

## **Developmental Coordination Disorder (DCD): Leaflet for Allied Health Professionals**



This leaflet was produced through a consensus process led by Movement Matters and involving relevant stakeholders and organisations from across the UK.

### **What is DCD?**

Developmental Coordination Disorder (DCD), also known as Dyspraxia in the UK, is a common disorder affecting fine or gross motor co-ordination in children and adults. This lifelong condition is formally recognised by international organisations including the World Health Organisation. DCD is distinct from other motor disorders such as cerebral palsy and stroke and occurs across the range of intellectual abilities. Individuals may vary in how their difficulties present; these may change over time depending on environmental demands and life experience.

An individual's coordination difficulties may affect participation and functioning of everyday life skills in education, work and employment.

Children may present with difficulties with self-care, writing, typing, riding a bike and play as well as other educational and recreational activities. In adulthood many of these difficulties will continue, as well as learning new skills at home, in education and work, such as driving a car and DIY.

There may be a range of co-occurring difficulties which can also have serious negative impacts on daily life. These include social and emotional difficulties as well as problems with time management, planning and personal organisation. These difficulties may also affect an adult's education or employment experiences.

### ***How might DCD affect the child at home and school?***

The child's movements may generally appear awkward. S/he may have difficulties with some or all of the following:

- Self-care e.g. washing, toileting, dressing (doing up buttons, tying shoe laces, putting clothes on the right way around).
- Doing crafts and playing with construction toys.
- Physical play, PE, and school sports, especially in playing team games, including ball skills.
- Handwriting and drawing.
- Using tools e.g. a toothbrush, cutlery, scissors, rulers.
- Learning new motor tasks.

Some children may also experience:

- General organisation and planning difficulties relating to themselves and their belongings e.g. losing clothing and books.
- Social difficulties e.g. difficulty in groups especially maintaining friendships.
- Emotional difficulties e.g. low self-esteem.

DCD may exist with other conditions (such as ADHD, Autism, Dyslexia and Specific Language Impairment). In these cases, the child may have a complex profile and a range of difficulties.

### ***When and how is DCD identified?***

A formal diagnosis of DCD can be made when there are significant motor difficulties that are not due to a visual impairment, neurological disorder or other medical condition.

Though formal identification of DCD rarely occurs prior to a child's 5<sup>th</sup> birthday, parents and teachers may notice that a very young child has coordination difficulties or delays in motor development when compared with peers. As soon as a child is old enough to be diagnosed, the first step is to differentiate the motor

difficulties from other motor disorders. This should include a physical examination by a medical practitioner (paediatrician or GP) and may include input from an appropriate AHP (e.g. physiotherapist). A detailed developmental and medical history should be taken and parent report of the child's current behaviour considered. It is important to differentiate the motor behaviour of children with DCD from other movement disorders such as cerebral palsy, muscular dystrophy, global developmental delay or tumors. Careful questioning of the parent together with a physical examination of posture, muscle tone and reflexes should be undertaken to help consider:

- Global rather than just a motor difficulty/delay
- When the motor difficulties were first noted, whether they were present in the very early years or onset recently
- Whether there has been a loss of previously acquired skills
- Evidence of increased or fluctuating muscle tone
- Asymmetry in motor control and coordination

Referral on to an Allied Health Professional (usually an occupational and/or physiotherapist) should be made for further evaluation of the child's motor performance via standardized parent questionnaires and motor tests. A final diagnosis should be based on multiple sources of information including that from the parent, from standardized motor tests and from a physical examination by a medical practitioner.

### ***How should I assess a child with DCD?***

The nature of an assessment will depend on its purpose. A diagnostic assessment should include an individually administered, standardized test of fine and gross motor skills to confirm that there is a significant movement difficulty. Information from the parent and/or teacher should also be gathered to confirm that the movement difficulties have a negative impact on everyday life skills (or Activities of Daily Living, ADL).

An assessment for intervention planning should be broader, with information collected from multiple sources including parents, teachers and the child/young person as well as from standardized motor tests.

DCD often co-occurs with other developmental disorders (including ADHD, Language disorders and Autistic Spectrum Disorders), psychiatric disorders (depression, anxiety) and other social and/or psychological problems. You should be alert to this during your own assessment of the child and ensure that information/reports from other professionals (e.g. psychologist, health or educational professional) are considered alongside your own assessment. Where appropriate, you should refer on for further assessment by a relevant professional.

### ***What assessment tools should I use?***

Current guidelines should be consulted for recommended tools and these should be selected according to the purpose of your assessment. Ensure that standardized tests are based on relevant normative data (recently published and appropriate for the UK population) and that there is evidence for good validity and reliability. Also make sure that you are suitably qualified and trained to carry out the assessment. European and UK guidelines published in 2012 recommend a range of tools for use in the assessment of DCD. At present, these include the following:

#### *For the assessment of general motor competence:*

Movement ABC-2 Test (Henderson, Sugden & Barnett, 2007)

Bruininks-Osteretsky Test of Motor Proficiency-2 (BOT-2; Bruininks & Bruininks, 2005)

#### *For the assessment of everyday movement skills by the parent and/or teacher.*

The DCD-Q-R (Wilson, Crawford, Green, Roberts, Aylott & Kaplan (2009)

Movement ABC-2 Checklist (Henderson, Sugden & Barnett, 2007)

#### *For an assessment of child's self-perceptions:*

The Perceived Efficacy and Goal Setting System (PEGS; Missiuna, Pollock, & Law, 2004).

The Children's Self-Perceptions of Adequacy in and Predilection for Physical Activity (CSAPPA; Hay, 1992)

### ***What principles should I consider when planning intervention?***

If you work in a service setting, you should agree referral, assessment and intervention pathways with your team and other agencies.

You should work together with the child, parent(s), teacher(s) and other relevant professionals to identify appropriate goals for intervention, also drawing on information from your assessment of the child's strengths and limitations.

Intervention should focus on supporting the child's learning and encouraging him/her to participate in activities. The type, level and extent of intervention required will vary depending on the range and severity of the motor and non-motor difficulties experienced by the child with DCD. At the lowest level, minor adaptations in the home and/or school environment will be sufficient and you should provide advice about this to parents and teachers. At a higher level, a more structured learning environment may be required.

You should follow the general principles recommended in the most recent European and UK guidelines. These include:

- Focusing on functional tasks of everyday living e.g. helping to wash paint brushes rather than meaningless hand exercises.
- Using multiple and short sessions as 'little and often' is best for learning e.g. five minutes handwriting practice every day rather than one long session per week. Practice should be integrated into everyday life tasks and situations.
- Setting up a variety of practice situations - e.g. different activities for fine motor skills: one handed tasks such as constructing jigsaws, picking up pegs; two-handed activities such as using scissors, handwriting, threading.
- Encouraging the use of cognitive strategies such as goal setting, self monitoring, problem-solving activities e.g. encourage the child to think about what aspects of the task they need to focus on to achieve success.
- Breaking down tasks into smaller units to be learned; ensure that the child knows what they are working towards and what the end goal looks like e.g. the different components in learning to bat in a game of rounders.
- Using movement for other goals, moving to learn as in cooperative games for social skills – to encourage socially appropriate opportunities for movement.

You can *encourage participation* in activities by changing the context in which the child is performing. This moves the focus from limitations just within the child towards consideration of how the environmental circumstances and context can be modified such that the child can participate.

- Adjust the demands of the task realigning them to the skill level of the child e.g. talk to the teacher about differentiation in PE lessons.
- Grade activities so that they gradually increase in difficulty e.g. at first the child may catch a large ball with two hands then gradually reduce the size of the ball or increase the distance.
- Where support is available (e.g. from a teaching assistant), encourage progress by gradually reducing the level of support as the child becomes more confident and starts to succeed.
- Give the child choice of activities, recognising that this may require a greater range than we typically see e.g. dance or martial arts may be preferable to team games.
- Encourage partner work with a friend who is empathetic yet challenging.
- Praise the child for effort as well as achievement.
- Celebrate successes – when the child is successful attribute this to his/her hard work and effort.

### ***Who should provide the intervention?***

Some children will receive sufficient support at school or at home, without recourse to referral to a therapy service. In this case you can work on a consultative basis, providing advice, support and training to families and teachers. Other children will require more specialist help in a 1:1 or small group setting.

### ***Which specific intervention approaches should I employ?***

Task-oriented approaches are recommended as the most effective in working with children with DCD. These work on teaching essential activities of daily living and thereby stimulate participation of the child at home and in school, leisure, and sports. It is important to practise the task itself (e.g. handwriting, activities of daily living, sports skills) and their specific components.

Task-oriented approaches using a cognitive approach are also recommended for some children. However, they will need sufficient cognitive ability to benefit from this approach, being able to set goals for themselves. Sufficient language skills are also required, as this approach is based on verbal interaction between the therapist and child.

Other specific approaches to intervention should only be employed if substantial evidence for their effective use in children with DCD is available. Recent European and UK guidelines should be consulted for further information on other approaches.

***How should I measure the effectiveness of intervention?***

You should measure outcomes that relate to the original intervention goals. Consider the views of all stakeholders (the child, parent, teacher and other relevant professionals) when monitoring performance and keep careful records of progress.

***Where can I go for further information?***

[www.movementmatters.org.uk](http://www.movementmatters.org.uk)

***References***

- Bruininks, R.H. & Bruininks, B.D. (2005). *Bruininks-Oseretsky Test of Motor Proficiency, 2<sup>nd</sup> Edition*. Windsor: NFER-Nelson.
- Hay, J.A. (1992). Adequacy in and predilection for physical activity in children. *Clinical Journal of Sports Medicine*, 2, 192–201.
- Henderson, S.E., Sugden, D.A. & Barnett, A.L. (2007). *Movement Assessment Battery for Children – 2 Examiner’s Manual*. London: Harcourt Assessment.
- Missiuna, C., Pollock, N. & Law, M. (2004). *Perceived Efficacy and Goal Setting System (PEGS)*. San Antonio, TX: Psychological Corporation.
- Wilson, B.N., Crawford, S.G., Green, D., Roberts, G., Aylott, A. & Kaplan, B.J. (2009). Psychometric properties of the revised Developmental Motor Coordination Questionnaire. *Physical & Occupational Therapy in Pediatrics*; 29, 182–202.