



Hypotonia/ Low Tone

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A man with a beard, wearing a red long-sleeved shirt, is leaning over a table. He is smiling and looking down at a young child lying on their back on the table. The child is wearing a grey sweatshirt with the word 'Best' and a GoPro logo, and red pants with white stars. The man's hands are near the child's head and arms. In the background, there are colorful toys, including a large colorful ball and a colorful ring toss game. A large pink diagonal shape is overlaid on the left side of the image, containing the text.

When Physio for Children CEO of Gympanzees

Hypotonia

Whole Body Hypotonia;

Mild Hypotonia

- e.g. Down Syndrome
- Problems with fine motor skills/ quality of movements. Difficulties combining skills

Moderate Hypotonia

- Moving on the floor, roll, possibly crawl. Difficulty moving against upright against gravity

Severe Hypotonia

- Difficulty with any movements. Takes up all of surface.

Early Stage Hypotonia

- Hypotonia caused by damage to the brain (Cerebral Palsy) can be in early months/ years of development and can be followed by;
- Spasticity, athetosis, ataxia or a combination.



Hypotonia in just 1 part of the body

- E.g. just the trunk in Cerebral Palsy caused by prematurity or some of the dystrophies. 3

What is Hypotonia (Low Tone)

- Tone refers to the natural tension or resistance of a muscle when moved passively. (E.g. take someone else's arm and try and move it (they aren't trying to help or work against you) there WILL be some natural resistance there)
- Controlled by the brain – telling your muscle how hard to work
- Hypotonia (low tone) is when a limb moves too easily, showing little tension or resistance.
- Tone results in a 'readiness to move'. If tone is low, the muscle isn't ready so it is harder to complete the action
- Any movement you make...you have to 'get ready' to move and then move so double as much effort with lower tone.
- The child with low tone feels floppy when handled and can feel like they are slipping through your hands when you pick them up.
- If tone is low, muscles have to be stronger to make up for this. So all your movement is done by your muscle's strength, rather than by the natural tension from tone. So it is harder work.

Muscle Strength – the way we can help!



- Muscle strength is not the same as muscle tone.
- Muscle strength is the active contraction of the muscle. More muscle fibres caused by repairing of micro-damaged fibres makes muscles grow bigger and thus stronger. It is possible to have very strong muscles even if tone is low and vice versa.
- Muscles work in pairs – both have to work together to have effective movement.
 - Co-contraction (the two are working against each other - keeping still) or Reciprocal Movement (one muscle contracting and one lengthening – act together to get movement). With low tone, both are harder to achieve.
- Muscle strength is not itself affected with low tone but there needs to be regular movement to build strength. They may be weak through lack of movement caused by the low tone.
- If we can get children moving, the muscle strength can compensate for the low tone, but it takes a lot of work
- Muscle activity is different through ranges of motion. It is strongest in the middle ranges, weaker at the ends of range so we want children to strengthen their mid ranges (bent elbows, knees, hips and body and head in the middle etc.)
- We use ligaments to make up for low tone – hypermobility. Our children want to be at the end of range of movement so they can rely on their ligaments and not have to work their muscles so hard. We want them in mid range to make sure they are getting stronger.
- If they are constantly going to the end of range because it feels comfortable, they are stretching their ligaments so causing more instability – again we want to work mid range.
- As body grows and gets heavier, muscle strength needs to keep up.

Features of mild to moderate low tone (1)

- Gross motor
 - Harder to initiate an activity - need to bring their tone to normal and then move, twice as hard as other children
 - Less likely to be active so reduced underlying strength. Harder to develop gross motor skills.
 - Poor rotation (twice as difficult). Rotation can make their tone even lower – so they try to avoid it wherever they can.
 - Weight shift causes rotation so they also avoid this causing 2D movements (forward and back rather than side to side or rotating.)
 - Gross motor skills need all of the different movements
 - Rotation is important for core stability and head control.
 - Poor balance – if they haven't got rotation they haven't got full core stability so balance will be affected.
 - More difficult to achieve milestones



Features of mild to moderate low tone (2)



- Fine motor
 - Distal actions are dependent on good central control. If core or shoulder stability is not good then fine motor activities will be harder for child.
 - If you can strengthen the core then arms, hands and legs will work better.
 - Start with big motor skills and only move on to fine motor activities when they are able to do that
 - First of all you want strength e.g. with basic open and close palm rather than complicated fine motor activities. As they get stronger, bring in the more complex patterns.



Mild to Moderate tone (3)

- Body awareness and Sensory Integration
 - Less response to incoming signals.
 - Decreased proprioception (where you are in space). Feel less therefore less sense of self in space – can bump into things, have to look at hand when feeding self etc We need to give them tools to teach them about their own bodies so they know how to move.
- Communication and Oromotor function,
 - Low tone affects mouth, tongue and swallow. Cant feel where food is in mouth. Communication is harder
 - You have loads of muscles in your mouth which need to be working well together
 - It is all about co-ordinating these muscles



Mild to Moderate tone (4)

- Concentration and attention
 - Harder to be attentive when working harder to keep postures. Want to feel safe so all effort goes into maintaining their posture.
 - Children are always looking to feel safe in their bodies
- Behaviour
 - Passive child/ bossy child
 - 'Laziness'! They have to work doubly as hard.
 - The only way they are going to get stronger is by encouraging movement
- Sight/hearing. Harder to process vision
 - Eye muscles also work best at the end of range so child might turn head to one side to see more easily out of the corner of their eye.
 - Aim for eyes in front.



Moderate to Severe Hypotonia – Features

Gross motor skills and postures

- Takes up all support as a result of gravity. Knees are bent and out to side. Arms can be flopped out. Melt into floor
- Low resistance to passive movements – hypermobile.
- Uses mass patterns to generate force. Body learns typical movements. Children will use full body movements rather than the more complex mixed patterns. E.g. full body extension or full body flexion can be easier than mixing flexion and extension – e.g. it is easier to extend the trunk if hips have a bit of extension.
Easier to stand than to sit with an upright spine and very flexed legs.
- Dissociation and rotation = reduced tone
- Uses flexion or extension – not co-ordinated together
- More stable in midline positions – girdles aligned.
- Centre is really important for your spine and muscles. It is good to work towards centre. Can do this with equipment – make sure they are all fitted correctly in their equipment.

Moderate to Severe Hypotonia – Features (2)

Abnormally high threshold to sensory stimulation

- Auditory
- Proprioceptive – can't move so no position of reference. Trigger to re-align gets less as spend longer in asymmetrical positions – can't feel joint position. You might need to give them lots of external stimulation to help them know where their body is in space. Looking at themselves in a mirror might help.
- Tactile - Need a lot more touch
- Visual – delay in response
- Pain
- Reduced state of alertness – less tension in muscle = reduced arousal. Harder to be alert of your body isn't
- Inability to generate enough activity to respond.

Moderate to Severe Hypotonia – Features (3)



Poor/ unsustained head and trunk control – most important

- Insufficient co-contraction (2 muscles working against each other to stay still)
- Poor alignment and poor awareness of alignment
- Our core is central to everything. If you have a good core, your arms and legs are able to work better
- If we can get our core strong, we have a much better chance of developing in other areas

Emotionally placid and passive

‘Good’ baby

- Poor means of communication (verbal and non-verbal, difficulty with smile/ grimace)
- Inability to respond to different types of stimulation
- Can be considered to lack motivation
- May be associated with delayed cognitive development.



Moderate to Severe Hypotonia – Features (4)



At risk of contractures

- Ligaments hyper laxity – use ligaments to get stability so they get longer. Excessive range of movement – Hamstrings, hips turned out, shoulders at risk of dislocation.
 - To avoid putting shoulders at risk, don't lift children under their arms. Squeeze chest or scoop up. Avoid pulling up by the hands unless they are pulling up against you. Don't pull on arms. Pulling against you is fine.
 - If in frog potential for ligaments to over stretch and hips could be at risk. Put a pillow under their knees to keep their legs straight or pillows down the side of their legs to stop hips turning out.
- Compensatory patterns knees always flexed and hips turned out (to take up surface).
- High risk of scoliosis. Care putting them in all equipment. Use bony markers at hips to make sure they are in as centrally as possible.

Low tone in one part of the body.

- E.g. Seen in Cerebral Palsy due to prematurity or some muscular dystrophies

Features

- Low tone limb/ body has effect on other parts of the body
- Low tone trunk will cause limbs to work harder to make up for instability.
- If you can make low tone area into a better level of tone and increase the strength, other areas of the body will work better.



What affects tone?



Tone varies hour to hour and person to person

For the low tone child, you want children to have as high tone as possible to do an activity so check this list to see what helps to increase the tone for your child. You then need to do this when you want your child to play/ concentrate etc.

Things that are exciting or alerting will keep tone higher. Things that are relaxing will lower tone further.

- Position
- Antigravity (sit vs. stand)
 - Move against gravity. Don't allow them to relax.
 - The upright they are, the higher the tone.
- Supportive
(a little more challenging will increase tone) Too much support may hinder development. Could do more for themselves if you allow yourself to pull away and not hold them.
- Environment
 - Sound – Techno or rock music ☺
 - Sight – watching something alerting on t.v
 - Smell
 - Feel of supporting surfaces – spikey surfaces to keep alert
- Movement – Rebound therapy
- - Vestibular system
 - Bouncing on leg or therapy ball before an activity
 - Swinging, spinning but be careful, gradual build
 - Rocking
- Mood
- Challenges of task – Too easy tone will go down. Too hard, they will switch off. A little effort but enjoyable will get better results. The feeling of independence and success will help them
- Illness
- Touch

What can you do about mild/moderate Hypotonia



- **Improve tone while doing activities**

- Reduce support - take your hands off when possible, use less support, maybe use fingers not a whole hand to help them work harder. “a poke not a hold”
- Ensure activity is interesting
- Challenge child (not too hard and not too easy)
- Change environment/ voice/ support
- Change positions –
 - antigravity positions (preferably not lying down)
 - Standing frame/ gaiters

- **Improve underlying strength – this is key to everything**

Prevent compensations – work on rotation, mid range positions/ activities.

Sitting on bench working head control and trunk control is best mid range position.

Keeping strong throughout range of motion – swimming, gymnastics, ballet, football

Discourage unhelpful positions, e.g. W-sitting.



Mild to Moderate tone – specific strategies (2)



- **Body awareness and Sensory Integration**
 - Stimulate proprioceptive system. Squeezing, rubbing, squeeze tips of fingers. Sitting – you push down through the shoulders. In stand, push down through hips towards the floor.
 - Hand to hand to body – teach about their body
 - Deep touch or heavy work (check website (<https://www.gympanzees.org/our-home/zoom-sessions>) for talk about proprioception
 - Pushing into their joints
 - Feel where their body is
 - Pushing down into the feet
 - Anything that compresses the joints or pulls them apart (care with this if they are hypermobile)
- **Communication and Oromotor function,**
 - Blowing games, deep strokes, chewy toys or vibration massagers. Pressing on and around mouth, vibrating toothbrush. Sucking through a straw.
- **Concentration and attention**
 - Keep them moving – wobble cushion. Keep sensory input high to keep attention. Regular movement breaks
- **Behaviour**
 - Need to build strength so they don't act 'lazy'.
- **Sight/hearing**
 - Monitor – gromits work well if necessary.
 - Keep stimulation high if vision starts to drift

What can you do about moderate/severe Hypotonia



- **Alignment and stability against gravity.**

- Avoid rotation and dissociation – work for alignment and midrange of motion (sitting, standing, hands and knees)
- Shoulders over hips, no noises or movements from different directions, everything should come from in front of them so they don't need to rotate.
- Use forward and back motion rather than side to side (less dissociation)
- E.g. Step with left leg and arm together – less rotation.

- **Build up tone by stimulation techniques in midrange aligned position.**

- Touch/ tapping – help them keep tone in a better place. On tummy, quads
- Pressure
- Weight bearing/ approximation (legs, knees, crawling)
- Work against gravity
- Weight bearing at the extremities
- Grasp (increases tone in whole arm/ shoulder)
- Motivation – find what they like doing like playing with tablet so they concentrate on that and keep positions for longer.
- Reduce support



What can you do about moderate/severe Hypotonia (2)



- **Work for head and trunk control**
 - First thing is to be up against gravity. Start with rest of body supported. Underneath chin and soft part of neck. Tiny little bits of support. Only as much as they can do.
 - Positioning – hold tops of shoulders. Looking into their eyes, always looking forward to keep head up
 - Start in the middle and when they have some control in the middle – tip back or forward very gently
 - Do head control before trunk control . Generally need some head control before working trunk control.
 - Use a mirror to help them know where they are. Talk through with them
- **Work for activity**
 - Create environment for need to be active/ to re-adjust position. Reaching, lift arms to get fed.
 - We want to work for as much movement as possible
 - Whenever they are not moving their bodies are growing and their muscles aren't
 - Keep a family/life balance – but if you can bring in activities into things like feeding (make them reach for it) that will really help
 - Towards midrange, if too far away from midrange will just flop.

What can you do about moderate/severe Hypotonia (3)



- **Use lots of sensory inputs**
 - Touch, Proprioceptive input, sound – more than you expect
 - Prepare for activity by waking up their body
 - Intense input like vibration can help
 - Movement especially up and down or more vigorous changes of direction can improve tone
 - Keeping moving hands to gives less chance for tone to drop – move n sit cushion.
 - ****Book recommendation 'The out of sync child' – Carol Kranowitz**** - for sensory needs.
- **Use of equipment**
 - Use equipment to make just 1 area work – e.g. standing frame to work head control or chair to work arms.
 - Head pod? - takes weight off head. R82
 - If part of the body is moving using equipment, tone will improve in the rest of the body (e.g. Innowalk/ Upsee/ ijoy). Up against gravity can make everything else more possible (Ijoy Ride)
 - 24 hour postural care is key for prevention of scoliosis.
- **Prevent dislocations and contractures**
 - Shoulders – hold chest rather than under arms
 - Dislocations – keep hips straight in bed and in equipment.

A man and a young boy are playing with colorful blocks in a room. The man is holding a block and placing it on top of a stack. The boy is looking at the blocks. The room has a large screen in the background showing a sunset. The scene is lit with warm, orange light.

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