



High Tone at home

By Stephanie Wheen

What is high tone

Tone is how resistant the limb or body part is to movement.

Increased tone (hypertonia) is when there is too much resistance

Reduced tone (hypotonia) is when there is not enough resistance

Made up of neural and non neural elements.

Neural

- From the brain
- Messages come to the muscles telling them to work too hard or not hard enough
- 2 sides of every joint to make it move – 1 tightens while the other relaxes.
- Increased tone - both are tightening and find it difficult to relax.
- Reduced tone – both are not working hard enough so too wobbly.
- Spasticity – velocity dependent contraction – if they move fast, both contract and don't move.

Non-Neural

What is happening in the muscles and joints

- Shortening of muscles
- Stickiness of muscles and fascia (other soft tissues around the muscles)
- Joints getting stiff (contractures)
- All are part of increased tone.

For reduced tone this is often linked to hypermobility as muscles and joints can get over – stretched.

Tone vs strength

- Tone and strength are 2 different things.
- Strength is how many muscle fibres are in a muscle. The more muscle fibres, the bigger the strength.
- Muscles fibres build when a muscle works hard and causes microdamage – more muscle fibres come in to fill the gaps and the muscle builds.
- Tone is more about how the muscles moves or doesn't move.
- You can have low tone and be incredibly strong (e.g. with Down Syndrome) OR have high tone and be incredibly weak (with spasticity).
- Therefore important to strengthen all muscles – even those with high tone.



What affects our tone?

- Our tone goes up and down throughout the day. E.g. first thing in the morning or when sitting on a sofa versus standing doing a speech
- Things that influence tone
 - Dependent on outside influence:
 - How much support we have – e.g. a supportive chair, supportive handling vs standing balance or sitting unsupported.
 - Temperature – nice and warm vs cold or wind
 - How confident we are in our surroundings - at home versus in a new place
 - Stimulation – loud noises, some touch, what they are seeing
 - Gravity – upright versus lying down
 - Internal factors
 - Mood – if happy and at ease vs excitement, distress, anger
 - Well or ill – illness can increase or decrease tone
 - How difficult the task is – nice and easy vs challenging and new
 - Repetition of their unhelpful movements
 - Speed of movement
 - Pain/ discomfort
 - Arousal level/ lack of sleep
 - Growth – weight and height – non-neural changes
 - Lack of movement, passive or reduced motivation to move
 - Communication

Tone as we get older

- Muscles only grow in length when they are stretched.
- If muscles are being pulled by increased tone so aren't getting a full stretch, they won't grow
- Our bones grow like building blocks – in response to time and weight going through the limbs.
- So if our bones grow and our muscles don't, our joints will get tighter and we lose the ability to fully use our limbs.
- Equally, if children put on weight then they need more muscle strength to move the same body part. They need to grow their strength to keep up with the size of their bodies

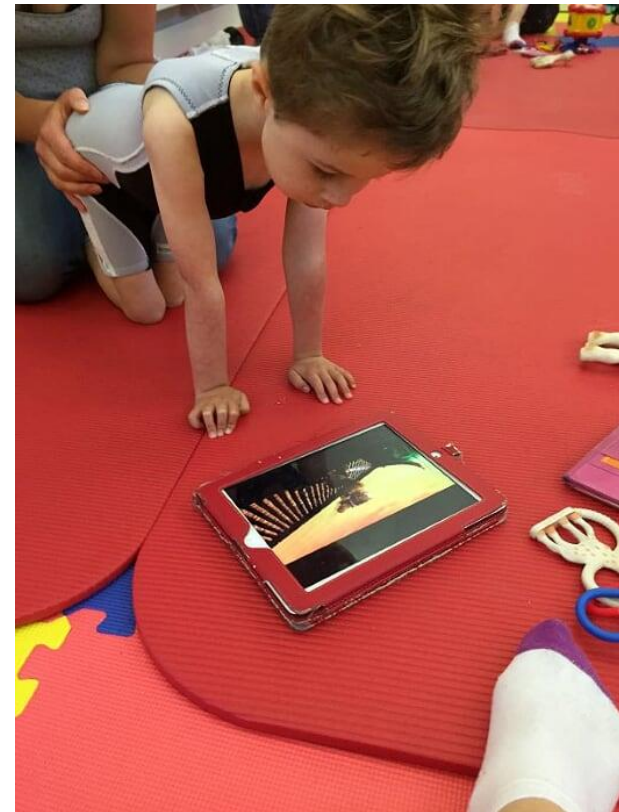
Stretching

- The only way for our children to keep muscles getting longer as bodies grow is stretching. This is working on the non-neural part of tone.
- BEST – their own stretching through every day activities – e.g. reaching out for objects with arms, reaching towards toes in standing or long sitting.
- NEXT – prolonged stretch – this is the only way if your child is getting tight to increase muscle length. Minimum ½ hour. Optimum 1 hour. Can break this into different sections of stretching.
 - E.g. standing frame for knees and hips
 - Long sitting with gaiters in front of TV
 - Lying on tummy over wedge
 - Hand splints and ankle splints/ night splints.
 - Sleeping systems
- Passive stretching – works to increase the muscle length to it's current length – great before an activity to allow them to do the activity the best way possible BUT won't increase muscle length.
 - Use it before going in standing frame, before putting on gaiters, before doing fine motor skills, before putting on splints.
 - Also can feel more comfortable after a stretch so can be a nice way to start the day.



Reducing and improving tone

- 3 best ways to influence tone:
 - Work on the environmental factors as listed above
 - E.g. if your child is trying to work on fine motor skills, make sure they are well supported in their chair, are happy and motivated, the task is not too challenging but still engaging, they have had a stretch, the room temperature is good etc.
 - Weight bearing (WB)
 - Any weight bearing through a limb which is on a stretch is fabulous to reduce tone.
 - E.g. If tight in their elbows and hands, WB on their hands is fab – in hands and knees, over a wedge, in standing leaning down on their hands.
 - If tight in knees, standing frame or standing work is great to reduce tone.



Tone influencing patterns (TIP's)

These are the opposite movements from the tight patterns.
- For the body this is twisting around.

Arm



Leg
even better take leg backwards.



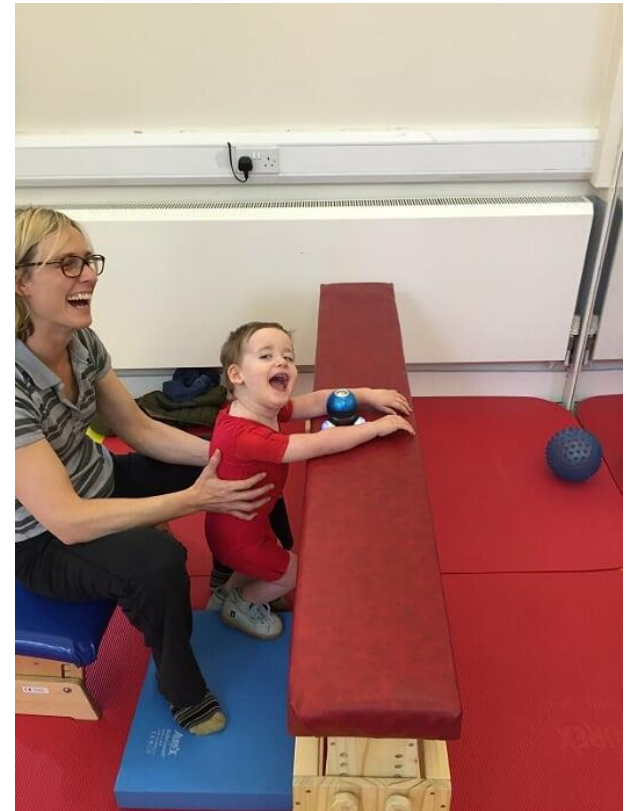
TIP's for home

These are the most extreme positions and so the most effective – however any position towards there is great – e.g. reaching outwards with arms, straightening out legs etc.

- Arms
 - Reaching up for any object – pass them toys, phone, feeding utensils to them in a TIP.
 - Play games which need as much reaching as possible
 - Use pushing games rather than pulling games.
 - Play away from the body rather than towards the body
 - Use grip but use release too – grip tightens whole arm. Stroke top of hand and bend wrist forward to help release fingers.
- Legs
 - Anything with knees straight and away from the body.
 - Kicking balls outways
 - Use a TIP stretch when changing pads/ nappies
 - Turn feet out in standing frame.
 - Stand practice – make feet turn out and 1 behind the other so the back leg gets an extra good TIP.

Other thoughts

- If your child is snapping back their knees, you will need to work on their knees stability with their knee slightly bent
 - Perch standing against furniture
 - Stood against the wall with legs a little forward
 - Stood on a wobble cushion
 - Sit to stand work.
- Great for hemi's
 - Using a scooter
 - Crawling more than walking as we know legs will be ok. It is harder to weight bear through arms as children get older so crawling is brilliant while it lasts.



Thank you for joining us.

- See 'Our Home' for more ideas and exercises.
- <https://www.gympanzees.org/our-home>