New Neonatal Resuscitation Program guidelines

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The International Guidelines 2000 Conference on Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC) formulated new evidence-based recommendations for neonatal resuscitation. These guidelines comprehensively update the last recommendations, published in 1992. These new guidelines are the result of 2 years' work by the American Neonatal Resuscitation Program (NRP) Steering Committee with input from Canada through the National NRP Committee.

The 2000 guidelines are as evidence based as possible and represent a substantial improvement over previous guidelines. The neonatal resuscitation manual has been completely rewritten and now includes an excellent CD-ROM that shows actual resuscitations. This manual is now available through the Heart and Stroke Foundation of Canada (manual including CD-ROM costs $60); an instructors manual will be available soon.

The new recommendations are designed to simplify resuscitation procedures and help doctors remember the principles and routines of resuscitation. Important changes in recommended routines are listed below.

Chest compressions

"Compressions should be administered if the heart rate is absent or remains less than 60 beats per minute despite adequate assisted ventilation for 30 seconds." The rationale behind this is to eliminate confusion surrounding the previous recommendation for heart rates between 60 and 80 (rising or not). Although both the two-thumb and two-finger methods are acceptable, the two-thumb method is now preferable because it allows better compression of the heart between the spine and the sternum. Depth of compression should be one third the anterior-posterior diameter of the chest. Palpation of the umbilical cord is recommended to ensure a pulse is generated.

Meconium-stained amniotic fluid

The new guidelines recognize that some infants with meconium staining do not need tracheal suctioning. Active, vigorous infants can well protect their airways, but a newly born infant with absent or depressed respiration, a heart rate <100 beats per minute, or poor muscle tone should have direct tracheal suction to remove meconium from the airway. Suctioning at the perineum remains an important part of managing any infant born in the presence of meconium-stained amniotic fluid.

Thermoregulation

Newborn infants should be kept warm, but not too warm. Recent animal and human studies suggest that selective cerebral hypothermia might protect against brain injury in asphyxiated infants, but controlled human studies are needed before any further recommendations can be made.

Suctioning

Routine suctioning of newborn infants is no longer necessary, either at the perineum or as part of the initial steps, unless they have mucus in the oropharynx.

Oxygenation and ventilation

For assisted ventilation, 100% oxygen is recommended. If 100% oxygen is unavailable, it is always better to start ventilation with room air until 100% oxygen can be obtained. Laryngeal mask airways are recommended, but only when bag-mask ventilation is ineffective or attempts at intubation have failed. Laryngeal mask airways are unlikely to have much place in delivery rooms in the near future in Canada.

Medications, vascular access, and volume expansion

"Epinephrine at a dose of 0.01 to 0.03 mg/kg should be administered if the heart rate remains <60 beats per minute

after a minimum of 30 seconds of adequate ventilation and chest compressions." Normal saline (an isotonic crystalloid solution) or O-negative red blood cells should be used for emergency volume expansion. Albumin-containing solutions are no longer the fluid of choice for initial volume expansion because of concerns about transmission of infectious agents and the reduced availability of albumin. The umbilical vein remains the best route for intravenous medication or volume expansion.

Ethics

The new recommendations contain a chapter on the ethics of neonatal resuscitation. The guidelines now recognize that there are situations where non-initiation or discontinuation of resuscitation is appropriate. There was debate at the conference over the length of time resuscitation should be continued in the absence of a heart rate. The new guidelines suggest that, if there is no heart rate after 15 minutes, "discontinuation of resuscitation efforts may be appropriate." Current data suggest, however, that resuscitation of newborns after 10 minutes of asystole is unlikely to result in survival without severe disability. Practices in this area vary widely across Canada.

The National NRP Committee has recommended that all physicians in Canada follow these new guidelines for newborn resuscitations as soon as possible. All NRP courses from now on should be taught using the new materials.

Resources

The following websites contain information relevant to the NRP program: **www.aap.org/NRP**, **www.currentsonline.com**, and **www.nrp.mb.ca** (a Canadian site).

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