

## Strength and Endurance

### What is strength and endurance?



In practical terms, muscle strength is *how strong* the child is and muscular endurance is *how long* the child's muscles can work.

In more specific terms:

**Muscular strength** is the ability to exert force against resistance. Exerting force may or may not mean there is movement of the joints or body. It might be that you carry an object in front of you and you contract your biceps, but there is no movement as your arms are neither raising nor lowering. This is called an isometric contraction. When the muscles contract and there is movement at a joint, such as a bicep curl, this is called an isotonic contraction.

**Muscular endurance** is the ability of a muscle or group of muscles to exert force repeatedly. Muscular endurance is similar to muscular strength in that strength is required to initiate movements, but it is the muscles endurance capacity that

enables it to continue for multiple efforts.

## **Why are strength and endurance important?**

Strength and endurance are important to enable children to perform every day functions such as fine motor skills (e.g. holding a pencil appropriately, cleaning teeth), gross motor skills (e.g. carrying heavy school bags, walking, running, skipping, playground skills such as climbing, and sporting skills such as catching, throwing and hitting a ball with a bat). Muscular endurance helps maintain proper posture all day long.

Improving strength and endurance contributes to a higher metabolism, which increases caloric use both while at work and rest, which in turn reduces the risk of obesity. Another important benefit to note is that when a child has good strength, they are more likely to have stronger tendons, ligaments and general joint health which reduces the risk of serious injury.

## **What are the building blocks necessary to develop strength and endurance?**

- **Body Awareness (proprioception):** Knowing body parts and understanding the body's movement in space in relation to other limbs and objects for 'automatic' movement to develop.
- **Coordination:** The ability to integrate multiple movements into efficient task performance such as ball games.
- **Sensory processing:** The accurate registration, interpretation and response to sensory stimulation in the environment and one's own body.
- **Muscle tone:** Residual muscle tension which helps determine the muscles 'readiness to work'.
- **Postural Control:** The ability to stabilize the trunk and neck to enable the efficient coordination of limbs for task performance (e.g. bike riding).
- **Crossing Mid-line:** The ability to cross the imaginary line running from a child's nose to pelvis that divides the body into left and right sides which help make movement in all directions easier.

## How can I tell if my child has problems with strength and endurance?

A child with problems with strength and endurance might:

- Be late in reaching developmental milestones (i.e. sit, crawl, walk, run and hop).
- Move stiffly and lack fluid body movement or alternatively looks awkward and appear clumsy.
- Avoid physical activity.
- Participate in physical activity for only short periods (as they has low endurance)
- Be unable to perform the same skills as their peers (e.g. catch, kick, hop and jump).
- Have difficulty performing movements safely (e.g. climbing).
- Need to exert more energy and effort than their peers to complete a physical task.
- Tire frequently upon physical activity.
- Frequently complain of sore limbs or joints.
- Struggle to get up and down from the ground.
- Have difficulty maintaining posture while sitting on the floor or at a table.

## When other difficulties might occur when a child has difficulties with strength and endurance?

When a child has difficulties with strength and endurance, they might also have difficulty with:

- **Writing and drawing** for long periods of time.
- **Self care:** involving the everyday tasks undertaken to be ready to participate in life activities (including dressing, eating, cleaning teeth etc).
- **Fine motor manipulation tasks** such as holding and moving pencils and scissors with control, construction tasks, tying shoelaces.
- **Postural control:** The ability to stabilize the trunk and neck to enable

efficient coordination of the limbs for self care or physical tasks.

- **Low alertness level:** The child's ability to maintain alertness allows them to tune into important information process new information for learning at all times.
- **Sensory processing:** The accurate registration, interpretation and response to sensory stimulation in the environment and their own body.
- **Chewing and swallowing** food repeatedly.
- **Dribbling** excessively.
- **Poor Articulation:** Clarity of speech sounds and spoken language.
- **Balance:** The ability to maintain position whether that is static, dynamic (moving) or rotational.
- **Coordination:** The ability to integrate multiple movements into efficient movement.
- **Hand dominance:** The consistent use of one (usually the same) hand for task performance which allows refined skills to develop.
- **Pencil grasp:** The efficiency of the how the pencil is held and moved to allow age appropriate pencil movement fro drawing or writing.
- **Pre-writing Skills:** Pencil strokes that comprise most letters, numbers and early drawings.

## What can be done to improve strength and endurance?

- **Build core strength:** Strengthen the 'core' (namely the large central muscles) of the body to provide greater body (especially trunk) stability.
- **Improve functional muscle strength** through out the body where muscles are "floppy".
- **Simplify physical skills** into one or two step components to teach the skill and then gradually add in additional components until the skill is able to be done in its entirety (e.g. skipping - start with a step, then add a hop).
- **Gradually increase duration** and intensity of activity to increase endurance.
- **Make sport fun:** Choose activities that the whole family can be involved in or where children are with their friends and they don't realise they are physically working hard (e.g. bike riding, hiking, ice skating).
- **Workout routines:** Have a set time where parents and children engage

in activities such as yoga or other body weight based exercises. Once in a routine it is easier to maintain.

- **Rewards:** Use a reward chart for each workout or exercise event completed.

## **What activities can help improve strength and endurance?**

- **Hop Scotch** for hopping, or other games that encourage direct task/skill practice.
- **Simon Says** for body awareness and movement planning (praxis).
- **Wheelbarrow walking** races (where the child 'walks' on their hand and adults hold their feet of the ground) to develop upper body strength.
- **Push ups:** These can be graded from doing it against a wall, to on a raised table to on hands and knees and then ultimately to on the ground on toes. This is an activity that engages a large amount of muscles, so the benefits for this one activity are enormous.
- **Unstable surfaces:** Walking/climbing over unstable surfaces (e.g. large pillows) as it requires a lot of effort and increases overall body strength.
- **Obstacle course:** Age appropriate obstacle course completion develops endurance.
- **Playground** climbing and swinging.
- **Swimming** is a whole body activity that helps build strength and endurance as the child is constantly working against resistance in the water.
- **Animal walks:** Pretending to be a variety of animals such as crabs, frogs, bears or worms as all of these use the child's body weight as resistance.
- **Throw bean bags:** The added weight of a bean bag when throwing helps develop strength and endurance.
- **Balloon tennis:** This activity uses the muscles of the shoulder and develops endurance as the child 'hits' the balloon above shoulder height repeatedly back to a partner.

## **Why should I seek therapy if I notice difficulties with**

## **strength and endurance in my child?**

Therapeutic intervention to help develop the child's strength and endurance difficulties is important to:

- Increase sporting ability and confidence to engage in sports. Participating in sport enables a child to enrich their lives with positive people and develop strong friendships.
- Help the child develop the strength and endurance to manage the physical needs of a full school day.
- Assist the child being able to stabilize their body to sit at a table for an extended period of time for social (e.g. family dinners) and table top tasks (e.g. homework).
- Ensure the child is able to hold and move their pencil or other utensils for age appropriate academic and self care tasks.
- Enable activities of daily living to be done with ease, such as opening lunch boxes, making the bed, carrying a school bag or even getting dressed.

## **If left untreated what can difficulties with strength and endurance lead to?**

When children have difficulties with strength and endurance, they might also have difficulties with:

- Managing to 'cope' with the physical demands of a full school day.
- Participating in sporting activities for extended periods of time.
- Poor self esteem when the child realises their skills do not match their peers.
- Bullying when other children become more aware of a child's difficulties.
- Poor fine motor skills (e.g. writing, drawing and cutting) due to poor core stability meaning that the child does not have a strong base to support the controlled use of their arms and hands.
- Walking up a flight of stairs which may be necessary in school, at home or visiting the doctors office.
- Inactive lifestyle, increasing the risks of other health related issues such as obesity, diabetes, cardiovascular disease or similar conditions.

## What type of therapy is recommended for strength and endurance difficulties?

If your child has difficulties with strength and endurance, it is recommended they consult an Occupational Therapist.

Contact us today to make an initial enquiry or book an assessment for your child on 1800 KID SENSE (1800 543 736)

