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# PRACTICE

## 10-MINUTE CONSULTATION

### Baby with an abnormal head

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This is part of a series of occasional articles on common problems in primary care. The *BMJ* welcomes contributions from GPs.

A young couple present to their general practitioner worried that their 4 month old baby's head "doesn't quite look right."

#### What you should cover

*What specifically is worrying the parents?*—Parents sometimes get concerned that their baby's head looks smaller or bigger than it should be, is flattened on one side, or is bumpy in places; they may also be worried about the presence or size of the "soft spot" (fontanelle).

*Is it posture related?*—Many babies have a postural asymmetry of the head (plagiocephaly). The main risk factor is the baby's preferred resting head position, both in utero and in the first few months after birth, while the skull bones are still malleable.

*Are other family members affected?*—Microcephaly (head circumference <3rd centile) and macrocephaly (head circumference >97th centile) can run in families and are generally without consequence. Spontaneous microcephaly is often indicative of a serious underlying problem such as a neurodevelopmental disorder or craniosynostosis (premature fusion of sutures). Although spontaneous macrocephaly is seldom of clinical relevance, identifying secondary causes is important as this may be due to increased intracranial volume, such as in hydrocephalus or a subdural haematoma as a result of birth trauma, or more rarely congenital tumours. A wide fontanelle that is bulging or other sutures widely open can indicate clinically important macrocephaly, as would any evidence of neurodevelopmental issues such as altered tone or convulsions.

*Do the parents have any concerns about the baby's development?*—If so, this may indicate a serious underlying cerebral problem.

*Are parents consanguineous?*—Metabolic disorders and syndromic disorders occur more commonly in children from first cousin marriages, and these may lead to a primary failure of brain growth and resulting microcephaly.

*What is the maternal history?*—Intrauterine infections (such as toxoplasmosis), excessive maternal alcohol consumption, and use of anticonvulsant drugs during pregnancy can lead to microcephaly. In such cases, the inadequate skull growth is usually secondary to an underlying failure of brain development.

*What was the gestational age at birth?*—This can affect the size and shape of the head, as a premature baby often has an "elongated head" with bilateral flattening on either side.

*Were there any problems at birth?*—A difficult or instrumented delivery (application of forceps or ventouse) may deform the face and skull, and can result in a subgaleal haemorrhage (extensive swelling due to bleeding beneath the muscle layer not restricted by sutures) or cephalhaematoma (subperiosteal bleeding limited by suture lines).

#### What you should do

*Look at the parents' head size and shape* to see if there is any obvious familial microcephaly or macrocephaly. If so, and provided there are no other concerns, reassure the parents.

*Measure and plot the baby's head circumference* to see if the head is of a normal size for (gestational) age and sex. A period of serial monitoring may be required. Measurement should be done with a non-expanding tape measure across the forehead and over the most prominent part of the parietal and occipital bones. Take the largest of three measurements. Plot the occipito-frontal circumference on an age-appropriate growth chart, and compare the head size with other growth parameters (that is, head size relative to body length and weight).

*Carefully examine the head* paying particular attention to:

- **Fontanelles**—The posterior fontanelle normally closes first, at around 8-12 weeks, and then the anterior fontanelle closes, at 12-21 months.<sup>1</sup>
- **Sutures**—Feel with the tip of your finger for any ridging over the sutures. A smooth ridge or elevation (rather than the normal corrugated flat surface) suggests premature fusion of the suture. The sagittal suture is most commonly affected, resulting in a “boat-shaped head.”
- **Shape**—Is there evidence of plagiocephaly? Positional or non-synostotic (that is, where none of the sutures is fused) plagiocephaly is the commonest cause of an unusual shaped head at this age, and this will usually resolve spontaneously by the age of 2 years.<sup>3</sup> Examination will reveal a flattened occiput, with the ipsilateral ear and forehead being pushed forward to produce a “parallelogram” look when observed from above (see figure 1).

*Examine the spine for scoliosis and truncal asymmetry* and look for torticollis or a sternomastoid “tumour” (tear), as muscle shortening with limited neck movement can sometimes result in positional plagiocephaly; this can be managed with the help of a paediatric physiotherapist. Remember, however, that torticollis may also be due to cervical spine skeletal anomalies, and if this is suspected a specialist paediatric neurosurgical assessment should be sought.

*Examine for dysmorphism, congenital abnormalities, and abnormal neurology*, such as hypotonia or hypertonia. Down’s syndrome, for example, is associated with microcephaly and/or brachycephaly (a flattened head). If present, refer for a paediatric assessment.

*Refer urgently* to a paediatric neurosurgeon if there is microcephaly with premature closure of fontanelle(s), or sutures are prematurely closed (synostotic). Any evidence of raised intracranial pressure—such as prominent skull veins, a bulging fontanelle, or a rapidly increasing head size—also warrants urgent referral.

## Management of positional plagiocephaly

- Explain that this has become more common after the success of campaigns to encourage parents to lay babies on their backs in order to reduce the risk of sudden infant death syndrome (SIDS).<sup>3</sup>
- Counsel parents that the vast majority of children with mild to moderate positional plagiocephaly do not need intervention. Reassure them that the head shape will naturally improve at 3-5 years of age as the child assumes a more upright posture.
- Be prepared to discuss the pros and cons of ongoing research: although it has generally been accepted that positional plagiocephaly does not result in developmental delay,<sup>4</sup> there is some evidence of an impact on the development of language and cognition skills.<sup>5-8</sup> In severe cases, some experts have suggested orthotic helmets may be used, but evidence of benefit is weak and disputed.<sup>9 10</sup>
- Encourage lying the baby prone when awake and instruct on varying sleep positions, in line with SIDS guidelines.<sup>3</sup>

- Suggest supervised “supported” sitting or lying on the side when awake, propped up with a cushion behind the back. Turning the cot position will encourage the infant to turn its head (to look at toys, for example) when lying supine, which will encourage lying on the non-flattened side.
- Parents may not be willing to accept the conservative management suggested above and may visit internet sites for expensive (up to £2500) custom made helmets. These have to be worn for up to 23 hours a day and may result in discomfort or pain from a poor fit or complications such as fungal infections of the scalp. They are therefore generally not recommended.<sup>11</sup>

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- 1 Tunnessen WW, Roberts KB. *Signs and symptoms in pediatrics*. 3rd ed. Lippincott Williams & Wilkins, 1999.
- 2 Hutchison BL, Hutchison LA, Thompson JM, Mitchell EA. Plagiocephaly and brachycephaly in the first two years of life: a prospective cohort study. *Pediatrics* 2004;114:970-80.
- 3 American Academy of Pediatrics, Task Force on Infant Positioning and SIDS. Positioning and SIDS. *Pediatrics* 1992;89:1120-6.
- 4 Hutchinson BL, Stewart AW, Mitchell EA. Deformational plagiocephaly: a follow up of head shape, parental concern and neurodevelopment at ages 3 and 4. *Arch Dis Child* 2011;96:85-90.
- 5 Robinson S, Proctor M. Diagnosis and management of deformational plagiocephaly. *J Neurosurg Paediatr* 2009;3:248-95.
- 6 Moss SD. Nonsurgical, non orthotic treatment of occipital plagiocephaly: what is the natural history of misshapen head? *J Neurosurg* 1997;87:667-70.
- 7 Loveday BPD, de Chain TB. Active counterpositioning or orthotic device to treat plagiocephaly. *J Craniofac Surg* 2001;12:308-13.
- 8 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:e109-16.
- 9 Moretson P, Steinbok P, Smith D. Deformational plagiocephaly and orthotic treatment: indications and limitations. *Childs Nerv Syst* 2012;28:1407-12.
- 10 Graham JM Jr, Gomez M, Halberg A, Earl DL, Kreutzman JT, Cui J, et al. Management of deformational plagiocephaly: repositioning versus orthotic therapy. *J Pediatr* 2005;146:258-62.
- 11 Singh A, Wacogne I. What is the role of helmet therapy in positional plagiocephaly? *Arch Dis Child* 2008;93:809-10.

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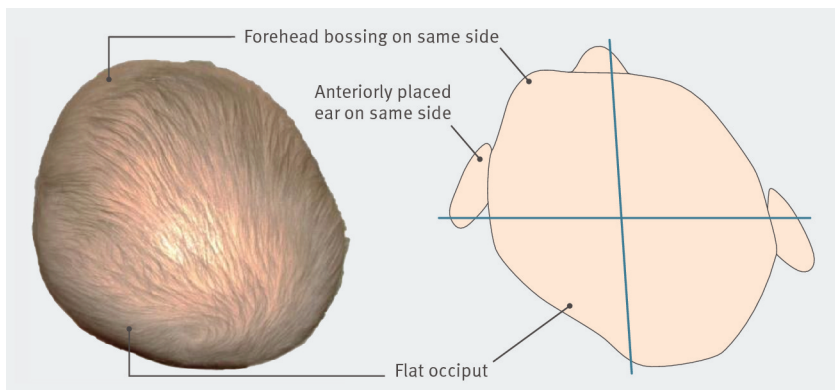
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**Useful reading***For parents*

- NHS Choices. Craniostenosis. 2012. [www.nhs.uk/conditions/craniostenosis/Pages/Introduction.aspx](http://www.nhs.uk/conditions/craniostenosis/Pages/Introduction.aspx)
- NHS Choices. Plagiocephaly and brachycephaly (flat head syndrome). 2012. [www.nhs.uk/conditions/plagiocephaly/Pages/Introduction.aspx](http://www.nhs.uk/conditions/plagiocephaly/Pages/Introduction.aspx)
- Pruitt SJ. *The truth about tummy time. A parent's guide to SIDS, the back to sleep program, car seats and more.* Authorhouse, 2011

*For professionals*

- Hayward R, Jones B, Dunaway D, eds. *Clinical management of craniostenosis.* Mac Keith Press, 2004
- Jones KL, Jones MC, Casanellas MDC. *Smith's recognizable patterns of human malformations.* 7th ed. Elsevier Saunders, 2013

**Figure**

Positional plagiocephaly: the occiput is flattened on the left and the ipsilateral ear and forehead are pushed forward with a “parallelogram” look when viewed from above