



## Athetosis and Dystonia

Stephanie Wheen  
Chartered Paediatric Physiotherapist

## Sub groups of Athetosis

1. **Pure athetosis** – small movements in hands and feet
2. **Choreoathetosis** – Large movements from shoulder and hip girdles
3. **Dystonic athetosis** – Big whole body movements – can get stuck
4. **Athetosis with spasticity** – a limb with spasticity on top of athetosis.

### Distribution;

- Quadraplegia
- Hemi-athetosis (just 1 limb – happens after birth)
- There can be a combination of the different types in any child
- Child is classified by the most severe element that the child has.

## Why does my child move as they do?

- **Fluctuating postural tone & Involuntary movement**
  - High tone vs Low tone – too much or not enough tension.
  - Involuntary movements results from fluctuation of tone and are reinforced by stimulation and volition (what they are trying to do)

### **Mobile spasms**

- Alternating and rhythmic e.g. shoulder forward and back
- Purposeful movement with no purpose (stepping)
- If one part moves and is stabilised, movement goes to another part of the body.

### **Dystonic Spasms**

- Sudden and extreme fluctuations of tone, i.e. from very low to very high.
- Predictable pattern
- Often related to change of head position
- Temporarily fixed in extreme position (can look like seizure)
- Localised to proximal body part e.g. head, shoulder and 1 arm OR can involve whole body
- Often at extremes of ranges of motion
- Symmetrical or (most) asymmetrical

## Balance between 2 muscles

- **Poor grading of movement**

- Either flexion or extension (bending or straightening).
- Agonist (shortening muscle) and antagonist (lengthening muscle) work together to make controlled and smooth movement.
- If they can't move in a controlled way, they look for stability and the easiest way is to go to the end of range of movement or against a surface.
- E.g. hyperextending knees – use of agonist against bony block to stabilise. Also uses extension when in wheelchair to gain stability.

- **Unsustained/ unsteady postural control**

- 2 muscles are not working smoothly together so it is difficult to stay still.
- Mid range of motion is the hardest which is generally where we need to be for posture!
- Can be reaction to voluntary movements – best if distracted.

## Common Features

- **Postural patterns;**

- Poor head/ trunk control – lack of co-contraction
  - Check eyes can move without head. Head and trunk control is key for her.
- Asymmetry
  - When agonist starts, antagonist switches off. So uses end ranges to stabilise = Asymmetrical
  - Up against gravity needs flex or extension. Extension more effective = asymmetry
  - Underlying low tone = gravity pulls into asymmetry
  - Head never in midline
  - Uses flexion in one side of the body to give stability for extension on the other.
- Total patterns – whole body does the same thing.
- Generally a wide variety of movement
  - No consistency in pattern, does activity differently every time child moves.

## • Associated problems



### – Vision

- Movement of eyes influences head – problem with dissociation of eyes from head
- Interferes with stability of head
- Head in 1 direction with eyes in the other direction to gain stability then look using periphery – leads to divergent squint.

### – Functional hearing

- Difficulty grasping an idea and acting on it.
- May have low frequency impairment (check hearing)

### – Eating and drinking

- Aspiration and reflux. Autonomic system affected includes smooth muscles = e.g. sphincters, oesophagus etc.
- Eating/ drinking can cause pain/ distress = extension pattern.

### – Emotional

- Labile – increases spasms with excitement.

### – Cognition

- Often very bright!!!

## What affects tone/involuntary movements?

- Position
  - Antigravity (sit vs. stand)
  - Supportive
- Environment
  - Sound
  - Sight
  - Feel of supporting surfaces
- Movement - Vestibular system
- Mood
- Challenges of task
- Illness
- Touch
- Pain

# General treatment principles.



## 1. Stabilise normal postural tone

- In more mid ranges e.g. in sit = flex + ext.

## 2. Alignment and midline

- Allows the 2 sets of muscles to work together.

## 3. Distal weight bearing <-> Proximal stability

- Stay in position – not mobile WB
- Stabilise around the centre to make it easier for the limbs to work.
- Gives stability in shoulder girdle for head control
- Use support through UL's when using walkers.

# General treatment principles cont.

## 4. Adjust the task and environment

### Activity

- Keep activity as un-stimulating as possible e.g. not noisy .
- Use monotone
- Wait before introducing too much into play
- Slow with books/ reading
- Best to start activity rather than wait for best posture as movements will be better when in middle of activity where it is less exciting and more automatic.

### Stimulation

- Be careful as you may provoke a spasm.
- There may be a delay so the response not always obvious. Wait!

### Visual

- Treat in box to give visual boundary

## General treatment principles cont.

### 5. Consideration of emotional, social and cognitive needs

- Cognition often very high compared to physical abilities
- Boring toys or age inappropriate toys might provoke spasms or distress
- Let child dictate what they do as much as possible
- Child may not want to be with other children with disabilities

### 6. Prevent contractures and deformities

- Why is the child using spasms?
- Can we change feeding/ communication/ being upright/ how people approach child/ reflux
- Symmetrical sitting to prevent asymmetrical contractures.

# General treatment principles cont.

## 7. Equipment and technology

- SF are useful for weight bearing and formation of hips
  - Make child secure so not gripping with UL's
  - Incorporate flex to break ext pattern and decrease spasms.
- Can get a lot from technology. – make sure it is symmetrical.
- Eye Gaze, communication books etc.
  - Need to be as effortless as possible to reduce spasms.
- Consider electric wheelchairs to increase independence. The position of the joystick is really important – make sure they stay symmetrical.



# TIP's (Tone Influencing Patterns)

TIP's are normal patterns of movement which are used to modify abnormal patterns of movement, to reduce and prevent high tone, and to build up tone into more normal patterns of activity.

- TIP's are basically the opposite pattern from the child's unhelpful postures.
- New position = new sensory input
- Experience of a new movement enables new possibility of movement
- TIP's are only a preparation for the child's own activity for function
- The more components you change the greater the effect on tone

## TIP for child with Athetosis/ Dystonia

- Want to work into flexion (arms and legs in towards the body, body bent forward)
- Want to work towards symmetry (everything pointing forwards – head, shoulders, hips, feet)
- Any activity should be towards the body
- If they are managing this, slowly bring in a little bit of extension (away from the body)
- Make sure the child takes over as much active control as possible

## How to do the TIP?

- If child has enough movement, get them to use all the extremes then slowly allow them to bring it back into less extreme movements.
- Give time to adjust/ adapt
- Introduce postural changes gradually – if a child has lots of muscle and joint tightness be careful
- Using force or producing pain should be avoided
- Avoid stretching muscle distally or in isolation
- Avoid concentrating on just 1 position for a long time.

## Whole body extension TIP



### **From semi supine/ side lie extension position.**

1. Hold at 1 foot and turn the foot and hip inwards while bending the hip and knee and bringing it towards the chest.
2. Bring other leg to join.
3. Body should have adopted a more flexed/ bent up posture.
4. Bringing knees to chest and use your body weight to keep knees to chest as you roll child into supine (symmetrical flexion position)
5. Bring arms in to chest and use sternum (breast bone) to increase flexion.
6. Roll onto side, keeping contact with child.

# Activities of Daily Living with the TIP

## Carrying

- Into flexed posture – hold knees up with her back to you then your other hand is free.
- Carry under shoulder/head and knees – then if she extends she will tire and gravity will bring her back into flexion. (same on lap)
- Straddle round hip – may work or be too hard.
- Over shoulder so shoulder is under sternum.

## Bathing

- Get into bath with child
- Child sitting perpendicular across legs with bum in space between legs.
- Use sternum to increase flexion
- Elongate neck with chin tuck with arm behind under occiput.
- Progress to her sitting between your legs – bend up her knees.

## Dressing

- Sat with bottom down between your legs.
- Bring top off from back to front.
- Bring trousers on from underneath first to increase hip flex. Use leaning on 1 side to take 1 side off then the other. Not too much lean as brings asymmetry!
- If child is helping taking top off then from in front.
- Possibly hold 1 arm into flexion while taking other arm off to break pattern of extension.

## Changing nappy

- On their back on a wedge for more flexion.
- Keep legs in flexion as this will affect further up.
- Hold 1 ankle of child with 1 hand while her other leg rests on your wrist. If she extends then just bring her legs in the air. She will tire and come back into flexion.
- Or can do prone over your knees with head down. <sup>16</sup>

## Eating and drinking

- Prepare with play in flexion
- In supportive seating or crook sit between your legs or 1 of your legs over theirs, other supporting from behind.
- Make sure spoon comes from low
- Hold chin
- Midline feeding
- If their arms are normally straight and behind, keep flexion of limbs by holding them together against the sternum
- Use doidy cup to reduce ext.



# Play/ communication



## **Supine on your legs**

- With feet against your chest.
- Pressure on sternum
- No rotation, maintain symmetry
- Eye contact, play in front
- If push with feet just getting more post pelvic tilt = more flexion.
- If bigger then same position but supporting head with feet with body in between your legs.

## **In sandwich sit (sat with you sitting around them)**

- To reduce extension = move support from behind higher up child's back.
- Bring shoulders forwards
- Cross arms over – hold while pressing on sternum
- Arm coming from under occiput to increase chin tuck and neck flex

## Side lying

- Head forwards by pressure on sternum, flex at shoulders and pelvis.
- Use towel to maintain shoulder flexion
- Parent lie in front so play in in front, no rotation/ extension.
- Toys = gripping and bring toys to him.
- Kneel either side of knees to maintain child in flexion.

## Take Home points

- We want to make the environment and the activity right for your child to reduce the likelihood of spasms.
- Use their TIP throughout their day to help reduce and control their tone and allow them to try other activities,
- Keep symmetry in their life and positioning as much as possible.
- Use flexion in part of the body to allow for some activity and extension in another part (e.g. bring 1 arm in to chest to allow the other arm to work better without an extension spasm)
- Don't let others underestimate your child!

A man with a beard, wearing a red long-sleeved shirt, is leaning over a child who is lying on their back on a mat. The man is smiling and looking down at the child. The child is wearing a grey hoodie with the word "Best" and a colorful logo on it, and red pants with white stars. The background shows a gymnasium with colorful equipment.

Thanks for Joining Us  
[www.gympanzees.org](http://www.gympanzees.org)