

Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
ANZCA PS07. (2017). Guidelines for Pre-Anaesthetic Consultation and Patient Preparation. From: <a href="http://www.anzca.edu.au/documents/ps07-2008-recommendations-for-the-pre-anaesthesia.pdf">http://www.anzca.edu.au/documents/ps07-2008-recommendations-for-the-pre-anaesthesia.pdf</a>	VII	<ul style="list-style-type: none"> <li>• Pre-operative anaesthetic consultations to identify potential risk factors for patients.</li> <li>• Allows for anaesthetist to identify those who are at risk of postoperative apnoeas.</li> <li>• Enables anaesthetist to determine the type of anaesthetic to be performed to help prevent apnoeas from occurring.</li> </ul>
ANZCA PS29. (2019). Guideline for the Provision of Anaesthesia Care to Children. From: <a href="http://www.anzca.edu.au/documents/ps29-2008-statement-on-anaesthesia-care-of-children.pdf">http://www.anzca.edu.au/documents/ps29-2008-statement-on-anaesthesia-care-of-children.pdf</a>	VII	<ul style="list-style-type: none"> <li>• Definitions of neonate, postmenstrual age and premature infant.</li> <li>• Ex-premature infants at risk of post-operative apnoea should not be discharged the same day unless they are medically fit and have reached a postmenstrual age of 54 weeks.</li> <li>• Term infants should not be considered for same day discharge unless they are medically fit and have reached a postmenstrual age of 46 weeks.</li> <li>• Risks should be discussed with parents.</li> </ul>

<p>ANZCA PS29BP. (2019). Guideline for the Provision of Anaesthesia Care to Children Background Paper. From: <a href="http://www.anzca.edu.au/documents/ps29bp-guideline-for-the-provision-of-anaesthesia.pdf">http://www.anzca.edu.au/documents/ps29bp-guideline-for-the-provision-of-anaesthesia.pdf</a></p>	<p>VII</p>	<ul style="list-style-type: none"> <li>• Explanation of terms and definition of postmenstrual age (PMA)</li> <li>• Neonates and ex-premature infants are noted to significantly have a higher risk of mortality or morbidity.</li> <li>• Significance of apnoea</li> <li>• Pre-operative risk factors for postoperative apnoea</li> <li>• Most post-operative apnoeas occur within the first 2 hours however can occur up to 12 hours post operatively.</li> <li>• Healthy ex-premature infants who have reached a postmenstrual age of 60 weeks can be sent home with standard discharge care.</li> <li>• Between 46-60 weeks PMA there is no consensus as to whether infants need to stay for overnight monitoring.</li> </ul>
<p>Cote, C, J., Zaslavsky, A., Downes, J, J., Kurth, C, D., Welborn, L, G., Warner, L, O., &amp; Malviya, S, V. (1995). Postoperative apnea in former pre-term infants after inguinal herniorrhaphy, A combined analysis. <i>Anaesthesiology</i>. 82: 809-822</p>	<p>V</p>	<ul style="list-style-type: none"> <li>• Showed that in ex-premature infants born at 35 weeks, the risk of post-operative apnoea did not fall to 1% or less until the infants reached a postmenstrual age of 54 weeks.</li> <li>• In ex-premature infants born at 32 weeks, the risk of apnoea did not fall to 1% or less until the infant reached 56 weeks gestation.</li> <li>• Apnoea in otherwise well ex-premature infants has been reported as late as 54 weeks postmenstrual age.</li> <li>• Full term infants born &gt;37 weeks gestation may develop apnoea after general anaesthesia or sedation as there have been reports of term infants up to 45 weeks postmenstrual age having apnoeas in the post-operative period.</li> </ul>

<p>Davidson, A, J., Morton, N, S., Arnup, S, J., De Graaff, J, C., Disma, N., Withington, D, E., Frawley, G., et al. (2015). Apnoea After Awake Regional and General Anaesthesia in Infants: The General Anaesthesia Compared to Spinal Anaesthesia Study – Comparing Apnea and Neurodevelopmental Outcomes, a Randomized Control Trial. <i>Anaesthesiology</i>. 123(1). 38-54.</p>	<p>II</p>	<ul style="list-style-type: none"> <li>• Early apnoea (0-30 minutes) was lower when using reginal anaesthesia.</li> <li>• The incidence of late apnoea (30 min – 12 hours) was equal in patients who received reginal and general anaesthesia.</li> <li>• The strongest predictor of apnoea was prematurity.</li> <li>• 96% of infants with apnoea were premature.</li> <li>• Cardiorespiratory monitoring should be used in all ex-premature infants in the postoperative period.</li> </ul>
<p>Disma, N., Clunies-Ross, N., &amp; Chalkiadis, G. (2018). Is Spinal Anaesthesia in Young Infants Really Safter and Better than General Anaesthesia? <i>Current Opinion in Anaesthesiology</i> 31(3). 302-307.</p>	<p>II</p>	<ul style="list-style-type: none"> <li>• Compared to general anaesthesia, spinal anaesthesia had less haemodynamic instability and less early (&lt;30 min) apnoeas in neonates.</li> <li>• Overall incidence of apnoeas in the first 12 hours postoperatively was similar between both general and spinal anaesthesia.</li> <li>• Spinal anaesthesia is a suitable alternative to general anaesthesia in neonates and infants undergoing minor surgery that avoids the need for intubation and ventilation.</li> <li>• Spinal anaesthesia has some advantages however has a significant failure rate and has not demonstrated to improve neurodevelopmental outcome.</li> </ul>
<p>Engle, W, A. (2004). American Academy of Paediatrics Committee on Fetus and Newborn. Age and Terminology During the Perinatal Period. <i>Paediatrics</i>. 114. 1362-1364.</p>	<p>VII</p>	<ul style="list-style-type: none"> <li>• Consistent definitions to describe length of gestation and age in neonates are needed to compare neurodevelopment, medical and growth outcomes.</li> <li>• Standard terminology and definitions on gestational age, postmenstrual age, chronological age, conceptual age, corrected age, adjusted age and estimated date of delivery.</li> </ul>

<p>Jones, L, J., Craven, P, D., Lakkundi, A., Foster, J, P., &amp; Baldawi, N. (2015). Regional (spinal, epidural, caudal) Versus General Anaesthesia in Preterm Infants Undergoing Inguinal Herniorrhaphy in Early Infancy. <i>The Cochrane Database of Systematic Reviews</i>. 9. DOI: 10.1002/14651858.CD003669.pub2</p>	<p>I</p>	<ul style="list-style-type: none"> <li>• Administration of spinal anaesthesia without sedative administration may reduce the risk of postoperative apnoea by 47% in preterm infants.</li> <li>• For ever 4 infants treated with spinal anaesthesia, one may be prevented from having a postoperative apnoea.</li> <li>• In infants without pre-operative apnoea, there is low-quality evidence that spinal rather than general anaesthesia may reduce risk of postoperative apnoea by 66%.</li> <li>• There was no difference in the effect of spinal compared to general anaesthesia on the overall incidence of postoperative apnoea, bradycardia, oxygen desaturation, need for postoperative analgesics or respiratory support.</li> <li>• The effect of newer, rapidly acting, quickly metabolised general anaesthetic agents on safely with regard to the risk of postoperative apnoea and neurotoxic exposure has not so far been established in randomised trials.</li> </ul>
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<p>Sale, S, M. (2010). Neonatal Apnoea. <i>Best Practice &amp; Research Clinical Anaesthesiology</i>. 24. 323-336. DOI: 10.1016/j.bpa.2010.04.002</p>	<p>v</p>	<ul style="list-style-type: none"> <li>• Premature infants have immature respiratory control that predisposes them to apnoea, haemoglobin oxygen desaturation and bradycardia.</li> <li>• Classification of apnoea.</li> <li>• Less soluble volatile agents and regional anaesthetic techniques are associated with lower incidence of postoperative apnoea.</li> <li>• Use of cardiorespiratory monitoring to monitor for apnoeas.</li> <li>• Treatment of apnoea, tactile stimulation is first response however if ongoing apnoea may need invasive interventions such as positive pressure ventilation.</li> <li>• Opioid should be avoided in the postoperative period for neonates as this can also cause apnoeas.</li> <li>• Pre-operative assessment and considerations.</li> <li>• Appropriate discharge for infants &lt;60 weeks must be dictated by the infants risk factors for apnoea.</li> <li>• The greatest risk of apnoea is in the immediate recovery period with risk of apnoea returning to preoperative risk 12 hours postoperatively.</li> <li>• High risk infants will need overnight monitoring.</li> </ul>
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