

Developmental Coordination Disorder

DSM-5-TR 315.4 | ICD-10-CM F82

Motor skill acquisition and execution well below age expectation, producing clumsiness and slowness that interferes with everyday activities.

PREVALENCE

5-6% of school-age children

TYPICAL ONSET

Early developmental period

SEX RATIO

~2-7:1 male:female

COURSE

Persists in adulthood ~50-70%

CLINICAL PICTURE

- Delayed motor milestones, then persistent difficulty with buttons, zippers, shoelaces, cutlery, and bike riding relative to peers.
- Handwriting is slow, illegible, and effortful; the child fatigues quickly and written output falls far below demonstrated oral ability.
- Ball skills, catching, and rapid direction change are poor, leading to last-picked status and progressive avoidance of sport.
- Bumping into furniture, frequent spills, and dropped objects get attributed to carelessness rather than to motor impairment.
- Self-care tasks take excessive time, and morning routines become a daily source of family conflict and chronic lateness.
- Adolescents avoid physical education, gain weight, and report low self-worth, anxiety, and diminished social participation.

DIAGNOSTIC CRITERIA AT A GLANCE

- Acquisition and execution of coordinated motor skills are substantially below expectation for age and opportunity to learn.
- Presents as clumsiness plus slowness and inaccuracy on tasks such as catching, using scissors, handwriting, or riding a bicycle.
- The deficit persistently and significantly interferes with daily living, academics, prevocational activity, play, or leisure.
- Onset is in the early developmental period; formal diagnosis is generally deferred to about age 5 when motor skills stabilize.
- Not better explained by intellectual disability, visual impairment, or a neurological condition such as cerebral palsy or muscular dystrophy.

NEUROBIOLOGY & PHYSIOLOGY

- Cerebellar dysfunction impairs internal forward models, degrading feedforward prediction and online correction of movement.
- Reduced activation across parietal, prefrontal, and cerebellar networks appears during motor imagery and visuomotor tasks.
- Deficient motor imagery and predictive control, rather than simple weakness, separate DCD from primary neuromuscular disease.
- Heritability is substantial, and prematurity and very low birth weight raise risk severalfold, with rates near 30-50% in preterm cohorts.
- Prenatal alcohol exposure and perinatal hypoxia are established risk factors for later coordination impairment.
- Reduced physical activity yields lower cardiorespiratory fitness, higher adiposity, and cardiometabolic risk by adolescence.

PSYCHOLOGICAL MECHANISMS

- Automatization is impaired, so motor tasks demand sustained conscious attention and compete with cognitive load in the classroom.
- Explicit instruction and guided problem solving outperform implicit motor learning, which is the basis for cognitive approaches.
- Perceived motor incompetence lowers self-efficacy, driving activity withdrawal and a downward spiral of skill and fitness.
- Anxiety and depression rates are elevated two to fourfold, mediated largely by peer victimization and social exclusion.
- Parents and teachers often misattribute slowness to laziness, which increases criticism and further erodes motivation.

DIFFERENTIAL & COMORBIDITY

- Neurologic examination must exclude cerebral palsy, muscular dystrophy, ataxia, and neuropathy; check creatine kinase if weak.
- Rule out uncorrected vision problems, joint hypermobility syndromes, and intellectual disability as primary explanations.
- ADHD** co-occurs in up to 50%; the combined attention and motor phenotype predicts worse functional and academic outcome.
- Autism spectrum disorder, specific learning disorder, and language disorder** each co-occur at markedly elevated rates.
- Obesity, low fitness, anxiety, and depression are downstream consequences that should be screened at every clinical visit.

Treatment EVIDENCE-BASED MANAGEMENT

PHARMACOLOGIC

- No medication treats DCD; task-oriented motor intervention from occupational or physical therapy is the core treatment.
- Treating comorbid **ADHD** with **methylphenidate** improves handwriting legibility and motor control in overlap phenotypes.
- Screen and treat comorbid anxiety and depression with SSRIs plus **CBT** when they limit participation in activity.
- Order creatine kinase, thyroid studies, and neurology referral when there is regression, weakness, or abnormal reflexes.
- No supplement, including fatty acid preparations, has replicated evidence for improving motor coordination in DCD.

PSYCHOTHERAPY

- CO-OP** teaches a goal-plan-do-check strategy for child-chosen goals across 10-20 sessions, with strong evidence and generalization.
- Task-oriented and activity-focused approaches outperform process-oriented sensory integration or kinesthetic training.
- Neuromotor task training and motor imagery training show moderate effect sizes in controlled intervention trials.
- CBT** addresses secondary anxiety, perfectionism, and avoidance and improves participation in physical activity.
- Practice must be distributed, high in repetition, and set in the environment where the skill is actually needed.

ADJUNCT & SUPPORTIVE

- Assess with the **MABC-2** performance test plus the **DCDQ** parent report; questionnaire alone is not sufficient.
- School accommodations include keyboarding, reduced copying, extended time, pencil grips, slant boards, and modified PE.
- Refer to adapted physical activity, swimming, martial arts, or cycling that build fitness without competitive ball skills.
- Task modification and environmental adaptation deliver immediate function even before skill remediation takes effect.
- Follow into adolescence: DCD persists in most, and driving, vocational, and fitness needs change substantially with age.

CLINICAL PEARLS

- DCD does not outgrow itself; roughly two-thirds still have impairment as adults.
- Teach the task the child wants to do; process-based therapy does not generalize.
- ADHD and DCD overlap in half of cases; screen for each when you find the other.

References

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NOTE

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