Meeting the Challenge of Developmental Coordination Disorder
With Associate Medical/Educational Diagnoses
Rhoda P. Erhardt, MS, OTR/L, FAOTA

This poster presents a practical approach for providing services to children with Developmental Coordination Disorder (DCD). It gives examples of associated diagnoses with symptom commonalities, stages of visual-perceptual-motor development, and a case study giving examples of therapeutic activities leading to improved function.

Commonalities of Delays and Deficits: DCD with ADHD, ASD, SLD, and SPD
- Academics (reading, writing, math)
- Attention
- Communication
- Executive function
- Motor control (gross, fine, visual)
- Postural control (balance, joint stability, muscle tone, strength)
- Self-regulation
- Social interaction
- Transition adjustments

Developmental Perceptual-Motor Stages: A Foundation for Spatial and Temporal Awareness and Motor Coordination
1. Posture
2. Body image
3. Laterality
4. Directionality
   • Relationship to external objects
   • Relationship between external objects

Criteria of DCD Diagnosis (DSM-5)
Diagnosis and Statistical Manual of Disorders - Fifth edition
- A neurodevelopmental disorder
- Childhood onset
- Impairment of motor skills interfering with academic, social, and occupational activities of daily living
- Other neurological conditions affecting movement ruled out

Examples of Conditions Associated with DCD
- Attention deficit/hyperactivity disorder (ADHD)
- Autism spectrum disorder (ASD)
- Specific learning disabilities (SLD)
- Sensory processing disorders (SPD)

Intervention Approaches
Process-oriented
- Bottom-up
  • Foundational components needed for successful performance and acquisition of motor skills

Task-oriented
- Top-down
  • Cognitive analysis of interaction between context, child’s resources, and task to be learned

Visual-Perceptual-Motor Activity Examples
Gross Motor: Standing on one leg while erasing chalk shapes with wet sock, to improve balance, eye-foot coordination, and spatial awareness, using rail for balance, then independently
Fine Motor: Clock game on chalkboard, for eye-hand control and bilateral competency
Oculomotor: Tracking with mirror eye and tongue – more strength and accuracy

Case Study: Functional Problems of a Teenager with Specific Learning Disorder
- Academic performance
- Handwriting
- Energy levels
- Manual dexterity
- Organizational skills
- Self-esteem
- Sports

Current DCD Assessments
- Bruininks-Oseretsky Test of Motor Proficiency (BOT-2)
- Developmental Coordination Disorder Questionnaire (DCD-Q)
- Developmental Test of Visual-Motor Integration (VMI)
- Movement Assessment Battery for Children (M-ABC-2)
- Test Of Legible Handwriting (TOLH)

Conclusions and References
Children who have been diagnosed with Developmental Coordination Disorder can benefit from visual-perceptual-motor intervention programs that have been proven effective in those who have conditions associated with DCD.

www.erhardtproducts.com/DCDrefs.html

History of Terminology
- Motorically deficient – 1925
- Clumsiness and motor difficulties – 1937
- Developmental apraxia - 1962
- Minimal brain dysfunction – 1966
- Perceptual-motor dysfunction - 1967
- Sensory integration disorder- 1972
- Developmental coordination disorder 1994-current

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Independent Evaluations of Occupational Therapy Program
Before Rx
<table>
<thead>
<tr>
<th></th>
<th>Age 13</th>
<th>Age 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optometric VMI-Beery percentile</td>
<td>7th</td>
<td>98th</td>
</tr>
<tr>
<td>Accomodative amplitude (focus)</td>
<td>8.60 OD 10.50 OD</td>
<td></td>
</tr>
<tr>
<td>Normal: 13 diopters</td>
<td>7.80 OS 19.50 OS</td>
<td></td>
</tr>
</tbody>
</table>

Psychological
- VMI-Beery percentile 16th 96th%
- VMI-Beery age equivalent 9-14

After Rx

www.opendyslexic.org
Free Font for Persons with Dyslexia

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