

## Autism Spectrum Disorder (ASD)

**CONDITION:** Autism Spectrum Disorder (ASD)

**DEFINITION:** ASD is a developmental disability that can cause significant social, communication and behavioral challenges

### **CONDITION SPECIFIC PRESENTATIONS:**

- **Social, communication, and behavioral challenges appear across a spectrum of mild to severe**
  - [Tips for working with an individual with ASD](#)
- **Tendency for restricted and repetitive behaviors**
  - Repetitive movements also known as stimming (hand flapping, spinning, rocking, etc.)
- **Sensory considerations** (light, noise, texture, smell, etc.)
  - Hyposensitivity – may need more sensory input
  - Hypersensitivity – may avoid or be very sensitive to certain stimuli
  - Sensory seeking – may seek increased input (example – wanting really tight hugs)
  - [Sensory resources: Ideas for when you need to decrease the sensory environment or when increased sensory input is needed for assessment or to complete treatment sessions](#)
- **Difficulty learning skills through imitation**
- May be aggressive towards self also known as self-injurious behavior (example – hit themselves, bite themselves) or others
  - These interfering behaviors may be related to communication difficulties

<b>COMMON IMPAIRMENTS</b>	<b>IMPAIRMENT BASED TESTS &amp; MEASURES</b>
Hypotonia	
Core weakness	<ul style="list-style-type: none"><li>• Sit-ups</li><li>• Push-ups</li></ul>
Decreased postural muscle endurance	<ul style="list-style-type: none"><li>• Performance outcome measure<ul style="list-style-type: none"><li>○ Ex) Number of sit ups in 30 seconds</li></ul></li></ul>
Impaired balance	<ul style="list-style-type: none"><li>• Berg Balance Scale</li></ul>
Decreased postural control and stability <ul style="list-style-type: none"><li>• Especially with removal or alteration of somatosensory or visual input</li><li>• Delayed anticipatory postural control</li></ul>	<ul style="list-style-type: none"><li>• Balance Error Scoring System (BESS)</li><li>• Modified Clinical Test of Sensory Interaction on Balance (MCTSIB)</li></ul>
Impaired coordination (eye-hand and upper limb, lower limb)	<ul style="list-style-type: none"><li>• Bruininks-Oseretsky Test of Motor Proficiency-2 (BOT-2) bilateral and manual coordination subtests</li></ul>
Difficulty imitating	

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Decreased agility	<ul style="list-style-type: none"> <li>• Bruininks-Oseretsky Test of Motor Proficiency-2 (BOT-2) running speed and agility</li> </ul>
Poor motor planning and sequencing	
Decreased physical activity	<ul style="list-style-type: none"> <li>• Heart rate monitoring</li> <li>• Accelerometer</li> <li>• Inclinometer</li> <li>• Pedometer</li> <li>• Direct observation</li> <li>• Screen monitoring devices</li> <li>• Self-report/parent-report</li> <li>• Activity diaries/logs</li> </ul>
Obesity	<ul style="list-style-type: none"> <li>• Body Mass Index (BMI)</li> <li>• Waist circumference</li> <li>• Skinfold thickness</li> </ul>
Decreased cardiovascular fitness	<ul style="list-style-type: none"> <li>• Six-minute Walk Test</li> <li>• Cycle ergometer</li> <li>• Treadmill</li> <li>• 1-mile walk/run</li> <li>• Shuttle run test</li> </ul>
Decreased muscular fitness	<ul style="list-style-type: none"> <li>• Flexed arm hang-up</li> <li>• Standing long jump</li> <li>• Dynamometer for limb muscles</li> <li>• Strength: Muscle torque or 1-rep maximum</li> </ul>

<b>COMMON ACTIVITY LIMITATIONS</b>	<b>ACTIVITY BASED TESTS &amp; MEASURES</b>
Decreased fine motor skills (object manipulation)	<ul style="list-style-type: none"> <li>• Bruininks-Oseretsky Test of Motor Proficiency-2 (BOT-2) fine motor subtest</li> </ul>
Delayed gross motor skills (running, skipping, etc.)	
Decreased walking endurance	<ul style="list-style-type: none"> <li>• Six minute walk test</li> </ul>
Gait instability	<ul style="list-style-type: none"> <li>• Observation gait analysis</li> </ul>
Toe walking	<ul style="list-style-type: none"> <li>• Cadence</li> </ul>

### **EQUIPMENT CONSIDERATIONS:**

<b>Wheelchair</b>	Possible for transport in community related to fatigue or safety concerns
<b>Orthotics</b>	Ranges from no orthotics, foot orthotics, SMOs, or AFOs

### **AGE SPECIFIC CONSIDERATIONS:**

- Obesity
- Decreased physical activity

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- Decreased physical fitness

### **PLAN OF CARE:**

- Physical fitness & reducing obesity programs
  - Durations in literature range from 8-14 weeks typically
  - Frequency in literature ranges from 1-3 times a week
- Physical activity programs
  - Aerobic exercise
    - Frequency: Progression from 3 to 5 days a week
    - Intensity: moderate progressed to vigorous
    - Time: 20-30 minutes in bouts per day progressed to 45-60 minutes in bouts per day
  - Resistance exercise:
    - Frequency: Progression from 3 to 5 days a week
    - Intensity: 1 day progressed to 2 days a week
    - Time: 10-15 rep maximum progressed to 8-10 rep maximum
  - Flexibility and neuromuscular training:
    - Frequency: Progression from 3 to 5 days a week
    - Intensity: 1-2 times per week
    - Time: 1 hour

### **INTERVENTIONS:**

<b>SUPPORTED IN EVIDENCE</b>	<ul style="list-style-type: none"> <li>• Physical fitness                             <ul style="list-style-type: none"> <li>○ Aerobic training                                     <ul style="list-style-type: none"> <li>▪ Jogging<sup>8</sup></li> <li>▪ Walk/run intervals<sup>8</sup></li> <li>▪ Cycling<sup>8</sup></li> <li>▪ Swimming<sup>8</sup></li> <li>▪ Treadmill training<sup>8</sup></li> <li>▪ Exergames<sup>8</sup></li> </ul> </li> <li>○ Resistance training                                     <ul style="list-style-type: none"> <li>▪ Target trunk, upper extremities, and lower extremities<sup>8</sup></li> <li>▪ Free weights<sup>8</sup></li> <li>▪ Theraband</li> <li>▪ Body weight resistance<sup>8</sup></li> <li>▪ Machines used with caution and supervision<sup>8</sup></li> </ul> </li> <li>○ Flexibility &amp; neuromuscular training                                     <ul style="list-style-type: none"> <li>▪ Stretching<sup>8</sup></li> <li>▪ Therapeutic horseback riding<sup>7, 8</sup></li> <li>▪ Aquatic exercise<sup>8</sup></li> <li>▪ Yoga<sup>8</sup></li> <li>▪ Tai-chi<sup>8</sup></li> </ul> </li> </ul> </li> </ul>
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	<ul style="list-style-type: none"><li>• Physical activity</li><li>• Coordination<sup>4</sup></li><li>• Recreation skills<sup>4</sup></li><li>• Yoga<sup>8</sup></li><li>• Golf<sup>5</sup></li><li>• Community-based exercise program<sup>8</sup></li></ul> <p>Specific principles:</p> <ol style="list-style-type: none"><li>1. Structured exercise environment<sup>8</sup><ul style="list-style-type: none"><li>• Consistent</li><li>• Well demarcated</li><li>• Limited in space</li><li>• Encourage attentional focus and engagement</li></ul></li><li>2. Nature of clinician's interaction<ul style="list-style-type: none"><li>• Brief initial verbal instructions<sup>2,8</sup></li><li>• Feedback<ul style="list-style-type: none"><li>○ Visual cues using demonstrations<sup>2,8</sup></li><li>○ Proprioceptive feedback<sup>2</sup><ul style="list-style-type: none"><li>▪ Hand-over-hand feedback<sup>2</sup></li></ul></li><li>○ Picture schedules</li></ul></li><li>• Reinforcement<sup>8</sup></li></ul></li></ol>
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### **REFERENCES & RESOURCES:**

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6. Shields N, Bos RVD, Buhkert-Smith K, Prendergast L, Taylor N. A community-based exercise program to increase participation in physical activities among youth with disability: a feasibility study. *Disability and Rehabilitation*. 2018;41(10):1152-1159. doi:10.1080/09638288.2017.1422034
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