

Childhood stroke

- Stroke is among the top ten causes of death in childhood with the highest mortality in the first 12 months of life.¹
- The incidence (number of new cases per year) of stroke is around 2 per 100,000-population.²
- Approximately one third of all cases occur in children less than one year of age.³
- Stroke affects between 1 in 2,300-5,000 newborns.⁴
- 50-85% of survivors of stroke will be left with long term problems which may include seizures, physical disability, speech or learning difficulties.⁵
- 20-40% of children have recurrent strokes.⁶
- The burden of stroke in children is likely to be greater than in adults because children surviving stroke will have more years living with functional limitations and disability.
- A prospective web based stroke registry has been set up by the International Paediatric Stroke Study Group (IPSSG) to provide important information about the incidence, treatment and outcomes of childhood stroke. Australian centres are involved in this collaboration. For example, the Royal Children's Hospital in Melbourne is one of the largest contributors to the registry with 130 children enrolled since August 2002 (about 30-40 children per year with newly diagnosed stroke).⁷

¹ US Department of Health & Human Services, Centre for Disease Control & Prevention and National Center for Health Statistics: Health Data for All Ages (HDAA). Mortality by cause, child and adolescent: US/state, 2000-2005. <http://205.207.175.93/HDAA/TableViewer/tableView.aspx?ReportId=274>

² Roach ES et al. Management of Stroke in Infants and Children. A Scientific Statement From a Special Writing Group of the American Heart Association Stroke Council and the Council on Cardiovascular Disease in the Young. *Stroke*. 2008;39:2644-2691.

³ Golomb MR et al Male Predominance in Childhood Ischemic Stroke: Findings from the International Pediatric Stroke Study. *Stroke* 2008. Published online prior to print, Sept 11, 2008. It can also be downloaded from: <http://stroke.ahajournals.org/cgi/content/abstract/STROKEAHA.108.521203v1>

⁴ Schulzke S, Weber P, Luetsch J, Fahnenstich H. Incidence and diagnosis of unilateral arterial cerebral infarction in newborn infants. *J Perinat Med*. 2005; 33: 170–175; and Lee J, Croen LA, Backstrand KH, Yoshida CK, Henning LH, Lindan C, Ferriero DM, Fullerton HJ, Barkovich AJ, Wu YW. Maternal and infant characteristics associated with perinatal arterial stroke in the newborn. *JAMA*. 2005; 293: 723–729.

⁵ Ganesan V et al. Outcome after ischaemic stroke in childhood. *Dev Med Child Neurol* 2000;455-61.

⁶ deVeber G, and the Canadian Paediatric Ischemic Stroke Study Group. Canadian Paediatric Ischemic Stroke Registry: Analysis of children with arterial ischemic stroke. *Ann Neurol* 2000;48(3):526. See also Fullerton H et al *Pediatrics* 2007;119:495-501

⁷ <https://app3.ccb.sickkids.ca/cstrokestudy/other/studyInfo.jsp>

- The causes and outcomes of childhood stroke are poorly understood, with little published research. However emerging data from the International paediatric stroke registry suggests that one half of the cases are due to blood vessel problems in the brain and one quarter due to clots travelling from the heart but no cause can be found in another one quarter of children.⁶
- The cause of stroke in newborns is usually unknown. Risk factors include pregnancy complications, difficulties at birth, blood clotting disorders and heart problems.⁸
- The optimal acute management of childhood stroke is unknown with treatment recommendations extrapolated from adults. However children do not have hardening of the arteries (atherosclerosis) or risk factors like smoking, high blood pressure and diabetes, conditions that are known to cause stroke in adults.
- Little is also known about the secondary prevention of childhood stroke.

The key issues for children and their families include:

- Lack of awareness amongst the community and primary care doctors about childhood stroke.
- Lack of understanding about the causes of stroke.
- Delayed recognition of stroke in children. The median time from onset of pediatric ischaemic stroke to diagnosis is over 22 hours⁹ limiting the ability to use treatments to dissolve clots in the brain.
- Limited evidence about the best form of treatment to prevent further strokes.
- Most parents are devastated by the news their child has had a stroke. There is also a lack of support services for families of parents caring for children with stroke.

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For more visit www.strokefoundation.org.au

⁸ Nelson KB. Perinatal ischemic stroke. Stroke 2007;38:742-745

⁹ Rafay MF, Pontigon AM, Chiang J, Adams M, Jarvis DA, Silver F, Macgregor D, Deveber GA. Delay to Diagnosis in Acute Pediatric Arterial Ischemic Stroke. Stroke. 2008 Sep 18. [Epub ahead of print]