

DCD Assessment Information Sheet



Advocacy Toolkit

What is Developmental Coordination Disorder (DCD)?

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}

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.

Why is assessment important?

DCD is a chronic disorder that affects fitness, activities of daily living, academic functioning, social relationships, and participation in meaningful life activities.^{1,2,4-6} Children with DCD also report psychological issues, including significantly higher levels of depression and anxiety, and decreased quality of life than their typically developing peers.^{6,7,8} Assessment facilitates the implementation of individualized, evidence-informed treatment that can improve physical, social, and psychological outcomes for these children.

Who can do the assessment?

DCD is typically diagnosed by a medical doctor or pediatrician (and in some jurisdictions, a psychologist) who is qualified to examine the specific DSM-5 criteria.¹ Comprehensive assessment leading to diagnosis ideally involves a multidisciplinary health professional team.^{1,2} Occupational therapists have a key role in assessing Criteria A and B.

At what age is a DCD diagnosis appropriate?

DCD is usually evident early on in a child's life but not typically diagnosed before age 5.¹ 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 Please also refer to the accompanying information sheet, *Early Identification and Early Intervention for DCD* (<http://bit.ly/2D8IDEY>).

How do I assess for DCD?

Assessment should include:^{1,2}

- A thorough medical and developmental history
- Clinical examination
- Motor testing
- Questionnaires
- Discussion with the child and key individuals regarding the impact of the child's motor skills on daily living skills, school, leisure and participation.

The following tools are recommended as primary assessment measures for school-age children for suspected DCD:¹

Diagnostic Criteria	Assessment Domain	Recommended Measures	Key Information
A	Motor functioning	Movement Assessment Battery for Children, 2 nd ed. (MABC-2) ⁹	Age range: 3 years to 16 years 11 months Subsections: Manual dexterity, ball skills, and balance (static & dynamic)
		Bruininks-Oseretsky Test of Motor Proficiency, 2 nd ed. (BOT-2) ¹⁰	Age range: 4 to 21 years Subsections: Running ability, agility, balance, bilateral co-ordination, upper limb speed, and dexterity, and visual motor control
B	Activities of daily living	Developmental Coordination Disorder Questionnaire (DCDQ'07) ¹¹	Age range: 5 to 15 years Subsections: Control during movement, fine motor skills & handwriting, general coordination Free download available at www.dcdq.ca
		Movement Assessment Battery for Children Checklist, 2 nd ed. (MABC-2 Checklist) ¹⁰	Age range: 5 to 12 years Subsections: Movement in a static environment, movement in a dynamic environment, non-motor factors
C	Early onset	Parent interview and/or tools such as the Listening for DCD Checklist ¹² or clinical interview guidelines ¹³ may be used	Developmental history as part of OT and/or physician assessment; a history of motor learning challenges should be evident from early in life
D	Medical examination	Neurological exam and other tests, as required	Refer to physician to rule out other possible medical or neurological explanations for motor difficulties ¹⁴
	Cognitive functioning	IQ testing	Not required if no history of challenges with school functioning/academic achievement ¹

The psychometric properties of these measures are described in the Management of DCD Evidence for Practice (E4P) Synthesis.

What motor performance scores indicate a possible DCD diagnosis?

Cut-off scores ¹	Children 3-5 years	Children 6 years and older
MABC-2	≤ 5th percentile	≤ 16th percentile; however, if a child scores below the 5th percentile in one domain (e.g., fine motor, balance) but scores above the 16th percentile in other domains, a DCD diagnosis could be made if other diagnostic criteria are met
BOT-2	2 SD below the mean	1 SD below the mean; as above

Where can I learn more?

- 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>
- Best practices in DCD treatment (information sheet): <http://www.childdevelopment.ca/DCDAdvocacyToolkit/DCDAdvocacyToolkitResources.aspx>
- Early Identification and Early Intervention for DCD (information sheet): <http://www.childdevelopment.ca/DCDAdvocacyToolkit/DCDAdvocacyToolkitResources.aspx>
- Review of standardized motor assessments: <http://www.therapybc.ca/eLibrary/resources.php>
- Listening for DCD Interview Guide (CanChild): <http://bit.ly/2Ca1qDw>
- DCDQ: <http://www.dcdq.ca>

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

References

1. Blank R, Smits-Engelsman B, Polatajko H, Wilson P. European Academy for Childhood Disability (EACD): Recommendations on the definition, diagnosis, and intervention of developmental coordination disorder (long version). *Dev Med Child Neurol*. 2012;54:54-93.
2. Chung A, Callanen A. Clinical Review: Developmental Coordination Disorder (Occupational Therapy). CINAHL Information Systems, Rehabilitation Reference Center, 2016.
3. American Psychiatric Association (APA). Diagnostic and statistical manual of mental disorders (5th ed.). 2013. Arlington, VA: APA.
4. Callanen A. Clinical Review, Developmental Coordination Disorder (Physical Therapy). CINAHL Information Systems, Rehabilitation Reference Center, 2017.
5. Magalhaes LC, Cardoso AA, Missiuna C. Activities and participation in children with developmental coordination disorder: A systematic review. *Res Dev Disabil*. 2011;32(4):1309-16.
6. Gagnon-Roy M, Jasmin E, Camden C. Social participation of teenagers and young adults with developmental coordination disorder and strategies that could help them: Results from a scoping review. *Child Care Health Dev*. 2016;42(6):840-51.
7. Zwicker JG, Harris SR, Klassen AF. Quality of life domains affected in children with developmental coordination disorder: A systematic review. *Child Care Health Dev*. 2013;39(4):562-80.
8. Zwicker JG, Suto M, Harris SR, Vlasakova N, Missiuna C. Developmental coordination disorder is more than a motor problem: Children describe the impact of daily struggles on their quality of life. *Br J Occup Ther*. 2018; 81:65-73.
9. Henderson SE, Sugden DA, Barnett AL. Movement Assessment Battery for Children, 2nd ed. London: Pearson, 2007.
10. Bruininks R, Bruininks B. Bruininks-Oseretsky Test of Motor Proficiency, 2nd Edition. Minneapolis, MN: NCS, Pearson, 2005.
11. Wilson BN, Crawford SG, Green D, Roberts G, Aylott A, & Kaplan B. Psychometric properties of the revised Developmental Coordination Disorder Questionnaire. *Phys Occup Ther Pediatr*. 2009;29(2):182-202.
12. Camden C, Rivard L, Pollock, Missiuna C. Listening for DCD Interview Guide. CanChild. 2013; Available from: <http://bit.ly/2Ca1qDw>
13. Missiuna C, Pollock N, Egan M, DeLaat D, Gaines R, Soucie H. Enabling occupation through facilitating the diagnosis of developmental coordination disorder. *Can J Occup Ther*. 2008;75(1):26-34
14. Harris SR, Mickelson ECR, Zwicker JG. Diagnosis and management of developmental coordination disorder. *Can Med Assoc J*. 2015;187:659-665.



[Access the full Toolkit here](#)



This document was developed by Giovanna Boniface, Stephanie Glegg, Ivonne Montgomery, and Dr. Jill Zwicker with funding support from a Michael Smith Foundation for Health Research (MSFHR) REACH Award and Sunny Hill Health Centre for Children. Stephanie Glegg is supported by a CIHR Vanier Canada Graduate Scholarship, the Canadian Child Health Clinician Scientist Program, a UBC Public Scholars Award and Four-Year Fellowship, and the Sunny Hill Foundation. Dr. Zwicker is a MSFHR Scholar and is funded by the Canadian Child Health Clinician Scientist Program, BC Children's Hospital Research Institute, Sunny Hill Foundation, and Canadian Institutes of Health Research.