DCD Early Identification and Intervention Sheet

Developmental Coordination Disorder

Advocacy Toolkit

What is Developmental Coordination Disorder (DCD)?

Developmental Coordination Disorder (DCD) is a chronic motor skill disorder seen in children and youth, which significantly affects activities of daily living, school performance, and leisure activities.[1,2] In order to meet DCD diagnostic criteria, the motor deficits must not be the result of any other known neurological or medical condition (such as cerebral palsy or a neurodegenerative disorder).[1]

The disorder is diagnosed using DSM-5 criteria:[3]
A. Acquisition and execution of coordinated motor skills are substantially below what would be expected given the child's age and opportunity for skill learning and use. Difficulties may be seen as clumsiness, inaccuracy, or slowness of performance of motor skills (e.g., catching a ball, using scissors, printing or handwriting, riding a bicycle, or participating in sports).
B. The motor skills deficit significantly and persistently interferes with activities of daily living and impacts school productivity, vocational skills, leisure activities, and play.
C. The onset of symptoms is in the early developmental period.
D. The motor skills deficit is not better explained by intellectual disability, visual impairment, or a neurological or medical condition affecting movement.

Can DCD be identified before the age of 5 years?

DCD is usually evident early on in a child's life but is not typically diagnosed before age 5.[1] However, preschoolers (aged 3 to 5 years) who show significant motor impairments (despite having had ample opportunities for learning and with other causes of motor delay ruled out) can receive a DCD diagnosis based on the findings from at least two longitudinal assessments (e.g., repeated administration of the MABC-2 at least 3 months apart).[1]

Why should we focus on early identification of DCD?

Parents who seek help for young children often experience greater delays and difficulties getting a DCD diagnosis, as compared to older children, which may contribute to higher stress levels.[3] Earlier diagnoses and interventions for children at risk of DCD may change the developmental trajectory for these children and positively contribute to family functioning and overall well-being.

What are the risk factors for and early signs of DCD?

While the diagnosis of DCD may not be appropriate in the early years, occupational therapists have an important role in identifying children who may be at risk of DCD. Key risk factors for DCD include prematurity,[4] low birth weight,[4] male sex,[4] autism,[5] and significant speech and/or language difficulties that persist at 4-5 years of age.[6]

Several early signs for possible DCD have been proposed, largely based on clinical impressions, history taking, and parent report.[3,6-9] Commonly identified signs include poor performance in activities of daily living (ADLs) that require motor coordination (e.g., dressing, utensil use), poor balance, clumsiness, poor motor sequencing, spatial awareness problems (e.g., poor figure ground skills and falling/bumping into others), poor visual tracking, immature grasp, poorly established hand dominance, and slower, less accurate movements. Motor milestones may or may not be delayed, but there is a history of difficulty learning age-appropriate motor skills.

Who can help to identify children with/at risk of DCD before the age of 5 years?

Parents play a critical role in the initial identification of motor difficulties for their children. Half of parents surveyed identified concerns prior to their child's 3rd birthday and sought help approximately 1.5 years after they first started to have concerns.[3] A smaller study found that nearly all the parents in an interview sample had identified concerns by age 4.[10] Early parent anxieties regarding poor motor development and behaviour are often confirmed by **early educators** in daycare or preschool settings.[11,12] These early educators are well poised for naturalistic observations of children in play and can be guided in identifying those most at risk of motor coordination difficulties;[7] most notably by **occupational therapists**[13] and **physical therapists**.[14] More attention has also been given to the potential role of **speech language pathologists** as early identifiers of children at risk for DCD given the high co-occurrence of speech and language impairments and motor impairments.[6] **Physicians**[15] are positioned to potentially identify children through well-baby and annual check-ups, but they will likely need a formal assessment of motor skills (Criterion A) and documentation of the impact on the motor skills deficit on daily life (Criterion B) (See Letter to the Doctor template [http://bit.ly/2D8IDEY].

What assessment tools can be used for early identification of children with/at risk of DCD?

Criterion A: The most commonly used measure is the **Movement Assessment Battery for Children-2** (MABC-2).[16] The MABC-2 has been shown to have excellent sensitivity (identifying children at risk of DCD) but also many false positives at age 3 years.[17] A cut-off score of ≤ 5th percentile is used for children ≤ 5 years of age, usually over 2 assessments at least 3 months apart.[1] Children at risk of DCD may be identified in infancy. For example, a retrospective study of preterm children diagnosed with DCD at 4.5 years found that these children scored more poorly on ALL early motor assessments, from as young as 4 months of age, compared to children who did not have motor problems.[18] These assessments include the **Movement Assessment of Infants**,[19] the **Bayley Test of Infant and Toddler Development – 3rd ed**[3,20] and the **Peabody Developmental Motor Scale – 2nd ed.**[21] The **Alberta Infant Motor Scale**[22] has also been used to identify preterm infants at risk of later motor impairments.[23,24]

Criterion B: The most studied and the only questionnaire validated in Canada is the **Little Developmental Coordination Disorder Questionnaire (Little DCDQ)** (available for $50 CAD at http://www.dcdq.ca/little-dcdq-ca.html).[25] The Little DCDQ is a parent-report questionnaire designed specifically to identify children (3 years to 4 years 11 months) at risk of DCD. Other questionnaires include the DCDQ[26]

(http://www.dcdq.ca, for children aged 5 years+), and the **Early Years Movement Skills Checklist** (a parent- and teacher-report measure)[27] developed in the United Kingdom.

What treatment approaches can be used for children with/at risk of DCD?

Individual intervention is generally recommended for younger children,[1] but evidence is emerging for group-level interventions.[28-31] The following treatment approaches show promise (mostly based on Level V best evidence, e.g., case reports, single subject research designs, pre/post designs with no control group) for younger children with/at risk of DCD:

- Modified Cognitive Orientation to Occupational Performance (CO-OP)[32-34]
- Task-specific intervention and parent education[31]
- Occupational Performance Coaching (teacher) and play-based intervention (child)[35]
- Motor Magic (occupational therapy embedded in the curriculum)[29,30]
- Fundamental Movement Skills[28]
- Animal Fun[36] (specific results for children with DCD have not yet been published)
- Strength training[37]

Where can I learn more?

- Results of scoping review of early identification and early intervention of children with/at risk of DCD will soon be submitted for publication (Lee & Zwicker, in preparation)
- Evidence on DCD assessment/diagnosis and management [Evidence for Practice (E4P) Synthesis]: http://www.childdevelopment.ca/DCDAdvocacyToolkit/DCDAdvocacyToolkitEvidenceforPracticeSummary.aspx
- Advocating for a DCD diagnosis (information sheet): http://www.childdevelopment.ca/DCDAdvocacyToolkit/DCDAdvocacyToolkitResources.aspx
- Review of standardized motor assessments: http://www.therapybc.ca/eLibrary/resources.php

This document was prepared in March 2018 and will be updated as new evidence emerges.

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