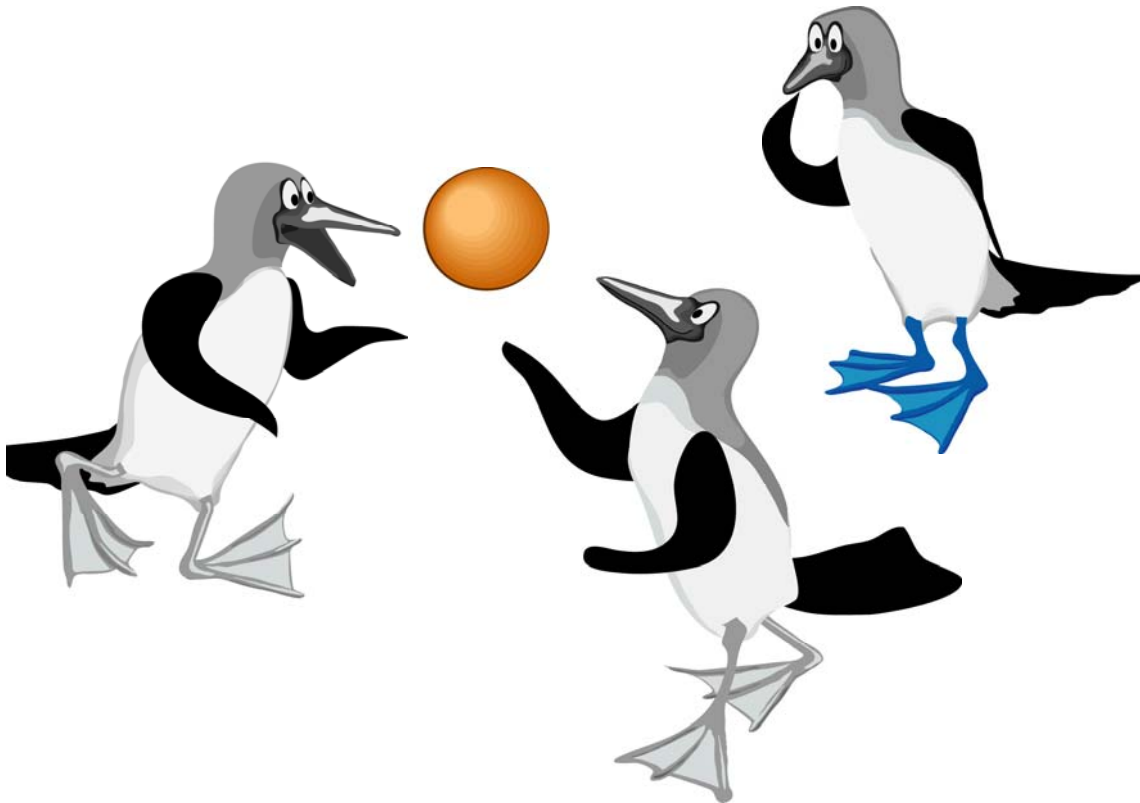


# Children with Developmental Coordination Disorder:

At home, at school, and in the community



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## Introduction

This booklet is designed to help parents and educators identify and manage school-aged children who are demonstrating movement problems typical of children with Developmental Coordination Disorder (DCD). Based on research evidence, the purpose of this booklet is to describe common characteristics of children with motor coordination difficulties, to provide guidance for seeking a referral to a physician, to describe the role of occupational therapists and physiotherapists who may work with these children, and to suggest modifications that may improve the ability of children to function at home, at school, and in the community.

Some children only experience coordination difficulties while others have associated learning, speech/language, and attention problems. Management of children with DCD varies greatly due to these differences. As a result, particular techniques and strategies may be more appropriate for one child than another. This booklet describes some of the more common techniques and practical suggestions that may be used. An occupational therapist and/or a physiotherapist may wish to highlight or add specific techniques to personalize it for a particular child/student.

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## What is Developmental Coordination Disorder?



Developmental Coordination Disorder (DCD) occurs when a delay in the development of motor skills, or difficulty coordinating movements, results in a child being unable to perform everyday tasks. A diagnosis can be made by a medical doctor who will ensure: 1) that the movement problems are not due to any other known physical, neurological, or behavioural disorders; and, 2) whether more than one disorder may be present. The characteristics of children with DCD, however, are usually noticed first by those closest to the child because the motor difficulties interfere with academic achievement and/or with activities of daily living (e.g., dressing, playground skills, handwriting, gym activities).

DCD is believed to affect 5-6% of school-aged children and tends to occur more frequently in boys. DCD can exist on its own or it may be present in a child who also has learning disabilities, speech/language difficulties, and/or attention deficit disorder. In this booklet, the coordination difficulties that are discussed are those that are most often seen in children with developmental coordination disorder.

## How Do Coordination Difficulties Occur?

There is no simple answer to this question since coordination difficulties can arise for many reasons. Although we do not know for sure what causes motor coordination problems, research suggests that children can experience difficulties in learning how to plan, organize, perform, and/or modify their movements. One thing we know for certain is that children with DCD have difficulty learning new motor skills. They tend to use their vision more than other types of feedback to guide their movements and, because of this, their motor skills may be more like those of younger children. Children with DCD perform inconsistently from one occasion to the next, and they often perform motor skills in the same way over and over again, even when they are unsuccessful. Typically, children with DCD depend on feedback and are not able to predict the outcome of their movements. As a result, they don't easily recognize movement errors, learn from their mistakes, or correct their movements.

The characteristics described above have led researchers to believe that the coordination difficulties of children with DCD may lie not only in learning how to move their bodies but also in learning how to use strategies to problem-solve solutions to motor tasks. Because motor skills do not become automatic for these children, they must devote extra effort and attention to complete motor tasks, even those that have been previously learned. Children with DCD often don't recognize the similarities of particular motor tasks, and this leads to difficulties transferring their motor learning from one activity to another (e.g., catching a large ball and then catching a small ball). They also have difficulty generalizing their motor learning from one situation to another (e.g., a child approaching a sidewalk curb has to figure out that stepping up onto the sidewalk is similar to climbing stairs). Having to respond to a changing environment (e.g., when catching or hitting a moving ball, or when avoiding others during team play) poses an additional challenge for children with DCD because they find it hard to monitor incoming information from the environment and to make their bodies respond in a timely way. The result of any of these problems is the same: children with DCD appear clumsy and awkward, and will have difficulty learning and performing new motor tasks.

### Characteristic Features of Children with DCD

When describing children with DCD, it is important to recognize that they are a very mixed group. Some children may experience difficulties in a variety of areas, while others may have problems only with specific activities. The following is a list of some of the more common characteristics that may be observed in a child with DCD.

#### Physical Characteristics

1. The child may be clumsy or awkward in his/her movements. He/she may bump into, spill, or knock things over.
2. The child may experience difficulty with gross motor skills (whole body), fine motor skills (using hands), or both.



The Blue-footed Booby-Bird of the Galapagos Islands has personality and talent – it can fly incredibly high into the air and dive into the ocean; it can even do a very funny dance. Despite these strengths, this unique bird has a lot of trouble landing and often goes for a tumble. We selected this bird as a mascot for our DCD educational materials so they will be easy to identify and will be attractive to share with children.

3. The child may be delayed in developing certain motor skills such as riding a tricycle/bicycle, catching a ball, jumping rope, doing up buttons, and tying shoelaces.
4. The child may show a discrepancy between his/her motor abilities and his/her abilities in other areas. For example, intellectual and language skills may be quite strong while motor skills are delayed.
5. The child may have difficulty learning new motor skills. Once learned, certain motor skills may be performed quite well while others may continue to be performed poorly.
6. The child may have more difficulty with activities that require constant changes in his/her body position or when he/she must adapt to changes in the environment (e.g., baseball, tennis).
7. The child may have difficulty with activities that require the coordinated use of both sides of the body (e.g., cutting with scissors, stride jumps, swinging a bat, or handling a hockey stick).
8. The child may exhibit poor postural control and poor balance particularly in activities that require balance (e.g. stair climbing, standing while dressing).
9. The child may have difficulty with printing or handwriting. This skill involves continually interpreting feedback about the movements of the hand while planning new movements, and is a very difficult task for most children with DCD.

## **Emotional/Behavioural Characteristics**

1. The child may show a lack of interest in, or avoid, particular activities, especially those that require a physical response. For a child with DCD, performing motor skills requires significant effort. Fatigue and repeated failure may cause the child to avoid participating in motor tasks.
2. The child may demonstrate a low frustration tolerance, decreased self-esteem, and a lack of motivation due to difficulties coping with activities that are required in all aspects of his/her life.
3. The child may avoid socializing with peers, particularly on the playground. Some children will seek out younger children to play with while others will play on their own or follow the educator or playground supervisor. This may be due to decreased self-confidence or avoidance of physical activities.
4. The child may seem dissatisfied with his/her performance (e.g., erases written work, complains of performance in motor activities, shows frustration with work product).
5. The child may be resistant to changes in his/her routine or in his/her environment. If the child has to expend a lot of effort to plan a task, then even a small change in how it is to be performed may present a significant problem for the child.

## Other Common Characteristics

1. The child may have difficulty balancing the need for speed with the need for accuracy. For example, handwriting may be very neat but extremely slow.
2. The child may have difficulty with academic subjects such as mathematics, spelling, or written language which require handwriting to be accurate and organized on the page.
3. The child may have difficulty with activities of daily living (e.g., dressing, using a knife and fork, brushing teeth, doing up zippers, organizing a backpack).
4. The child may have difficulty completing work within an expected time frame. Since tasks require much more effort, children may be more willing to be distracted and may become frustrated with a task that should be straightforward.
5. The child may have general difficulties organizing his/her desk, locker, homework, or even the space on a page.

If a child exhibits any number of the above characteristics and if these problems are interfering with the child's ability to participate successfully at home, at school, or in the community, then it is important to have the child seen by a family doctor or pediatrician. The medical practitioner may then refer the child to a health service provider at a local children's hospital or treatment centre or to another community agency.

It is not uncommon for parents or educators to be told that a child will "grow out" of their difficulties. However, studies have now shown quite conclusively that most children do not outgrow these problems. While children do learn to perform certain motor tasks well, they will continue to have difficulty with new, age-appropriate tasks. It is important to recognize these motor difficulties because children with DCD are more likely to develop academic and behavioural problems, demonstrate low self-esteem, depression, and anxiety, and they are at greater risk of becoming overweight.

## The Role of Therapists

Occupational therapists (OTs) and physiotherapists (PTs) are educated and trained in analyzing motor skill development and also in determining the ability of a child to cope with the demands and activities of everyday life. Both are uniquely suited for making recommendations for the management of a child with movement problems. In today's health care environment, OTs and PTs often function in the role of consultant; this is particularly true of therapists working within school settings. In a consultant role, the therapist will observe the child performing tasks that are difficult for him/her and make recommendations to his/her parents and educators. These recommendations may include: strategies or accommodations to assist with tasks at home, at school, or in the community; modifications to the child's environment; ways to promote physical activity and increase participation; guidelines on choosing community leisure and sports activities that are matched to the child's interests and abilities; and assistance with setting appropriate expectations to ensure success.

OTs and PTs can help parents, educators and the child to develop a better understanding of the coordination difficulties that the child is experiencing. It is important that parents and educators identify and learn to manage these problems early in order to prevent secondary complications. The child may need to be taught strategies to compensate for his/her motor problems and must be given adequate opportunities to practice those motor skills that need to be learned.

It is important to educate children with DCD so they become aware of their strengths, as well as their limitations, and so that they gain an understanding of ways in which they may compensate for any difficulties. Children will then be more likely to experience success and may be more willing to attempt activities that they find difficult.

If a child is experiencing a great deal of difficulty or is demonstrating secondary emotional and behavioral problems, the OT or PT may decide to work with the child individually on a short-term basis. The therapist may do some direct skill teaching of motor tasks that the child needs or wants to learn. S/he may also use a cognitive approach that teaches the child problem-solving strategies that will help the child learn new motor tasks (this type of approach requires a therapist to have extra training). In either case, the reasons and plan for treatment will be discussed with the parent and child. Although in most cases the coordination difficulties do not disappear, children can show considerable improvement in their ability to perform specific tasks and can be helped to participate successfully at home, at school, and in the community.

## **The Role of Educators and Parents**

There are many small modifications that can make life easier for a child with DCD. Here are a few ideas that may be useful; an OT or PT may have additional suggestions.

### **At Home**

1. Encourage the child to participate in games and sports that are interesting to him/her and which provide practice in, and exposure to, motor activities. Physical activity and enjoyment should be emphasized rather than proficiency or competition.
2. Try to introduce the child to new sports activities or a new playground on an individual basis, before he/she is required to manage the activity in a group. Try to review any rules and routines that are associated with the activity (e.g., baseball rules, soccer plays) at a time when the child is not concentrating on the motor aspects. Ask the child simple questions to ensure comprehension (e.g., "What do you do when you hit the ball?"). Private lessons may be helpful at certain points in time to teach the child specific skills.
3. The child may exhibit a preference for, and perform better at, individual sports (e.g., swimming, running, bicycling, skiing) rather than team sports. If this is the case, then try to encourage the child to interact with peers through other activities that are likely to be successful (e.g., cubs, music, drama, or art).

4. Encourage the child to wear clothing to school that is easy to get on and off. For example, sweat pants, sweat shirts, t-shirts, leggings, sweaters, and Velcro shoes. When possible, use Velcro closures instead of buttons, snaps or shoelaces. Teach the child how to manage difficult fasteners when you have more time and patience (e.g., on the weekend, or over the summer) rather than when you are pressured to get out the door.

5. Encourage the child to participate in practical activities that will help improve his/her ability to plan and organize motor tasks. For example, setting the table, making lunch, or organizing a knapsack. Ask questions that help the child focus on the sequence of steps (e.g., “What do you need to do first?”). Recognize that, if your child is becoming frustrated, it may be time to help or to give specific guidance and direction.

6. Recognize and reinforce the child’s strengths. Many children with DCD demonstrate strong abilities in other areas – they may have advanced reading skills, a creative imagination, sensitivity to the needs of others, and/or strong oral communication skills.

## At School

Educators and parents can work together to ensure that the child with DCD experiences success at school. Parents may find it helpful to meet with the educator near the beginning of the school year to discuss their child’s specific difficulties and to make suggestions about strategies that have worked well. An Individualized Education Plan (IEP) may be needed for some children; however, the following accommodations may be sufficient for others.



### In the Classroom:

1. Ensure that the child is positioned properly for deskwork. Make sure that the child's feet are flat on the floor, and that the desk is at an appropriate height with the shoulders relaxed and the forearms comfortably supported on the desk.

2. Set realistic short-term goals. This will ensure that both the child and educator continue to be motivated.

3. Provide the child with extra time to complete fine motor activities such as math, printing, writing a story, practical science tasks, and artwork. If speed is necessary, be willing to accept a less accurate product.

4. When copying is not the emphasis, provide the child with prepared worksheets that will allow him/her to focus on the task. For example, provide children with prepared math sheets, pages with questions already printed, or 'fill in the blank' for reading comprehension questions. For study purposes, photocopy notes written by another child.

5. Introduce computers as early as possible to reduce the amount of handwriting that will be required in higher grades. Although keyboarding may be difficult initially, it is a very beneficial skill and is a skill at which children with movement problems can become quite proficient.

6. Teach children specific handwriting strategies that encourage them to print or write letters in a consistent manner. Use thin magic markers or pencil grips if they seem to help the child improve pencil grasp or to reduce pencil pressure on the page.

7. Use paper that matches the child's handwriting difficulties. For example:

- widely spaced lines for a child who writes with very large lettering;
- raised, lined paper for a child who has trouble writing within the lines;
- graph paper for a child whose writing is too large or improperly spaced;
- graph paper with large squares for a child who has trouble keeping numbers aligned in mathematics.

8. Focus on the purpose of the lesson. If a creative story is the goal, then accept messy handwriting, uneven spacing and multiple erasures. If the goal is to have the child learn to set up a math problem correctly, then allow time to do it even if the math problem does not get solved.

9. Consider using a variety of presentation methods when asking the child to demonstrate comprehension of a subject. For example, encourage children to present a report orally, use drawings to illustrate their thoughts, type a story or report on the computer, or record a story or exam on a tape recorder.

10. Consider allowing the child to use the computer for draft and final copies of reports, stories and other assignments. If it is important to see the “non-edited” product, ask the child to submit both the draft and final versions.

11. When possible, encourage the child to dictate stories, book reports, or answers to comprehension questions to the educator, a volunteer, or another child. For older children, voice recognition software can be introduced as soon as the child’s voice patterns have matured enough that they are consistent.

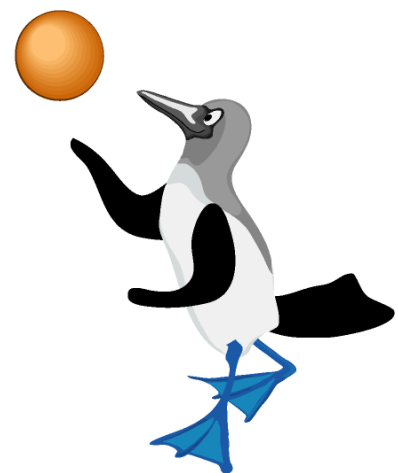
12. Provide additional time, and/or computer access, for tests and exams that require a lot of written output.

### **In Physical Education:**

1. Break down the physical activity into smaller parts while keeping each part meaningful and achievable.

2. Choose activities that will ensure success for the child at least 50% of the time and reward effort, not skill.

3. Incorporate activities that require a coordinated response from arms and/or legs (e.g., skipping, bouncing and catching a large ball). Encourage children to develop skills using their hands in a dominant/assistant fashion (e.g., using a baseball bat or a hockey stick).





4. Keep the environment as predictable as possible when teaching a new skill (e.g., place a ball on a T-ball stand). Introduce changes gradually after each part of the skill has been mastered.
5. Make participation, not competition, the major goals. With fitness and skill-building activities, encourage children to compete with themselves, not others.
6. Allow the child to take on a leadership role in physical education activities (e.g., captain of the team, umpire) to encourage them to develop organizational or managerial skills.
7. Modify equipment to decrease the risk of injury to children who are learning a new skill. For example, Nerf balls in graduated sizes can be used to develop catching and throwing skills.
8. When possible, provide hand-over-hand guidance to help the child get the feel of the movement - for example, by asking the child to help the educator demonstrate a new skill to the class. Also, talk out loud when teaching a new skill, describing each step clearly.
9. Focus on understanding the purpose and the rules of various sports or physical activities. When a child understands clearly what he/she needs to do, it is easier to plan the movement.
10. Give positive, encouraging feedback. If providing instruction, describe the movement changes specifically (e.g., “you need to lift your arms higher”).

## In the Community

1. Encourage exposure to physical activities for fun and participation, with an emphasis on health and fitness.
2. Consider lifestyle sports such as swimming, skating, cycling, and skiing to maintain or improve strength and overall endurance.
3. Keep in mind the potential need for extra support or individual lessons with sporting activities, especially as higher skill levels must be reached.
4. Ensure safety through the use of protective gear (wrist guards, helmets) with physical activities.
5. Help coaches, sports instructors, and community leaders understand the child’s strengths and challenges so they can support and encourage them to be successful.
6. Encourage children to engage in activities that are non-motor based such as music, drama, clubs to promote social experiences and the benefits of social participation.

## Summary

Developmental Coordination Disorder is a motor skill disorder that interferes with children's ability to perform many tasks that are required every day. Children with DCD are a mixed group. Any given child may present with a variety of different problems.

Educators and parents who are with a child every day may be the first to notice the difficulties that the child is experiencing. It is important for the child to be seen by a physician at an early age to rule out other medical reasons for their motor difficulties. Children with DCD who are not recognized may experience failure and frustration, are often perceived to be lazy or unmotivated, and may develop additional physical, social, and behavioural problems.

Intervention for children with DCD may include referral to an occupational therapist or physiotherapist. An OT and/or PT will help the child learn to perform daily tasks more successfully and will make recommendations to parents and educators regarding the participation of children with DCD at home, in the classroom, on the playground, and in leisure activities in the community.

Contrary to the widely accepted belief that children with DCD will outgrow their problems, studies have demonstrated that children may acquire certain skills with extra practice but new motor skills will still be a problem. Children with DCD require early intervention to help them learn strategies to compensate for their coordination difficulties, to feel better about themselves as individuals, and to prevent other secondary issues from developing.

## Resources

Many resources about children and youth with DCD can be found on the *CanChild* website at: [www.canchild.ca](http://www.canchild.ca) (click on “Developmental Coordination Disorder”). These include:

- Information for Physicians and other Health Professionals
- Flyers and Resources for Educators
- Typing/Keyboarding and School-Related Recommendations
- Encouraging Physical Activity
- List of Books/Other Resources

*If you have found this booklet to be helpful, please let us know:*



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