ACADEMY OF PEDIATRIC PHYSICAL THERAPY

FACT SHEET

Selected Assessment Tools for Evaluation of Children With Autism Spectrum Disorder in School-Based Practice

This table presents selected, potentially helpful assessment tools for different domains of interest to school-based physical therapists working with children with autism spectrum disorder (ASD). No assessment tool focused on motor skills and participation has been specifically validated for children with ASD; however, many tools exist that can provide information related to the child's motor skills and abilities. The inclusion of a tool on this list was guided by our clinical experience and is just a sample of many possible options. It does not equate with an endorsement or statement of reliability or validity to use the tool with children with ASD. Similarly, the comments offered on each tool represent the thoughts and experience of the authors. Readers should access tests, manuals, and research reports for more details. Unless it is referenced otherwise, the psychometric properties presented were retrieved from the source listed next to the name of the test, generally the administration manual.

A student is determined to be eligible for special education services if he or she has an educational disability as defined by the Individuals with Disabilities Education Act (IDEA) and specialized instruction is required for the student to make progress in school. Motor performance measures may contribute information to eligibility determination but rarely are the sole measures or determinants. The sensory-motor manifestations of ASD are varied. In the school-based practice setting, use of relevant assessment tools should aid the physical therapist in delineating varied aspects of a child's motor function, sensory processing, and participation, while reflecting the state-identified core curriculum or the alternative curriculum designed for a specific student.

The tools included in this document present limitations with the population of children with ASD. Modifying or supplementing standardized tests affects the validity, reliability, and applicability of norms and test results obtained. Modifications to standardized testing must be disclosed when presenting test results. While informing goal setting and curriculum planning, this would prevent the use for purpose of eligibility. The tools presented here should not replace a comprehensive ecological assessment addressing the concerns and questions of the evaluation team as described in the "Children With Autism Spectrum Disorder: Practice Recommendations for School-Based Physical Therapy Evaluation" document.[1] For a general list of pediatric assessment tools organized by International Classification of Functioning, Disability and Health (ICF) model, please refer to the fact sheet "List of Assessment Tools Categorized by ICF Model."[2]

Name of Test	Description of Test	Age Range	Reliability/Validity	Strengths/Weaknesses
Participation level				
School Function Assessment (SFA)[3]	Completed through physical therapist observations and report of IEP team members (parents, teachers, other related services professionals). Measures student performance of functional tasks that support their participation in the academic and social aspects of elementary school.	Children with disabilities attending grades K-6 Criterion-referenced	Internal consistency: Cronbach alpha =.92–.98 Test-/retest reliability: ICC = .80–.99 Content validity: Relevant for children with disabilities Construct validity: Shown to behave as expected from theory Limited research on interrater and intrarater reliability and criterion-related validity between SFA and other existing tests	The SFA satisfies the IDEA requirement that related services must be tied to an educationally relevant outcome. Test can be used to document progress and effects of intervention. Test results can help team develop specific goals for IEP. Can be completed in 30 minutes or longer if done as a team.
Pediatric Evaluation of Disability Inventory—Computer Adaptive Test (PEDI-CAT)[4]	Measures capability and performance of functional activities in Daily Activities, Mobility, Social/Cognitive, and Responsibility dimensions of participation.	Ages 1 to 21 years Norm-referenced and criterion-referenced	Test–retest reliability: ICC = .958–.997 across domains Discriminant validity between normative and disability groups (including autism diagnosis) at all ages was significant at $P<.0001$.	The PEDI-CAT corrected the ceiling effect on mobility items from the original PEDI. This problem limits the use of the original PEDI for physical therapist working with the population of children with autism. Choice of "speedy" with 5-15 items per domain or "content-balance" administration with 30 items per domain.

				Combines elements of adaptive behaviors measures typical of special education programs and functional assessments used in pediatric rehabilitation.
Canadian Occupational Performance Measure—Fourth Edition (COPM)[5]	Student and/or parent report Designed to detect change in client's or family's perception of occupational performance and satisfaction over time.	All ages Criterion-referenced	Test–retest reliability: ICC = .63 for performance score, .84 for satisfaction	COPM is easy to administer and takes approximately 20 minutes to complete.
Children's Assessment of Participation and Enjoyment/Preference for Activities of Children (CAPE/PAC)[6]	Student report with or without parent's assistance 55 items; 5 scales Provides information on 6 aspects of recreational participation.	Ages 6 to 21 years	CAPE test–retest reliability: .ICC = 64–.86 Internal consistency: Cronbach's alpha = .67 to .84 depending on the domain or type of activity for the PAC (preference score) and .30 to .77 depending on the domain or type of activity for the CAPE (participation score) Validation process is ongoing. Item development was conducted through a literature review, expert review, and pilot testing of the CAPE and PAC with both typically developing children and children with disabilities.	Test takes 45-65 minutes to administer. Child uses visuals and visual rating scales, which allow independence for some children with ASD. May need to have parents assist with answering questions/confirming answers when using with children with ASD.

Perceived Efficacy and Goal Setting System (PEGS)[7]	Student, parent, and teacher reports Assesses a child's daily activities in the home, school, and community environments. Looks at self-care, academic tasks, and leisure activities.	Ages 5 to 10 years	Reported valid for use with children with varied disabilities, including autism.	Questionnaires take about 20 minutes to complete. Uses colorful cards as visuals support. Helpful in identifying goal priorities.
Assessment of Life Habits (Life-H)—Children[8]	Student or parent report Long and short forms (242 or 77 questions) available. Questionnaire looks at: nutrition, fitness, personal care, communication, housing, mobility, responsibilities, interpersonal relationships, community life, education, employment, and recreation.	Ages 5 to 13 years Versions also exists for children birth to 4 years and for adults.	Reliability for total score: ICC = .73	Short form is recommended for school-based practice. Helpful in identifying goal priorities or need for accommodations.
Vineland Adaptive Behavioral Scales, Second Edition (Vineland-2)[9]	Parent and teacher reports 5 domains: Communication, Daily Living, Socialization, Motor, and Maladaptive Behaviors	All ages Fine and gross motor norms only for children younger than 6.11 years old	Test–retest reliability: r = .83 - .94 for Adaptive Behavior Composite ages 3-21 years Interrater reliability: r = .78 for the Adaptive Behavior Composite ages 0-18 years Internal consistency: split half reliability	Various editions of the test can be completed in 20–90 minutes.

			coefficients = .95 - .97 for Adaptive Behavior Composite ages 0-18 years Validity evidence based on clinical groups: in individuals with ASD, the Adaptive Behavior Composite and domains scores were at least 2 SD below the mean of the non-clinical group[9]	
Scale for the Assessment of Teachers' Impressions of Routines and Engagements (SATIRE)[10]	Teacher report 5-point scale for goodness of fit across 12 routines: Arrival, Free Play, Meal, Circle, Snack, Nap, Structured Activity, Departure, etc.	All ages	N/A	The design is flexible and can be adapted to any routine Guides clinicians in building a picture of the motor expectations throughout all daily routines
Vanderbilt Ecological Congruence of Teaching Opportunities in Routines (VECTOR), Classroom Version[11]	Physical therapist observations Assesses ecological congruence in 3 developmental domains: Engagement, Independence, and Peer Interactions.	Age 18 months to school-age	N/A	The form is based on a 10-minute observation for 10 different routines and is scored using a 5-point scale. Use of the VECTOR guides changes in the environment and adult interventions as needed for optimal engagement of student. The form is appropriate for early intervention, preschool, kindergarten, and first grade.
Therapists as Collaborative Team members for	Teacher's report	Preschool and kindergarten	N/A	The questionnaire helps identify challenging routines

Infant/Toddler Community Services (TaCTICS) questionnaire from Florida Project[12]	Questionnaire for gathering information from classroom teacher on the student's participation and preferences			and optimal timing for providing intervention. The administration takes approximately 15 minutes. Questionnaire can be done as an interview or the teacher can complete and return. Face-to-face administration provides more complete/relevant information.
Activity level				
Miller Function and Participation Scale (M-FUN)[13]	Visual motor, fine motor, and gross motor skill assessment Participation assessment: home and classroom checklists	Ages 4 to 7.11 years (17 skills) Ages 2.6–to 3.11 years (15 skills) Norm-referenced for skill assessment Criterion-referenced for participation assessment	Internal consistency reliability coefficients: .85 for visual motor, .90 for fine motor, .92 for gross motor Test-retest reliability: ICC = .77 for visual motor and gross motor and .82 for fine motor Interrater reliability: correlation = .91 for visual motor and gross motor and .93 for fine motor For a screening population, sensitivity and specificity are 74% and 94% on fine motor and 67% and 94% on gross motor at -2 SD Sensitivity and specificity for a referral population are included in table format in the test manual[13]	The M-FUN skills assessment takes 40-60 min. to administer. The participation checklists each take an additional 5-10 min to complete. The behaviors are rated using an easy-to-use 5-point scale from "almost always successful" to "not observed." Looks at motor skills for games and play in context.

Test of Gross Motor Development, Second Edition (TGMD-2)[14]	Locomotor and Object Control subtests 12 test items	Ages 3 to 10 years Norm- and criterion-referenced	Reliability for content sampling: ICC = .85–.91; for time sampling: ICC = .88–.96 Scorer reliability = .98 across all aspects of test	Test includes skills typically practiced during play or in physical education classes. Visuals from the manuals are helpful for children with ASD. There are few items assessing balance. Test takes 30 minutes to administer. Quality of movement and activity skills are addressed. Test identifies children who are significantly behind their peers in gross motor development.
Movement Assessment Battery for Children—Second Edition (Movement ABC-2) [15]	Includes manual dexterity, aiming and catching, and balance subtests Non-motor factors affecting movement are considered 3 age bands Checklist	Ages 3 to 16 years Norm-referenced	Lack of research on reliability and validity is a reported weakness[16] Factorial validity confirmed for children with Developmental Coordination Disorder but not convergent or discriminant validity[17] Construct validity: Cronbach's alpha = .94 Discriminative validity (comparing children with and without motor impairments): $p<.001$[18]	Test includes simple tasks taken out of game or play context. Test takes 20-40 min. to administer. Easier to administer with children with short attention span than other traditional motor skill battery. Teacher checklist is an interesting tool to gather activity and participation information. The repeated trials (5 practice and 10 test trials) can be a

			Checklist: Sensitivity = 41%; Specificity = 88%.[18]	challenge for some children
Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2)[19]	8 subtests: Running Speed and Agility, Balance, Bilateral Coordination, Strength, Upper Limb Coordination, Response Speed, Visual Motor Control, and Upper Limb Speed and Dexterity 30 items in gross motor and upper limb coordination	4-21 years Norm-referenced	Sensitivity = 88% Specificity = 74% Mean subtest internal consistency reliability coefficients ranged from .73 - .91 across all subtests and the three age ranges Interrater reliability: Pearson's *r* = .98, .99 for all components except fine motor (*r* = .92)	Due to the complexity of tasks in the BOT-2, use of this test may be best suited for children with ASD who function at the higher end of the spectrum. The manual includes information on use of the BOT-2 in a clinical sample of 45 individuals 4 – 21 years with ASD. The test may have to be administered over multiple sessions due to child fatigue. Use of this test is not recommended for children with significant motor disabilities.
HELP 3-6 (2nd edition)[20]	Covers 585 skills across 6 domains: Cognitive, Language, Gross Motor, Fine Motor, Social, and Self-Help	Ages 3 to 6 years Curriculum-based; not standardized; no normative sample	No data, not standardized	Helps guide observations and review expectations for play skills expected of children at 3-6 years of age
Assessment, Evaluation and Programming System (AEPS)[21]	Multi-domain evaluation for preschool children with disabilities	Ages 3 to 6 years Curriculum-based; not standardized; no normative sample	No data, not standardized	Test includes simple gross motor tasks expected of children up to age 6 years. Parent questionnaire is very helpful in gathering information and selecting relevant goals across environments.

				A 3-point scale is used: consistently, inconsistently, or does not meet criterion.
Early Start Denver Model Curriculum Checklist for Young Children with Autism (ESDM)[22]	Multi-domain evaluation for preschool children with ASD Includes 8 domains: receptive communication, expressive communication, social skills, imitation, cognition, play, fine motor, gross motor, behavior and personal independence.	The intervention approach was developed for children 7 months to 48 months old. It includes task analysis and a data collection system. Criterion-referenced tool Not standardized; no normative sample	No data, does not provide a score	Best used with an interdisciplinary team model. Useful for tracking progress and for goal setting. The checklist can be used for children up to transition to kindergarten. Completion of the checklist is done in a play-based interactive style. It can usually be completed in one play session of 1.0-1.5 hours.
Verbal Behavioral Milestones Assessment and Placement Program (VB-MAPP)[23]	Includes 16 areas of skills: mand, tact, intraverbal, listener, echoic, imitation, textual, copying, transcription, listener responding, visual perceptual, independent play, social behavior, spontaneous vocal behavior, group skills, linguistic structure and math. Includes assessment of	Can be used with any individual with a language delay. Specifically designed for younger children with ASD or developmental disabilities. Criterion-referenced tool. Not standardized; no normative sample	No data, not scored against a normative sample.	Best used with an interdisciplinary team model using a combination of teacher or parent reports and structured observations and testing. Useful for tracking progress and for goal setting. The skills observed are those typically achieved by 48 months of age. The assessment results are presented as a visual summary that can be updated following each evaluation.

	barriers to learning and a transition assessment to guide placement decision.			Can take several testing sessions to complete. Can be completed by assigning parts of the assessment to different team members.
Body structure and function				
Sensory Processing Measure[24]	Includes 7 areas: visual, auditory, tactile, proprioceptive, and vestibular sensory systems, as well as praxis and social participation 4-point Likert-type scale	Ages 5 to 12 years	Internal consistency: Cronbach alpha = .95 Interrater reliability: ICC = .98 Content and construct validity is established Criterion-related validity established	Takes 15-20 minutes to complete.
Sensory Profile[25]	Determines how well children process sensory information in everyday situations. Looks at sensory processing, modulation, and behavioral and emotional responses.	Ages 3 to 10 years	Internal consistency: Cronbach alpha ranged from .47 to .91 across the 14 sections and 9 factors.	Links sensory processing with child's daily life performance. Easy tool to distribute to the teachers and parents to get some baselines on unusual responses to sensory stimuli.
Sensory Profile School Companion[26]	Evaluates a child's sensory processing skills and how these skills affect the child's classroom behavior and performance.	Ages 3 to 11 years	See manual for information.[26]	Easy tool to distribute to the teachers and parents to get some baselines on unusual responses to sensory stimuli

Sensory Integration Inventory—Revised[27]	Provides information on the subject's sensory processing abilities and specific self-stimulatory or self-injurious behaviors. Looks at tactile, vestibular, proprioceptive, and general reactions	All ages	See manual for information.[27]	Involves 30 to 60 minutes of observation and caregiver interview
Quick Neurological Screening Test- III (QNST-II) [28]	Through counting the number of neurologic soft signs present in an individual, assesses 15 areas of neurological integration including praxis, dexterity, visual tracking, spatial orientation, tactile perception abilities, and motor skills.	Norms available for ages 5 through 90 years. Standardized, criterion-based	Temporal stability between test-retest showed a correlation of r=.87 for the total score while the "item difficulty index", used as a measure of internal consistency, showed most of the indices at r=.80 or above. This is when looking at 15 items across 6 age categories. Construct validity: all clinical groups comparisons to matched non-clinical groups showed statistically significant higher scores (more neurological soft signs present). t-tests for separate variance at p=0.00 for selected groups are: ADHD t=-7.05, df=112.80; developmental delay t=-6.60, df=46.28; learning disabilities t=-5.85, df=108.09.	The QNST-III was designed for children and adults (such as individuals with learning disabilities) with soft neurological signs. Takes 30 minutes to administer. Does not have children with ASD in its sample so validity of results may be affected Only 11 out of 37 participants with autism or PDD-NOS were able to be tested with this tool by Pfeiffer et al [29] due to participant difficulty following directions.

Florida Apraxia Screening Test—Revised (FAST-R)[30] (Modified for use with children by Mostofski et al[29])	Gesture to Command (25 items), Gesture to Imitation (25 items), Gesture with Tool Use (17 items)	Used with children with ASD ages 8 to 12 years[31]	Interrater reliability for total percent correct and total absolute errors respectively: ICCs =.85 and .92; Pearson's correlation coefficients were .86 and 0.93, all *p*'s , .001.[31] No norms for children, but one can use control data from Mostofski et al[31] to compare results.	Mostofski et al[31] modified the FAST-R by removing gestures likely to be unfamiliar to children (e.g., shaving) and replacing them with gestures better known to children (e.g., tooth brushing) Test was adapted for use with children with ASD to assess whether only imitation skills were challenged or whether a more generalized deficit in praxis existed
Sensory Integration and Praxis Test (SIPT) [32]	Measures sensory integration processes that underlie learning and behavior. 17 subtests requiring children to perform visual, tactile, kinesthetic, and motor tasks.	Ages 4.0 to 8.11 years Norm-referenced	Interrater reliability: *r* = .94 – .99 No comparable tests for concurrent validity.	Extensive training is required for test administration. Lengthy time (2 hours) is required to administer the SIPT, with 2 testing sittings recommended.
Test of Ideational Praxis—Long Form and Short Form (TIP)[33,34]	Long form—6 items: variations of movement children can produce with a variety of materials (boxes, hoop, string, etc) Short form—1 item: variations of	Criterion- and norm-referenced Ages 5 to 8 years Can be used also for older children	Interrater reliability: ICC = .85 long form total[35]	The short form can be administered in 5 minutes. The full test takes 40 minutes to administer.

	positions a child can produce with a string			
Brockport[36]	Companion version of the Fitnessgram for children with disabilities	Offers various fitness assessments to choose from for strength, flexibility, agility, cardiorespiratory endurance, etc.	See manual. Different for each subtest[36]	Therapist can pick and choose which test to use. Aligns with physical education fitness curriculum; provides adaptation ideas for fitness testing.

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Developed by a volunteer workgroup of the APTA's Academy of Pediatric Physical Therapy's School-Based Special Interest Group (chaired by Marcia K. Kaminker, PT, DPT, MS, PCS). Special thanks to this workgroup, chaired by Liliane Savard, PT, DPT, PCS, which included: Michelle Albrecht, PT, DPT; Lori Glumac, PT, DSc, PCS; Karen Greeley, PT, DScPT; Kathleen Murphy, PT, DPT; and Bala Pillai, PT, MA, PCS.