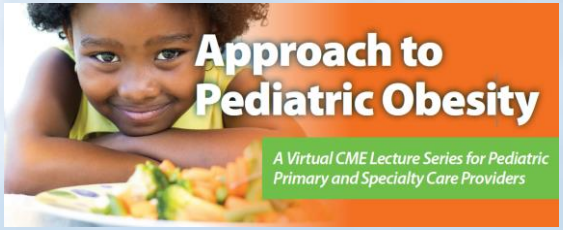
Approach to Pediatric Obesity: Fitness Assessment and Smart Goals



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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
Mutliple bouts a day

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

Structured activity

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

Dabas and Seth. Inf J Pediatr. 2018; 85(7):546-553; Wyszynska J Front Pediatr. 2020; 5(8):535705

↓ 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* !

Lobelo and Quevedo. AM J Lifestyle Med. 2016; 10(1):36-52.

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?

Circulation
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AHA SCIENTIFIC STATEMENT

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

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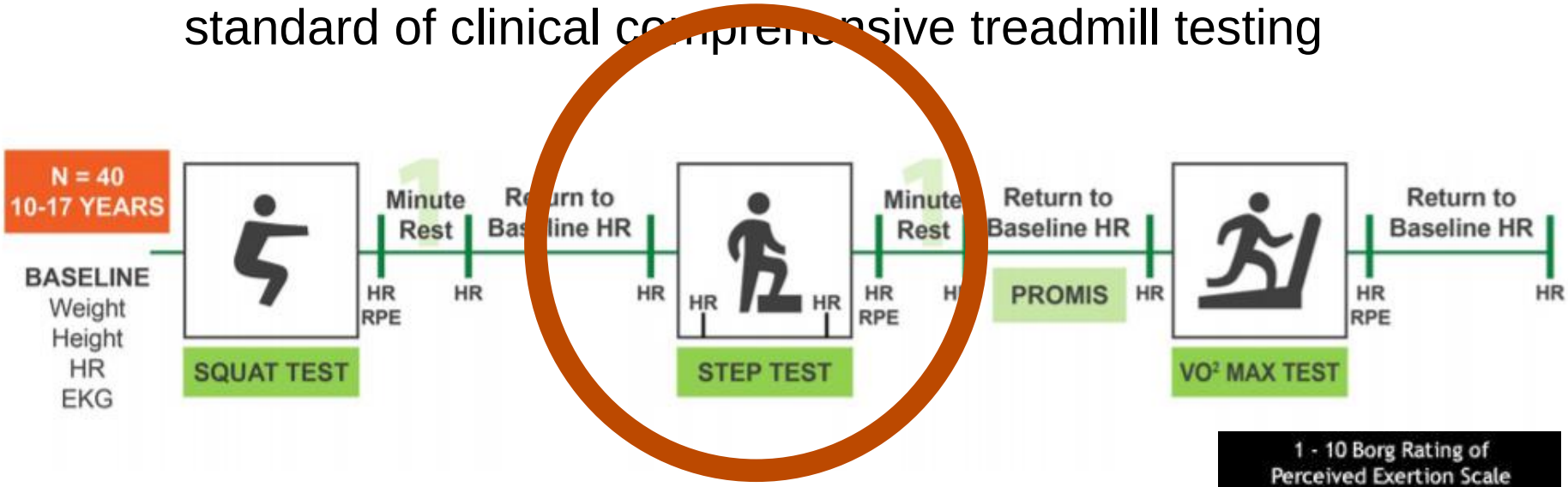
Compared discriminative ability of simple 45-second squat test and 3-minute bench step test to the gold standard of clinical comprehensive treadmill testing



1 - 10 Borg Rating of Perceived Exertion Scale	
0	Rest
1	Really Easy
2	Easy
3	Moderate
4	Sort of Hard
5	Hard
6	
7	Really Hard
8	
9	Really, Really, Hard
10	Maximal: Just like my hardest race

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

https://fitnessgram.net/assessment/ https://www.cooperinstitute.org/

Flexibility and Strength Measures

Chen W. et al. Obesity Rev. 2002 3(3); 225-232; Pate RR et al. Arch Pediatr Adolesc Med. 2006. 160; 1005-1012.
Kolimechkov S et al. Eur J Phys Educ Sport Sci. 2019; Canadian Health Measures survey cycle 5 (2016-217).

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.

Pate RR et al. Arch Pediatr Adolesc Med. 2006. 160; 1005-1012. Kolimechkov S et al. Eur J Phys Educ Sport Sci. 2019; 5(4): 1-14. Jankowski M et al. Pediatr Cardiol. 2015; 36:27-32.

ASSESSMENT MATERIALS

Fitness Category of Heart Rate Scores After Step Exercise

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

Fitness Category	HR Percentiles	Boys HR (6-9 years)	Boys HR (10-12 years)	Girls HR (6-9 years)	Girls HR (10-12 years)
Excellent	< 5th	< 95	<93	<100	<102
Very Good	<25th	95-106	93-105	100-113	102-116
Good	< 50th	107-115	106-116	114-123	117-128
Sufficient	< 75th	116-126	117-128	124-135	129-141
Poor	< 95th	127-142	129-147	135-152	142-157
Very Poor	>95th	>142	>147	>152	>157

How flexible are you?

Reach your hands out as far as you can

BOYS

Age (Years)	Percentile (Poor → Excellent)										
	5th	10th	20th	30th	40th	50th	60th	70th	80th	90th	95th
6-7	9.5	13.2	17.5	20.4	22.8	24.9	27.0	29.4	32.4	36.8	40.7
8-9	9.0	12.3	16.5	19.5	22.0	24.4	26.8	29.3	32.3	36.4	39.9
10-11	8.8	12.0	16.0	19.0	21.7	24.3	27.0	29.5	32.5	36.4	39.6
12-13	8.8	11.8	15.7	18.8	21.6	24.3	27.1	29.7	32.7	36.6	39.5
14-15	8.8	11.7	15.6	18.7	21.6	24.4	27.3	29.9	33.0	36.8	39.6
16-17	8.8	11.7	15.6	18.7	21.6	24.4	27.4	30.1	33.2	37.0	39.7
18-19	8.8	11.7	15.6	18.7	21.6	24.5	27.5	30.3	33.4	37.1	39.8

GIRLS

Age (Years)	Percentile (Poor → Excellent)										
	5th	10th	20th	30th	40th	50th	60th	70th	80th	90th	95th
6-7	15.1	19.3	23.8	26.7	29.0	30.9	32.8	35.0	37.6	41.6	45.1
8-9	15.0	19.2	23.7	26.6	28.9	30.9	32.9	35.1	37.8	41.7	45.2
10-11	14.9	19.1	23.6	26.6	28.9	31.0	33.0	35.2	37.9	41.9	45.3
12-13	14.9	18.9	23.5	26.5	28.9	31.0	33.1	35.3	38.1	42.0	45.3
14-15	14.8	18.8	23.4	26.4	28.8	31.0	33.1	35.5	38.2	42.1	45.4
16-17	14.7	18.7	23.3	26.4	28.8	31.1	33.2	35.6	38.4	42.3	45.5
18-19	14.6	18.6	23.1	26.3	28.7	31.1	33.3	35.7	38.5	42.4	45.6

Source: Canadian Health Measures survey cycle 5 (2016-2017)

How strong is your grip?

BOYS

Age (Years)	Percentile									
	5th	10th	20th	30th	40th	50th	60th	70th	80th	90th	95th
6 – 7	11.3	12.9	15.1	16.7	18.1	19.5	20.9	22.4	24.1	26.4	28.3
8 – 9	16.0	18.2	21.0	23.0	24.8	26.5	28.2	30.1	32.2	35.2	37.7
10 - 11	23.6	26.8	30.7	33.5	35.9	38.1	40.3	42.7	45.7	49.9	53.4
12 - 13	33.2	37.6	42.8	46.5	49.5	52.3	55.2	58.3	62.1	67.7	72.6
14 – 15	42.4	47.8	54.2	58.6	62.2	65.5	68.8	72.5	77.1	83.9	89.9
16 - 17	50.0	56.2	63.4	68.3	72.3	75.9	79.6	83.7	88.8	96.5	103.3
18 - 19	55.7	62.3	70.0	75.3	79.5	83.3	87.2	91.5	97.0	105.1	112.4

GIRLS

Age (Years)	Percentile									
	5th	10th	20th	30th	40th	50th	60th	70th	80th	90th	95th
6 – 7	10.5	12.0	13.9	15.4	16.7	17.9	19.2	20.6	22.3	24.5	26.4
8 – 9	16.3	18.3	20.8	22.7	24.3	25.8	27.3	29.0	31.0	33.9	36.3
10 - 11	22.4	25.0	28.0	30.3	32.1	33.9	35.7	37.7	40.1	43.6	46.6
12 - 13	27.8	30.7	34.3	36.8	39.0	41.0	43.0	45.2	48.0	52.0	55.5
14 – 15	32.0	35.2	39.1	41.8	44.2	46.4	48.6	51.1	54.1	58.4	62.2
16 - 17	34.9	38.3	42.4	45.3	47.8	50.2	52.5	55.1	58.3	62.9	66.8
18 - 19	36.8	40.2	44.4	47.4	50.0	52.5	54.9	57.6	60.9	65.6	69.7

Source: Canadian Health Measures survey cycle 5 (2016-2017)

Name: _____ DOB: _____ Date: _____

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

Hooker SA et al. FPM Journal. 2018; 25(2):31-36

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 knee to chest
  - Lunges 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

UF Department of Pediatrics, College of Medicine

UF Department of Orthopaedics and Rehabilitation, College of Medicine

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 exercise movements
- Get up during TV commercials
- Walk and talk on the phone
- Take the stairs
- Try and incorporate even 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

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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.

	N=180 mean SD (min - max)
Age (yr)	13.7 ± 3.4 (7- 20)
BMI (kg/m^2)	33.6 ± 7.9 (17.6 - 52.9)
Sex (% female/ male)	54.2/ 45.8
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.

Compared to our previous work in otherwise healthy children:

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

these patients are less fit.

3-min Bench Step Test	
Resting HR (bpm)	
Immediately step test post HR (	
1-min Post HR (bpm)	129.9 ± 21.6 (76-177)
Peak Rating of Perceived Exertion (1-10 scale)	6.6 ± 2.2 (1-10)
Percentile Score (1st=best, 100th=worst)	64th ± 31 (5-95th)

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

Table 3. Strength and flexibility assessment results of all patients.

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

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

SMART Goal Foci

Aerobic fitness

70.8%

Flexibility

19.6%

Musculoskeletal fitness and strength

5.8%

EVERYTHING
3.8%

Sample SMART goals

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

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

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

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

Jump rope & walking for 3 days/week at least 20 mins

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

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!

Hang posters in clinic with active kids and families

Simple handouts with PA choices can provide specifics

Set one activity goal and follow up at next appointment

Encourage activity when patients report it

Try to get parents involved with activity

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

Lobelo F et al. Pediatrics.145(3):e20193992.

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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