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# Low Tone, Flat Feet, and Exercise for Children with NF

September 18<sup>th</sup>, Mi Ran Shin, MD, MPH

# Objectives

- Identify 'Low Tone' in children with NF, its implications and interventions
- Identify 'Flat Feet' in children with NF, its implications and interventions
- Know some options for exercising in children with NF

# Definition of Low Tone

Medical term is called “hypotonia”  
Described typically as having a ‘floppy child’  
Unclear understanding of low tone..

Clinically can manifest as

- Sitting with ‘poor posture’
- Hypermobile joints
- Floppy child when picked up



Ira T. Lott, in Progress in Brain Research, 2012



Figure 1: A child with NF sitting, low tone with poor trunk control. Picture credit from: <https://www.candgnews.com/index.php/news/spreading-neurofibromatosis-awareness-108069>

# Clinical implications

Depending on severity, can affect development  
(i.e. difficulties sitting on time)

Can impact/ be associated with secondary musculoskeletal changes such as...

- Flat feet
- Pronation (rolling) of feet
- Scoliosis

# What can we do?

Treatment depends on the severity, body parts affected

If low tone at trunk, your provider may consider trunk brace/vests such as..



<https://www.bostonoandp.com/blog/finding-a-path-to-independence-with-dmo-supergirl-suit/>



# If hypotonia is affecting feet

Can consider shoe inserts or ankle braces such as..  
SMO : Supramalleolar orthoses

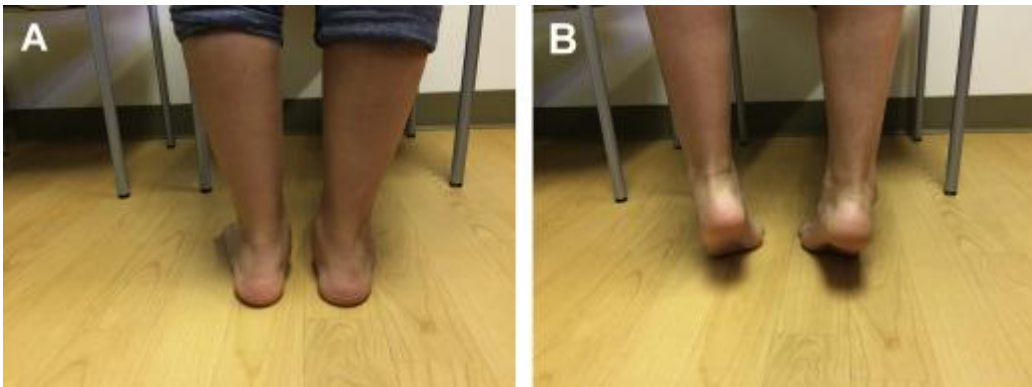


<https://surestep.net/products/surestep-smo/>

# Definition of 'Flat Feet'

Lack of arch development  
Typically develops by age 3-6 years

Mostly asymptomatic but..  
Can lead to pain, rigid causing secondary deformities



Ford, Samuel E., MD; Scannell, Brian P., MD. Published September 1, 2017. Volume 22, Issue 3



# Treatment

Depends on whether there's any symptoms (i.e. pain), severity, rigidity, secondary changes

- Observation
- Shoe inserts
- SMO
- Surgical procedures



HotDog - PAIRS  
\$47.00



PattiBob - PAIRS  
\$40.50



Chipmunk - PAIRS  
\$54.50

<https://www.cascadeshop.com/shoeinserts.aspx>



# Challenges with Exercising



# Exercise options

- Home exercise
- Physical / Occupational therapies
  - Private / Early Intervention / School based
- School based classes (i.e. gym/ P.E)
- Team sports
  - School club, community, traveling team
- Recreational
  - Hiking, walking, play ground
- Private personal training

# Goals and Benefits of Exercising

Structured program to address specific difficulties

- Increase muscle strength
- Prevent contractures (stretching)
- Improve posture
- Improve balance
- Build stamina decrease fatigue
- Improve functional tasks/ development
- Decrease pain
- Participation/ quality of life



**Questions?**

**Thank You!**



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