South Dakota State University

ECE 470: Early Childhood Education Inclusion Strategies

Concepts addressed in this course: Areas of exceptionality in students’ learning: Special physical or sensory challenges

Students should refer to:

Specifically, students should review:
I. Definition of Orthopedic & Neurological Impairments
   a. Orthopedic
      i. Nerves, muscles, and bones do not respond in a coordinated fashion
      ii. Severe orthopedic impairment that affects educational performance caused by congenital anomaly (e.g. club foot), disease (e.g. bone tuberculosis), or other causes (e.g. CP, amputations, or contractures)
   b. Neurological
      i. Disorders or defects in the brain, spinal cord or nervous system that affects movement of the body
      ii. Examples - neural tube defects, spinal cord injuries, and traumatic brain injury

II. Terminology to Know
   a. Tendons, ligaments, flexion, extension, midline, abduction, adduction, proximal, distal, superior, inferior, prone, supine, hypertonic, spastic, hypotonic, athetosis, ataxia, range of motion, and contractures

III. Classification of Orthopedic and Neurological Impairments
   a. Mild – can walk with or without equipment, able to communicate with assistive technology. Mainly difficulties with fine motor skills
   b. Moderate – requires some special equipment for mobility, needs more assistance with communication and self-help skills
   c. Severe – Usually not able to move without the aid of a wheelchair. Self-help and communication skills are challenged by disorder

IV. Diagnostic Tools
   a. X-rays
   b. Computerized asial tomography (CAT scans)
   c. Positron emission tomography (PET scans)
   d. Single photon emission computer tomography (SPECT)
e. Magnetic resonance imaging (MRIs)
f. Ultrasonography
g. Electroencephalography (EEG)

V. Types of Disorders
a. Developmental coordination disorder
b. Developmental dyspraxia
c. Neurological impairments
   i. Cerebral palsy
      1. Diplegia
      2. Monoplegia
      3. Paraplegia
      4. Quadriplegia
      5. Triplegia
      6. Spastic CP
      7. Dyskinetic CP
      8. Ataxic CP
      9. Mixed
   ii. Neural tube defects
   iii. Spinal cord injuries
   iv. Traumatic brain injury
   v. Seizures
d. Musculoskeletal conditions
   i. Absent limbs
   ii. Muscular dystrophies

VI. Intervention Techniques
a. Mobility aids
   i. Splinting
   ii. Bracing
   iii. Short-distance mobility
   iv. Long-distance mobility
b. Transferring

VII. Environmental & Instructional Strategies
a. Have “reachers” aided devices in classroom
b. Include pictures of individuals using mobility devices in classroom
c. Develop language and identifying feelings – ways to work through feelings
d. Facilitate development of sexual identity and appropriate gender identity
   Individuals with mobility impairments are often seen as asexual
e. Take a wheelchair tour of the classroom and reevaluate the classroom set up
f. Use adjustable tables for correct table height
g. Use lighter equipment in block area to avoid fatigue
h. Be sure that large equipment is stable and may be used to pull up to stand
i. Move sand and sensory table away from wall to be accessed from all sides
j. Use nonslip floor coverings

Development of this review sheet was made possible by funding from the US Department of Education through South Dakota’s EveryTeacher Teacher Quality Enhancement grant.
k. Use adjustable handle grips for writing and art tools
l. Stabilize snack equipment with high sides & use finger foods
m. Use abduction block, wedges, and rolls to help stabilize
n. Provide bags/knapsacks to carry things around room
o. Use padded lapboards for children who are more comfortable sitting on the floor than in a chair
p. Use bicycle gloves for pushing wheelchair or climbing
q. Prioritize schedule and activities for children who tire quickly – more energy and/or concentration first

VIII. Curriculum Adaptations

a. Social studies – personalize equipment; represent equipment in the classroom, guests that play a role in child’s life – osteopath, orthopedic surgeon

b. Language arts
   i. Speaking – using communication boards and schedules, expanding on child’s utterances when they use telegraphic speech
   ii. Listening – sit in chairs during group time, read stories about children who have orthopedic impairments, use flannel boards, and use stories with vocabulary to introduce orthopedic vocabulary.
   iii. Reading – provide experiences and field trips to places read about
   iv. Writing – use writing without tools first, provide a variety of fine motor experiences, use materials that have some resistance, use gripping materials for writing tools, warm up muscles with clay or dough before writing, use finger plays to develop fine motor skills, and use computers to write

c. Mathematics – may take longer to do hands-on math given muscle tone issues, learn about relationships of distance and speed, measuring and weighing related to the need to replace braces as they grow, discuss shapes that rolls and those that don’t

d. Science – cause and effect tools, causal relationships, learn about pulleys and wheeled items – moving something that they may not be able to move otherwise, use objects of various size and textures, exploring the basic principles of physics and gravity

e. Movement – large motor – strength & endurance
   i. Climbing – do not assist to climb higher than they can
   ii. Encourage using equipment - again do not assist beyond their level
   iii. Work at vertical surfaces for muscle endurance
   iv. Pushing something weighted as they walk
   v. Mounting toys on walls
   vi. Put up safeguards on walls for children prone to bumping edges, etc.

f. Movement – fine motor – manipulation
   i. Magnetic toys, blocks that snap together, using Velcro on blocks, pegboard toys, pop beads, stringing boards with reinforced string

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ends, use clothespins for hanging clothes, special handled scissors, use pipe cleaners for stringing instead of laces
ii. Blowing bubbles encourages lung usage

  g. Sensory integration
  i. Expose to different textures, placing bean bags on difference body parts, movement activities, separating two motions or different actions and then combine the motions again
  ii. Play tether ball – eye/hand coordination

**Helpful websites include:**
Brain Injury Association:  [http://www.biausa.org](http://www.biausa.org)
iCan ONLINE:  [http://www.ican.com](http://www.ican.com)
National Paralysis Foundation:  [http://www.spinalvictory.org/default.htm](http://www.spinalvictory.org/default.htm)