If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. Non-essential images have been removed for your convenience. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.
Technical issues with the Recording?

- Clear browser cache using these instructions
- Switch to another browser
- Use a hardwired Internet connection
- Restart your computer/device

Still having issues?

- Call 866-782-6258 (M-F, 8 AM-8 PM ET)
- Email customerservice@PhysicalTherapy.com
Positional Head Deformities in the NICU: types and prevention

Michele Hyams, PT,DPT,CNT, DCS, CIMI

Learning Outcomes

- Identify three different types of head shaping abnormalities.
- Identify three risk factors for high-risk deformities.
- Identify two possible positioning methods utilizing devices to help head shaping.
- Initiate parent and nursing education for carryover for head shaping.
- Identify when to refer for cranial molding for further intervention.
Introduction

- Cranial deformations refers to the external forces impacting cranial molding from the environment or positioning
  - Plagiocephaly is the most common
- Since the implementation of the American Academy of Pediatrics Back to Sleep campaign to decrease sudden infant death syndrome, cranial deformities has increased to 48% of infants
Plagiocephaly

- One side of the occiput is flattened and the contralateral side is rounded
- Positional plagiocephaly occurs due to “persistent mechanical forces on the malleable bones of the neonatal cranium”
- Determined by the Cranial Vault Asymmetry Index (CVAI)

Brachycephaly

- Symmetrical – uniform flattening of the back of the head
- Asymmetrical – an excessively wide head due to combination of plagiocephaly and brachycephaly
- Determined by width and length measurements
  - If width divided by length is greater than 90
Scaphocephaly

- Long and narrow head, often flattened sides, with a wide forehead.
  - Most common in premature infants
- Determined by width and length measurements
  - If width divided by length is less than 79
What are the risk factors?

- Restricted uterine environment
  - Multiple births
- Prematurity
  - Especially extremely low birth weight infants
- Trauma at birth
- Lack of bone mineralization
- Torticollis
- Paralysis
- Neurological deficits
- Restricted positioning

Clinical impact of cranial deformities

- Delayed developmental milestones
- Shift of cortical structures
- Lower scores in receptive language
- Lower scores fine motor subscales – Bayley
- Elevated risk of auditory processing disorders
- Elevated risk visual field abnormalities
- Delayed psychomotor development
- Asymmetries facial features with shift mandible
  - Increased prevalence abnormal dentition
Pressure Ulcers

- Bony prominences
- Increased risk of occurrence in the NICU

Torticollis

- Definition: a unilateral shortening of the sternocleidomastoid muscle causing lateral flexion towards the affected side and rotation to the opposite side
- Congenital muscular torticollis guidelines by APTA
- Often associated with plagiocephaly
This is the same little girl and please take note of the spine…….

Therapy protocols

- Assessment – track measurements
  - Craniometer
  - Helmet indicated?
- Positioning
  - Mattress, gel pillow, assistive devices
- Parent Education
  - Handouts for torticollis
- Follow up after discharge
  - therapy
The above measurements represent the measurement of the bony lateral part of the eye. Under the coronal suture of the fontanelle, through the mouth of the lateral orbital margin (of the upper eyelid). The horizontal distance is measured where the nasal bone meets the frontal bone. This difference represents the variation in length between the right and left sides of the nose. In the presence of any asymmetry, further assessment of the nasal bones is required.

The above measurements indicate the difference between the nasal bones, which is the junction between the nasal bone of the nose and the superior margin of the maxillary sinus. The measurements taken at this point will help in identifying any nasal asymmetry.

**Precautionary Recommendations:**

- **Signatures of Participants:**
  - Date: ______________
  - Signature of Participant: __________________________________________

- **Precautionary Recommendations:**
  - Date: ______________
  - Signature of Participant: __________________________________________
Assessments

- Argenta scale
  - Five ratings from minimal to severe
  - Type 1 is posterior flattening
  - Type 2 ear shift
  - Type 3 forehead deformity
  - Type 4 cheek, face and jaw deformity
  - Type 5 is vertical and/or temporal deformity

- Craniometer with tracking
  - Brachiocephalic and scaphiocephalic
  - Plagiocephalic
Physical Therapy Interventions

- Tummy time
- Less time in seated position in devices
  - Written instructions for repositioning
Positioning

- Mattress’
  - Delta foam, z-flo, crown cradle, air mattress
- Gel
  - Small and large

Nursing and parent education

- Torticollis
- Pictures and education to decrease stigma
Parent education

- Home program
  - Torticollis exercises, tummy time, positioning
  - Decreased time in rockers and bouncers
- Family centered involvement
  - Individual insight into child's needs
  - Psychosocial factors
  - Prenatal and postnatal

When to refer for helmet

- Refer while brain is still growing
  - Optimal age is 5 to 6 months
  - Not effective after 18 months
- Compliant parents
- Measurements completed by STARscanner Laser Data Acquisition scanner
- Contraindications
Therapy coinciding with helmet

- Continue work on torticollis
  - Posture
  - Perceptual awareness of environment
- Tummy time
- Parent education
  - Helmets worn 23 hours per day
  - Adverse signs to look for including
    - Heat rash
    - Pressure sores
What are the contraindications?

- The biggest is craniosynostosis
- Helmets can now be done with shunts.
Surgery

- First option with lamboid craniosynostosis
- Within first year for malleability of the cranial bones

Summary

- Positional deformations are on the rise, especially with increased prematurity
- Need to use knowledge translation to engage nursing and parents to assist in prevention
- Positioning and therapy interventions combined is important
- Refer for helmet when measurements outside of the norms
References

- Pictures and video from Orthopedic Motion (The orthotic and prosthetic institute).

References continued.

- Classifying Plagiocephaly: How is Severity Defined. Technology in Motion 2018.
References continued

- Collett B, Wallace E, Kartin D, Cunningham M, Speltz M. Cognitive Outcomes and Positional Plagiocephaly, Pediatrics 2019, 143 (2)

References continued

Questions???

Things to think about................

- What are ways you prevent cranial deformities in your unit?
- Do you measure heads while the child is in the NICU?
- How do you engage the parents and do education when deformities occur?