

# FACT SHEET



## PEDIATRICS

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# The Role and Scope of Pediatric Physical Therapy in Fitness, Wellness, Health Promotion, and Prevention

## Introduction

Pediatric physical therapists are:

- Autonomous health practitioners trained as practitioners of choice in providing health promotion interventions to increase fitness; enhance wellness; and prevent illness, disease, or severity of disability for all children.
- Experts who use family-centered care approaches with awareness of and attention to the influences of the child, family, and community environment on health outcomes in patient management for children with functional mobility limitations and/or movement disorders.<sup>1-4</sup>
- Practitioners who provide preventive interventions to identify potential health risk factors and recommend health promotion strategies for all children.<sup>1,2,5</sup> Goals for secondary and tertiary prevention for children with disabilities include traditional rehabilitation outcomes (eg, improved functional mobility, physical activity, and participation in daily activities).<sup>1-6</sup>

The primary purposes of this fact sheet are to provide pediatric physical therapists with the following: (1) a rationale for incorporating health promotion strategies into practice; (2) definitions for health promotion and related topics; (3) general considerations for health promotion interventions; (4) specific information for children and youth with disabilities and for children who are obese; (5) roles in community settings; and (6) resources and references.

## Pediatric Physical Therapy: Rationale and Roles in Fitness, Wellness, Health Promotion, and Prevention

Although the majority of children in the United States (US) are in good health, there is growing concern about unhealthy trends observed in increasing numbers of children. More than one third of US children are overweight or obese.<sup>7</sup> Health behaviors contribute to obesity rates. Most children do not participate in the daily recommended levels of 60 minutes of moderate to vigorous physical activity (MVPA). Most participate in more than 2 hours/day of sedentary “screen time” and most have unhealthy diets.<sup>8</sup> Children with chronic conditions and disabilities have more sedentary lifestyles and have higher rates of obesity compared to peers.<sup>9,10</sup> Pediatric physical therapists can address these concerns by incorporating health promotion, wellness, fitness, and prevention strategies into practice.<sup>1,5</sup>

In addition to restoration of function, the American Physical Therapy Association's (APTA's) *Guide to Physical Therapist Practice*<sup>1</sup> (the Guide) defines scope of practice to include a role in prevention, health promotion, wellness, fitness and screening activities. The goals of physical therapy intervention are to minimize impairments, activity limitations, participation restrictions, and health costs while achieving optimal function. As pediatric physical therapists, the goal is to work towards having the family and child adopt fitness as an important activity and to carry the fitness program forward. As the Guide recommends, once the physical therapy goals have been achieved, physical therapists refer patients to other health practitioners (eg, community fitness staff) for health promotion and long-term fitness and wellness programs.<sup>1</sup>

## Definition of Terms

We have defined key terms for clarity so that interventions and outcome measures are designed appropriately to achieve identified goals for health promotion, wellness, fitness, and prevention in all children—including those with typical development, chronic conditions (eg, obesity) or disabilities (eg, cerebral palsy, autism)<sup>11</sup>:

*Physical Fitness:* “A set of attributes that are either health- or skill-related. The degree to which people have these attributes can be measured with specific tests.”<sup>12</sup>

- Health-related fitness includes body composition, cardiorespiratory endurance, flexibility, muscular endurance, and muscle strength.<sup>13</sup>
- Skill-related fitness includes agility, balance, coordination, power, speed, and reaction time.<sup>13</sup>

- Physiological fitness includes nonperformance-based metabolic and morphologic fitness and bone health.<sup>13</sup>

*Physical Activity:* “Any bodily movement produced by skeletal muscles that result in energy expenditure.”<sup>12</sup>

*Exercise:* “A subset of physical activity that is planned, structured, and repetitive and has as a final or intermediate objective of improvement or maintenance of physical fitness.”<sup>12</sup>

*Wellness:* “A state of being describing a state of positive health in an individual and compromising biological and psychological well-being as exemplified by quality of life and a sense of well-being.”<sup>13</sup>

*Health Promotion:* “Represents a comprehensive social and political process, it not only embraces action directed at strengthening the skills and capabilities of individuals, but also action directed towards changing social, environmental and economic conditions so as to alleviate their impact on public and individual health. Health promotion is a process of enabling people to increase control over the determinants of health and thereby improve their health. Participation is essential to sustain health promotion action.”<sup>14,15</sup>

*Prevention:* Pediatric physical therapists may provide prevention services in 3 ways<sup>1</sup>:

- Primary prevention: Eliminating health problems in at-risk populations by providing health promotion.
- Secondary prevention: Reducing the severity, duration, or number of negative health outcomes by early diagnosis of the target condition and quick and effective intervention.
- Tertiary prevention: Reducing the impact of disability and promoting rehabilitation, health, and function in children and youth with chronic conditions or permanent disabilities.

## Reimbursement Considerations

Health promotion interventions may be appropriate to achieve physical therapy goals. Reimbursement will differ depending on the family’s insurance, the setting for the physical therapy (eg, clinic, school, early intervention) and the type of intervention (eg, primary, secondary, tertiary). The reason for the intervention (eg, child/family goals, medical necessity) will influence the reimbursement and the number of “allowed” sessions. The pediatric physical therapist can determine if there is a billable physical therapy ICD code related to a body structure and function impairment or activity limitation that can be submitted for health insurance coverage.

**Table 1. General Considerations for Health Promotion Interventions**

<b>Child and Family</b>	Interview child and parent to identify health risk factors, child and family goals, and resources; determine usual or typical physical activity levels and general health of child and family; and identify child and parent willingness or readiness to make health changes. <sup>15</sup>
<b>Screening, Examination, Evaluation, and Intervention<sup>1</sup></b>	<p><b>Screening:</b> Consider using a physical health checklist or an activity profile for children and youth to identify risk factors and general health and activity levels<sup>16</sup></p> <p><b>Examination:</b> Take a child history; review body systems using appropriate tests and measures based on screening results.</p> <p><b>Evaluation:</b> Clinical judgment from screening and exam to help guide intervention.</p> <p><b>Intervention:</b> Consider exercise prescription using the FITTE Principles<sup>17</sup>—(Frequency = # sessions/week; Intensity = weight progression (strength); cardiorespiratory fitness level (aerobics); Time or duration = number of sets/reps (strength); time/intensity (aerobics); length of program; Type = what kind of program? (eg, physical fitness, strength, physical activity, sports, etc); Enjoyment = Children should participate for FUN more than for competition.</p>
<b>Measures</b>	<p>Physical therapists should choose specific measures to determine intervention effectiveness. Physical therapists should take baseline and postintervention measures that are meaningful to intervention goals and strategies. Measures should be reliable, valid, and feasible.</p> <p>Clinical measures may include:</p> <ul style="list-style-type: none"> <li>• <b>Aerobic/Endurance:</b> Timed run/walk/wheel tests using set distances and stopwatch.</li> <li>• <b>Functional Strength/Endurance:</b> Repetitions for sit-to-stand, step-ups, sit-ups, or push-ups.</li> <li>• <b>Strength:</b> Weights, reps, and sets for progressive resistive exercises (PREs).</li> <li>• <b>Surveys:</b> Information from parents, teachers, and children on activity and participation.</li> </ul>
<b>Setting</b>	<p><b>Clinic:</b> The child must be medically stable and the physical therapist may request physician clearance based on screening and examination findings. The clinic may be best if the physical therapist needs to monitor vital signs.</p> <p><b>Community:</b> A community recreation center may be appropriate to implement a program for children and youth who are more stable and are motivated to participate in a community-based program. Fitness staff buy-in and participation are critical in community programs.</p>

Table 2. Strength Training Considerations for Health Promotion in Children With Specific Disabilities

Strength Training	Measurements	Precautions/Considerations
<p><b>Cerebral Palsy</b> 2-3 times per week, 1-3 sets of 8-12 repetitions using free weights, machines, or isokinetic exercise machines and sufficient resistance; Able to perform 3 sets with ease before increasing weight; Improve 30%-50% over 8-12 weeks<sup>18-20</sup></p> <p><b>Down Syndrome</b><sup>21</sup> 2-3 times per week, 1-3 sets of 8-12 repetitions using resistance bands, free weights, machines, or exercise machines and sufficient resistance<sup>22</sup></p> <p><b>Duchenne Muscular Dystrophy</b> Low-resistance program and functional strengthening to decrease disuse atrophy especially for ambulatory and early nonambulatory phases<sup>23</sup></p> <p><b>Spina Bifida</b> Train active muscle groups 2-3 times per week, 1-3 sets of 8-12 repetitions using free weights, machines, or isokinetic exercise machines<sup>24,25</sup></p> <p><b>Autism</b> Consider strength training using Progressive Resistive Exercises (PREs) as outlined in the guidelines from the 2009 National Strength and Conditioning Association Position Paper.<sup>26</sup> Evidence suggests that moderate to vigorous physical activity may reduce stereotypical behaviors in addition to having positive health benefits.<sup>27</sup></p>	<p>Hand-held dynamometry<sup>28,29</sup></p> <p>Brockport<sup>30</sup></p> <ul style="list-style-type: none"> <li>• Modified curl-ups</li> <li>• Isometric push-up</li> <li>• Wall squat</li> </ul> <p>Bruininks-Oseretsky Test of Motor Performance, 2nd Edition (BOT-2)<sup>31</sup></p> <p>10 Repetition Maximum (RM)</p> <p>Sit-to-stand<sup>29</sup></p> <p>Lateral step-ups</p> <p>Half kneel to stand (CP-GMFCS Levels I-II-III)</p> <p>Timed Up-and-Down Stairs (TUD)<sup>32</sup></p> <p>Timed Up-and-Go (TUG)<sup>33,34</sup></p> <p>Hammersmith Motor Ability Test<sup>35</sup></p>	<p><b>Overall</b><sup>36</sup></p> <ul style="list-style-type: none"> <li>• Screen for hypertension before initiating a program.</li> </ul> <p><b>Cerebral Palsy</b><sup>19,37,38</sup></p> <ul style="list-style-type: none"> <li>• Do not initiate program if child has uncontrolled seizures.</li> <li>• Strengthening programs should be supervised by a trained adult.<sup>39</sup></li> <li>• Modify resistance and weight-bearing for children with severe osteoporosis.</li> <li>• Limit resistance initially following orthopedic surgery when there are weight-bearing limitations.</li> <li>• Limit area-specific passive stretching for 2-3 weeks following spasticity management with phenol injections.</li> <li>• Be cautious using 1RM for strength measures, especially for youth with osteoporosis, poor motor control, or malalignment.</li> </ul> <p><b>Down Syndrome</b><sup>40,41</sup></p> <ul style="list-style-type: none"> <li>• Screen for any cardiorespiratory restrictions secondary to potential of unrepaired congenital heart defect.</li> <li>• Screen for potential atlantoaxial instability (cervical spine X-ray).</li> <li>• Potential of joint hypermobility: Check alignment during activities such as hyperextension at knees and elbows with exercise.</li> <li>• Design strengthening program in consultation with the medical team.</li> </ul> <p><b>Duchenne Muscular Dystrophy</b><sup>42,43</sup></p> <ul style="list-style-type: none"> <li>• Avoid high-resistance exercise and eccentric muscle contractions.</li> <li>• Communicate closely with medical team and family when prescribing a strengthening program to monitor any adverse effects</li> <li>• Be aware of potential cardiac compromise and any related exercise restrictions.</li> </ul> <p><b>Spina Bifida</b><sup>44</sup></p> <ul style="list-style-type: none"> <li>• Be aware of signs/symptoms related to associated conditions, such as shunt malfunction, tethered cord, Arnold Chiari malformation.</li> </ul> <p><b>Autism</b><sup>45</sup></p> <ul style="list-style-type: none"> <li>• Higher incidence of seizures, sensory issues that may require activity modifications.</li> <li>• Consider behavioral issues and child's ability to follow a supervised PRE program.</li> </ul>

**Table 3. Aerobic Exercise Considerations for Health Promotion in Children With General Disabilities**

Aerobic Exercise	Measurements
<ul style="list-style-type: none"> <li>• National Physical Activity Guidelines recommend that children get a minimum of 60 minutes of moderate to vigorous physical activity (MVPA) which may occur in bouts of &gt;10 minutes. Children with disabilities may need to modify these recommendations based on type of disability and overall conditioning level.<sup>46</sup></li> <li>• School physical education classes should include structured aerobic exercise for 150-225 minutes/week depending on child's age.<sup>47</sup> Amount of adapted physical education may vary based on child's disability or level of conditioning, but the recommendation for amount of structured exercise in physical education classes is meant for all children.</li> <li>• Strategies to increase intensity of aerobic activities will depend on child's disability, conditioning level, and any cardiac precautions.<sup>30</sup></li> </ul> <p>Using the FITTE principles,<sup>17</sup> one may consider the following strategies when designing an aerobic exercise program to promote health and increase aerobic capacity in children with disabilities:</p> <ul style="list-style-type: none"> <li>□ <b>Frequency:</b> Gradually increase the number of sessions per week from 2 to 4 or more days/week.<sup>48</sup></li> <li>□ <b>Intensity:</b> Gradually increase the cardiorespiratory training demand in each session; consider having the child work at 40%-85% peak oxygen consumption or at a target heart rate (THR) that is from 40%-85% of their max HR. For children with CP, it is recommended that 194 beats per minute be used as an estimate of max HR when individual HR monitoring is not possible.<sup>49</sup></li> <li>□ <b>Time:</b> Gradually increase time in aerobic exercise; consider starting at 20 minutes and increasing to 40 minutes per session as tolerated.<sup>48,50</sup></li> <li>□ <b>Type:</b> Consider introducing land or aquatic exercise programs based on child's disability, conditioning level, precautions, and preference.<sup>48,50-52</sup></li> <li>□ <b>Enjoyment:</b> Be sure to include activities, props, games, music, movement, etc, to motivate and encourage participation.<sup>48,50-52</sup></li> </ul>	<p>½ or 1-mile walk/run test<sup>20,30</sup></p> <p>Brockport<sup>30</sup></p> <ul style="list-style-type: none"> <li>• Shuttle Run Test (SRT) 16 m</li> <li>• Target Aerobic Movement Test (TAMT)</li> </ul> <p>3-, 6-, or 12-minute walk test or wheelchair push test<sup>20,24,25,30</sup></p> <p>600-yard walk/run<sup>20,24,30</sup></p> <p>Working Heart Rate<sup>49</sup></p> <p>Energy Expenditure Index (EEI)<sup>42,44</sup></p> <p>SRT: For children with cerebral palsy at Gross Motor Function Classification System (GMFCS) Levels I, II, and III<sup>53</sup></p>

*Precautions for aerobic exercise programs are similar to those outlined in Table 2 for strength-training programs. It is important to screen for any cardiac or pulmonary conditions and to revise programs as indicated.*

**Table 4. Physical Therapists Roles in Adapted Sports Programs and Consultation in the Community<sup>54-56</sup>**

Interventions	Measurements
<p>Physical therapists can:</p> <ul style="list-style-type: none"> <li>• Instruct children and caregivers about importance of MVPA, strengthening and weight bearing exercises, and ways to adapt activities to maximize participation.</li> <li>• Instruct community fitness providers on how to include children with disabilities in active recreation and sports programs.</li> <li>• Assist with the design, implementation and measurement of active recreation and sports programs for children with disabilities.<sup>44-46</sup></li> </ul>	<p>Physical therapists can work with community fitness instructors to:</p> <ul style="list-style-type: none"> <li>• Design outcome measures for program evaluation of community health promotion programs for children and youth with disabilities. <ul style="list-style-type: none"> <li>□ Measures may be similar to clinic measures used in physical therapy.</li> <li>□ Measures may be summative evaluations of participation in programs (eg, attendance records, information on adverse reactions or injuries).</li> <li>□ Measures may be summative program evaluations (eg, program satisfaction questionnaires for children and/or parents; program effectiveness for attaining identified goals and objectives on body structure and function, activity, or participation).</li> </ul> </li> </ul>

Abbreviation: MVPA, moderate to vigorous physical activity.

Table 5. Considerations for Health Promotion for Children With Typical Development Who Are Obese

Intervention	Measurements	Precautions
<p><b>Physical Activity Programs for School-aged Children</b>                      Noncompetitive games; strength training with resistance bands; information about self-management, goal setting, social support, health, and nutrition.<sup>57</sup></p>	Body Mass Index Shuttle Run Push-Up Test Reach Test	Statement of Sufficient Health form submitted by parents
<p><b>Nutrition, Strength, Aerobic program for Adolescent Girls</b>                      Nutrition educational sessions about diet and motivation for healthy eating; strength-training exercises; aerobic cardiovascular fitness exercises.<sup>58</sup></p>	Body-Mass Index Body composition Glucose tolerance testing 3-day physical activity and diet recall Leg press and bench press Accelerometer data	Participants were excluded if they have had any major medical diagnoses since birth
<p><b>Elementary-school Children in Second and Third Grades</b>                      Physical Activity Across the Curriculum (PAAC)<sup>59</sup></p>	Body-Mass Index Accelerometer data Academic achievement	No precautions
<p><b>Lunch-Time Walking Program in Elementary Schools</b>                      Card marked for every ¼ mile walked.<sup>60</sup></p>	Body-Mass Index Waist circumference The Progressive Aerobic Cardiovascular Endurance Run (PACER) test	No precautions
<p><b>School-based Program: Healthy for Life/PE4ME</b>                      Focuses on the school, nutrition, and physical activity: The Sports, Play, and Active Recreation for Kids (SPARK) curriculum.<sup>61</sup></p>	Body-Mass Index Blood Pressure Questionnaire on lifestyle choices and self-esteem	No precautions
<p><b>Physical Activity Program for Obese Children Ages 6-14 Years Who Are Not Physically Active</b>                      Games for strength, balance, fun, endurance, and courage; sports (eg, swimming, hiking, climbing, skating, sliding, football); activities with music; athletics; orienteering; ball games.<sup>62</sup></p>	Body-Mass Index Maximum oxygen uptake Physical fitness tests: running, jumping, throwing, climbing.	No precautions
<p><b>Hospital-based Intervention for Obese Children Ages 5-17 Years</b>                      Dietician monitoring, education, food journal; individual family sessions to identify triggers for overeating and discussions about being overweight.<sup>63</sup></p>	Body-Mass Index Waist circumference Blood pressure Body fat	Pediatric consultant determined if program was a good fit
<p><b>After-school Program for Children in Kindergarten Through Fifth Grade</b>                      Track and field exercises including calisthenics, strength and flexibility exercises, sprinting, or long-distance running; nutrition education and games such as dodge ball, soccer, and freeze tag.<sup>64</sup></p>	Hip-to-waist ratios Body composition Food frequency interview by dietician	Precaution if history of cardiovascular disease or contraindications for moderate intensity exercise
<p><b>Physical Activity Program for Obese Children Ages 7-17 Years</b>                      Physical activity sessions; motivating and fun games.<sup>65</sup></p>	Body-Mass Index Blood Pressure	No precautions

## Select Websites and Resources on Health Promotion, Fitness, Wellness, and Prevention

### APTA's Section on Pediatrics:

- [www.apta.org](http://www.apta.org)
- Section on Pediatrics "Goofy for Exercise"
  - [www.pediatricapta.org](http://www.pediatricapta.org)
  - APTA's Section on Pediatrics Sports and Fitness Special-Interest Group Web site:
  - [www.pediatricapta.org/special-interest-groups/pediatrics-sports-fitness/index.cfm](http://www.pediatricapta.org/special-interest-groups/pediatrics-sports-fitness/index.cfm)

### For Children With Disabilities:

- I Can Do It! You Can Do It!
  - [www.hhs.gov/od/physicalfitness.html](http://www.hhs.gov/od/physicalfitness.html)
- National Center for Physical Activity and Disability
  - [www.ncpad.org](http://www.ncpad.org)
- Disabled Sports USA
  - [www.dsusa.org](http://www.dsusa.org)
- American Therapeutic Recreation Association
  - [www.atra-online.com](http://www.atra-online.com)

### Community and School Programs for Children With Typical Development

- SPARK: [www.sparkpe.org](http://www.sparkpe.org)
- CATCH: [www.catchinfo.org](http://www.catchinfo.org)
- Marathon Kids: [www.marathonkids.com](http://www.marathonkids.com)
- Fitnessgram®: <http://fitnessgram.net/home>

### General Health and Fitness Web Sites for Children and Families

- [www.acefitness.org](http://www.acefitness.org)
- [www.americanheart.org](http://www.americanheart.org)
- [www.apta.org](http://www.apta.org)
- [www.efit.com](http://www.efit.com)
- [www.fitness.gov](http://www.fitness.gov)
- [www.fitteen.com](http://www.fitteen.com)
- [www.healthscout.com](http://www.healthscout.com)
- [www.kidshealth.org](http://www.kidshealth.org)
- [www.kidshealthworks.com](http://www.kidshealthworks.com)
- <http://marrtc.missouri.edu/warmup/index.html>
- [www.trimkids.com](http://www.trimkids.com)
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