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Neonatal resuscitation: Evolving strategies

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Birth asphyxia accounts for about 23% of the approximately 4 million neonatal deaths each year worldwide (Black et al, Lancet, 2010, 375(9730):1969-87). The majority of newborn infants require little assistance to undergo physiologic transition at birth and adapt to extrauterine life. Approximately 10% of infants require some assistance to establish regular respirations at birth. Less than 1% need extensive resuscitative measures such as chest compressions and approximately 0.06% require epinephrine (Wyllie et al, Resuscitation, 2010, 81. Transition at birth is mediated by significant changes in circulatory and respiratory physiology. Ongoing research in the field of neonatal resuscitation has expanded our understanding of neonatal physiology enabling the implementation of improved recommendations and guidelines on how to best approach newborns in need for intervention at birth. Many of these recommendations are extrapolated from animal models and clinical trials in adults. There are many outstanding controversial issues in neonatal resuscitation that need to be addressed. This article provides a comprehensive and critical literature review on the most relevant and current research pertaining to evolving new strategies in neonatal resuscitation. The key elements to a successful neonatal resuscitation include ventilation of the lungs while minimizing injury, the judicious use of oxygen to improve pulmonary blood flow, circulatory support with chest compressions, and vasopressors and volume that would hasten return of spontaneous circulation. Several exciting new avenues in neonatal resuscitation such as delayed cord clamping, sustained inflation breaths, and alternate vasopressor agents are briefly discussed. Finally, efforts to improve resuscitative efforts in developing countries through education of basic steps of neonatal resuscitation are likely to decrease birth asphyxia and neonatal mortality.

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