

Balance & Coordination

What is balance and coordination?

Balance is the ability to maintain a controlled body position during task performance, whether it is sitting at a table, walking the balance beam or stepping up onto a kerb. To function effectively across environments and tasks, we need the ability to maintain controlled positions during both static (still) and dynamic (moving) activities.

Static balance is the ability to hold a stationary position with control (e.g. “Freeze” or “statue” games). Dynamic balance is the ability to remain balanced while engaged in movement (e.g. running or bike riding).

Why are balance and coordination important?

Age appropriate balance and coordination allows the child to be involved in the sports participation with a reasonable degree of success as it aids fluid body movement for physical skill performance (e.g. walking a balance beam or playing football). The involvement in sport is helpful in maintaining self regulation for daily tasks as well as developing a social network and achieving a sense of belonging in a community or social setting. It also helps children develop and maintain appropriate controlled body movement during task performance which, when effective, limits the energy required thus minimising fatigue.

With good balance and coordination there is less likelihood of injury as the child is likely to have appropriate postural responses when needed (e.g. putting hands out to protect themselves when they fall off their bike). The physical attributes of balance and coordination also allow appropriate posture for table top tasks and subsequent success at fine motor tasks.

What are the building blocks necessary to develop balance and coordination?

- **Attention and concentration:** The ability to maintain attention to a specific task for an extended period of time as the core strength is not challenged.
- **Body Awareness:** Knowing body parts and understanding the body's movement in space in relation to other limbs and objects for negotiating the environment or ball and bike skills.
- **Bilateral integration:** Using two hands together with one hand leading: e.g. holding a tennis racquet with the non-dominant hand with the 'helping' non-dominant hand holding and stabilising only between hits.
- **Crossing Mid-line:** The ability to cross the imaginary line running from the child's nose to pelvis that divides the body into left and right sides, which also influences hand dominance.
- **Hand eye coordination:** The ability to process information received from the eyes to control, guide and direct the hands in the performance of a given task such as handwriting or catching a ball.
- **Hand Dominance:** The consistent use of one (usually the same) hand for task performance which is necessary to allow refined skills to develop.
- **Muscular strength:** A muscles ability to exert force against resistance (e.g when climbing a tree to push or pull up).
- **Muscular endurance:** The ability of a singular muscle or group of muscles to exert force repeatedly against resistance to allow sustained physical task engagement.
- **Self regulation:** The ability to obtain, maintain and change alertness level appropriate for a task or situation which then allows better attention to the task.
- **Postural Control:** The ability to stabilize the trunk and neck to enable coordination of the limbs for controlled task performance.

- **Body Awareness (Proprioception):** The information that the brain receives from the muscles and joints to make us aware of body position and body movement which in turn allows skills to become 'automatic'.
- **Sensory processing:** The accurate processing of sensory stimulation in the environment as well as in our own body for quick and physically appropriate responses to movement.
- **Isolated movement:** The ability to move an arm or leg while keeping the remainder of the body still needed for refined movement (e.g. throwing a ball one handed or swimming freestyle).

How can I tell if my child has problems with balance and coordination?

If a child has difficulties with balance and coordination they might:

- Fall easily, trip often or can't 'recover' quickly from being off balance.
- Move stiffly and lack fluid body movement (e.g. run like a 'robot').
- Avoid physical activity (e.g. playground use, sports participation).
- Be late to reach developmental milestones (e.g. crawling and walking).
- Be slower than their peers to master physical skills (e.g. bike riding, swimming or tree climbing).
- Be less skillful than their peers in refined sports participation (e.g. team sports).
- Push harder, move faster or invade the personal space of others more than they intend to.
- Be fearful of new physical games (e.g. swings) or scared of heights that do not faze their peers.

- Have difficulty getting dressed standing up (e.g. they need to sit down to get put pants as as they lose their balance standing on one leg).
- Have trouble navigating some environments (e.g. steps, kerbs, uneven ground).
- Tire more quickly than their peers or need to take regular short rest periods during physical activity.

What other problems can occur when a child has balance and coordination difficulties?

When a child has balance and coordination difficulties, you may also see difficulties with:

- **Motor (muscle) planning** of how to perform a physical task (e.g. they may start at step three not one).
- **'Floppy' or 'rigid' muscle tone:** Floppy muscles make the limbs looks limp or alternatively overly 'tight' muscles make the limbs look rigid.
- **Spatial awareness** of how they are using or placing their body (e.g. so that they unintentionally invade other peoples personal space without knowing it).
- **Low Endurance** for physical (fine and gross motor) tasks.
- **Pre-writing skill development:** sloppy or excessively heavy pencil strokes that comprise most letters, numbers and early drawing.
- **Pencil grasp:** The efficiency of, and the manner in which, the pencil is held in drawing and writing is often compromised (too loose or extremely tight and heavy in pressure).

- **Pencil control:** The accuracy with which the child moves the pencil for drawing and writing.
- **Left right discrimination:** Conceptualising directional difference so the child 'knows' the difference between left and right side of the body.
- **Hand dominance:** The consistent use of one (usually the same) hand for task performance which is necessary to allow refined skills to develop.
- **Articulation:** Clarify of speech sounds and spoken language.
- **Self care:** Dressing independently, holding and using cutlery, tooth brush as but some examples.
- **Sensory processing:** Accurate registration, interpretation and response to sensory stimulation in the environment and their own body.

What can be done to help improve balance and coordination skills?

- **Improve attention to task** and alertness levels to support a rapid response when they lose their balance.
- **Explicit teaching of mechanics:** Correct alignment of the body in order to maintain balance (e.g. aiming at and facing the body towards the target when throwing).
- **Strengthen the 'core'** namely the central muscles of the body to provide greater body (especially trunk) stability.
- **Simplify tasks to concentrate** on only one movement at a time, until the child is ready to integrate several at once.
- **Improve muscle strength** to allow for better muscle control for speed and direction of movement.
- **Improve muscular endurance** to increase the length of time with which the child can maintain balance and coordination.

- **Improve sensory processing** to ensure the body is receiving and interpreting the correct messages from the muscles in terms of their position, their relationship to each other, the speed at which they move and how much force they are using.
- **Social motivators:** If a child has a friend or family member involved in a sport, they may be more persistent in participating and practicing those specific skills.

What activities can help improve balance and coordination?

- **Unstable surfaces:** Walking over unstable surfaces (e.g. pillows, bean bags or blankets on the floor) that make the trunk work hard to maintain an upright position.
- **Unstable swings and moving games** including suspended climbing ladders and jungle gyms. When swings move in unexpected ways it forces the trunk muscles to work harder.
- **Wheelbarrow walking** (the child 'walking' on their hands while an adult holds their legs off the floor).
- **Swimming:** Involves the body having to work against resistance of the water, thus providing better awareness of where the body is in space.
- **Kneeling** (with no hands touching the floor) to tap a balloon back to another person.
- **Hopscotch:** Requires the child to switch movement patterns frequently and rapidly.
- **Stepping stone games** with big jumps (i.e. no steps between the 'stones') challenge a child's balance.
- **Bike and scooter:** Both activities require the child to continually make postural adjustments to maintain balance.

Why should I seek therapy if I notice difficulties with balance and coordination in my child?

Therapeutic intervention to help the child with balance and coordination difficulties is important to:

- **Increase the child's confidence** in gross motor activities (e.g. playing on the playground, running, jumping).
- **Enhance their self-esteem** (so they aren't ostracized or picked last in sport team due to their physical challenges).
- **Increase sporting ability** and confidence to engage in sports. Participating in sport enables the child to enrich their lives with positive people interaction and develop strong friendships through fitness opportunities.
- **Having appropriate balance** and coordination will enable my child to participate in sport and we know that active children are more likely to be active adults, resulting in a healthier and longer lasting lives.
- **Physical Education (P.E.)** is a part of the school curriculum which includes athletics and swimming carnivals and often participation is compulsory. Without appropriate balance and coordination the child will find it difficult to comply with school regulations to participate.
- **Having the balance and coordination** to successfully carry out gross motor skills reduces the likelihood of injury and thus increases the longevity of the child's ability to be involved in sporting pursuits.

If left untreated what can difficulties with balance and coordination lead to?

When children having difficulties with balance and coordination they might also have difficulties with:

- **Social isolation** as they might struggle to participate in social activities such as pool parties, birthday parties at a physical activity location (e.g. Bounce, Latitude, Ice skating, ten pin bowling) and other physical play with friends.
- **Poor self esteem** when they realise their skills do not match their peers.
- **Bullying** when others become more aware of the child's difficulties.
- **Poor fine motor skills** (e.g. writing, drawing and cutting) due to poor core stability meaning they do not have a strong base to support the controlled and efficient use of their arms and hands.
- **Inability to ride a bike or scooter**, which will limit the options for play with peers as many like to ride their bikes as a means of catching up with friends.

What type of therapy is recommended for balance and coordination difficulties?

If my child has difficulties with balance and coordination, it is recommended they consult an Occupational Therapist. It may also be appropriate to consult a Physiotherapist for these gross motor skills. It is important to acknowledge however that in many (but not all) paediatric cases, there is a large overlap in the skills addressed by Physiotherapy and Occupational Therapy.