Best Evidence Statement (BESt)

Date: June 6, 2012

Title: Use of Care Giver Education to Prevent Positional Plagiocephaly

Clinical Question:

P (population)	Among infants less than two months of age
I (intervention)	does infant positioning education given to their care givers
C (comparison)	vs. no education
O (outcome)	increase the amount of time the infant spends in positions other than supine and decrease the incidence of positional plagiocephaly?

Target Population: Infants less than two months of age and premature infants with adjusted age less than two months

Exclusion Criteria: Infants who have a medical condition where varying infant position may increase or cause health risk.

Recommendation:

It is recommended that care givers of infant(s) routinely receive education regarding "tummy time" and infant positioning beginning prior to two months of age to decrease the amount of time infants spend in positions other than supine and decrease the incidence of plagiocephaly (vanVimmeren, L. A., van der Graaf, Y., Boere-Boonekamp, M. M., L'Hoir, M. P., Helders, P. J. M. & Engelbert, R. H. H., (2008 [2a]); Wen, L. M., Baur, L., Simpson, J. M., Rissel, C., & Flood, V. M. (2011,[2b]); Cavalier, A., Picot, M.-C., Artiaga, C., Mazurier, E., Amihau, M.-O., Captier, G., . . . Picard, J.-C., (2011 [3a]); Lennartson, F., (2011[4b]); Jennings, J. T., Sarbaugh, B. G., & Payne, N. S., (2005 [4b]).

Discussion/Summary of Evidence related to the recommendation:

Prevention Education and Timing of Preventative Education

Early caregiver education regarding unlimited restriction of movement, infant positioning, and safe infant environment reduces the incidence of positional plagiocephaly (PP) (Cavalier et al., 2011[3a]; Lennartson, (2011[4b]) and has a positive effect on reduction of diagnosed cases of PP during the first 12 months (Wen at al., 2011[2b]; Hutchison et al., 2010[2b]) and infants less than 6 months of age (vanVimmeren et al., (2008[2a]); Hutchison et al., (2010[2b]).

Three studies demonstrated that positioning education given to caregivers decreased the amount of time infants spent in bouncers, carriers and other infant furniture and increased the amount of time spent in positions other than supine (Wen et al., 2011[2b], Cavalier et al., 2011[3a]; Jennings et al., 2005[4b].

Education given to caregivers was effective in decreasing the incidence of PP or increasing the amount of time infants spent in positions other than supine when provided during pregnancy (Wen et al. 2011[2b]), in the immediate postpartum period (Wen et al., 2011[2b]; Cavalier et al., 2011[3a]; Lennartson, 2011[4b]; Jennings et al., 2005[4b]) and during the first months (Wen et al., 2011[2b]; Hutchison et al., 2010[2b].

Reference List: *(Evidence Level in [ ]; See Table of Evidence Levels*

Callahan, C. W., & Sisler, C. (1997). Use of seating devices in infants too young to sit. *Journal of Pediatric & Adolescent Medicine, 151,* 233-235 [4a].

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Cavalier, A., Picot, M-C., Artiaga, C., Mazurier, E., Amilhau, M-O.,. . . Captier, G., Picard, J-C. (2011). Prevention of deformational plagiocephaly in neo-nates. *Early Human Development, 87,* 537-543 [3a].

Hutchison, B.L., Stewart, A.W., de Chalain, T.B., & Mitchell, E. A. (2010). A randomized controlled trial of positioning treatments in infants with positional head shape deformities. *Acta Paediatrica 99*, 1556-1560 [2b].

Jennings, J. T., Sarbaugh, B. G., & Payne, N. S. (2005) Conveying the message about optimal infant positions. *Physical & Occupational therapy in Pediatrics*, 25(3), 3-18 [4b].

Lennartsson, F. (2011) Testing guidelines for child health care nurses to prevent nonsynostotic plagiocephaly: a Swedish pilot study 12. *Journal of Pediatric Nursing, 26(6),* 541-551 [4b].

Moon, R. Y. (2011) SIDS and other sleep-related infant deaths: Expansion of recommendations for a safe infant environment. Journal of Pediatrics *128(5)*, 1341-1367 [5a].

Persing, J., James, H., Swanson, J., & Kattwinkel, J. (2003). Prevention and management of positional skull deformities in infants. [GuidelinePractice Guideline]. *Pediatrics, 112*(1 Pt 1), 199-202 [5a].

vanVimmeren, L. A., van der Graaf, Y., Boere-Boonekamp, M. M., L'Hoir, M. P., Helders, P. J. M., & Engelbert, R. H. (2008). Effect of pediatric physical therapy on deformational plagiocephaly in children with positional preference*, ARCH Pediatric Adolescent Medicine, 162(8),* 712-718 [2a].

Wen, L. M., Baur, L. A., Simpson, J. M., Rissel, C., & Flood, V. M. (2011) Effectiveness of an early intervention on infant feeding practices and "tummy time". *Archive Pediatric Adolescent Medicine,165*(8) [2b].

Supporting Information

Background/Purpose of BESt Development:

Pershing, Swanson, & Kattwinkel identified a significant increase in diagnosis of positional plagiocephaly beginning in 1992 related to the change to back sleeping position for infants (2003 [5a]). At that time a six-fold increase in cases of positional plagiocephaly were reported from 1992 through 1994. Recommendations included parental counseling during the newborn period (2-4 weeks of age) when the skull is maximally deformable) regarding infant positioning (Pershing et al., 2003 [5a]). Despite this recommendation there continues to be an increase in the diagnosis of positional plagiocephaly. Callahan & Sisler (1997 [4a]) found the average young infant (less than 5 months of age) spent 5.7 hours daily in a car seat or other sitting device. The American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome (Moon, 2011 [5a]) expanded the recommendations for safe infant sleep environment to include parent education regarding "supervised awake tummy time on a daily basis", rotating the infant's head position when placed supine and reduction in the use of car seats and other sitting devices when not traveling.

Definitions:

Positioning or Tummy Time (TT) Education: Education given to the primary care givers of infant(s) which includes importance of supine position education while the infant is asleep or unsupervised with equal weight to the importance of prone positioning, freedom of mobility (decreased use of infant furniture), and placing the infant in a variety of positions while awake and supervised.

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Primary Care Giver is the person who takes primary responsibility for someone who cannot care fully for themselves. It may be a parent, family member, guardian, medical professional or another trained professional. Depending on culture there may be other members of the family engaged in care. The primary care giver is responsible for positional education given to all others involved in care.

Positional Plagiocephaly (PP) is an asymmetric head shape caused by positioning, as opposed to an asymmetric head shape caused by craniosynostosis. Positional Plagiocephaly is also called deformational plagiocephaly (DP) and may be referred to as non-synostotic plagiocephaly (NSP).

Applicability Issues:

Identification of correct person(s) to consistently provide the education
Caregiver practice adherence to recommendations
Additional time needed for the nurse and/or primary care physician to address the issue during clinic visits.
Availability of education materials for caregivers and parents
Parental anxiety over intolerance of *tummy time*
Strategies to follow for care givers (i.e. how to build tolerance of infant tummy time)

Outcome or Process Measures:

Decrease in number of referrals to plagiocephaly clinic.
Increased number of infants with documentation of education provided.

Search Strategy:

Key words: positional plagiocephaly; plagiocephaly; infant positioning; non-syndromic plagiocephaly; deformational plagiocephaly
Limits: English, Infants, 2000 to 2011.
Databases: Cinahl, Pub Med
End date of retrieval: 12-30-11

Relevant CCHMC Evidence-Based Documents:

Growing Through Knowing: Plagiocephaly, Prevention Begins at Birth
http://groups.cchmc.org/otpt/ptandfamed/knowing%20notes/plagioparentletter042610v19gtk_3.pdf

Health Topic: Plagiocephaly
http://www.cincinnatichildrens.org/health/p/plagiocephaly/

Group/Team Members*:*
Candyce L. Wilson, RN, BSN; Division of Out-patient Services
Mary Ellen Meier, RN, MSN, CPN; Center for Professional Excellence and Business Integration, Research and Evidence-Based Practice, EBP Mentor
Zienia Samaan, MD, FAAP, Medical Director Pediatric Primary Care Center & Hopple Street Health Center
Pamela Hudson, PT, MPH
Dawn Rothchild MSN, RN, Division of Plastic & Reconstructive Services
David A. Billmire MD, FAAP, Medical Director Division of Plastic Surgery

Conflicts of Interest were declared for each team member:
☒ No financial conflicts of interest were found.

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Note: Full tables of evidence grading system available in separate document

- Table of Evidence Levels of Individual Studies by Domain, Study Design, & Quality *(abbreviated table below)*
- Grading a Body of Evidence to Answer a Clinical Question
- Judging the Strength of a Recommendation *(abbreviated table below, dimensions table above)*

Table of Evidence Levels *(see note above)*:

Quality level	*Definition*
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local Consensus

†a = good quality study; b = lesser quality study

Table of Language and Definitions for Recommendation Strength *(see note above)*:

Language for Strength	*Definition*
It is strongly recommended that… It is strongly recommended that… not…	When the dimensions for judging the strength of the evidence are applied, there is high support that benefits clearly outweigh risks and burdens. *(or visa-versa for negative recommendations)*
It is recommended that… It is recommended that… not…	When the dimensions for judging the strength of the evidence are applied, there is moderate support that benefits are closely balanced with risks and burdens.
There is insufficient evidence and a lack of consensus to make a recommendation…	

Given the dimensions below and that more answers to the left of the scales indicate support for a stronger recommendation, the recommendation statement above reflects the strength of the recommendation as judged by the development group.
(Note that for negative recommendations, the left/right logic may be reversed for one or more dimensions.)

1. Grade of the Body of Evidence	☐ High	☒ Moderate	☐ Low
Comments:			
2. Safety/Harm (Side Effects and Risks)	☒ Minimal	☐ Moderate	☐ Serious
Comments: The American Academy of Pediatrics (Moon, 2011[5a]) expanded their recommendations for care giver SIDS education (safe infant sleep environment) to include caregiver education regarding supervised awake tummy time and reduction in use of infant furniture.			
3. Health benefit to patient	☐ Significant	☒ Moderate	☐ Minimal
Comments:			
4. Burden on patient to adhere to recommendation	☒ Low	☐ Unable to determine	☐ High
Comments: There is no additional burden on the health care provider to provide this education as it occurs at time of SIDS education. This education is a recommended requirement in the infant population. Infant positioning is part of routine care given by care giver, education includes information that can be done during routine infant care.			
5. Cost-effectiveness to healthcare system	☒ Cost-effective	☐ Inconclusive	☐ Not cost-effective
Comments: Average cost of helmeting infant (local data) is $2500 for helmet and average of $516 for clinic visit(s). Total Average Cost per infant= $3016 health care dollars per infant. Many families also incur additional cost of radiology exam. There is no additional cost to physician or care giver when plagiocephaly is prevented. Education is part of the routine exam and no specialty equipment is needed. Prevention of positional plagiocephaly saves a minimum of $3016 health care dollars per case where plagiocephaly is prevented.			
6. Directness of the evidence for this target population	☒ Directly relates	☐ Some concern of directness	☐ Indirectly relates
Comments:			
7. Impact on morbidity/mortality or quality of life	☐ High	☒ Medium	☐ Low
Comments: There is no evidence of harm due to positional plagiocephaly however the literature indicates emotional concern of caregivers due to disfigurement. Parents seeking appointments in the plagiocephaly clinic at CCHMC regularly verbalize this concern.			

Copies of this Best Evidence Statement (BESt) and related tools (if applicable, e.g., screening tools, algorithms, etc.) are available online and may be distributed by any organization for the global purpose of improving child health outcomes.
Website address: http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/best.htm
Examples of approved uses of the BESt include the following:

- copies may be provided to anyone involved in the organization's process for developing and implementing evidence based care;
- hyperlinks to the CCHMC website may be placed on the organization's website;
- the BESt may be adopted or adapted for use within the organization, provided that CCHMC receives appropriate attribution on all written or

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electronic documents; and
- copies may be provided to patients and the clinicians who manage their care.

Notification of CCHMC at EBDMinfo@cchmc.org for any BESt adopted, adapted, implemented, or hyperlinked by the organization is appreciated.

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This Best Evidence Statement has been reviewed against quality criteria by 2 independent reviewers from the CCHMC Evidence Collaboration.

For more information about CCHMC Best Evidence Statements and the development process, contact the Evidence Collaboration at EBDMinfo@cchmc.org.

Note
This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

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