Pediatric Athletes With Physical Disabilities

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It is estimated that there are about 40 million physically challenged persons in the United States; about 12% of school-age children have physical disabilities. More than 3 million persons with physical and mental disabilities are involved in organized sports, and many more in recreational physical activities. There is a wide spectrum of physical, mental, and sensory disabilities (see sidebar). Some of the commonly used terms in the context of this discussion are briefly defined in Table 1.1-3

Athletes with various medical conditions have different capabilities for physical performance. Even athletes with the same medical condition can differ widely in their capacity for physical and mental performance on a given task. It is therefore necessary to classify athletes with disabilities based on their functional capabilities. Such functional classification takes into account the specific disability, nature of the sport, use of adaptive equipment by the athlete, and observation of the athlete during a given task. Trained and certified personnel classify athletes with disabilities. Grouping athletes with similar functional capabilities levels the playing field.

In addition to appropriate classification, a careful preparticipation evaluation (PPE) is important to identify specific medical issues with implications for sport participation. PPE also provides a setting to explore psychosocial issues that might be of relevance for the child and the family. PPE of a child with physical disability should ideally be conducted by the health-care professional most familiar with the athlete’s medical condition, who should be knowledgeable about the specific disability and its medical implications for sport participation. The purpose of the PPE is to appropriately match the athlete with a given sport. In addition to specific assessment of the disability, a thorough medical history should include general questions applicable to all athletes (see sidebar on next page). Musculoskeletal and neurologic assessment should be part of a careful physical examination. Any special equipment, orthotics, or other adaptive and assistive devices used by the athlete should be carefully evaluated by a knowledgeable professional.

Key Points

- All children with physical disabilities can be appropriately matched with different sport activities.
- Children with physical disabilities derive great psychological and physical benefits from sport participation.
- Special attention should be given to the unique medical needs of children with specific disabilities.
- Key Words: autonomic dysreflexia, myelomeningocele, Down syndrome.

Major Physical Disabilities

- Cerebral palsy
- Myelomeningocele and other neural-tube defects
- Spinal-cord injuries
- Limb amputations
- Traumatic brain injury
- Sensory impairment: vision and hearing deficits
- Neuromuscular disorders

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Thermoregulation

The ability to regulate body temperature is centrally mediated and is lost in athletes with spinal-cord injuries or lesion, especially with a lesion above thoracic 8.2,4,9 These athletes are at increased risk for developing hyperthermia, as well as hypothermia. They have reduced capacity for heat loss because of impaired sweating below the level of the lesion, thus reducing the effective body-surface area for evaporative cooling. Because of poor muscle tone and contractions there is venous pooling in the lower limbs and decreased venous return. This limits the body’s ability to lose heat by convection and radiation. An athlete with hyperthermia might have increased fatigue, headache, lightheadedness, muscle aches, nausea, vomiting, neurologic impairment, increased core temperature, and impaired sweating.1,4,9

Hypothermia is also a risk for these athletes. There is loss of sensation below the level of the lesion, and the athlete might not be aware of wet clothes. Motor function is also impaired, and there is decreased muscle mass and reduced capacity to generate heat from muscle contractions.1,4,9 Central thermoregulation is also impaired in these athletes, further increasing the risk for hypothermia. An athlete with hypothermia feels confused and cold and might have slurred speech.4 Cardiac and respiratory complications can result if this is not promptly recognized and treated. Athletes with spinal-cord injury are at risk for hypo-

### Table 2. Terminology

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<thead>
<tr>
<th>Term</th>
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<tr>
<td>Impairment</td>
<td>Any loss or abnormality of psychological, physical, or anatomical structure or function</td>
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<td>Disability</td>
<td>Any restriction or lack (resulting from impairment) of an ability to perform an activity in the manner or within the range normal for a human being</td>
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<td>Handicap</td>
<td>A disadvantage for a given individual that results from impairment or a disability that limits or prevents the fulfillment of a role that is normal for that individual</td>
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<td>Adapted sport</td>
<td>A sport that is modified or especially designed for athletes with disabilities</td>
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<td>Paralympic Games</td>
<td>Games for athletes who have physical disabilities or visual impairment</td>
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<td>Special Olympics</td>
<td>A sport training and competition program for persons with mental retardation who are age 8 years and older, irrespective of their abilities</td>
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### Key Elements of PPE History

- Known medical conditions
- Recent febrile illness
- Past history of major surgeries
- Medications or supplements used by athlete
- Known allergies
- History of syncope
- History of palpitation, chest pain, heart murmur, high blood pressure
- Family history of premature cardiac death or other cardiovascular disease
- History of head or neck injury
- Difficulty breathing
- Hearing or vision problems
- Weight-control practices
- Immunization status
- Menstrual history in females