Learning to Cycle
Applying Evidence-Based Principles

Goal Setting:

The child has identified learning to ride a bicycle as his goal. You will want to help the child specify where he will ride his bicycle (e.g., participating in a school activity, going out with peers, cycling with his family)

Evaluation:

Despite the fact that children with DCD share some common features, they also differ. You must perform an evaluation to identify how the child rides his bicycle, but here are some common features you might observe:

- The child doesn't know how to get on the bicycle (e.g., he has a hard time lifting his leg over the sidebar and an adult needs to hold the bike)
- The child holds the handlebars very tightly (he co-contracts the muscles in his hands and arms and has stiff arms movements)
- The child looks at his hands or the ground (instead of looking in the direction he is going)
- The child has a "floppy" posture (the trunk is flexed/unstable)
- The child is afraid to lift his feet from the ground and lacks the coordination to start pushing on the pedals
- The child doesn't know how to "turn" the pedals in the forward direction
- The child has a hard time with the "pushing-pulling" movements or alternating his legs (he co-contracts the muscles in his legs and has stiff legs movements)
- The child gives up very quickly

Analysis:

Factors helping:

- Children with DCD have good vision, which is important for cycling
- Children with DCD have good verbal memory and cognitive functions, which will help them to learn the different components of cycling
- Cycling is an activity with repetitive movements; once children with DCD learn how to cycle, they often perform the activity well.

Factors hindering:

- Cycling requires the coordination of many body parts; bilateral coordination of arms and legs, alternating leg movements (pushing-pulling) the coordination of arms with legs and arms combined with trunk coordination.

Intervention plan:

- Involve the child in creating his own intervention plan (self-discovery): Examples of strategies you can use include:
  - Videotaping the child while mounting his bike and attempting to cycle
  - Asking the child to watch you or others cycling (or watch videos)
  - Describing the actions of the different body parts
  - Mimicking/imitating different movements required for cycling
  - Trying to perform the required movements in different ways
  - The overall goal is to have the child identify (with your verbal guidance) some of the elements listed above in the evaluation and analysis sections

- Breaking down the activity into its sub-tasks (based on dynamic movement analysis). Examples of sub-tasks can include:
  - Holding the child's bicycle and asking him to mount on his bike (focusing on the leg movement and trunk posture)
  - Asking the child to mount his bike independently (adding to the above the arm control)
  - Asking the child to push his bike while walking (focusing on arm control and direction)
  - Sitting on the bike without pedals and using his feet on the ground to propel it forward
  - Asking the child to sit on his bike while someone pushes him (adding to the above a focus on trunk control)
  - Practicing the hand movements required to brake when stopped (and eventually adding to the above)
  - Using a SMALL DESCENDING SLOPE to practice trunk control, independent control of steering and braking (with someone holding the bicycle and/or following closely behind the bicycle)
  - Practicing leg movements on the bicycle while someone else controls the direction
  - Practicing cycling independently in a safe, quiet environment free from obstacles
  - Practicing cycling in different environments, contexts and situations - and Encouraging fitness and participation!

- For each of the above, remember to
  - Ask questions to engage the child's problem-solving skills
  - Provide instructions about what the child is expected to do and how to perform the movement
  - Use feedback during or after the activity (e.g., verbal and visual, such as reviewing videos)

- Use modality-specific strategies (e.g., visual cues: encouraging the child to look ahead at an object at the end of the cycling path)
- Encourage the child to use mental and self-verbalization strategies to evaluate the performance (e.g. What have you done differently this time? What is working? What do we need to change?)

Other tips:

- Use proper seat height (for ease of pedalling). You can start with the seat at a lower position (easier to put the feet on the floor) but gradually want to raise it to a position where the knee is slightly flexed when the pedal is down
- Use helmets (for safety!)
- Try taking off the pedals to start. When you add the pedals, to ease the initiation of pedalling, you might need to place one pedal upfront (with an angle of about 45 degrees with a vertical line)
- If the break are "retro brakes" and the child is having a hard time switching from pedalling forward to pedalling backward, you might want to use hand brakes. The sequence suggested above is just one way to approach the task; the best sequence may vary from one child to the other
- When the child needs support, it is often better to be behind the child and hold the bike seat (without touching the child)
- Encourage practice - it is unlikely you will go through all the steps in one session. Provide the child with opportunities to practice each of these steps, and eventually combine them until reaching his goal to cycle
- Involve the parents and allow them to try the teaching techniques with you there so they can clarify and ask questions as needed

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