Approach to Pediatric Obesity: Fitness Assessment and Smart Goals

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Disclosures

• Currently an Associate Editor, *Medicine and Science in Sports and Exercise*

• Receiving industry support from Lallemand Health Solutions, Montreal Canada
Objectives

• Provide a brief view of why exercise and fitness are critical for combatting childhood overweight and obesity

• Demonstrate the importance of fitness testing and goal-setting in the pediatric clinic environment

• Provide the rationale underlying the development of the UF Mini-Fitness Clinic at UF Pediatrics and partnership with UF Physical Medicine and Rehabilitation (PMR)

• Provide attendees with a template for a fitness assessment clinic for other patient groups
Regular exercise combats pediatric obesity and secondary health issues

Unstructured activity

- Play
- Sports
- Transportation
- Chores
- Recreation
- Multiple bouts a day

Structured activity

- Defined exercise sessions
- Personal trainer sessions
- After school activity classes
- PE class
- Scheduled times

Moderate-to-Vigorous

- ↑ Body composition
- ↑ Muscle growth
- ↑ Bone density
- ↓ Blood pressure
- ↑ Metabolic profile
- ↑ Insulin sensitivity
- ↑ Endothelial function
- ↓ Blood lipids
- ↑ Psychological well-being
- ↑ Cognitive outcomes
- ↑ Self efficacy
- ↑ Academic performance

↓ Risk for cardiovascular disease, stress and life expectancy

Impactful physician action to change patient behaviors:

Bring up the importance of exercise!
And providers…be an active role model!

Change the environment and patient experience by inserting fitness testing into regular appointments.

How do you do this without adding extra cost of charge? How do you keep physician burden low?
Cardiorespiratory Fitness in Youth: An Important Marker of Health: A Scientific Statement From the American Heart Association

Geetha Raghuveer, Chair, MD, MPH, FAHA, Jacob Hartz, MD, David R. Lubans, PhD, Timothy Takken, PhD, Jennifer L. Wiltz, MD, MPH, FAHA, Michele Mietus-Snyder, MD, Amanda M. Perak, MD, FAHA, Carissa Baker-Smith, MD, MPH, MS, FAHA, Nicholas Pietris, MD, Nicholas M. Edwards, Vice Chair, MD, MPH, FAHA, and On behalf of the American Heart Association Young Hearts Athero, Hypertension and Obesity in the Young Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young

ABSTRACT: Cardiorespiratory fitness (CRF) refers to the capacity of the circulatory and respiratory systems to supply oxygen to skeletal muscle mitochondria for energy production needed during physical activity. CRF is an important marker of physical and mental health and academic achievement in youth. However, only 40% of US youth are currently believed to have healthy CRF. In this statement, we review the physiological principles that determine CRF, the tools that are available to assess CRF, the modifiable and nonmodifiable factors influencing CRF, the association of CRF with markers of health in otherwise healthy youth, and the temporal trends in CRF both in the United States and internationally. Development of a cost-effective CRF measurement process that could readily be incorporated into office visits and in field settings to screen all youth periodically could help identify those at increased risk.

Key Words: AHA Scientific Statements  
cardiorespiratory fitness  
cardiovascular diseases  
cognition  
exercise  
mental health  
physical activity
Establishing the Mini-Fitness Clinic

1. Performed the science to determine best assessments
2. Leveraged partnerships with departments with expertise in exercise prescription and clinical understanding of physical medicine
3. Helping patients develop SMART goals
4. Tracking and follow-up at clinic visits 3-6 months
1. Determination of best assessment methods

- Identify expedient, experiential exercise assessment
- Cardiovascular fitness; followed by hand-grip strength and sit-and-reach

PLOS ONE

RESEARCH ARTICLE

Simple tests of cardiorespiratory fitness in a pediatric population

Brittany S. Bruggeman, Heather K. Vincent, Xiaofei Chi, Stephanie L. Filipp,
Rebeccah Mercado, François Modave, Yi Guo, Matthew J. Gurka, Angelina Bernier*

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Compared discriminative ability of simple 45-second squat test and 3-minute bench step test to the gold standard of clinical comprehensive treadmill testing.

Selected 3min Step test for discriminative ability to determine health risk using FITNESSGRAM cutoff. Correlated well with VO$_{2\text{max}}$ test in boys and girls ($r=-0.528$ to -0.549).

Flexibility and Strength Measures

2. Partner with exercise and physical medicine specialists

- UF PMR focuses on exercise medicine and functionality
- PMR hosts an undergraduate internship experience with pediatrics to enable a student-run, faculty-supervised clinic
- Academic credit served 40 hrs/week
- Interns are trained by faculty in both departments to better understand the challenges of pediatric patients and how to perform assessments and interpret findings
- No-cost enterprise
- The assessment time and goal setting ranges from 15-20 minutes.
Daily Operation in the Clinic

- Review patient list to determine who might be a good candidate.
- During clinic visit, Pediatric specialist will review physical activity and nutrition patterns. Ask about PA level- PA as Vital Sign (add to EMR)
- A referral is made to have the assessment performed right after the visit is concluded.
- Patient and family are walked to the Fitness testing area, intern completes the assessment and selects the fitness area that needs the greatest attention (see norms for fitness measures).
- One-two SMART goals are developed with the patient.

ASSESSMENT MATERIALS
Fitness Category of Heart Rate Scores
After Step Exercise

The faster your heart rate drops after exercise the fitter you are.

<table>
<thead>
<tr>
<th>Fitness Category</th>
<th>Boys HR (6-8 years)</th>
<th>Boys HR (10-12 years)</th>
<th>Girls HR (6-8 years)</th>
<th>Girls HR (10-12 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>&lt; 5th</td>
<td>&lt; 95</td>
<td>&lt; 93</td>
<td>&lt; 100</td>
</tr>
<tr>
<td>Very Good</td>
<td>&lt; 25th</td>
<td>95-106</td>
<td>93-105</td>
<td>100-113</td>
</tr>
<tr>
<td>Good</td>
<td>&lt; 50th</td>
<td>107-115</td>
<td>106-116</td>
<td>114-123</td>
</tr>
<tr>
<td>Sufficient</td>
<td>&lt; 75th</td>
<td>116-126</td>
<td>117-128</td>
<td>124-135</td>
</tr>
<tr>
<td>Poor</td>
<td>&lt; 95th</td>
<td>127-142</td>
<td>129-147</td>
<td>135-152</td>
</tr>
<tr>
<td>Very Poor</td>
<td>&gt; 95th</td>
<td>&gt; 142</td>
<td>&gt; 147</td>
<td>&gt; 152</td>
</tr>
</tbody>
</table>

How flexible are you?
Reach your hands out as far as you can.

How strong is your grip?

Follow-up Questions:

1. What were your exercise goals/recommendations from your previous visit?

2. Did you complete these goals/recommendations or at least attempt these recommendations? If not, why?

3. What are your new goals/recommendations for your next visit?
3. Develop SMART Goals

• Based on percentile scores, choose fitness area with lowest score

• Share options on the exercise sheet as examples of how to address the goal (WHAT will you do?)

• Briefly talk about options of when to get it done in the day and how often child will commit (WHEN and HOW to get action done)

• Encourage child and parent that small changes can make a big difference

• Indicate follow-up will occur with attending to see if the goal is met

Simple Ways to Improve Your Fitness

Aerobic Fitness
- Raise your heart rate, breathe hard
- Jump rope
- Sports (Ex: basketball, soccer, tennis, swimming)
- Bike riding, push scooters
- Walking (walking dog, walk to school, with friends/family)
- Play outdoor games
- Make your own obstacle courses and time yourself

Flexibility
- Stretch your muscles and move your joints
  - Dynamic Stretching (moving while stretching)
    - Walking knees to chest
    - Lunge with twist
    - Walking and reaching to toes with each step
  - Static Stretching (holding a stretch for 10-30 seconds)
    - Hamstring stretch
    - Thigh stretch
    - Knee-to-chest stretch
    - Shoulder stretch
    - Butterfly stretch

Strength
- Make your muscles work hard
  - Push-ups and pull-ups
  - Helping carry groceries
  - Playing on monkey bars, jungle gym or rings
  - Planks
  - Squats
  - Wall sits
  - Lunges
  - Yardwork with family

Small changes lead to BIG results.
Start small and keep moving!

Sit less and move more each day. Build in enough sleep.
- Limit sedentary screen time to no more than 2 hours per day
- Breakup long periods of sitting with stretching, some basic exercises movements
- Get up during TV commercials
- Walk and talk on the phone
- Take the stairs
- Try and incorporate some light activity during the day (helping with housework, yardwork, cleaning)
- Set an appointment to walk for 10-15 minutes each day at least once.
- 9 to 11 hours of sleep for children between the ages of 5-13 and 8 to 10 hours of sleep for children between the ages of 14-17
- Consistent bed and wake-up time

Why is physical activity good for you?
- Supports concentration and learning
- Good mood and mental health
- Helps your coordination skills and balance
- Helps reach and maintain healthy weight
- Improves heart health, lowers heart rate
- Lowers blood pressure
- Improves self-confidence and independence
- Fights sickness and keeps you healthy
- Builds strong bones and muscles
- Make friends and develop social skills
- Better sleep at night

UF Department of Pediatrics
UF Department of Orthopaedics and Rehabilitation
Division of Physical Medicine & Rehabilitation
DEPARTMENT OF ORTHOPAEDICS AND REHABILITATION in the COLLEGE OF MEDICINE
Take advantage of UF Sports Performance Center BODPOD testing to help families track progress

FREE service to persons <18 years!
PRELIMINARY DATA
Table 1. Preliminary data, patient characteristics.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N=180</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean SD (min - max)</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>13.7 ± 3.4 (7- 20)</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>33.6 ± 7.9 (17.6 - 52.9)</td>
</tr>
<tr>
<td>Sex (% female/ male)</td>
<td>54.2/ 45.8</td>
</tr>
</tbody>
</table>

Mixture of metabolic conditions and diabetes

Included children who spoke English as a second language, children with autism
Table 2. Fitness assessment results of all patients.

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Mean ± SD (Min - Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-min Bench Step Test</td>
<td></td>
</tr>
<tr>
<td>Resting HR (bpm)</td>
<td>87.2 ± 17.5 (51 - 133)</td>
</tr>
<tr>
<td>Immediately step test post HR (bpm)</td>
<td>157.7 ± 18.6 (104 - 195)</td>
</tr>
<tr>
<td>1-min Post HR (bpm)</td>
<td>129.9 ± 21.6 (76-177)</td>
</tr>
<tr>
<td>Peak Rating of Perceived Exertion (1-10)</td>
<td>6.6 ± 2.2 (1-10)</td>
</tr>
<tr>
<td>Percentile Score (1st=best, 100th=worst)</td>
<td>64th ± 31 (5-95th)</td>
</tr>
</tbody>
</table>

Compared to our previous work in otherwise healthy children:

1-min Post HR 110±26 bpm ~40th percentile fitness

these patients are less fit.

- Percentile scores and effort ratings were nearly identical between males and females (p>.875)
Table 3. Strength and flexibility assessment results of all patients.

<table>
<thead>
<tr>
<th></th>
<th>mean SD (min - max)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Handgrip strength</strong></td>
<td></td>
</tr>
<tr>
<td>Strength (lbs)</td>
<td>57.0 ± 23.4 (5-135)</td>
</tr>
<tr>
<td>(kg)</td>
<td>25.9 ± 10.6 (2.2 – 61.4)</td>
</tr>
<tr>
<td>Percentile Score</td>
<td>63rd ± 32 (5-95th)</td>
</tr>
<tr>
<td>(1st=worst, 100th=best)</td>
<td></td>
</tr>
<tr>
<td><strong>Flexibility (sit and reach distance)</strong></td>
<td></td>
</tr>
<tr>
<td>Distance (cm)</td>
<td>26.2 ± 8.2 (9 - 49)</td>
</tr>
<tr>
<td>Percentile Score</td>
<td>43.8 ± 25.6 (5-95th)</td>
</tr>
<tr>
<td>(1st=worst, 100th=best)</td>
<td></td>
</tr>
</tbody>
</table>

- Percentile scores and effort ratings were nearly identical between males and females (p>.875)
SMART Goal Foci

Musculoskeletal fitness and strength
5.8%

Aerobic fitness
70.8%

EVERYTHING
3.8%

Flexibility
19.6%
Sample SMART goals

- Just started basketball (sports team)
  Flexibility 2 days/week for 10 mins

- Walking dogs & playing sports w/ friends 2 days/week for 30-40 mins

- Planks, push-ups, sit-ups & work on weights w/ older brothers for at least 3 days/week

- Walking 4 days/week for 10-15 mins
  Stretch between games or in between TV commercials & stretch 5 mins before walking

- Walking for 15 min 2 days/week and “Just Dance” active video game 30 min 2 days/week

- Jump rope & walking for 3 days/week at least 20 mins
How are children and families responding?

Parents tend to really appreciate the assessments

Some children are trying to perform the activities but are not consistent

Some children did not do anything and did not want to see exercise tester at follow–up or admitted to not making changes

Motivated few families hire personal trainers, make significant changes at home (food intake, sugary beverages, add step activity to schedule)
Getting Started without a Fitness Clinic

Ask about PA levels and get it in EMR!

Encourage activity when patients report it

Simple handouts with PA choices can provide specifics

Set one activity goal and follow up at next appointment

Try to get parents involved with activity

Hang posters in clinic with active kids and families
Moving Forward at UF

• Stay the course: Repeat each visit, notice small changes in behavior and health

• Choose key outcomes to track progress of health metrics and behaviors

• Move SMART goals to exercise prescriptions in pediatric settings

• Move physical activity as part of routine care plan and ensure PA can be tracked in the EMR throughout UF

Sincerest appreciation

James Sanchez, Inaugural intern
Alexandria Lam, Current Intern

UF Department of Pediatrics for the support to break ‘new ground’ with Patient services
THANK YOU

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