

Table 2: Evidentiary Table

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
Abbott AH, Netherway DJ, et al (1998)	Computer Tomography Determined Intracranial Volume of Infants With Deformational Plagiocephaly: A Useful “Normal”?	Retrospective review of 202 infants with deformational plagiocephaly. An intracranial volume (ICV) was calculated for 66 infants based on data available from their computed tomography (CT) scans.	Class III—Retrospective review. No delineation of sensitivity, specificity, positive or negative predictive values.	Intracranial volume calculated through CT imaging for the 66 infants with deformational plagiocephaly was not statistically different compared to “normal,” age-matched infants from previously reported studies. Although CT scan may have some role in imaging, calculation of ICV was not useful.
Bruner TW, David LR, et al (2004)	Objective Outcome Analysis of Soft Shell Helmet Therapy in the Treatment of Deformational Plagiocephaly	Prospective, non-randomized, single arm study evaluating the results of helmet therapy for infants with deformational plagiocephaly. Three-dimensional (3D) reconstructed CT scans were used to calculate ICV. Pre-treatment CT scans and CT scans obtained 6 months after initiation of treatment with a soft shell helmet were compared.	Class III—Prospective, single cohort. No delineation of sensitivity, specificity, positive or negative predictive values.	This group concluded that 3D CT scans are a useful method of comparing head shapes before and after therapy. Criticisms include that (1) no mention was made of radiation dose exposure to infants, (2) only 34/69 infants completed the study, and (3) no comparison was made to initial or clinical assessment of the severity of deformity/plagiocephaly.

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
Captier GN, Leboucq, et al (2003)	Plagiocephaly: morphometry of skull base asymmetry	Retrospective review of 102 CT scans performed on infants with skull asymmetry, of which 82 had deformational plagiocephaly. Twenty had craniosynostosis. Skull base asymmetries were evaluated and compared.	Class III—Retrospective review of CT scans.	Both groups had skull base asymmetries as characterized by CT scanning. Criticisms: (1) Again, no mention made of radiation exposure. (2) There was no comparison of this methodology to clinical assessment, ie did CT scanning add anything to the diagnosis?
Collett BR, Heike CL, et al (2012)	Longitudinal, Three-Dimensional Analysis of Head Shape in Children With and Without Deformational Plagiocephaly or Brachycephaly	Prospective, non-randomized, study of 3 cohorts of infants with clinically diagnosed plagiocephaly or brachycephaly, non-diagnosed "normal head-shaped" infants, and non-diagnosed infants with asymmetries appreciated only after 3D topographical imaging. Imaging and measurements were done at enrollment and at 18 months. All groups demonstrated improvement in asymmetries.	Class III—Prospective, non-randomized without blinded or randomized comparison. Adjusted z-score differences in head shape at different times during treatment or observation were reported. 3D surface scans of children with diagnosed plagiocephaly or brachycephaly, confirmed on 3D topographical imaging (all cases); children with brachycephaly, but not plagiocephaly (isolated brachycephaly); children without diagnosed plagiocephaly or brachycephaly, with some dysmorphology (affected controls); and children	All groups demonstrated improvement in head shape as measured with 3D topographical imaging. Infants treated with cranial molding orthotics demonstrated better improvement than those who did not receive molding therapy. 3D topographical imaging provided a useful tool for actualized and documenting improvement in cranial asymmetries. Criticism: there was no comparison between clinical assessment of severity and actual measurements, so could improvement have

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
			without previously diagnosed plagiocephaly or brachycephaly and confirmed absence of cranial dysmorphology on 3D imaging (unaffected controls) were evaluated and significance and CI values were reported.	been realized without 3D topography?
Collett BR, Aylward EH, et al (2012)	Brain volume and shape in infants with deformational plagiocephaly	Retrospective, non-randomized, cohort comparison of 20 infants with deformational plagiocephaly and 21 without.	Class III—Prospective, non-randomized. This was a magnetic resonance imaging (MRI) study of various intracranial measurements and volumes of infants with or without deformational plagiocephaly. Adjusted group differences in brain shape for children with confirmed deformational plagiocephaly (DP; cases) versus children with confirmed absence of DP (unaffected controls) were reported with confidence intervals and significance of measurements.	The authors concluded that: (1) the shape of the brain as noted through MRI is affected or controlled by the skull shape, and (2) degree of asymmetry is associated with neurodevelopmental outcomes. Criticisms include that although there were 78 infants with plagiocephaly identified, only 50 consented to the study, and only 30 MRI studies were attempted and 20 completed successfully. The cost and time involved in obtaining the MRI studies were not calculated, and there was no comparison between clinical assessment of head asymmetry and findings on MRI.

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
David DJ and Menard RM	Occipital plagiocephaly	Retrospective review of 204 patients with occipital plagiocephaly, all of whom had skull x-rays and only 2 had true synostosis. CT scans were done in cases in which the diagnosis was in question.	Class III—Evidence from a single center experience.	The authors concluded that clinical examination and skull x-rays were sufficient for diagnosis, and CT imaging should be reserved for only those patients in which both the clinical exam and radiological skull x-rays results are equivocal.
Fisher DC, Kornrumpf BP, et al (2011)	Increased Incidence of Metopic Suture Abnormalities in Children with Positional Plagiocephaly	Retrospective review of the CT scans of 2 groups of patients: those with deformational plagiocephaly and those with metopic synostosis. Of the 4754 patients diagnosed with DP over a 10-year period, 291 had a CT scan performed. There were 41 infants treated for metopic synostosis.	Class III—Retrospective review of 2 cohorts of CT scans; 1 group of infants with DP and 1 group with metopic synostosis. Anterior-interorbital, lateral-orbital, lateral-temporal, and mid-orbital distance measurements of infants with positional plagiocephaly were reported and compared to normal and to infants with true metopic synostosis. Standard deviations and confidence intervals were calculated.	The authors found that there was a high degree of metopic suture abnormalities associated with DP but that these abnormalities do not cause trigonocephaly, which is typically seen in true metopic synostosis. Criticisms of this manuscript include that there was no comparison of clinical assessment with CT based findings and actual measurements. While CT scans were useful in documenting the degree of asymmetries, there was no comparison to clinically based assessment of severity.

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
Huang MH, Gruss JS, et al (1996)	The Differential Diagnosis of Posterior Plagiocephaly: True Lambdoid Synostosis versus Positional Molding	Retrospective review of 102 infants seen from 1991 to 1994 in a large multi-disciplinary center at the Children's Hospital and Medical Center in Seattle Washington with posterior plagiocephaly.	Class III—Retrospective review; single cohort.	Of the 102 infants, 98 were diagnosed with positional plagiocephaly based on clinical examination. Only 4 were deemed to have craniosynostosis. There were 4 criteria described for the clinical diagnosis of plagiocephaly. CT scans were done only “when indicated;” it is not clear how many did receive CT scans.
Hutchison BL, Stewart AW, et al (2009)	Characteristics, head shape measurements and developmental delay in 287 consecutive infants attending a plagiocephaly clinic	Retrospective review of all children who attended the craniofacial clinic of the department of Pediatrics, the University of Auckland, New Zealand, from May 2005 to August 2007.	Class III—Retrospective review of 287 consecutive infants with plagiocephaly.	Of the 287 infants evaluated, 7 (2%) were suspected of having craniosynostosis and so were referred for CT. In the author's opinion, CT scanning is not indicated for all infants with plagiocephaly, only those in whom the skull deformation is severe and the suture is “ridged.”
Kane AA, et al	Mandibular dysmorphism in unicoronal synostosis and plagiocephaly without synostosis	Retrospective analysis of CT data of 20 infants with plagiocephaly without synostosis (PWS) who had pre-treatment CT data available.	Class III—Evidence from a comparative clinical study evaluating the CT findings of infants with PWS vs normal infants and infants with true synostosis.	The authors concluded that 3D CT did show significant differences in mandibular morphology and was a useful study. The authors' primary interest was to investigate whether or not

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
				dentoskeletal abnormalities existed in PWS and in coronal synostosis and to determine if those abnormalities were significantly different from “normal.”
Katzel EB, Koltz PF, et al (2011)	Treatment of Plagiocephaly with Helmet Molding Therapy: Do Actual Results Mimic Perception?	Retrospective analysis of parent opinion/assessment vs topographical analysis of 61 infants with plagiocephaly and 91 age-matched infants with topographical scans before and after treatment.	Class III—Retrospective comparison of parents’ opinion about improvement in head shape and the topographical data from infants treated with cranial molding therapy.	The authors evaluated parents’ opinions about their infants’ head shapes before and after cranial molding therapy. The topographical data from 91 age-matched infants were studied. These were not the same infants assessed by their parents, so the correlation with parent opinion and actual improvement cannot be made. The only true findings included that, in general, parents were happy with the outcome after cranial molding therapy and that topographical scanning can be used as an objective measure of head shape.
Kluba SR, Schreiber, et al (2012)	Does Helmet Therapy Influence the Ear Shift in	Prospective longitudinal, single arm study of a single cohort. 3D stereophotogrammetry of	Class III—Evidence from a prospective, single case series	There was good correlation in clinical assessment of cranial asymmetry, whereas clinical assessment of ear

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
	Positional Plagiocephaly?	80 infants with positional plagiocephaly was accomplished before and after helmet therapy. Of those 80, 60 were found to have an ear shift. Separately, 3 surgeons were asked to evaluate these 80 infants before and after cranial molding therapy.		position asymmetries did not correlate to data assessment through 3D stereophotogrammetry. The authors had 2 main conclusions: (1) clinical assessment of cranial asymmetry, but not ear position, does correlate well with 3D stereophotogrammetry data, and (2) helmet treatment does improve ear position in infants with plagiocephaly, as documented with 3D stereophotogrammetry. One may conclude, then, that both clinical assessment and 3D stereogrammetry are both valid and useful in the assessment of infants with plagiocephaly.
Krimmel MB, Will, et al (2012)	Value of high-resolution ultrasound in the differential diagnosis of scaphocephaly and occipital plagiocephaly	Prospective clinical comparison.	Class II—Clinical, ultrasound, and radiological data from 54 infants under 12 months of age with plagiocephaly were presented. The 2 groups described were 47 infants with solely positional plagiocephaly and 7 infants with true craniosynostosis. Under their premise that the	In 45/47 infants with positional plagiocephaly, the ultrasound images did confirm patent sutures. In 2/47 studies, the ultrasound was inconclusive. In 5/7 with craniosynostosis, the ultrasound did show closed cranial sutures. In 2/7 infants with

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
			<p>inconclusive US findings are regarded as false-positive and false-negative results, the US method had at least a sensitivity of 71.4% (95% confidence interval: 35.5%, 100%), a specificity of 95.7%, a positive predictive value of 71.4% and a negative predictive value of 95.7%.</p>	<p>craniosynostosis, the ultrasound was inconclusive and was followed by a CT in 1 patient and a skull x-ray in the other. In conclusion, the authors felt that ultrasound effectively distinguished between open and closed sutures.</p>
<p>Kuang AA, Bergquist C, et al (2013)</p>	<p>Effectiveness and Safety of Independent Pediatric Nurse Practitioners in Evaluating Plagiocephaly</p>	<p>Retrospective review of the electronic medical records of all patients (N = 1228) seen in a craniofacial clinic from 2005 to 2011.</p>	<p>Class III—Retrospective review of a single series.</p>	<p>The authors concluded that clinical examination by a skilled craniofacial team was able to effectively and safely diagnose plagiocephaly and rule out craniosynostosis without the need of imaging.</p>
<p>Linz C, et al</p>	<p>Occipital plagiocephaly: unilateral lambdoid synostosis versus positional plagiocephaly</p>	<p>A prospective study of 269 children with plagiocephaly without synostosis (PWS, n = 261) and 8 infants with lambdoid synostosis were clinically examined to outline the specific clinical features of both true positional deformity versus craniosynostosis. After clinical examination, ultrasounds (US) were performed. US revealed</p>	<p>Class III—Evidence from a prospective, non-randomized, comparative clinical study evaluating the clinical and radiological-ultrasound findings of infants with plagiocephaly, with or without synostosis.</p>	<p>The authors concluded that there are quite distinctive clinical features apparent in infants with lambdoid synostosis when compared to infants with PWS. Additionally, the group concluded that ultrasonography done in infants ≤ 12 months can be used to confirm the diagnosis of synostosis.</p>

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
		<p>either a lambdoid synostosis or a patent lambdoid suture in cases of PWS. In 258 of the 269 PWS infants, clinical examination was able to confirm the diagnosis, so that in 3 infants who were initially diagnosed with PWS, a lambdoid synostosis was found on US. In all true lambdoid synostosis cases, US did support the clinical diagnosis. Their conclusion was that CT scan was not necessary in the diagnosis of true lambdoid synostosis.</p>		
Lipira AB, Gordon S, et al (2010)	Helmet Versus Active Repositioning for Plagiocephaly: A Three-Dimensional Analysis	<p>Retrospective data analysis of 70 infants with plagiocephaly prospectively entered into a non-randomized study with 2 treatment arms: helmet versus positional therapy. 3D topographical analysis was performed before and after treatment. Infants treated with positional therapy (n = 35) were matched for severity of deformity.</p>	<p>Class III—Evidence from a well-designed, case-controlled, comparative clinical study, in which infants with plagiocephaly and treated differently were compared. Cases were matched for severity of deformity. Clinical outcomes were assessed in an objective manner using 3D stereophotogrammetric analysis. 3D topographical imaging was found to be useful for initial assessment</p>	<p>Using 3D stereophotogrammetric analysis, the authors demonstrated that the infants treated with cranial molding therapy did show a larger reduction in cranial asymmetry as compared to the non-helmeted group. Whole head surface topogrammetry was a useful, objective tool in assessing and determining the cranial asymmetry in infants with plagiocephaly. Of note, comparison of clinical</p>

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
			and follow-up of infants with PWS.	assessment versus efficacy or objectivity of topographical scanning was not the primary aim of this study.
Littlefield TR, Beals SP, et al (1998)	Treatment of Craniofacial Asymmetry with Dynamic Orthotic Cranioplasty	Retrospective analysis of an Excel database of 759 patients with positional plagiocephaly treated between 1988 and 1995 with a Dynamic Orthotic Cranioplasty (DOC).	Class III—Evidence from a single case series of 759 patients with plagiocephaly treated with a cranial molding helmet. Data for 285 (37.5%) were complete and available for analysis.	Photographs and anthropometric measurements were used to assess and evaluate cranial asymmetry before, during, and after treatment. The authors concluded that cranial molding therapy did reduce cranial asymmetry and that anthropometric measurements are reliable and useful.
Lo LJ, et al. (1996)	Plagiocephaly: differential diagnosis based on endocranial morphology	A retrospective study of CT scans done on 234 infants with skull deformity, of whom 170 had PWS, 60 had coronal synostosis, and 4 had lambdoid synostosis. CT data was available in 32 PWS, 27 UCS, and 4 LS. Four radiologists were asked to diagnose unilateral coronal synostosis, true lambdoid synostosis, or positional plagiocephaly (PWS). They found that	Class III—Retrospective review of 3 cohorts of infants' CT scans; 1 group of infants with PWS and 2 groups with synostosis.	The authors concluded that CT was useful for the differential diagnosis of clinical plagiocephaly. CT imaging showed significant differences in the external perimeter analysis, cranial fossae symmetry and shape, and the cranial fossa midline angulation. Criticisms include that there was no comparison with sensitivities and specificities of clinical examination and that there

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
		<p>quantitation of anteroposterior fossae midline angulation assisted in the correct diagnosis of PWS versus lambdoid synostosis.</p>		<p>was no consideration of radiation dose or exposure.</p>
<p>Losee JE, Feldman E, et al (2005)</p>	<p>Nonsynostotic Occipital Plagiocephaly: Radiographic Diagnosis of the "Sticky Suture"</p>	<p>Retrospective analysis of 3D CT data from 33 infants with posterior plagiocephaly. There were 26 infants without craniosynostosis and 7 infants with classic lambdoid craniosynostosis.</p>	<p>Class III—Evidence from a comparative clinical study evaluating the CT findings of infants with lambdoid synostosis vs those infants without true or classic synostosis. The differences in (1) suture sclerosis and narrowing, (2) endocranial ridging, (3) focal fusions, (4) change in normal overlapping suture morphology to end-to-end orientation, (5) perisutural thickening and thinning, and (6) increases in ipsilateral frontal subarachnoid spacing were reported and significance was determined.</p>	<p>CT was found to be helpful in the differential diagnosis of lambdoid synostosis versus simple occipital plagiocephaly or a "sticky suture." The need for CT scanning for diagnosis was not compared to skull x-rays or clinical examination.</p>
<p>Meyer-Marcotty P, Bohm H, et al (2012)</p>	<p>Head orthosis therapy in infants with unilateral positional plagiocephaly: an interdisciplinary</p>	<p>Prospective, longitudinal designed, IRB-approved, case-controlled study of 20 infants with positional plagiocephaly and 20 age-matched controls without</p>	<p>Class III—Evidence from a well-designed comparative study of infants with and without positional plagiocephaly. The utility of topographical scanning for</p>	<p>The authors found the 3D stereophotogrammetry very useful.</p>

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
	approach to broadening the range of orthodontic treatment	cranial asymmetry. Any patient with craniosynostosis diagnosed clinically or confirmed with cranial ultrasound was excluded. A 3D topographical scan was constructed using 5 synchronized cameras.	diagnosis and follow-up of infants with PWS was reported.	
Moghaddam MB, Brown TM, et al. (2014).	Outcome analysis after helmet therapy using 3D photogrammetry in patients with deformational plagiocephaly: the role of root mean square	Retrospective analysis of 40 infants with positional plagiocephaly, between 4 and 10 months of age. The authors felt that clinical assessment by the parent or clinician and anthropometric measurements are subjective, too variable, and time-consuming. They developed a clinical protocol with Root Mean Square (RMS) that is a measure unique to 3D photogrammetry that takes into account changes in shape and volume over time.	Class III—Evidence from a case series of 40 infants under 10 months with positional plagiocephaly. All had 3D stereophotogrammetry before and after treatment with a cranial molding orthotic.	The authors concluded that 3D stereophotogrammetry was an effective and useful tool for the diagnosis and treatment of plagiocephaly. The RMS application was useful in following head shape changes over time.
Mulliken JB, et al.	Analysis of posterior plagiocephaly:	In a prospective study of 115 infants with posterior plagiocephaly, only 1 infant had lambdoid synostosis and 114 infants had PWS. Some	Class III—Evidence from a single case series of 114 infants with PWS.	The authors concluded that clinical examination of infants is usually sufficient for the diagnosis of PWS, but in some cases (54/114)

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
	deformational versus synostotic.	children (n = 54) had skull x-rays and only 11 had CT scans done. CT scans were able to confirm the diagnosis of PWS when there was a clinical question.		skull x-rays were needed. In 11/54 equivocal skull x-rays, a 3D CT confirmed the diagnosis of PWS. Only 1 infant had true lambdoid synostosis.
Netherway DJ, Abbott AH, et al (2006)	Three-Dimensional Computed Tomography Cephalometry of Plagiocephaly: Asymmetry and Shape Analysis	Retrospective study of 21 children with positional plagiocephaly and 20 with craniosynostosis.	Class III—Evidence from a series of infants with plagiocephaly from craniosynostosis or positional deformity. A 3D CT scan was done for each child. All but 1 child were under 27 months. Seventy-eight different osseous landmarks were identified and used to measure cranial asymmetry.	The authors concluded that 3D CT scanning and the measurement of cranial skull vault asymmetry based on the acquired images are useful in the diagnosis and treatment of plagiocephaly in children.
O'Broin ES, Allcutt D, Earley MJ	Posterior plagiocephaly: proactive conservative management	A retrospective case review of 39 infants with PWS who underwent a clinical examination, orthopometric measurements, photographs, skull x-rays, and 4 had CT scans done.	Class III—Evidence from a single case series of 39 infants with plagiocephaly.	The authors found that clinical examination was usually useful for diagnosis and skull x-rays were difficult to interpret. For cases in which the skull x-ray results and clinical examination were equivocal, 3D CT scans were recommended.

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
Pollack IF, Losken HW, et al (1997)	Diagnosis and Management of Posterior Plagiocephaly	Retrospective analysis of 71 infants treated prospectively with a clinical management protocol for posterior plagiocephaly. All had skull x-rays. When skull x-rays were not diagnostic, a CT scan was performed.	Class III—Forty out of 71 skull x-rays clearly showed open and patent cranial sutures. CT scans of the head were then obtained in 31/71, and 29 CT scans did show patent, open sutures. In 2 children, true lambdoid synostosis was diagnosed and confirmed.	The authors concluded that their management protocol provided satisfactory clinical improvement in 64/ 69 patients with posterior plagiocephaly. Fifty-six percent (40/71) of skull x-rays were diagnostic and obviated the need for CT scans. In 31 infants (43%), CT scans were necessary.
Schaaf H, Malik CY, et al (2010)	Three-Dimensional Photographic Analysis of Outcome After Helmet Treatment of a Nonsynostotic Cranial Deformity	Prospective analysis of 181 infants with positional plagiocephaly. All infants were subjected to a 3D stereophotogrammetric analysis of head shape before and after treatment.	Class III—Evidence from a single series of infants with positional plagiocephaly treated with cranial molding therapy. Head shape imaging was acquired on all using 3D stereophotogrammetric analysis. Cranial vault asymmetry index, cranial vault symmetry, and cranial index were assessed and compared before and after treatment.	The authors concluded that 3D stereophotogrammetric analysis provided useful and accurate information for the diagnosis and treatment of positional plagiocephaly.
Schaaf H, Pons-Kuehnemann J, et al (2010)	Accuracy of Three-Dimensional Photogrammetric Images in Non-	Retrospective, non-consecutive, single case series of 100 infants under 20 months of age, randomly chosen, with deformational plagiocephaly. All infants	Class III—These infants were assessed for cranial vault asymmetry using 2 different methodologies: caliper measurement and 3D stereophotogrammetry. The	The authors concluded that 3D stereophotogrammetry is a safe and effective method to diagnose and treat infants with plagiocephaly. There was very little variation

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
	Synostotic Cranial Deformities	underwent clinical assessment using caliper measurements and 3D stereophotogrammetric analysis, by 5 clinicians. Each clinician re-measured the 3D stereophotogrammetry pictures 5 times.	inter- and intra-rater agreements of the 3D stereophotographs had a low variability in the variance component analysis.	between the actual caliper measurements and the measurements done using 3D stereophotographs.
Schweitzer T, Bohm H, et al (2012)	Avoiding CT scans in children with single suture craniosynostosis	Retrospective analysis of 137 infants who were being evaluated for craniosynostosis or positional deformity during 2008-2009. There were some infants with single-suture craniosynostosis (n = 110) and some diagnosed with positional plagiocephaly (n = 27).	Class III—Evidence from a single center experience.	The authors concluded that CT scanning is rarely necessary in the differentiation of plagiocephaly versus craniosynostosis. In 133 (97%) of the 137 infants, the diagnosis was made on clinical examination only. Two infants had diagnostic ultrasounds, and only 2 needed CT scan confirmation of the diagnosis.
Sze RW, et al	Ultrasound screening of the lambdoid suture in the child with posterior plagiocephaly	Prospective study of 41 infants who were referred for CT scans of the head. Of those infants, 29 were referred for plagiocephaly and suspected synostosis, of whom 2 had lambdoid fusion. Twelve infants had been referred for indications	Class II—Evidence from a comparative clinical study evaluating the US findings of infants (n = 27) with PWS versus "normal" infants (n = 12) and 2 with true lambdoid synostosis. The mean sensitivity and specificity of ultrasound in the differential	The author concluded that sonography of the lambdoid sutures shows excellent preliminary promise as a screening test of lambdoid suture patency and is helpful in the diagnosis of PWS.

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
		not related to head shape and were found to have a normal study. Ultrasound imaging and evaluation of the lambdoid sutures were performed. Radiologists interpreting the ultrasound images were blinded to the CT results. The authors reported that in their study, the mean sensitivity and specificity of ultrasound for distinguishing an open from a closed, fused lambdoid suture by 3 blinded pediatric radiologists was 100% and 89%, respectively.	diagnosis of an open from a fused lambdoid suture by 3 blinded pediatric radiologists were 100% and 89%, respectively.	
Thompson JT, David LR, et al (2009)	Outcome Analysis of Helmet Therapy for Positional Plagiocephaly Using a Three-Dimensional Surface Scanning Laser	Retrospective review of 175 infants; 59 were excluded for failure to follow up or other craniofacial conditions. The remaining 116 infants were included.	Class III—Evidence from single series of infants evaluated using a 3D laser scanning system.	The authors concluded that the laser scanning system was a useful method for objectively measuring outcomes in infants being treated for plagiocephaly with cranial molding helmets.
Vu HL, Panchal J, et al (2001)	The Timing of Physiologic Closure of the Metopic Suture: A Review of 159 Patients Using	Retrospective series of 84 infants with plagiocephaly and 75 infants with trauma who received a CT scan. All CT scans were reviewed for	Class III—Evidence from a series of children with plagiocephaly who received a 3D CT scan to assess suture patency.	The authors concluded that based on their findings, 3D CT scans did have a role in the evaluation and treatment of plagiocephaly.

AUTHORS	TITLE	STUDY DESCRIPTION	DATA CLASS/QUALITY AND REASONS	RESULTS AND CONCLUSIONS
	Reconstructed 3D CT Scans of the Craniofacial Region	patency of the metopic suture.		
Zonenshayn M, Kronberg E, et al (2004)	Cranial index of symmetry: an objective semi-automated measure of plagiocephaly	Retrospective review of 16 infants with plagiocephaly. Diagnosis and treatment was facilitated with a digital camera, a special headband, and measurements made from the digital images.	Class III—Evidence from a single case series of infants with plagiocephaly.	The authors concluded that their system with the headband and digital photography was useful and efficient and reduced radiation exposure.