FACT SHEET

Interventions for Non-Synostotic Cranial Deformities in Infants including Plagiocephaly

Characteristics of a Newborn Skull[1]

- Highly soft and pliable, with spaces called sutures in between the plates of bones.
- Variable shape due to the inherent plasticity, intrauterine constraint, and journey through the birth canal; also influenced by cranial size, shape, and growth.
- Eight sutures and six fontanels accommodate increased growth of the skull as the brain is growing.

The head shape should assume a normal shape within 6 weeks after birth. An abnormal head shape continuing beyond 6 weeks of age should be evaluated by a physician.

What Are Infant Head Shape Deformities?

- Infant head shape deformities are skull distortions that occur in response to prenatal and postnatal external compression forces.[1-3]
- Non-synostotic deformities include deformities where the sutures of the skull are open and have not prematurely fused.
- Therapists should differentiate non-synostotic cranial deformities from other causes of abnormal head shapes, including craniosynostosis and craniofacial syndromes.

Infant Head Shape Deformity Statistics

- One in three infants has some degree of skull distortion.[3-5]
- Male babies are 1.58 to 3 times more likely than female babies to have deformational plagiocephaly.[3,5]
- The prevalence of plagiocephaly has increased since 1992, following the American Academy of Pediatrics' "Back to Sleep Campaign," now called "Safe to Sleep," which recommends infants sleep in supine to decrease the risk of sudden infant death syndrome (SIDS).[6-8]

What Are the Causes of Skull Deformation?

Intrauterine and extrauterine factors[3,9]

- Uterine crowding due to large fetus, multiple fetuses, or oligohydramnios (decreased amniotic fluid)
- Small maternal pelvis
- Left occiput anterior (LOA) position in utero predisposing the fetal head to unilateral pressure.

Neonatal factors (birth and neonatal period)[1,8]

- First-born infant
- Pressure on the head by a tight birth canal
- Forceps, vacuum, suction used at delivery and prolonged labor
- Macrocephaly, hydrocephalus[10]
- Infants born prematurely or with low birth weight[1,3,11-13]
- Torticollis

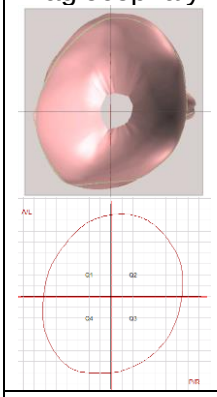
Revised 6/17/2020

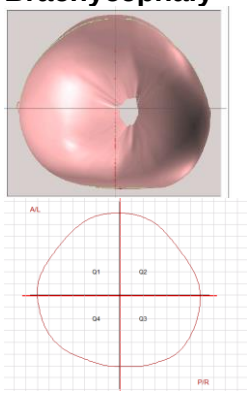
- Skull shape deformations that occur after birth or progress
- Hypotonic infants presenting with weak neck muscles[14]
- Congenital hip and spine problems[15]

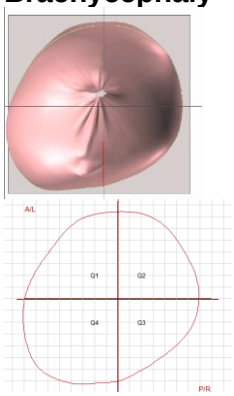
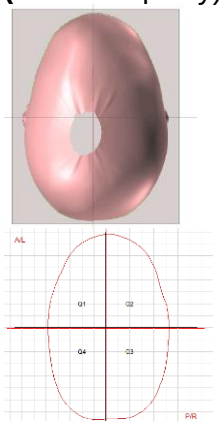
Environmental factors[7]

- Preference to turn head to one side while sleeping due to crib/sleep surface position
- Sleeping and playing in the supine position with very little or no time spent in prone[1,4,14]
- Excess time spent in infant carriers, car seats, and strollers[6,16]
- Prolonged placement in one position in the neonatal intensive care unit (NICU)[13,17]
- Prolonged position secondary to medical and orthopedic treatments (Ex. Feeding tube, ventilation, Pavlik harness)[11,13,17]

What Are the Types of Skull Deformation?

Type	Characteristics
Craniosynostosis	
Craniosynostosis	• Premature closure of one or more sutures of the skull. • Clinical presentation of the skull is dependent on the suture(s) involved: sagittal, metopic, coronal, and lambdoid. ○ Lambdoid synostosis is least common[18]; mistaken for plagiocephaly. • Suspicion of craniosynostosis requires referral back to pediatrician for evaluation by a pediatric neurosurgeon or craniofacial physician.[10] • Most infants require surgical intervention to open prematurely closed sutures.
Non-synostotic	
Plagiocephaly 	• Unilateral occipital flattening, anterior progression of the ear on the same side as the flattened occiput, varying degrees of ipsilateral frontal and contralateral posterior parietal bossing (parallelogram shape). • Cranial Vault Asymmetry (CVA) is assessed by measuring the longest and shortest diagonals of the skull and subtracting the difference in millimeters.[19] • Severe cases can involve the eyes, cheeks, and jaw.[5] • Associated with congenital muscular torticollis, congenital hip dislocation, and congenital scoliosis.[15] • Right occipital flattening more common than left occipital flattening (2:1).[3-5] • Severity is determined by the number of skull quadrants involved in the deformity with or without the presence of facial and jaw asymmetry.

Brachycephaly 	• Skull is disproportionately wide compared to its length
	• Prominent or bossed forehead
	• Increased height of the cranial vault
	• Central occipital flattening
	• Severity is determined by the number of deviations above the mean for Cephalic Index (CI), increased vertex height, and frontal involvement of the forehead and facial structures.
	  ▪ CI = (Width/Length) x 100.[19]
	  ▪ CI is higher for infants who sleep supine and spend extended time in supine.
	  ▪ The mean CI is 79% to 84% depending on age and gender of the infant.[19]

Type	Characteristics
Non-synostotic (Continued)	
Asymmetrical Brachycephaly 	• Combination deformity is characterized by disproportion and asymmetry. • Severity is determined by the number of asymmetrical skull quadrants and the degree of disproportion.
Scaphocephaly (Dolichocephaly) 	• Disproportionately long skull for its width. • ~75% of neonates born preterm (<32 weeks post-menstrual age) present with some degree of dolichocephaly at term age[12] • Shape common in babies who spend extended time in NICU or are positioned side-lying. • Sagittal Craniosynostosis can also present with a Scaphocephalic head shape. In the absence of a NICU history or excessive side positioning, craniosynostosis should be ruled out by a craniofacial specialist. • Severity determined by the number of deviations below the mean for Cephalic Index (CI). ○ CI = (Width/Length) x 100.[11,19]

Photos provided courtesy Orthomerica

How Can Skull Symmetry Be Promoted?[16]

Early caregiver education, diagnosis, treatment, and counseling are important following the infant's birth when the skull is most susceptible to deformation.

First Choice Interventions:

(Infants 0 – 4 months of age without torticollis, developmental concerns, or obvious skull deformities)

Parent Education, Repositioning, and Exercises[6,7,16,20]

Goal: Shift infant off flattened areas to encourage a symmetrical head shape and promote typical development.

- Alternate the head position in supine (right cheek on surface one time, left cheek next).
- When awake and supervised, prop the baby onto one side with a foam wedge or a towel rolled lengthwise along the baby's back.
- Conduct supervised "tummy time" in the waking hours to improve the baby's muscle strength, development, and keep the pressure baby off the back of the head.
- Watch for "high guard," "touch down" positioning of the arms and ensure that the infant has opportunities for midline play.
- Limit time in car seats, infant seats, swings, and strollers.
- Frequently change the position of the crib or the orientation of the baby in the crib to reduce the baby's tendency to look in the same direction.

- Change positions when feeding, carrying, and holding the baby.
- Provide supervised upright play as soon as the baby has upright head control.
- Interact with the baby from different sides, during feeding, changing, and playing.
- Encourage side-lying play opposite the flat side of the head.
- Request referral for physical therapy or cranial remolding orthosis evaluations, if the infant demonstrates resistance to repositioning, neck tightness, movement asymmetries, or if the head shape worsens or does not improve with the repositioning and exercises.

Second Choice Interventions:

Cranial Remolding Treatment[8]

Goal: Encourage symmetrical and proportionate skull growth through the use of a custom, Cranial Remolding Orthosis (CRO.)

- Provide total contact over the abnormally prominent areas of the skull.
- Direct growth into the areas of void within the CRO where growth is desirable.
- Initiate treatment within the first year of life when the skull is rapidly growing.

All cranial orthoses require FDA clearance; Photos provided courtesy of Orthomerica

Indications:

- Babies 3-18 months with moderate to severe head shape deformities with symmetrical movements and no torticollis
- No response or poor response to repositioning therapy
- Secondary changes to the skull or frontal facial asymmetries
- Babies with persistent skull deformity after a repositioning program

Contraindications to Cranial Remolding Orthosis:

- Craniosynostosis
- Unresolved hydrocephalus
- Children beyond 18 months of corrected age
- Babies under 3 months of corrected age

Cranial Remolding Treatment Considerations (helmets and bands)[8,16]

- Age at beginning of treatment, type and severity of deformation, and caregiver adherence with the treatment program all affect treatment. Factors include:
  - Average age range for initiating treatment is 4 to 12 months.
  - Overall age range for treatment is 3 to 18 months.
  - Optimum age range for initiating treatment is 4 to 6 months.
  - Cranial remolding orthosis is worn 23 hours per day for a period of 3 to 6 months.
  - Follow up is 1-2 weeks after the initial fit and every 2-3 weeks thereafter.
  - Request referral for Physical Therapy evaluation if torticollis, movement asymmetries or developmental delays are observed.

Physical Therapy Treatment[20]

Goals: Resolve range of motion deficits, promote age-appropriate motor skill development, strengthen weak muscle groups, provide a home handling/positioning program, and promote resolution of the head shape deformity as a result of the therapeutic interventions. Request referral for cranial remolding treatment if the head shape does not resolve with physical therapy interventions only.

Indications:

- Restricted neck and shoulder range of motion
- Presence of torticollis
- Delay in gross and fine motor skills
- Lack of head shape improvement after 1 month of caregiver repositioning/handling/tummy time
- Babies 0-12 months with minimal head shape deformities and asymmetrical movement preferences
- Babies 0-4 months with moderate to severe head shape deformities and asymmetrical movement preferences

Cranial Remolding Treatment and Physical Therapy

Since congenital muscular torticollis and non-synostotic cranial deformities often have similar etiology and environmental factors, concurrent treatment of cranial remolding treatment and PT can enhance outcomes.

Goal: Coordination of the infant's care through collaborative communication between the caregivers, physician(s), and treating clinicians to include:

- Treatment plans
- Infant's progress
- Caregivers compliance
- Factors that may impact treatments
- Discharge and follow-up planning

<u>Third Choice Interventions:</u>

Surgery for non-synostotic cranial deformities[18]

Indications:

- Rare in in infants with head shape deformities without synostosis
- Used in very severe deformities resistant to non-surgical measures[10]

Cited References:

1. Aarnivala H, Vuollo V, Harila V, et al. The course of positional cranial deformation from 3 to 12 months of age and associated risk factors: a follow-up with 3D imaging. *Eur J Pediatr*. 2016;175(12):1893-1903.
2. Aihara Y, Komatsu K et al. Cranial molding helmet therapy and establishment of practical criteria for management in Asian infant positional head deformity. *Childs Nerv System*; 2014 Sep;30(9):1499-1509.
3. Peitsch WK, Keefer CH, LaBrie RA, Mulliken JB. Incidence of cranial asymmetry in healthy newborns. *Pediatrics*. 2002;110:1-8.
4. Bellardini E, Cisti M, Basagila N, et al. Prevalence and characteristics of positional plagiocephaly in healthy full-term infants at 8-12 weeks of life. *Eur J Pediatr*. 2018;177:1547-1554.
5. Leung A, Madrusiak A et al. Clinical assessment of head orientation profile development and its relationship to positional plagiocephaly in healthy term infants—a prospective study. *Early Human Dev.* 2016;96:31–38.
6. American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome. SIDS and Other Sleep-Related Infant Deaths: Updated 2016 Recommendations for a Safe Infant Sleeping Environment. Pediatrics. 2016;138(5):e20162938
7. Ditthakasem K, Kolar J. Deformational plagiocephaly: A review. *Pediatr Nurs*. 2017;43(2):59-64.
8. Graham T, Adams-Huet B et al. Effects of initial age and severity on cranial remolding orthotic treatment for infants with deformational plagiocephaly. *J Clin Med*. 2019;8(8). pii: E1097.
9. Littlefield TR, Kelly KM, Pomatto JK, Beals SP. Multiple-birth infants at higher risk for development of deformitational plagiocephaly: II. Is one twin at greater risk? *Pediatrics*. 2002;109(1):19-25.
10. Fenton R, Gaetani SA. A pediatric epidemic Deformational plagiocephaly/ brachycephaly and congenital muscular torticollis. *Contemporary Pediatrics.* 2019;36(2):10-18.

11. Ifflaender S, Rüdiger M et al. Prevalence of head deformity in pre-term infants at term-equivalent. *Early Hum Dev.* 2013;89(12):1041-7.
12. McCarty DB, Peat JR, Malcom WF, Smith B, Fisher K, Goldstein RF. Dolichocephaly in Preterm Infants: Prevalence, Risk Factors, and Early Motor Outcomes. *American Journal of Perinatology*. 2016; 34(4):372-378.
13. Nuysink J, Eijsermans MJ et al. Clinical course of asymmetric motor performance and deformational plagiocephaly in very preterm infants. *J Pediatr*. 2013;163(3):658-65.
14. Hutchison BL, Stewart AW, Mitchell EA. Characteristics, head shape measurements and developmental delay in 287 consecutive infants attending a plagiocephaly clinic. *Acta Pediatrica*. 2009; 98:1494-1499.
15. Talmage MS, Nielson AN et al. Prevalence of hip dysplasia and associated conditions in children treated for idiopathic early-onset scoliosis—don't just look at the spine. *J Pediatr Orthopedics*. 2020;40(1):e49-e52.
16. Naidoo SD, Skolnick GB et al. Long-term outcomes in treatment of deformational plagiocephaly and brachycephaly using helmet therapy and repositioning: a longitudinal cohort study. *Childs Nerv Syst*. 2015;31:1547-1552.
17. Danner-Bowman K, Cardin AD. Neuroprotective Core Measure 3: Positioning & Handling — A Look at Preventing Positional Plagiocephaly. *Newborn and Infant Nursing Reviews.* 2015;15(3):111-113
18. Dempsey RF, Monson LA et al. Nonsyndromic craniosynostosis. *Clin Plastic Surg.* 2019;46(2):123-139.
19. Wilbrand JF, Schmidtberg K et al. Clinical classification of infant nonsynostotic cranial deformity. *J Pediatr.* 2012;161(6):1120-5.
20. Cevik S, Isik S et al. The role of age on helmet therapy in deformational plagiocephaly and asymmetric brachycephaly. *Childs Nervous System*. 2020;36(4):803-810.

Supplementary References

1. Aarnivala H, Vuollo V, Harila V, et al. Preventing deformational plagiocephaly through parent guidance: a randomized controlled trial. *Eur J Pediatr*. 2015;174:1197–1208.
2. Academy of Pediatric Physical Therapy. *Congenital Muscular Torticollis Clinical Practice Guideline Implementation Resources*. 2018. Available at: https://pediatricapta.org/clinical practice guidelines/
3. Academy of Pediatric Physical Therapy. *User Guide: How to Use 2018 Congenital Muscular Torticollis Clinical Practice Guideline Discharge Guide.* 2018. Available at: https://pediatricapta.org/services/document-download/?document_id=d79bd460-e158-11e8-ac38-005056a04e37
4. Academy of Pediatric Physical Therapy. *2018 CMT CPG Resource Packet for Parents and Caregivers.* 2018. Available at: https://pediatricapta.org/services/document-download/?document_id=be667c76-e158-11e8-ac38-005056a04e37
5. Andrews BT, Fontana S. Correlative versus causative relationship between neonatal head shape anomalies and early developmental delays. *Frontiers Neurosci*. 2017. Available at: https://doi.org/10.3389/fnins.2017.00708
6. Baird LC, Klimo P, Flannery AM., et al. Congress of Neurological Surgeons systematic review and evidence-based guideline on the management of patients with positional plagiocephaly: The role of physical therapy. *Neurosurg*. 2016;79(5):E630-E631.
7. Cabrera-Martos, Valenza MC et al. Effects of manual therapy on treatment duration and motor development on infants with severe nonsynostotic plagiocephaly: a randomized controlled pilot study. *Childs Nerv Syst*. 2016;32(11):2211-2217.
8. Cabrera-Martos I, Valenza MC et al. Repercussions of plagiocephaly on posture, muscle flexibility and balance in children aged 3-5 years old. *J Paediatr Child Health*. 2016;52(5):541-6.
9. Cabrera-Martos I, Valenza MC et al. Impact of torticollis associated with plagiocephaly on infants' motor development. *J Craniofac Surg.* 2015;26(1):151-6.
10. Cabrera-Martos I, Valenza MC et al. Clinical profile and evolution of infants with deformational plagiocephaly included in a conservative treatment program. *Childs Nerv Syst.* 2013;29:1893–1898.
11. Collett BR, Gray KE, Starr JR, Heike CL, Cunningham ML, Speltz ML. Development at age 36 months in children with deformational plagiocephaly. *Pediatrics*. 2013;131(1):e109-15.
12. Collett BR, Heike CL et al. Longitudinal, three-dimensional analysis of head shape in children with and without deformational plagiocephaly or brachycephaly. *J Pediatrics*. 2012;160(4):673-678.e1
13. Collett BR, Wallace ER. Infant/toddler motor skills as predictors of cognition and language in children with and without positional skull deformation. *Childs Nervous System*. 2019 Jan;35(1):157-163.
14. Collett BR, Wallace ER, Kartin D, Cunningham ML, Speltz ML. Cognitive outcomes and positional plagiocephaly. *Pediatrics.* 2019; 143(2) e20182373.
15. Dorhage KW, Beck-Broichsitter BE et al. Therapy effects of head orthoses in positional plagiocephaly. *J Craniomaxillofac Surg*. 2016;44(10):1508-1514.
16. Dorhage K, Wiltfang J et al. Effect of head orthosis on skull deformities in positional plagiocephaly: evaluation of a three-dimensional approach. *J CranioMaxillofac Surgy*. 2018;46(6):953-957.

17. Eberle NA, Stelnicki EJ et al. Efficacy of conservative and cranial orthotic therapy in over 4000 patients treated for positional plagiocephaly over a 5 year period. *Plastic Reconstructive Surg*. 2015;136(4S):5-6.
18. Fenton R, Gaetani S et al. Description of mandibular improvements in a series of infants with congenital muscular torticollis and deformational plagiocephaly treated with physical therapy. *Cleft Palate Craniofac J*. 2018;55(9):1282-1288.
19. Fish D, Lima D et al. Cranial remolding orthoses. In: Webster J, Murphy D (Eds). *Atlas of Orthoses and Assisted Devices. 5th Edition*. Elsevier: Philadelphia, PA. 2018.
20. Flannery AB, Looman WS et al. Evidence based care of the child with deformational plagiocephaly, part ii: management. *J Pediatr Health Care*. 2012;26(5):320-331.
21. Fontana SC, Daniels D et al. Assessment of deformational plagiocephaly severity and neonatal developmental delay. *J Craniofac Surg* 2016;27(8):1934-1936.
22. Fowler EA, Becker DB et al. Neurologic findings in infants with deformational plagiocephaly. *J Child Neurol.* 2008;23(7):742-7.
23. Freudisperger C, Steinmacher S et al. Impact of severity and therapy onset on helmet therapy in positional plagiocephaly. *J Craniomaxillofacial Surg.* 2016;44:110-115.
24. Goh JL, Bauer DF, Durham SR et al. Orthotic (helmet) therapy in the treatment of plagiocephaly. *Neurosurg Focus*. 2013;35(4):E2.
25. Graham JM, Kreutzman J, Earl D, Halberg A, Samayoa C, Guo X. Deformational brachycephaly in supine-sleeping infants. *J Pediatr.* 2005;146:253-257.
26. Graham T, Gilbert N et al. Significant factors influencing the effectiveness of cranial remolding orthoses in infants with deformational plagiocephaly. *J Craniofacial Surg*. 2019;30(6):1710-1713.
27. Han M, Kang J et al. Relationship between starting age of cranial-remolding-orthosis therapy and effectiveness of treatment in infants with deformational plagiocephaly. *Childs Nerv Syst.* 2017;33(8):1349-1356.
28. Hautopp L, Wester S et al. Benefit of physiotherapeutic treatment in children with torticollis. *Dan Med J*. 2014;61(12):A4970.
29. Ho JPK, Mallitt KA et al. Use of external orthotic helmet therapy in positional plagiocephaly. *J Clin Neurosci*. 2016;29:46-51.
30. Howlowka M, Reisner A et al. Plagiocephaly severity scale to aid in clinical treatment recommendations. *J Craniofac Surg*. 2017;28(3):717-722
31. Hussein M, Woo T et al. Analysis of the correlation between deformational plagiocephaly and neurodevelopmental delay. *J Plast Reconstr Aesthetic Surg*. 2018;71(1):112-117.
32. Kane AA, Mitchell LE, Craven KP, Marsh JL. Observations on a recent increase in plagiocephaly without synostosis. *Pediatrics.* 1996;97(6):877-885.
33. Kaplan S, Coulter C, and Sargent B. Physical therapy management of congenital muscular torticollis: a 2018 evidence-based clinical practice guideline from the APTA Academy of Pediatric Physical Therapy. *Pediatr Phys Ther*. 2018;30:240–290. Available at: https://pediatricapta.org/services/document-download/?document_id=ef617417-e150-11e8-ac38-005056a04e37
34. Kelly KM, Joganic EF et al. Helmet treatment of infants with deformational brachycephaly. *Global Pediatr Health*. 2018;5:2333794X18805618.
35. Kennedy E, Majnemer A, Farmer JP, Barr RG, Platt RW. Motor development of infants with positional plagiocephaly. *Phys Occup Ther Pediatr.* 2009;29(3):222-235.
36. Kilmo P, Lingo PR et al. Congress of Neurological Surgeons systematic review and evidence-based guidelines on the management of patients with positional plagiocephaly: the role of repositioning. *Neurosurgery*. 2016;79:e627-e629.
37. Kluba S, Kraut W et al. What is the optimal time to start helmet therapy in positional plagiocephaly. *Plast Reconstr Surg*. 2011;128(2):492-8.
38. Kluba S, Robkopf. Malocclusion in the primary dentition in children with and without deformational plagiocephaly. *Clin Oral Investig*. 2016;20(9):2395-2401.
39. Knight S, Anderson VJ. Early neurodevelopment in infants with deformational plagiocephaly. *J Craniofacial Surg*. 2013;24:4.
40. Kordestani RK, Patel S, Bard DE, Gurwitch R, Panchal J. Neurodevelopmental delays in children with deformational plagiocephaly. *Plast Reconstr Surg.* 2006;117:207-218.
41. Kreutz M, Fitze B. Facial asymmetry correction with molded helmet therapy in infants with deformational skull base plagiocephaly. *J Craniomaxillofacial Surg*. 2018;46:28-34.
42. Levi B, Wan DC, Longaker MT & Habal MB. Deformational plagiocephaly: A look into the future. *J Craniofac Surg.* 2011;22(1): 3-5.
43. Linz C, Collmann et al. Occipital plagiocephaly: unilateral lambdoid synostosis versus positional plagiocephaly. *Arch Dis Child.* 2014;100(2):1-6.
44. Mawji A, Vollman AR et al. The incidence of positional plagiocephaly: a cohort study. *Pediatrics*. 2013;132(2):298-304.

45. Mawji A, Vollman AR et al. Risk factors for positional plagiocephaly and appropriate time frames for prevention messaging. *Paediatr Child Health* 2014;19(80:423-427.
46. Murgia M, Venditto T et al. Assessing the cervical range of motion in infants with positional plagiocephaly. *J Craniofac Surg.* 2016;27:1060-1064.
47. Nitsos A, Estrada R et al. Tummy time for Latinos with limited English proficiency and feasibility of a cultural and linguistically adapted parent education intervention. *J Pediatric Nursing.* 2017;36:31-36.
48. Nuysink J. Supporting early development of infants with identified positional plagiocephaly. *Phys Occup Ther Pediatr*. 2009;29(3): 236-8.
49. Rogers GF. Deformational plagiocephaly, brachycephaly, and scaphocephaly. Part I:Terminology, diagnosis, and etiopathogenesis. *J Craniofac Surg*. 2011; 22(1):9 – 16.
50. Rogers GF. Deformational plagiocephaly, brachycephaly, and scaphocephaly. Part II: Prevention and treatment. *J Craniofac Surg* 2011;22(1):9-117-23.
51. Rogers GF, Oh AK & Mulliken JB. The role of congenital muscular torticollis in the development of deformational plagiocephaly. *Plast Reconstr Surg*. 2009;123:643-652.
52. Siatkowski RM, Fortney AC, Nazir SA, et al. Visual field defects in deformational posterior plagiocephaly. *J AAPOS*. 2005;9:274 – 278.
53. Siegenthaler MH. Methods to diagnose, classify and monitor infantile deformational plagiocephaly and brachycephaly: a narrative review. *J Chiropractic Med*. 2015;14:191–204.
54. Speltz ML, Collett BR, Stott-Miller M, et al. Deformational plagiocephaly delays motor skill development in 6-month-old infants. *J Pediatr.* 2010;157(3): 514-515.
55. Steinbok P, Lam D. Long-term outcome of infants with positional plagiocephaly. *Childs Nerv Syst.* 2007;23:1275-1283.
56. Steinberg JR, Rawlani R et al. Effectiveness of conservative therapy and helmet therapy for positional cranial deformation. *Plast Reconstr Surg*. 2015;135:833-842.
57. Tamber MS, Nikas D et al. Congress of Neurological Surgeons systematic review and evidence-based guideline on the role of cranial molding orthosis (helmet) therapy for patients with positional plagiocephaly. Neurosurgery. 2016;70:E632-e633.
58. van Vlimmeren L, Engelbert R et al. The course of skull deformation from birth to five years of age: a prospective cohort study. *Eur J Pediatr.* 2017;176:11-21.
59. Watemberg N, Ben-Sasson A et al. Transient motor asymmetry among infants with congenital torticollis—description, characterization, and results of follow-up. *Pediatr Neurology*. 2016;59:36-40.
60. Yu CC, Wong FH, et al. Craniofacial deformation in patients with uncorrected congenital muscular torticollis: An assessment from three-dimensional computed tomography imaging. *Plast Reconstr Surg.* 2004;113:24-33.

Supported by the Practice Committee of APTA Pediatrics, with special thanks to expert contributors Dulcey Lima OTR/L; Jessica Corso, CO, LO, FAAOP; Colleen P Coulter, PT, DPT, PhD, Board-Certified Clinical Specialist in Pediatric Physical Therapy, Catie Christensen, PT, DPT, Board-Certified Clinical Specialist in Pediatric Physical Therapy, and Kim Lephart, PT, DPT, MBA, Board-Certified Clinical Specialist in Pediatric Physical Therapy.