

ACADEMY OF PEDIATRIC PHYSICAL THERAPY FACT SHEET

Practice Recommendations for the School-Based Physical Therapy Evaluation of Children With Autism Spectrum Disorder

The Centers for Disease Control and Prevention estimates the prevalence of autism spectrum disorder (ASD) to be 1 in 88 children.¹ The high prevalence of ASD has become an extraordinary challenge to early intervention and education programs across the nation. Although deficits in communication and social skills are considered to be defining characteristics of this disorder, current literature suggests impairments in motor development and motor control systems as core characteristics of children with ASD.^{2,3} Physical therapists (PTs) are increasingly involved in working with children with ASD and, like other professionals, they encounter the need for autism-specific assessment and intervention strategies.

Motor deficits have often been attributed to poor cognition, but recent research has shown that motor impairments frequently seen in children with ASD cannot be attributed solely to cognitive delays and are present across the autism spectrum.³⁻⁵ In a review of the literature, Jeste⁶ found a wide range of motor delays and deficits reported in ASD, including delays in both gross motor and fine motor domains and deficits in praxis, motor planning, gait, coordination, and postural control. Sturm et al⁴ found that 75% of a sample of 101 children with high-functioning pervasive developmental disorders had motor deficits.

Many children with autism demonstrate delayed abilities on standardized motor tests,^{2,7,8} especially as they grow older and the complexity of the test items increase. While there is significant variability in the motor skills of children with ASD, common characteristics have been identified and include hypotonia, developmental dyspraxia, stereotypic repetitive movements, oral-motor dysfunction, clumsiness, decreased eye-hand coordination, poor balance, and impaired finger-to-thumb opposition.^{7,9-12} Difficulty imitating the movements of others also may be particularly challenging for children with ASD.^{3,5,13} Difficulty with imitation can discriminate children with ASD from those with other developmental disorders as early as 2 years of age.^{14,15}

Dawson et al^{16,17} found that sensory disturbances are present during the first year of life of children who are later diagnosed with ASD. In a chart review of 200 children with ASD, Greenspan and Weider¹⁸ reported that all of the children demonstrated auditory processing difficulties. Sensory processing

abilities are known to be uneven and fluctuating, even within the same child. They can range from hyper to hyporesponsiveness, depending on the type of sensory input as well as other unknown factors. A typically developing postural and motor control system requires the organization of sensory information from visual, somatosensory, and vestibular systems.¹⁹ If children with ASD have deficits in these areas, their postural control mechanisms may be disrupted. They may be unable to adapt sensory input to changes in tasks and environmental demands, and they may lack accurate internal models of the body and actions necessary for postural and motor control.²⁰

It is important that any child with suspected motor deficits receive a motor assessment to identify areas of need, not only to enhance motor development but also to promote cognitive and language development. Motor and social skills have been linked by many experts who study children with ASD.^{2,3,10,20} Coordination and mobility are necessary for children to explore and interact with their environment and to fully engage in social interactions. Barnard²¹ stated, “Physical therapists are in a unique position to support children with autism. Educational programs should address the need to promote activities for a lifetime of physical activity, starting at a young age.” Among others, she recommends the following strategies for educational assessment and planning:

- Early assessment of gross motor skill strengths and challenges
- Early identification of meaningful lifelong physical activities that match family and community offerings

Participation in fitness activities is decreased in children with ASD compared to typically developing children. When studying patterns of recreational activities in children with high-functioning autism (HFA) and their peers, Potvin²² found the greatest disparity between the 2 groups was in participation in physical activity, such as team sports, bicycling, and hiking. This finding was considered important because children with HFA have poorer fitness and higher rates of obesity than their peers.^{23,24} The importance of physical activity in maintaining health is well recognized.

Physical therapists should advocate for education programming that addresses the needs of children with ASD. As active members of interdisciplinary teams assessing children and developing their individualized education programs (IEPs) or supporting program/curriculum development, physical therapists can facilitate access to age-appropriate physical activity, leisure, and fitness activities to promote optimal physical development for children with ASD. In states that use the “developmental delay” category for students between the ages of 3 and 9 years old or a subset of this age span (an option under federal regulations), physical therapists can assist in identifying and documenting a student’s delay in the gross motor area.²⁵ Physical therapists also may be asked to contribute to the IEP process by assessing and providing recommendations for a student who is already eligible for special education and for whom functional, participation, and/or sensorimotor issues have been raised by the team. PTs may evaluate children with ASD as part of “early intervening services” or response to intervention (RTI) programs before they are considered for special education eligibility.²⁶ In addition, physical therapists should play a key role in collaborating with team members for integration of physical activity into daily routines.²⁷

The first step in a school-based evaluation is for the team to identify the functional limitations and participation restrictions affecting the student. This information will guide the physical therapist in the choice of examination, observation, and assessment tools. After the IEP team determines that specialized instructional support is needed, the IEP team meets and develops a written IEP to document

the student's specific education needs. A student's annual goals should be developed collaboratively based on the needs of the child as identified during the evaluation process.²⁵ Student goals should be discipline-free, chronologically age-appropriate, meaningful to the student and the student's family, measurable for progress monitoring, and achievable in a program year or IEP duration (based on the student's present level of performance). IEP goals also should serve a relevant purpose in the student's education, support participation in appropriate activities, include tasks that the student can perform frequently, and provide a clear focus for instruction.²⁸

The IEP process requires that the following questions be considered²⁹:

- What are the educationally relevant priorities or skills that the student needs/wants to develop?
- What are the barriers and/or supports to the accomplishment of these skills?
- What is the least-restrictive environment needed to support the student?
- Whose expertise is needed to address the barriers and/or capitalize on the supports to help the student accomplish these skills?
- How should the intervention be provided? (eg, monitoring, consultation, direct services)
- In what setting should the intervention be provided?
- Who will be responsible for ensuring daily practice of identified skills? (eg, parents at home, teachers, paraprofessionals, or a combination)
- How will progress on priorities/goals and carryover be monitored?

Physical therapists who provide services within the educational environment can use this document and *Selected Assessment Tools for Evaluation of Children with Autism Spectrum Disorder in School-Based Practice*³⁰ to assist them in the assessment and information-gathering process for evaluating children with ASD. Recommendations are provided for observing motor performance during functional activities within the school environment and for obtaining relevant information through teacher and parent interviews or questionnaires. To date, 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 a child's motor skills and abilities. Using assessment tools may support or guide the PT's observations and may be necessary in some states to document eligibility for special education and related services. Administration of these tests may be challenging if communication and/or cognitive limitations are present. Individual assessment modifications should be made, depending on the questions the team wants to answer and the findings from the review of systems and screening. PTs should consult their local and state regulations to ensure compliance and that they are gathering all necessary information.

GUIDE FOR SCHOOL-BASED PHYSICAL THERAPY EVALUATION

The following information is presented as a guide for the physical therapist's observations and information-gathering during the assessment process of children with ASD in the school setting. The format is consistent with APTA's *Guide to Physical Therapist Practice*,³¹ the World Health Organization's International Classification of Functioning, Disability and Health (ICF Model)³² and the Individuals with Disabilities Education Act (IDEA).³³

Examination

A. Review of Records:

- Diagnosis
- Reason for referral
- Current health status
- Services the student is currently receiving in school and/or through community-based providers
- Prior history of physical therapy evaluation or intervention
- Social history, support system, and cultural preferences
- Significant medical history including seizure disorder, allergies, special diet, asthma, hospitalizations, surgeries, immunizations, medications
- Questions generated by the team from evaluation planning meeting/document

B. Review of Systems (*combination of chart review and interview*):

- Sensory system: hearing and vision
- Gastrointestinal system
- Integumentary system
- Cardiovascular/pulmonary system
- Musculoskeletal system
- Neuromuscular system
- Communication, affect, cognition, learning style and preferences, behavior, etc

C. Teacher's Report:

- Curriculum with regard to functional mobility, gross motor, and play or work skills
- Classroom schedule
- Physical expectations for field trips
- Teacher's concerns (eg, interactions and skills the teacher would like the student to develop)
- Student's assets (motivating factors, functional abilities, etc)
- Student's ability to follow school routines by modeling his or her own behavior on that of other children (eg, follow in line, observe and imitate movements)
- Gross motor imitation skills (eg, level of support needed to perform movements, ability to perform movements upon demonstration or verbal direction by teacher)
- Tendency to seek or repeat certain sensations/movements
- Presence of fear of certain movements
- Willingness to participate in classroom motor activities
- Attention to instruction (eg, length of time, posture, adaptations)

D. Parent's Report (*ie, successes and concerns during routines at home*):

- Walking and moving inside the home
- Posture when sitting and standing
- Preferred toys, play themes, or comfort objects
- Preferred fine motor activities
- Preferred gross motor activities
- Moving from one activity to another
- Toileting, grooming, and dressing
- Eating and drinking
- Moving up and down stairs
- Safety and mobility outside of the home (eg, walking on side-walks, riding in the car)

- Safety and mobility on playground equipment and frequency of visit to playgrounds
- Understanding of safety instructions, such as “Stop!” and “Come here!”
- Awareness of body when moving in environment
- Awareness of appropriate versus inappropriate places to climb
- Energy level throughout the day
- Response to and communication about pain

E. Student’s Report:

- Current priorities related to motor skills
- Interests related to active physical recreational pursuits
- Interests related to vocations (secondary)
- Preferred work environment (secondary)
- Preference for working alone or with others (secondary)
- Preference working indoors or outdoors (secondary)

F. Observation of Student’s Participation in Classroom Routines:

Transportation

- Negotiating bus steps
- Moving on and off bus seat
- Participating in bus evacuations
- Carrying own belongings

Arrival in Classroom

- Managing locker
- Managing backpack and other belongings
- Moving into and out of desk chair
- Managing materials in desk

Free Play/Centers (Preschool, Kindergarten)

- Choosing an activity
- Attending to an activity
- Engaging in activity versus self-stimulatory behaviors

Lunch/Snack Time

- Carrying cup, plate, tray
- Chewing efficiently and swallowing in a safe and coordinated manner
- Disposing of snack
- Maintaining adequate posture when eating
- Moving onto lunch bench without bumping into others
- Tolerating cafeteria noise
- Negotiating lunch line and cafeteria safely
- Eating lunch in a neat and timely manner

Transitions

- Finding locations within the school building independently
- Avoiding distractions in the environment
- Walking in hallways with a quiet body/voice and without tripping
- Following a line of other children (eg, stopping, starting, keeping pace with peers)
- Opening doors with and without carrying school materials
- Holding doors open for others

Circle Time (Preschool, Kindergarten, Primary Elementary)

- Moving between the floor and standing
- Staying seated on the floor for the duration of circle activities
- Attending to visual information presented
- Attending to verbal instruction
- Following directions
- Aligning behavior with peers (eg, imitating actions/movements/posture/voice)
- Sitting on a stool, floor, or chair with a back without leaning excessively into supports
- Imitating motor actions of teacher

Tabletop Activities

- Sitting erect versus leaning on desk
- Type of seating/desk
- Using forward vision versus looking sideways at materials
- Completing assignments (eg, level of assistance required)
- Organizing materials, following sequences, looking for models, etc
- Crossing midline voluntarily
- Using both hands to manipulate materials

Playground (Preschool, Elementary)

- Observing rules for proper use of playground equipment
- Navigating playground surfaces and equipment
- Ascending and descending curbs
- Negotiating obstacles while running
- Running using coordinated arm and leg movements
- Participating in ball skills
- Participating with peers versus playing alone
- Participating in small-group games
- Leaving the playground area at designated time

Work Sites/Community-Based Instruction (*secondary*)

- Finding important locations within the worksite or community independently
- Avoiding environmental distractions
- Walking in the community with a safe/quiet body and quiet voice
- Walking in crowded areas without bumping into others
- Opening doors with or without carrying items in hands
- Holding doors open for others
- Walking at a sufficient pace for community ambulation

- Placing and reaching items on low and high shelves
- Demonstrating self-regulation in community areas
- Managing curbs, ramps, stairs, etc
- Maneuvering shopping cart through stores

Bathroom/Continence

- Communicating need to use bathroom
- Managing clothing
- Moving on and off of toilet
- Sitting on toilet without support
- Using toilet tissue
- Washing hands
- Completing all steps in a timely manner

Special Subjects (eg, Art, Physical Education (PE), Computer, Music, Library)

- Sitting upright in assigned chair
- Staying seated for the completion of activities
- Managing art materials (pencils, paint brush, papers, etc)
- Demonstrating repertoire of skilled movement during PE
- Observing of rules for safety during PE games
- Negotiating uneven surfaces and obstacles during PE
- Running using coordinated arm and leg movements during PE
- Participating in games with peers during PE
- Changing clothing without assistance and within allotted time frame for PE (secondary)
- Participating in PE fitness testing (plus results if known)
- Using computer mouse
- Using computer keyboard
- Participating during music movement activities
- Imitating peers during music
- Imitating teacher during music
- Squatting and reaching to access low and high library shelves

Dismissal

- Showing appropriate behavior during transition
- Gathering belongings
- Following peers to bus or pick-up by parent

G. Ecological Observation and Development of Motor Skills:

Functional Mobility

- Transfers
- Gait
- Managing stairs/curbs

Play Skills

- Playing simple physical games

- Using the gross motor toys available in the school setting
- Following adult direction to use different play equipment

Motor Control

- Performing new motor tasks and sequences
- Performing dual tasks (walking and paying attention to orientation/verbal instructions)
- Positioning self squarely on furniture or equipment
- Getting on or off equipment safely
- Initiating or changing activity
- Demonstrating fluidity of movements

Motor Learning

- Demonstrating learning in group situations
- Attempting to perform new skills after modeling by adults and/or peers
- Attending to verbal instructions to perform actions
- Relying on guided movement with physical assistance, hand-under-hand or hand-over-hand
- Relying on visuals, videos, or social stories

Spatial Awareness

- Understanding directionality concepts
- Judging distance or where ball will land

Additional tests and measures may be used to assist in determining a young student's needs in gross motor play skills.³⁰ Testing may need to be modified due to communication deficits.

H. Body Structures and Functions

- Cognition (arousal, attention, communication skills)
- Vision (eye contact, visual tracking)
- Muscle tone
- Respiratory function
- Endurance/stamina (keeping pace with peers versus tiring easily)
- Balance (single-leg balance, walking a balance beam)
- Range of motion
- Posture
- Proprioception (replicating limb positions)

Strength (*functional*)

- Holding on to playground equipment (grip strength)
- Throwing objects with force/distance
- Pushing or pulling heavy items
- Supporting body weight on hands (eg, wheelbarrow walking, prone scooter board)
- Achieving and maintaining a "superman" position (prone extension)
- Achieving and maintaining a "curl-up" position (supine flexion)

Visual-Motor Coordination

- Accurately pointing or exchanging pictures to supplement verbal communication
- Imitating actions on body, actions on objects, etc
- Catching balls or bean bags
- Throwing at a target or into a container

Sensation (*eg, light touch, pressure, temperature, pain*)

- Tolerating light touch
- Acknowledging painful sensations
- Localizing touch

Vestibular

- Demonstrating postrotary nystagmus (eye movement after rotation)
- Tolerating head-down positions
- Tolerating linear and/or rotational movements on movable and fixed play equipment

Additional tests and measures can be used to assess body structures and functions.^{30,34} Testing may need to be modified due to communication deficits.

Evaluation

- Synthesis of findings and clinical judgment

Physical Therapist's Diagnoses

- Refer to the *Guide to Physical Therapist Practice*³¹

Prognosis (Including Plan of Care)

- Educational impact
- Expected outcomes
- Areas of need for further development that the team should consider

Plan of Care

- To be determined upon selection of appropriate goals by the educational team

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