me, I won't exercise alone</td>
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<td>Develop social support (Buddy system), identify solo activities that can be enjoyed</td>
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### 2008 Physical Activity Guidelines for U.S. Adults

**Aerobic Activity:**
- A minimum of 150 minutes of moderate intensity aerobic activity per week
- 75 minutes of vigorous intensity aerobic activity per week
- An equivalent combination of the two per week

**Resistance Training:**
- A minimum of 2 days per week of resistance training

### 3 Pillars of Success

- **SPECIFIC:**
  - Set realistic, achievable goals
  - Prioritize
  - Evaluate progress
  - Incorporate

- **OVERLOAD:**
  - Overload progressively

- **PROGRESSION:**
  - Progress consistently

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**AADE16**
Specificity of Exercise Programming

**Goals**
- Manage ABCs
- Weight Management
- Improve Muscular Strength
- Improve Cardiorespiratory Fitness

**Specificity: One Size does not Fit all!!**
- What is considered when dosing medications?
  - what type (metformin)
  - how much (500 mg)
  - how often (bid)
  - consider contraindications (renal impairment)
  - monitor for titration (increase to 1000 mg bid)
- What about MNT?
  - what type of carbs (whole grains, fiber, etc)
  - how much (45 grams per meal / 15 per snack)
  - how often (regular intervals, i.e. every 4-6 hrs)
  - contraindications (hyper/ hypoglycemia, gluten allergy)
  - titration (reduce snacking)

We must consider an individualized exercise Rx

Specificity: It’s the PRINCIPLE of it all!

The Exercise Rx should be a good **FITT**
- Frequency (how often)
- Intensity (how strenuous)
- Time (how long)
- Type (mode/ what kind)
- Progression/ Adjustments (titration)

AADE 7 Self Care Behaviors

- Monitoring
- Taking Medications
- Healthy Eating

**Being Active**
- Reducing Risks
- Problem Solving
- Healthy Coping

**FITT - Frequency**
- Aim for at least 3x per week for Aerobic Activity
- 5-7 days per week most beneficial for blood sugar control and weight loss
- What about the “weekend warrior”
  - can obtain health benefits with 1-2x per week
  - increased risk for injury and Cardiac event
  - Not the best for glycemic control
**Frequency Matters**

Mean Glucose Levels on the Exercise and Sedentary Days.

![Graph showing glucose levels on exercise and sedentary days](image)

*The Diabetes Research in Children Network (DirecNet) Study Group*

**Attributable Fractions (%) for All-Cause Deaths**

40,842 men & 12,943 women from the Aerobic Cooper Longitudinal Study

![Bar chart showing attributable fractions for all-cause deaths](image)


**FITT- Intensity**

<table>
<thead>
<tr>
<th>Light</th>
<th>Moderate</th>
<th>Vigorous</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Moderate intensity for health improvements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Vigorous intensity for greater health improvements and cardiorespiratory fitness levels and muscular strength</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cardiorespiratory Fitness (CRF)**

![Heart rate equations and examples](image)


**Benefits of Intensity on CRF**

*Improve the fitness level by safely prescribing an activity plan set above the patient’s current fitness level, yet below the workload that evokes any abnormal clinical signs / symptoms or general discomfort.*

**HEART RATE EQUATIONS:**

- **Age predicted maximal heart rate (220 - age) x (intensity) = Target HR**
  - Example for age 40: 180 x 50-70% = 90 - 126 bpm

- **Karvonen formula**
  - (Max HR (220 - age) - Resting HR) x intensity + Resting HR = Target HR
  - Example for age 40: 180 - 65 = 115 x 50% = 57.5 + 65 = 122 - 146 bpm
Rating of Perceived Exertion (RPE)

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>2-4</td>
</tr>
<tr>
<td>Moderate</td>
<td>5-7</td>
</tr>
<tr>
<td>Vigorous</td>
<td>8+</td>
</tr>
</tbody>
</table>

Limitations:
- Those who are sedentary, older, etc. working at same absolute MET level will have different relative exercise intensity.
- Example: an active person working at 6 METS may be a moderate intensity for them while a sedentary person starting a routine at 6 METS could feel very vigorous.

MET (metabolic equivalents): Index of Energy Expenditure

MET min/ wk?
METs x min =
5 METs x 150 minutes (30 min/ 5 days) = 750

Goal: >=500 - 1000 MET min/ wk
- Greater volume for Weight Management

Kcal/min?

Kcal to reduce weight:
METs x 3.5 x BW(kg)/ 200
5 METs x 3.5 x 90/ 200 = 7.9 kcal/ min
7.9 x 30 = 237 kcal (1,185 kcal/ wk)

237 kcal/ day + 500 reduction (food) = 737 kcal deficit x 5 = 3685 kcal deficit per week.

MET (metabolic equivalents):
Index of Energy Expenditure

Ratio of rate of EE during Exercise vs. the rate of EE at rest
1 MET = O2 uptake of 3.5 ml/kg/min

<table>
<thead>
<tr>
<th>Light</th>
<th>Moderate</th>
<th>Vigorous</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3 METS</td>
<td>3 - 5 METS</td>
<td>&gt;= 6 METS</td>
</tr>
</tbody>
</table>

Maximum Aerobic Capacity (VO2max)

Resistance Training (RT) Intensity

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength</td>
<td>Strength</td>
</tr>
<tr>
<td>*Power</td>
<td>Power</td>
</tr>
<tr>
<td>Hypertrophy</td>
<td>Hypertrophy</td>
</tr>
<tr>
<td>Muscular endurance</td>
<td>Muscular endurance</td>
</tr>
</tbody>
</table>

Training goal

Repetition maximum continuum
**FITT - TIME**

For aerobic benefits:
- aim for minimum of 10 minutes
- progress to 30 minutes or more
- can break up bouts in 10 minute intervals to accumulate more activity throughout the day

Long term Goals for disease management: 150 min MOD or 75 min VIG per week

Increase activities of daily living: (helps induce more weight loss)
- take the stairs
- do more to sit less
- park farther away from destinations

---

**Objective Monitors**

**Pedometer**
- Measures vertical acceleration of the hip
- Record steps taken and offer the ability to estimate the distance walked, if stride length is known
  - 1800- 2500 steps = 1 mile
  - 10,000 step/ day goal

**Accelerometers/ Activity Monitors**

- Multi-sensor technology:
  - 3 dimensional movement patterns:
    - Front/ back; side/side; up/down
  - Internal clock (minute- minute tracking)

Options:
- Heat flux (measures metabolism)- for changing activities
- Skin temp gauge

---

**FITT – TIME (WEIGHT LOSS???)**

150 minutes or fewer per week

---

**FITT – TYPE**

Cardiorespiratory Fitness (aerobic capacity)

Muscular Fitness
- muscular strength
- muscular endurance
- Neuromuscular balance

Flexibility (ROM)
Fx Significance with Select Resistance Training Exercises

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Equipment Used</th>
<th>Muscles Used</th>
<th>Fx Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triceps press/dips</td>
<td>Machine; chair with arms; wheelchair</td>
<td>Chest, triceps, shoulders</td>
<td></td>
</tr>
<tr>
<td>Seated row</td>
<td>Machine, bands around pole</td>
<td>Back and biceps, quadriceps, hamstrings, adductors</td>
<td></td>
</tr>
<tr>
<td>Side lateral raise or shoulder press</td>
<td>Dumbbells, cans, jugs</td>
<td>Shoulders, chest, back, shoulders</td>
<td></td>
</tr>
<tr>
<td>Standing curl</td>
<td>Machine, bands around pole</td>
<td>Back, biceps, shoulders, hamstrings, adductors</td>
<td></td>
</tr>
<tr>
<td>Bent over row</td>
<td>Machine, bands around pole</td>
<td>Back, biceps, shoulders, hamstrings, adductors</td>
<td></td>
</tr>
<tr>
<td>Side lateral raise or shoulder press</td>
<td>Dumbbells, cans, jugs</td>
<td>Shoulders, chest, back, shoulders</td>
<td></td>
</tr>
<tr>
<td>Squat/Deadlift</td>
<td>Dumbbells, cans, body weight</td>
<td>Lower body, hips, back, hamstrings, adductors</td>
<td></td>
</tr>
</tbody>
</table>

Overload & Progression: General Adaptation Syndrome

Rate of Progression - Resistance Training

<table>
<thead>
<tr>
<th>Program Stage</th>
<th>Week</th>
<th>Frequency</th>
<th>Intensity</th>
<th>Time</th>
<th>Load</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial (sédentary)</td>
<td>1 – 4</td>
<td>3 – 7</td>
<td>&lt; 60%</td>
<td>10 – 30</td>
<td>30-70</td>
<td></td>
</tr>
<tr>
<td>Improvement</td>
<td>5 – 24</td>
<td>3 – 7</td>
<td>60-80%</td>
<td>20 – 40</td>
<td>60-120</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>24+</td>
<td>5 – 7</td>
<td>60-90%</td>
<td>30 – 60</td>
<td>150+</td>
<td></td>
</tr>
</tbody>
</table>

Rate of Progression - Aerobic

<table>
<thead>
<tr>
<th>Program Stage</th>
<th>Week</th>
<th>Frequency</th>
<th>Intensity</th>
<th>Time</th>
<th>Load</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial (sédentary)</td>
<td>1 – 4</td>
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<td>30-70</td>
<td></td>
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<td>Improvement</td>
<td>5 – 24</td>
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<td>60-120</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>24+</td>
<td>5 – 7</td>
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<td>30 – 60</td>
<td>150+</td>
<td></td>
</tr>
</tbody>
</table>

How do I manage all this?
Measurement and Evaluation

Exercise vital sign in Kaiser Permanente’s Epic EHR

Intermountain Healthcare physical activity vital sign in HELP2 EHR.

Objective Measurement and Evaluation in Practice

Measurable CRF Improvements

Excel Worksheet

Conclusion

• Assessing patient’s exercise behaviors/barriers will drive your FITT prescription volume and progression
• FITT Principles are key components to drive clinical improvements (whether metabolic or physical outcomes) with exercise therapy
• FITT measures help to identify whether the activity level is enough to induce significant blood sugar reductions, weight loss or other health related outcomes
Physical activity Resources

Continuing Education
ADA, ACSM, AADE
Webinars
Online Learning
Certification (ACSM, ACE, NSCA, NASM, etc.)

Web Sources
www.health.gov/paguidelines/guidelines
www.acsm.org
www.exerciseismedicine.org
www.acefitness.org
www.WebExercises.com
www.diabetesmotion.com

Activity Trackers/ Apps
My Fitness Pal
Map My Fitness
Fitbit

What happened to written logs????

Books

“...diabetes is not going to be something we’re going to manage as providers. It’s going to be about us giving patients the tools they need, so that they manage it.”

Robert Gabbay, MD, PhD
Chief Medical Officer
Joslin Diabetes Center
Boston, MA

Sample exercise RX

Patient: Debbie
Considerations: Retired, currently active, normal wt 150 lbs (BMI 28), T2DM
DM meds: Lantus 10 units hs, insulin aspart bid
Her Goals: Reduce daily blood sugar variations and exercise induced hypoglycemia
Exercise experience: Currently exercising 3x per week for 45 minutes walking
FITT Principle
• Frequency: 3 days per week (to help with blood sugar variations)
• Intensity: moderate (same)
• Time: 30 minutes (to reduce hypoglycemia)
• Type: walking
• Progression: increase duration to 45 minutes
• Medication consideration: reduce insulin by 1 unit to help avoid hypoglycemia

Monitor blood sugars: pre and post

Sample exercise RX

Patient: Johnny Past
Considerations: Sedentary, obese (BMI 42), wt 290 lbs, T2DM, knee OA, HTN, moderate retinopathy
DM meds: Lantus 30 units hs, insulin aspart 1000 bid
Her Goals: Reduce weight and improve fitness level
Exercise experience: Former high school athlete and gym rat (hx of heavy resistance training)
Years since last exercise plan: 15 years
FITT Principle
• Frequency: 3 days per week
• Intensity: light intensity combination of aerobic and resistance training
• Time: 10 minutes aerobic + 1 set of 12 reps of major muscle groups (2 minutes rest between sets)
• Type: stationary bike with resistance training
• Progression: increase stationary bike to 15 minutes and resistance training to 2 sets of 12 reps until volume becomes easy. Then continue to increase aerobic activity

Sample exercise RX

Patient: Lucy
Considerations: Sedentary, overweight (BMI 36), new onset T2DM (A1c 6.8%), reports no orthopedic problems, no other medical conditions
DM meds: none
Her Goals: Lose weight and improve blood sugar
Exercise experience: never participated
FITT Principle
• Frequency: 5 days per week
• Intensity: moderate
• Time: 10 minutes
• Type: walking
• Progression: once 5 days per week is achieved, increase duration to 15 minutes and progress 5 minutes per bout as tolerated.

PATIENT MUST SIGN OFF ON THIS AS A VIABLE ACTION PLAN
THE BEST THEORETICAL RX IS NOT ALWAYS THE BEST FOR THE PATIENT
Sample exercise RX

**Patient:** Julie

**Considerations:** Sedentary, obese, wt 285 lbs (BMI 30), T2DM (A1c 8%), HTN, HLD, depression

**DM meds:**
- glipizide 5 mg qd
- metformin 1000 bid

**Her Goals:**
- wants to remain independent

**Exercise experience:**
- none

**Barriers:**
- fixed income
- fears walking outside due to high crime area
- lives with and takes care of mother who is not supportive of her health needs but sleeps often

**FITT Principle**
- **Frequency:** 3 days per week
- **Intensity:** Light intensity combination of aerobic and resistance training
- **Time:** 10 minutes or more of aerobic + 1 set of 12 reps of major muscle groups (2 minutes rest between sets)
- **Type:** 
  - aerobic video with resistance training (bands or household items)
- **Progression:**
  - increase aerobic activity until whole video achieved and resistance training to 2 sets of 12 reps until volume becomes easy. Then continue to increase aerobic activity
  - do activity when mom is sleeping or sit down with mom and express importance of behavior changes and ask for support

**PAR-Q**

**Physical Activity Readiness Questionnaire**
- Self reported medical history (or health risk appraisal)
- Can also use AHA/ACSM Health Fitness Facility Pre-participation Screening Q’aire

In office Demonstration

Sample exercise RX

**Patient:** Thomas

**Considerations:** T2DM (A1c 7.8%), sedentary, overweight (BMI 31), wt 245 lbs

**DM meds:** metformin 1000 bid

**His Goals:**
- improve aerobic fitness

**Exercise experience:**
- used to bike in many organized rides to support charities

**Barriers:**
- does not have time to train on his bike due to having twins recently

**FITT Principle**
- **Frequency:**
- **Intensity:**
- **Time:**
- **Type:**
- **Progression:**

**PAR-Q**

Yes/No
1. Have you ever been told that you have a heart condition and that you should only do physical activity recommended by a Doctor?
2. Do you feel pain in your chest when you do physical activity?
3. Do you have angina, that is, chest pain with effort or during a strong emotional state?
4. Do you have your blood pressure checked before physical activity or do you take heart medication?
5. Do you have a heart or lung condition that could be made worse by a change in your physical activity?
6. Do you need a doctor’s note or a prescription for your antidepressant or heart medicine?
7. Do you have any advice from your doctor that you should not do physical activity?