

information statement

baby's head shape

To Reduce the Risk of Sudden Unexpected Deaths in Infancy (SUDI), including SIDS and Fatal Sleep Accidents

1. Sleep **baby on the back** from birth, not on the tummy or side
2. Sleep baby with **head and face uncovered**
3. Keep baby **smoke free** before birth and after
4. Provide a **safe sleeping environment** night and day
5. Sleep baby in their **own safe sleeping place** in the **same room as an adult care-giver** for the first six to twelve months
6. **Breastfeed** baby

The term Sudden Unexpected Death in Infancy (SUDI) is now used as this term refers to all cases of sudden and unexpected death in infancy and includes deaths from Sudden Infant Death Syndrome (SIDS) and fatal sleeping accidents. Safe sleeping recommendations target known risk factors associated with SUDI. Where studies specifically define the population as SIDS, this specific term will be used to describe the study findings.

Positional plagiocephaly describes a flattened spot on an infant's head. This can develop if a baby lies with their head in one position for long periods of time during the first months of life.

There are many strategies that parents can use to help reduce the risk of these flattened spots developing on their baby's head.

Tummy time from birth, when baby is awake and supervised, is one of the most effective strategies for reducing the risk of positional plagiocephaly.

When flattened spots develop, these are usually reversible and rarely need significant medical or surgical intervention¹. The most common treatment strategies are the same as the prevention strategies.

There is no evidence to suggest that plagiocephaly affects brain development.

key points

For the majority of children, plagiocephaly is preventable. The ways to prevent or treat plagiocephaly include:

- Always place baby to **sleep on the back**. Alternate baby's head position (left or right) when placed to sleep



- Do not place baby in the seated position for long periods
- From birth, offer baby increasing amounts of time playing on the tummy while **awake** and **watched** by an **adult**
- Alternate the holding position when feeding baby i.e. hold in left arm for one feed and the right arm for the next feed

The following presents a summary of the investigations and findings:

Flattened spots that develop on a baby's head, particularly to the side and back of the head, occur as a result of prolonged mechanical forces on the baby's rapidly growing skull. The term used to describe this type of misshapen head is positional plagiocephaly^{2,3}.

Plagiocephaly may occur before or during birth (e.g. breech position or multiple fetuses)²⁻⁴, although it tends to occur more often in the postnatal period, particularly if the baby has a positional preference (baby favours placing their head to one side) and/or the baby spends long periods of time with their head in a constant resting position²⁻⁵.

Positional plagiocephaly is a relatively common condition, with an estimated prevalence between 10-30%²⁻⁵. Studies^{2,5-9} have demonstrated that risk factors associated with the development of plagiocephaly after birth include:

- Male gender
- Prematurity
- First born babies
- Multiple births
- Positional preference (baby's head to one side during sleep/changing)
- Babies who have a difficult or assisted delivery (e.g. forceps or vacuum extraction)
- Limited neck rotation at birth
- Exclusive bottle feeding combined with positioning baby to same side for each feed
- Not enough supervised tummy time when awake: less than 3 episodes of tummy time per day
- Slow achievement of motor milestones
- More than 20 hours a day spent on the back. This includes both sleeping and waking time.

Positional plagiocephaly is more common in younger babies, with rates increasing from 6 weeks of age to a peak at 4 months^{2,3,5}. Providing that the baby does not constantly rest his or her head on the flattened area, the vast majority of babies with positional plagiocephaly improve spontaneously without any treatment as the baby gains head control and a full range of neck motion¹⁰⁻¹².

Currently there is no evidence to suggest that positional plagiocephaly affects the development of the baby's brain, although babies who have slow achievement of motor milestones are more likely to develop positional plagiocephaly due to reduced head and neck control^{2,12-14}.

For the very small number of babies who experience persistent and uncorrected positional plagiocephaly, uneven growth of the face and head may alter the baby's physical appearance and may cause problems with chewing or eating. Parent counselling and education, mechanical adjustments using positioning strategies, and physiotherapy are recommended.

In severe cases, where there is no improvement with usual care, some facilities offer parents helmet therapy where babies are required to wear specially designed helmets for a number of months in order to correct the deformity¹⁵⁻¹⁷. Currently there are few studies demonstrating the efficacy of helmet therapy, and there are considerable costs, inconvenience, possible complications and problems with compliance associated with their use^{3,15-18}.

For the majority of children, positional plagiocephaly is a preventable condition^{3,17}.

Studies have also demonstrated the baby's positional preference and infant care practices used by parents play a major role both preventing and treating the flattening of the back of the baby's head. These practices include frequent supervised tummy time from birth^{4,19}.

Tummy time, from birth, while awake and supervised, is very important for a baby's motor development¹⁴. This position helps the baby to strengthen arm shoulder and neck muscles and, in turn, this facilitates motor development. There is a current recommendation that babies have supervised awake tummy time starting with several minutes at least three times a day from birth, and increasing the length of the time as the baby develops strength in the neck, arms and shoulders²⁰.

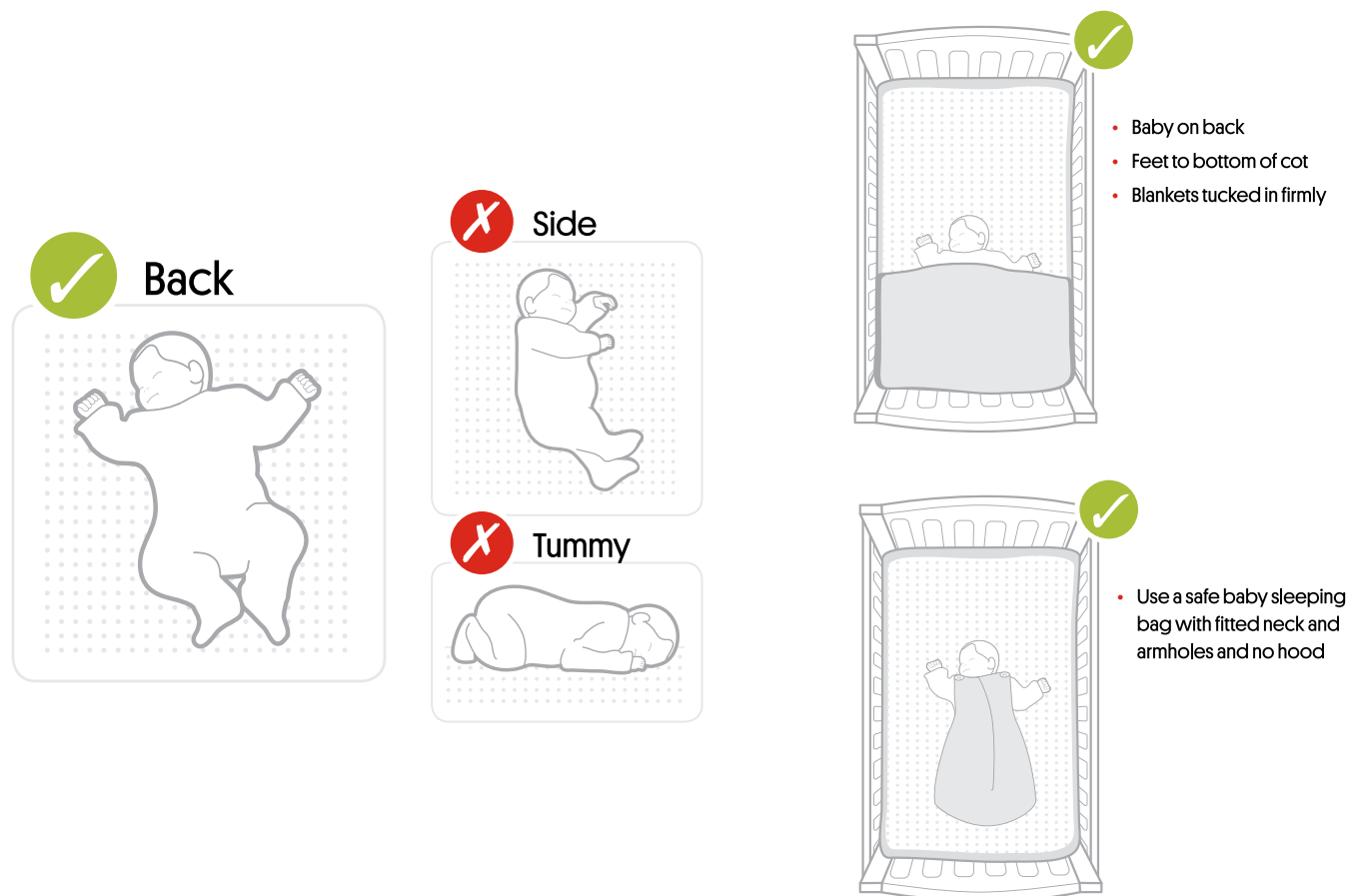
Positional plagiocephaly may be prevented or treated by simple repositioning techniques and by minimising pressure on the head when baby is awake^{3,4,18}. These following simple measures are most effective if implemented from birth. For most babies, regular repositioning of the baby's head before the baby is 4 months old will result in optimal outcomes^{2,3,10,17}.

Babies should be placed on their tummy to play several times per day, from birth, as tummy time is important for a baby's motor development and is one of the most effective strategies for reducing the risk of positional plagiocephaly. Tummy time should only occur when baby is awake and observed by an adult to ensure that the baby maintains a clear airway and does not fall asleep.

- Always **sleep** baby on the back, not on the tummy or side^{21,22}.
- Alternate the head position each time the baby is put down to sleep (left and right)^{3,18,23}.
- As babies become more alert and interested in the environment they like to look at certain objects before falling asleep, sleeping baby at alternate ends of the cot will encourage him or her to look in different directions. Changing the position of the cot in the room may also have the same effect.^{18,23}
- When the baby is awake, minimise the time that the baby spends lying down with pressure on the same part of the head by carrying and cuddling baby in upright positions, or use a sling^{2,3,6,18,23}.
- Avoid prolonged periods in car seats, strollers, swings and bouncers as this places additional pressure on the back of the head^{2,3,6,10,18}.
- From birth, give baby increasing amounts of side lying and tummy time to play^{2,3,10,18,23} on a firm surface when **awake** and being **observed** by an adult but never put baby on the side or tummy to sleep.
- Alternate the holding position when feeding baby i.e. hold in left arm for one feed and the right arm for the next feed^{2,3,6}.
- Devices that restrict the movement of a baby or the baby's head are not recommended^{17,22}.
- Do not use the side sleep position to prevent positional plagiocephaly. The side position is unstable and unsafe; the babies are at a greater risk of rolling on to the tummy^{21,22}.

A small number of babies may develop positional plagiocephaly as a result of tight muscles on one side of the neck, a condition known as torticollis or wryneck^{2,18,24,25}. These tight muscles can make it difficult for the baby to turn their head, so that the head rests in the same position^{2,18,24,26}.

If the baby has a strong preference for turning the head to one side, or has difficulty turning their head please consult a doctor or community child health nurse who can arrange for appropriate physiotherapy treatment and follow-up care for the baby^{2,12,18,24}.



In Australia, between 1990 and 2015 approximately 5,000 babies died suddenly and unexpectedly. Baby deaths attributed to SUDI have fallen by 8% and it is estimated that 9,/- infant lives have been saved as a result of the infant safe sleeping campaigns.

The Safe Sleeping program is based on strong scientific evidence, has been developed in consultation with major health authorities, SUDI researchers and paediatric experts in Australia and overseas, and meets the National Health & Medical Research Council rules for strong evidence.

For further information visit the Red Nose website at rednose.com.au or phone Red Nose on 1300 998 698.



references

1. Laughlin J, Luerssen TG, Dias MS, Committee on P, Ambulatory Medicine SoNS. Prevention and management of positional skull deformities in infants. *Pediatrics*. 2011;128(6):1236-41.
2. Bialocerkowski AE, Vladusic SL, Wei Ng C. Prevalence, risk factors, and natural history of positional plagiocephaly: a systematic review. *Developmental Medicine & Child Neurology*. 2008;50(8):577-86.
3. Bialocerkowski AE, Vladusic SL, Howell SM. Conservative interventions for positional plagiocephaly: a systematic review. *Developmental Medicine & Child Neurology*. 2005;47(8):563-70.
4. van Vlimmeren LA, van der Graaf Y, Boere-Boonekamp MM, L'Hoir MP, Helders PJ, Engelbert RH. Risk factors for deformational plagiocephaly at birth and at 7 weeks of age: a prospective cohort study. *Pediatrics*. 2007;119(2):e408-18.
5. Hutchison BL, Edwin AM, Thompson MD. Non-Synostotic Plagiocephaly and Brachycephaly: An Overview. *Current pediatric reviews*. 2006;2(1):33-9.
6. Hutchison BL, Thompson JMD, Mitchell EA. Determinants of Nonsynostotic Plagiocephaly: A Case-Control Study. *Pediatrics*. 2003;112(4):e316.
7. Hutchison BL, Hutchison LAD, Thompson JMD, Mitchell EA. Plagiocephaly and Brachycephaly in the First Two Years of Life: A Prospective Cohort Study. *Pediatrics*. 2004;114(4):970-80.
8. Lima D. The Management of Deformational Plagiocephaly: A Review of the Literature. *JPO: Journal of Prosthetics and Orthotics*. 2004;16(4):S9-S14.
9. McKinney CM, Cunningham ML, Holt VL, Leroux B, Starr JR. A case-control study of infant, maternal and perinatal characteristics associated with deformational plagiocephaly. *Paediatric and Perinatal Epidemiology*. 2009;23(4):332-45.
10. Persing J, James H, Swanson J, Kattwinkel J, American Academy of Pediatrics Committee on P, Ambulatory Medicine SoPS, et al. Prevention and management of positional skull deformities in infants. American Academy of Pediatrics Committee on Practice and Ambulatory Medicine, Section on Plastic Surgery and Section on Neurological Surgery. *Pediatrics*. 2003;112(1 Pt 1):199-202.
11. Peitsch WK, Keefer CH, LaBrie RA, Mulliken JB. Incidence of cranial asymmetry in healthy newborns. *Pediatrics*. 2002;110(6):e72.
12. Miller RI, Clarren SK. Long-term developmental outcomes in patients with deformational plagiocephaly. *Pediatrics*. 2000;105(2):E26.
13. Kordestani RK, Patel S, Bard DE, Gurwitch R, Panchal J. Neurodevelopmental delays in children with deformational plagiocephaly. *Plastic and Reconstructive Surgery*. 2006;117(1):207-18; discussion 19-20.
14. Majnemer A, Barr RG. Association between sleep position and early motor development. *The Journal of Pediatrics*. 2006;149(5):623-9.
15. Gill D, Walsh J. PLAGIOCEPHALY, BRACHYCEPHALY AND CRANIAL ORTHOTIC DEVICES: MISSHAPEN HEADS AND HELMETS. *Archives of Disease in Childhood*. 2008;93(9):805-7.
16. Singh A, Wacogne I. What Is the Role of Helmet Therapy in Positional Plagiocephaly? *Archives of Disease in Childhood*. 2008;93(9):807-9.
17. American Academy of Pediatrics Task Force on Sudden Infant Death S. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics*. 2005;116(5):1245-55.
18. Saeed NR, Wall SA, Dhariwal DK. Management of positional plagiocephaly. *Archives of Disease in Childhood*. 2008;93(1):82-4.
19. Cavalier A, Picot MC, Artiaga C, Mazurier E, Amilhau MO, Froye E, et al. Prevention of deformational plagiocephaly in neonates. *Early Hum Dev*. 2011;87(8):537-43.
20. Wittmeier K, Mulder K. Time to revisit tummy time: A commentary on plagiocephaly and development *Paediatrics and Child Health*. 2017;22 (3):159-61.

21. Mitchell EA. SIDS: facts and controversies. *The Medical Journal of Australia*. 2000;173(4):175-6.
22. Moon RY, Horne RS, Hauck FR. Sudden infant death syndrome. *The Lancet*. 2007;370(9598):1578-87.
23. Australian Physiotherapy Association. How to protect the head shape of your baby. In: Australian Physiotherapy Association, Endorsed by SIDS & Kids and Royal Children's Hospital, editors. *Pamphlet*. Melbourne 2005.
24. Golden KA, Beals SP, Littlefield TR, Pomatto JK. Sternocleidomastoid imbalance versus congenital muscular torticollis: their relationship to positional plagiocephaly. *The Cleft Palate-Craniofacial Journal: Official Publication of the American Cleft Palate-Craniofacial Association*. 1999;36(3):256-61.
25. Rogers GF. Deformational plagiocephaly, brachycephaly, and scaphocephaly. Part I: terminology, diagnosis, and etiopathogenesis. *J Craniofac Surg*. 2011;22(1):9-16.
26. Pogliani L, Cerini C, Vivaldo T, Duca P, Zuccotti GV. Deformational plagiocephaly at birth: an observational study on the role of assisted reproductive technologies. *J Matern Fetal Neonatal Med*. 2014;27(3):270-4.



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