



# Chapter 1

## Introduction to the Brockport Physical Fitness Test

The Brockport Physical Fitness Test (BPFT) is a health-related, criterion-referenced test of fitness. The term *health-related* is used to distinguish objectives of this test battery from others that might be more appropriately related to skill or physical performance. The phrase *criterion-referenced* conveys that the standards for evaluation are based on values believed to have significance for an individual's health. **Criterion-referenced standards** can be established in a number of ways, including through research findings, logic, expert opinion, and norm-referenced data (e.g., averages, percentiles).

The BPFT is designed primarily for use among youngsters with disability. It is particularly compatible with Fitnessgram®, the fitness test developed by the Cooper Institute® (2013).

In the mid-1990s, the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) adopted the Prudential Fitnessgram (Cooper Institute for Aerobics Research, 1992) as its recommended health-related, criterion-referenced test of **physical fitness**. However, while the Prudential Fitnessgram manual contained a section addressing special populations, different or modified test items and standards were not presented in a systematic way for young people with specific disabilities.

To address this need, the College at Brockport, State University of New York, received funding from the Office of Special Education and Rehabilitative Services in the U.S. Department of Education from 1993 to 1998 to support the work of Project Target (1998). The project aimed to develop a health-related, criterion-referenced physical fitness test for young people (aged 10 to 17) with disability. A key element of the project was to develop standards that would provide targets for attaining health-related physical fitness.

Another key goal of Project Target was to develop an educational component to enhance the development of health-related fitness in youngsters with disability. The populations targeted in this project included youth with mental retardation, spinal cord injury, cerebral palsy, blindness, congenital anomaly, or amputation. (In this current revision of the BPFT, the term *mental retardation* has been replaced by *intellectual disability* in order to be consistent with current conventions.)

Although the project targeted these particular disabilities, it also provides a process that can be used to assess the physical fitness of youngsters with other disabilities. During the project, a total of 1,542 young people (with and without disability) were tested, and data from several other

projects (including thousands of youngsters) were also analyzed as part of Project Target. The result of Project Target is the Brockport Physical Fitness Test.

This second edition of the BPFT retains information about the test's background, definitions and classifications of disabilities, test items, test selection guides, and standards (slightly revised) for assessing performance. Some technical information from the first edition is not included here, but it can be found in Winnick and Short (2005). New and revised features of the second edition include a test manual with instructional video clips and reproducibles available in the accompanying web resource.

The BPFT includes a number of unique elements. First, it represents an initial attempt to apply a health-related, criterion-referenced fitness approach to youngsters with disability. Second, it recognizes the individualized nature of fitness testing and encourages a personalized approach based on health-related needs and a desired fitness profile. Third, in an effort to provide options for test administrators to personalize testing, the battery includes several test items from which to choose. Finally, some of the test items presented are new (or at least nontraditional) and are designed to include a larger number of individuals in the testing program than was previously possible.

This test manual is fairly thick. Many of the pages are dedicated to the directions for administering individual test items that are presented in chapter 5. Testers, however, should also become familiar with the material presented in other chapters because understanding the rationale for the test (along with its strengths and weaknesses) is important in interpreting results.

## **Test Construction**

The BPFT includes 27 test items, but, generally speaking, only 4 to 6 items are needed in order to assess the health-related physical fitness of a particular individual. As expected, considerable study was undertaken to determine what test items to recommend in the test and what standards and fitness zones should be used to evaluate physical fitness. The process developed for

selecting test items and standards for youngsters reflects the **personalized approach** described in detail in chapter 2. The steps include identifying and selecting health-related concerns of importance for an individual, establishing a desired personalized fitness profile, selecting components and subcomponents of physical fitness to assess, selecting test items to measure the selected components, and selecting health-related standards and fitness zones to evaluate physical fitness.

In selecting test items and standards for the BPFT, one of the primary criteria used was validity. Once a conceptual framework was established for health-related physical fitness, test items and standards were selected on the basis of logic, literature review, and data deemed relevant to validity. The theoretical conceptual basis for the test's validity is more specifically discussed and summarized in Winnick and Short (2005).

A second criterion for selection of test items was reliability. All of the test items recommended are believed to be reliable. Many data were found in the literature regarding the reliability of test items, and additional data supporting test-item reliability were collected as part of Project Target. Again, readers can obtain detailed information about the test's reliability in Winnick and Short (2005).

A third criterion for selection of test items and standards was the extent to which test items could be used for different categories of youngsters. Preference was given to test items and standards that could be applied to young people with and without disability and that could be found in appropriate tests of physical fitness designed for the general population. In particular, test items from Fitnessgram were selected so that the BPFT could be easily coordinated with that test. Preference was also given to test items that could be administered to both males and females, to youngsters between 10 and 17 years of age, and to young people with various disabilities.

The fourth criterion of primary importance was for test items to be suitable for measuring different physical fitness traits or abilities but also to encompass the components of physical fitness selected and defined for this test. This approach was taken so that each item in the test added new information about an individual's ability.

Additional secondary criteria were also applied in the selection of test items. Specifically, to the extent possible, preference was given to items reasonably familiar to physical educators, economical in terms of time and expense, and easily administered in field situations.

## Target Populations

The BPFT was targeted for use among youngsters with disability—specifically, those with visual impairment, intellectual disability, or orthopedic impairment, including cerebral palsy, spinal cord injury, congenital anomaly, and amputation. However, it builds on and closely relates to physical fitness tests of youth in the general population, particularly Fitnessgram. Youngsters in the general population, of course, include those without disability (that is, those who are free from impairment or disability that influences test results).

The following sections present definitions and classifications associated with groups with whom the BPFT might be used.

### Youngsters With Intellectual Disability

The first disability classification associated with this test is intellectual disability. Its definition is based on the American Association on Mental Retardation's (1992) definition of (in the terminology commonly used at the time) mental retardation:

Mental retardation refers to substantial limitations in present functioning. It is characterized by significantly subaverage intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work. Mental retardation manifests before age 18.

This definition includes three major criteria for the determination of an intellectual disability: subaverage intellectual functioning, deficits in

adaptive behavior, and manifestation before age 18. This edition of the BPFT uses the term *intellectual disability* instead of *mental retardation*.

Although many youngsters with intellectual disability have no limitation in physical fitness, others exhibit limitations ranging from mild to severe. As a result, they may require slight to marked modifications in testing to measure physical fitness.

Youngsters with intellectual disability and mild limitations in physical fitness include both people who require intermittent or limited support in learning or performing test items and people who require substantial modification in test items or alternative test items to measure components of physical fitness. These individuals are capable of levels of fitness consistent with good health, can participate in games and leisure activities in selected appropriate environments, and can perform activities of daily living. Youngsters with intellectual disability and mild limitations are perhaps best associated with the lower levels of the “mild mental retardation” and “moderate mental retardation” classifications used in previous classification systems.

Youngsters with intellectual disability who have severe limitations generally need extensive or pervasive support related to physical fitness. These individuals require significant help in learning and performing physical fitness test items. They also need alternative test items or marked modification in measuring a component (or more than one) of physical fitness. As a result, valid assessment of physical fitness may not be possible in this group using typical health-related physical fitness tests. Thus, for this group, measurement of physical activity may be preferred over assessment that uses physical fitness test items.

Suitable test items of physical fitness for this group may include alternative assessments, such as rubrics and task-analyzed test items. In addition, these individuals often require physical assistance as they perform test items. (These approaches are discussed in greater detail in chapter 6.)

Table 1.1 summarizes limitations and needs related to physical fitness testing of youngsters with intellectual disability.

## Youngsters With Visual Impairment

Visual impairment is defined as impairment in vision that, even with correction, adversely affects a child's educational performance. It includes both partial sight and blindness. Categories of blindness given in table 1.2 are consistent with those used by the U.S. Association of Blind Athletes (USABA). The partial-sight category used with this test corresponds to the B4 category developed by the USABA classification for sport competition.

## Youngsters With Spinal Cord Injury

For purposes of the BPFT, a spinal cord injury is a condition that involves damage to the spinal cord resulting in motor and possibly sensory and muscular impairment. It includes traumatic as well as congenital spinal cord injury or malfunction. Both the level and the extent of damage affect the nature and degree of a person's impairment and disability. A complete spinal cord injury results in total loss of sensory, motor, and autonomic

functions below the neurological level of spinal cord damage. An incomplete injury results in a partial but not total loss of function below the level of injury on the spinal cord.

The BPFT includes test items for individuals who have low-level quadriplegia or paraplegia and who primarily use wheelchairs for locomotion in their activities of daily living. These test items can also be used for ambulatory youngsters with spinal cord injury. To enable selection of appropriate test items and standards for measuring and evaluating physical fitness, the BPFT uses a three-category classification of spinal cord injury: low-level quadriplegia (LLQ), paraplegia—wheelchair (PW), and paraplegia—ambulatory (PA). See table 1.3 for more detail.

## Youngsters With Cerebral Palsy

In order to group and categorize physical fitness test items and performance for this population, the BPFT has adopted the definition of cerebral palsy and the classification system used by the Cerebral Palsy International Sports and Recreation Association (CPISRA, 1993). Here is the definition:

**Table 1.1** Limitations and Needs of Youngsters With Intellectual Disability in Physical Fitness Testing

Limitation	Needs
None	These individuals have no unique physical fitness needs and require no unique modification or support in learning and performing physical fitness tests. The desired physical fitness profile and standards for evaluating physical fitness are identical to those for youngsters without disability.
Mild	These individuals have mild limitations in physical fitness requiring intermittent or limited support in learning or performing test items. They may also require substantial modification of test items or alternative test items to measure components of physical fitness. They can demonstrate physical fitness on an achievement scale. Adjusted standards for assessing physical fitness may be appropriate. The desired physical fitness profile leans toward or closely relates to that of youngsters without disability.
Severe	Because of severe limitations, these individuals need extensive or pervasive support in learning and performing test items. They also need alternative test items or marked modification in measuring components of physical fitness. They may require assessment involving physical activity rather than physical fitness. They generally need individualized criterion-referenced standards for assessment of physical fitness.

**Table 1.2** Classification System for Youngsters With Visual Impairment

Category	Description
B1	Individuals who are totally blind (may possess light perception but are unable to recognize hand shapes at any distance)
B2	Individuals who can perceive hand shapes but with visual acuity of not better than 20/600 or who have less than 5° in the visual field
B3	Individuals with visual acuity from 20/599 to 20/200 and those with 5° through 20° in the visual field
PS	Individuals who are partially sighted (those with visual acuity from 20/199 to 20/70)

Cerebral palsy is a brain lesion which is nonprogressive and causes variable impairment of the coordination, tone and strength of muscle action with resulting inability of the person to maintain normal postures and perform normal movements.

In order to describe degree of impairment as it influences performance in physical activity and sport, this test has adapted and collected test data

for a classification system originally developed by CPISRA (1993) based on a functional evaluation that includes assessing the extent of an individual's control of the lower extremity, trunk, upper extremity, and hand. This classification system is summarized in table 1.4.

Category C1 includes individuals with the most severe involvement (e.g., those who depend on an electric wheelchair or assistance for mobility),

**Table 1.3** Classification System for Youngsters With Spinal Cord Injury

Category	Description
Low-level quadriplegia (LLQ)	Individuals with complete or incomplete spinal cord damage that results in neurological impairment of all four extremities and the trunk, as well as individuals with lower cervical (C6–C8) neurological involvement
Paraplegia—wheelchair (PW)	Individuals with complete or incomplete spinal cord injury below the cervical area resulting in motor loss in the lower extremities (paraplegia) and the need to use a wheelchair for daily living activities
Paraplegia—ambulatory (PA)	Individuals with complete or incomplete spinal cord injury resulting in motor loss in the lower extremities but who ambulate in daily activities without wheelchair assistance

**Table 1.4** Classification System for Youngsters With Cerebral Palsy

Category	Description
C1	Individuals with severe spastic quadriplegia, with or without athetosis, or with poor functional range of movement and poor functional strength in all extremities and trunk; and individuals with severe athetoid quadriplegia, with or without spasticity, with poor functional strength and control. In either case, these individuals depend on an electric wheelchair or assistance for mobility and are unable to functionally propel a manual wheelchair.
C2	Individuals with severe to moderate spastic quadriplegia, with or without athetosis, or with severe athetoid quadriplegia with fair function in the less-affected side. These individuals have poor functional strength in all extremities and trunk but are able to propel a manual wheelchair. Further classifications are C2U if the individual exhibits relatively better upper-body abilities than lower-body abilities and C2L if the individual exhibits relatively greater lower-body than upper-body abilities.
C3	Individuals with moderate quadriplegia or severe hemiplegia resulting in use of a wheelchair for activities of daily living who can propel a manual wheelchair independently and have almost full functional strength in the dominant upper extremity.
C4	Individuals with moderate to severe diplegia with good functional strength and minimal limitation or control problems in the upper limbs or trunk. A wheelchair is usually chosen for sport.
C5	Individuals with moderate diplegia or triplegia who may require the use of assistive devices in walking but not necessarily when standing or throwing. Problems with dynamic balance are possible.
C6	Individuals with moderate athetosis or ataxia who ambulate without aids. Athetosis is the most prevalent factor, although some individuals with spastic quadriplegia (i.e., more arm involvement than in ambulant diplegia) may fit this classification. All four limbs usually show functional involvement in sport movements. Individuals in the C6 class usually have more control problems in upper limbs than those in C5 but usually have better function in lower limbs, particularly when running.
C7	Individuals with ambulant hemiplegia and spasticity on one side of the body who ambulate without an assistive device but often with a limp due to spasticity in a lower limb. These individuals have good functional ability on the dominant side of the body.
C8	Individuals who are minimally affected by spastic diplegia, spastic hemiplegia, or monoplegia or who are minimally affected by athetosis or ataxia.

Adapted, by permission, from Cerebral Palsy International Sport and Recreation Association (CP-ISRA), 1993, *CP-ISRA handbook*, 5th ed. (Heteren, Netherlands: CP-ISRA).

Readers interested in subsequent changes made in this classification system should consult the Blaze Sports ([www.blazesports.org](http://www.blazesports.org)).

whereas category C8, the highest class, includes those who are minimally affected (e.g., those who can run and jump freely). The first four classes are appropriate for individuals who use wheelchairs, and the second four are appropriate for those who are ambulatory. Although the system has been modified by Blaze Sports America, the 1993 system is used with the BPFT so as to be consistent with data collected during Project Target.

## Youngsters With Congenital Anomaly or Amputation

For the purposes of the BPFT, individuals with congenital anomaly include youngsters with fully

or partially deformed extremities at birth, whereas individuals with amputation are missing part or all of an extremity (or more than one). Amputation may be congenital or acquired. The BPFT's classification system, tests, and standards assume that these individuals are nondisabled except for their congenital anomaly or amputation. Individuals who have physical conditions or diseases in addition to congenital anomaly or amputation must have programs more specifically personalized for them with medical consultation.

For the BPFT, individuals are subclassified according to limb involvement. The specific location of limb involvement (right or left side) is not typically a factor in subclassification.