

Determining Eligibility for Adapted Physical Education: Selection and
Application of Assessment Tools
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The process of determining whether a student is eligible for an adapted physical education (APE) program in the school setting includes gathering objective data related to the student's abilities and needs. Francis X. Short, in Chapter 4 of Adapted Physical Education and Sport (1) discusses the "Determination of Unique Need" (1, p64) as a critical component of this process as well as of the development of an Individualized Education Plan (IEP) which includes goals and objectives related to physical education. The purpose of this paper is to assist those persons who participate in the information gathering process in the selection of assessment tools which provide objective, measurable, reliable and valid data related to a student's diagnosis or condition. It is beyond the scope of this discussion to review all possible assessment tools or all possible diagnoses, and the reader is encouraged to investigate additional choices to ensure an informed decision. Three lists of assessment tools used with children with special needs can be found at PE Central (2,3) and State Council on Adapted Physical Education (4) websites. Francis X. Short (1, Chapter 4) also includes a discussion of types of tests, with specific examples of each type, which can be used for assessments related to adapted physical education.

Information provided for each of the following assessment tools includes a basic description of the tool and its properties as well as students/persons with whom it could be used. Additional information related to each tool can be accessed via the cited references. The references cited for each

assessment tool are not intended as an indication of the total sum of citations which are or may be available for each assessment tool or each population discussed in relation to the assessment tools.

Activity Scale for Kids-Performance Version (ASK©p) and Capability Version (ASK©c) is a reliable, valid self-report measure for use with children, ages five to 15 years, with musculoskeletal limitations (amputations, arthritis, cerebral palsy, fractures, muscular dystrophy, scoliosis, spina bifida) (5,6). ASK©p measures what the child actually did the previous week. ASK©c, the capability version, measures what the child could do during the previous week, is typically used for research (7) and can be used to monitor changes. [Another self-report instrument, ActivityGram, developed for use with students without disabilities, utilizes computer software, is valid and reliable and can be used for certain children with disabilities (1, p71-72).]

Berg Balance Scale is a well known performance based 14 item assessment tool used to measure balance during functional tasks such as sitting, walking and changing positions. Score ranges indicate fall risk. This scale was developed for (8), and found valid and reliable for use with, elderly patients (9,10,11). It has also been recommended for use with children beginning at age five years (12) for the same purposes.

Brockport Physical Fitness Test is a reliable and valid criterion-referenced test that can be used for the evaluation of physical fitness of children, ages ten to 17, with (e.g. mental retardation, spinal cord injuries, cerebral palsy, blindness, congenital anomalies and amputations) and without disabilities (1, p13 and 70). Physical fitness components of the Brockport are aerobic functioning, body composition, and musculoskeletal functioning. Specific items related to the child's diagnosis can be selected as part of the items tested.

Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2) is a norm-referenced standardized motor performance test for use with persons of ages four to 21 years who have mild to

moderate motor impairments, developmental coordination disorder (DCD), also known as “clumsy child syndrome, dyspraxia, minimal brain dysfunction, perceptual motor dysfunction, and developmental dyspraxia” (14, p65), mild to moderate mental retardation and high-functioning autism/Asperger’s Disorder (14). Reliability and validity have been established with the second edition (14, p51-72). In addition to use in general testing of developmental motor skills (9) the BOT and BOT-2 have been cited in research reports related to balance in children (15), balance in children with cerebral palsy (16), fitness programs for children with cerebral palsy (17,18) and as having concurrent validity with the Movement Assessment Battery for Children (19). The short form can be used as a screening device; in particular, the manual coordination, strength and agility subtests are applicable for use in screening children for adapted physical education program needs (14).

Competency Testing for Adapted Physical Education (CTAPE) is a standardized and valid criterion-referenced competency based test (standardized by the Louisiana Task Force on Adapted Physical Education) which discriminates between children who have average motor skills and those whose motor skill development is significantly below average (20). The CTAPE has six test levels for six age groups ranging from six to 15 years and older. The CTAPE provides percentage score guidelines related to physical education program placement and an assessment supplement for use with students whose scores are at or below the nineteenth percentile.

Dynamometer use is common for determination of muscle strength in many populations. Studies have used dynamometers with research related to children with cerebral palsy and other disabilities (16,17,21), typically developing children of ages two through four (22) and ages six through 13 (23), and adolescents and young adults with myelomeningocele (24), with documentation of reliability of the measurements (22,23).

Energy Expenditure Index (EEI) is a measure of endurance (working heart rate – resting heart rate/speed) which can be used for persons of ages three and older (9). EEI use with children with cerebral palsy has been validated (25). Numerous studies and papers regarding children with cerebral palsy and other disabilities (17, 18, 21, 26, 27, 28) have used or discussed EEI for data collection related to fitness and/or function.

Functional Gait Assessment(FGA) is a ten item assessment used for detecting ambulation balance impairments. It has been found to be reliable and valid for use with persons with vestibular impairments (29). Age referenced norms are available for adults of ages 40-89. The FGA was determined to have concurrent validity (29) with the Timed Up and Go test which is used with persons from ages four and up (12) and has been used in balance studies with children with post-traumatic brain injury (30) and cerebral palsy (16), validated for use with children with and without disabilities (31) and found reliable and valid for children with and without cerebral palsy (32).

Functional Reach Test (FRT) measures “anticipatory standing balance when reaching” (9, p4) and is an indicator of postural stability. It has good to excellent reliability in children with (33) and without (34) disabilities and concurrent validity with the Timed Up and Down Stairs Test (32) and the Pediatric Evaluation of Disabilities Index (35).

Gross Motor Function Measure (GMFM) is a standardized, reliable and valid [children between five months and 16 years (12)] criterion-referenced measure of motor function in children with cerebral palsy (36,37) and acquired brain injury (38), and has been used for children with other diagnoses (osteogenesis imperfecta, acute lymphoblastic leukemia) with concomitant motor impairments. The GMFM has been validated for use with children with Down syndrome (36). It has been cited (15,18) or used for data collection (21,27,28,38,39,40,41,42) in many studies.

Miller Assessment of Preschoolers (MAP) is a standardized, norm-referenced screening test for children of ages two years and nine months to five years and eight months (12,43,44). Validity and reliability have been established for the main test (44). MAP has five performance indices (Foundations Index – neurological and neuromotor, coordination – gross, fine and oral motor tasks; Verbal Index; Non-Verbal Index; Complex Tasks Index – interaction of sensory, motor, cognitive skills and interpretation of visual-spatial information).

Movement Assessment Battery for Children (Movement ABC) is a norm-referenced standardized assessment (18) used for identification of motor function impairments in children of ages four to 12 years with mild movement disorders (12). Test-retest reliability and concurrent validity with the Bruininks-Oseretsky test of Motor Proficiency (first edition) were established in a study related to children with generalized joint hypermobility (19). The Movement ABC, or MABC, has been used for testing motor performance in studies with typically developing children (45), children with mild cognitive impairments (46), children with minor neurological dysfunction (47), children with developmental coordination disorder (48,49), children with visual impairments (50) and children with congenital anomalies (51). MABC was selected as the motor competence assessment tool for a study of how physical fitness develops in children with high and low levels of motor competence (52).

Peabody Development Motor Scales, Second Edition (PDMS-2) is a norm and criterion-referenced (1) standardized assessment of gross and fine motor development (1,2,12) used for children of ages one through 83 months (2,12). The reliability and validity have been established for typically developing children (1) and children with mild to moderate motor impairment (15). PDMS-2 is used for establishment of concurrent validity of other tools (53,54) and has been described as the gold standard for its uses (54).

Pediatric Balance Scale (PBS) is a reliable measure of balance for school-aged children, five years and older (18) with mild to moderate balance impairments (15). It is a modification of the Berg Balance Scale which has been discussed previously in this paper. The reliability study participants included children with diagnoses of Prader-Willi syndrome, learning disabilities, speech-language impairments, mental retardation, spina bifida, status-post brain tumor resection, cerebral palsy (athetosis, hemiparesis, spastic diplegia) and hypotonia (15, p117). The PBS was used in a study as a measure of balance with a pediatric patient who was status-post medulloblastoma removal (55).

Pediatric Clinical Test of Sensory Interaction for Balance (P-CTSIB) is used to measure the effects of the sensory system on stationary balance (ability to maintain standing position using visual, vestibular and somatosensory input)(56) with children of ages four through ten years (12). The test is reliable for use with children of ages four through nine (56) with and without disabilities (57). P-CTSIB has been used in balance studies of preschool children (58) and children with cerebral palsy (16,59). Findings related to balance and impairments (decreased strength and/or range of motion) suggested that testing at the impairment level could provide indication for effective interventions which would impact on balance abilities (59).

Pediatric Evaluation of Disability Inventory (PEDI) is a standardized norm and criterion-referenced (referenced to children with disabilities), reliable and valid evaluation of functional abilities (self-care, mobility, social function)(60) for children of ages six months to seven years six months (12, 18,60). The PEDI can be used for evaluation of older children if the functional abilities are below the age of seven years six months (18). PEDI has been used in studies of balance with children with spastic cerebral palsy (hemiplegia, diplegia and quadriplegia) (16), fitness (17) and classification of (61) children with developmental disabilities (17), functional performance of children with spina bifida (62), measurement of functional change in children with acquired brain injury (63) and

measurement of function in children with complex spinal impairments (idiopathic scoliosis, congenital scoliosis, kyphoscoliosis)(64). The minimal clinically important difference when the PEDI is used to assess functional change was determined to be 11 points in a study of children receiving inpatient rehabilitation services (65).

Presidential Fitness Test (PFT) is a norm-referenced test used with children of ages six to 17 years, with and without disabilities (17). It has been used for the evaluation of fitness in studies with (17) and/or involving (66) children with disabilities (Down syndrome, spina bifida, cerebral palsy, autism, mental retardation, retinopathy of prematurity, anxiety disorder) . Modifications to the PRT were made in the cited study (66) involving children with disabilities.

Rate of Perceived Exertion Scale (RPE) has been found to be valid and reliable for use with lean and obese persons (67) and adolescent girls (68). The RPE has been used in studies with adults and children with cerebral palsy (28,69,70), developmental coordination disorder (71) and pediatric cancer survivors (72).

School Function Assessment SFA) is a standardized and valid criterion-referenced assessment designed to measure functional participation in school activities (12), functional change (18,73) and the need for assistance and adaptations in the school environment for children of elementary school ages (from kindergarten through sixth grade) with a variety of disabilities including motor, communication, emotional, cognitive and behavior impairments (74). The SFA was also designed to assist in program planning including the development of Individualized Education Plan objectives (73, p1). The format is “judgment-based” (73, p1). School personnel who know the student well, including having familiarity with the student’s performance in daily activities, complete the questionnaire. Performance in six school activities/environments (including the classroom, transitions, meals and playground areas) is assessed. The validity and reliability of SFA use with elementary school children

has been supported by numerous studies (75,76,77,78). The SFA was used as an assessment tool in a case study of a child with cerebral palsy (79) and as a tool in an inter-rater reliability study in which participants were children with attention deficit disorder, cerebral palsy, developmental delay, speech and language delay and spina bifida (61).

Shuttle Run Test I (SRT-I) and Shuttle Run Test-II (SRT-II), developed for use with children with cerebral palsy, were found to be reliable and valid measures of aerobic capacity in children and adolescents (subject ages ranged from seven to 20 years)(80). SRT-I and SRT-II were designed for use by children who are classified as level I or level II, respectively, using the Gross Motor Function Classification System (GMFCS), a reliable and valid method for rating motor behavior of children with cerebral palsy and Down syndrome (53).

Single Limb Stance(SLS) or Timed One Legged Stand (TOLS) or One-Leg Standing Balance has a high degree of test-retest (for time, eyes open) and interrater reliability in typically developing children (81). TOLS was used, among other assessments, for the establishment of concurrent validity of a Timed Up and Down Stairs test (32) for use with children with and without cerebral palsy. Reduced single limb stance is associated with limitations of ankle stability and postural control in children (32).

Six Minute Walk Test measures endurance for walking in children of ages five and older (18). The six-minute walk test is used for data related to functional exercise capacity in persons with pulmonary and cardiac impairments who are undergoing medical interventions (82,83) It was used as one outcome measure in a case-study of an adolescent with cerebral palsy (21) and has been found to have good reliability when used with children and adolescents with obesity (84). It was found to be “useful for monitoring clinical status in children with end stage renal disease” (85 p2222).

Standardized Walking Obstacle Course (SWOC) is a valid and reliable functional measurement tool (31) for use with children of all ages (18) with and without disabilities who are able to follow simple directions and can ambulate without an assistive device. The SWOC measures ambulation speed and stability (18). Children included in the reliability study (31) had diagnoses/classifications of multiple handicap, orthopedic impairment, other health impairment, cerebral palsy, Down syndrome, attention deficit disorder, mental retardation and development delay. Additional studies (86,87) found that the SWOC results distinguished between children with cerebral palsy or Down syndrome and children with typical development. The SWOC has concurrent validity with the Timed Up and Go test (31).

Test of Gross Motor Development – 2 (TGMD-2) is a reliable, valid (88,89,90), norm-referenced standardized assessment of motor abilities that develop in children of ages three to ten years (12,88). Skills tested include locomotion skills, such as running and jumping, and object control skills, such as catching and kicking balls (88). Applications of the TGMD-2 include identifying children with gross motor developmental delays, planning instructional gross motor programs and assessing progress (88). The TGMD-2 has been used as an assessment measure in studies related to skill and activity of preschool children (91), motor skills and activity in children with and without visual impairments (92), neuromotor task training for children with developmental coordination disorder (93) and overhand throw acquisition with first grade students (94). The TGMD-2 has been cited in papers discussing functional mobility for children with cerebral palsy (18) and movement skills of children with attention-deficit hyperactivity disorder (95).

Timed Up and Down Stairs Test (TUDS) is a reliable and valid functional mobility outcome measure for use with children with and without cerebral palsy (32) of all ages (18) who can walk up and down stairs independently. The TUDS has concurrent validity with, and includes components of,

other measures/tests (TUG, FRT, TOLS) which assess static and anticipatory control of balance, dynamic balance and strength (32).

Timed Up and Go (TUG) measures anticipatory balance and motor control while performing typical motor activities (12,18). It is used for determination of fall risk and for assessment of functional ability changes (31). The TUG has excellent interrater reliability in children with disabilities and is related to the index of sway on the P-CTSIB and to the mobility sections of the PEDI (32). It has been used as an outcome measurement tool in studies of children with cerebral palsy (16,27) and in studies for determination of reliability and validation of other tests/measurements (29,31).

Toddler and Infant Motor Evaluation (TIME) is a norm-referenced assessment of motor abilities with high test-retest and interrater reliability (96), moderate construct validity (97) and good discriminative validity when used in large populations (98). The TIME identifies mild to severe (12,18) motor delays and detects changes in function for children of ages four months to three years six months (12,18,96,97). The TIME has been used as an assessment of motor mobility and stability in children with Prader-Willi syndrome (99,100) and of the quality of movements of children with Down syndrome and other developmental disabilities (101).

Table 1 provides a condensed compilation of the information discussed above. The sixth column provides a reference to which of the five developmental objectives of physical education, as identified by the American Alliance of Health, Physical Education, Recreation and Dance (102), the information acquired from the assessment tool may apply. This will be of assistance in identifying a unique need for APE as well as in developing measurable goals and objectives, based on the data provided by the test results, for the IEP.

Table 1.**Applications of Assessment Tools Related to Determination of Unique Need for Adapted Physical Education Programs**

ASSESSMENT TOOL	DIAGNOSES/POPULATIONS	AGE RANGE	PROPERTIES	USES	PE OBJECTIVES COMPONENTS
(ASK©)	Musculoskeletal limitations (amputations, arthritis, cerebral palsy, fractures, muscular dystrophy, scoliosis, spina bifida)	5-15 years	Reliable, valid	Measurement of functional activities, monitor changes	Neuromuscular, Interpretive, Social, Emotional
Berg	Any diagnosis or condition that may or does affect static or dynamic balance	5 years through adulthood	Reliable, valid with adults. Good sensitivity and specificity	Determination of fall risk, effectiveness of interventions.	Neuromuscular
Brockport	Children with and without disabilities	10-17 years	Criterion referenced, reliable, valid	Determination of fitness levels	Organic
(BOT-2)	Persons with (motor delay, developmental motor coordination disorder, mild-moderate mental retardation, cerebral palsy, autism) and without disabilities	4-21 years	Standardized norm referenced, reliable, valid	Measurement of gross and fine motor skill levels, screening, making educational placements, diagnosing motor impairments	Neuromuscular
CTAPE	Children with mild to significant decrease in motor skills abilities	6-15 years and above	Standardized, valid	Determination of motor skills level, determination of need for alternate physical education placement	Neuromuscular
Dynamometer	Persons with (cerebral palsy, myelomeningocele) and without disabilities	2 years and older	Reliable	Determination of muscle strength	Organic
EEl	Persons with and without disabilities	3 years and older	Valid	Measurement of fitness (cardiovascular endurance)	Organic
FGA	Persons with (cerebral palsy) and without disabilities with vestibular impairments.	Age referenced norms available for persons of ages 40-89.	Reliable, valid with persons with vestibular impairments	Detection of ambulation balance impairments	Organic, Neuromuscular
FRT	Persons with and without disabilities	Children 5-15 years. Adults of all ages	Reliable, valid	Measurement of anticipatory standing balance	Neuromuscular
GMFM	Children with cerebral palsy, acquired brain injury, osteogenesis imperfecta, leukemia, Down syndrome	5 months-16 years	Standardized criterion referenced, reliable, valid	Measurement of motor function and changes of motor function	Neuromuscular
MAP	Children with (cerebral palsy, history of prenatal drug exposure) and without disabilities/impairments	2 years 9 months-5 years 8 months	Standardized norm referenced, main test reliable and valid	Screening	Neuromuscular
MABC	Typically developing children, children with impairments/disabilities (cognitive impairments, neurologic dysfunction, developmental coordination disorder, visual impairments, congenital anomalies)	4-12 years	Standardized norm referenced, reliable, valid	Identification of motor function impairments/delays	Neuromuscular
PDMS-2	Children with mild-moderate motor impairment, typically developing children	1-83 months	Norm and criterion referenced, reliable, valid	Identification of motor delays and functional limitations, assessment of progress	Neuromuscular
PBS	Children with mild to moderate balance impairments (Prader-Willi syndrome, learning disability, speech-language impairments, mental retardation, spina bifida, status-post brain tumor resection, cerebral palsy, hypotonia)	≥5 years	Reliable	Detection of balance impairment	Neuromuscular
P-CTSIB	Children with and without disabilities	4-9 years	Reliable	Detection of balance impairment	Neuromuscular
PEDI	Children with disabilities (cerebral palsy, developmental disabilities, spina bifida, acquired brain injury, spinal impairments)	6 months-7 years, 6 months Older children whose functional levels are below the age of 6 years, 7 months	Standardized norm and criterion referenced, reliable, valid	Detection of functional impairments in the mobility, self-care and social domains; measurement of change	Neuromuscular, Social
PFT	Children with (Down syndrome, spina bifida, cerebral palsy, autism, mental retardation, retinopathy of prematurity, anxiety disorder) and without disabilities	6-17 years	Norm referenced	Evaluation of fitness levels Modifications may be necessary if used with children with disabilities	Organic
RPE	Children (cerebral palsy, developmental coordination disorder, cancer survivors) with and without disabilities	10 years and older	Valid, reliable	Measurement of perceived exertion	Organic
SFA	Children with motor, communication, emotional, cognitive and behavior impairments	Elementary school ages: kindergarten – 6 th grade	Criterion referenced, reliable, valid	Measurement of functional participation in school activities, measurement of change, assistance in program planning	Neuromuscular, Social, Emotional
SRT-I, SRT-II	Persons with cerebral palsy	7-20 years	Reliable, valid	Measurement of aerobic capacity	Organic
SLS	Persons with (cerebral palsy) and without disabilities	4 years and older	Reliable, valid	Measurement of balance on one leg	Neuromuscular
Six Minute Walk	Persons, including children with pulmonary and cardiac impairments	5 years and older	Reliability established for children and adolescents with obesity	Measurement of endurance	Organic
SWOC	Ambulatory children with (multiple handicap, orthopedic impairment, other health impairment, cerebral palsy, Down syndrome, attention deficit disorder, mental retardation, developmental delay) and without disabilities	4 years and older	Valid, reliable	Measurement of ambulation speed and stability.	Neuromuscular
TGMD-2	Children with (cerebral palsy, visual impairments, attention deficit hyperactivity disorder, developmental coordination disorder) and without disabilities	3-10 years	Standardized norm referenced, reliable, valid	Identification of developmental delay related to locomotion and object control skills, assistance in program planning, measurement of progress	Neuromuscular
TUDS	Children with and without cerebral palsy who can walk up and down stairs	all ages	Reliable, valid	Functional mobility outcome measure	Neuromuscular
TUG	Children with disabilities (e.g. cerebral palsy)	4 years and older	Reliable	Measurement of balance and motor control, determination of fall risk	Neuromuscular
TIME	Children with development disabilities (Down syndrome, Prader-Willi syndrome)	4 months – 3 years	Norm referenced, reliable, valid	Assessment of motor abilities, detection of delays and changes	Neuromuscular

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