

Task Force Insights

The heart rate threshold of <60 bpm was originally selected on the basis of expert opinion and a desire to simplify the resuscitation algorithm. The ScopRev provided no data sufficient to alter the existing recommendation, but the optimal threshold and whether it differs for different subgroups of infants remain unknown.

Treatment Recommendations

ILCOR has not developed an evidence-based treatment recommendation for heart rate threshold to initiate chest compressions previously. However, ILCOR guidance since 1999 has been to initiate chest compressions if the heart rate is <60 bpm despite adequate assisted ventilation for 60 seconds.²⁹⁹ Insufficient evidence was found in the ScopRev to support a new SysRev or a different recommendation.

Supplemental Oxygen During Chest Compressions (ScopRev)**Rationale for Review**

A 2015 ILCOR SysRev examined evidence for 100% O₂ as the ventilation gas during chest compressions compared with lower concentrations of O₂ and concluded that there were no human data to inform this question.²²¹ Surveillance of resuscitation literature suggested that there may be more recent studies, including indirect evidence from animal models. A ScopRev was initiated from a priority list from the ILCOR NLS Task Force.³⁰⁰ See the ILCOR website for the full online CoSTR.³⁰³

PICOST

- Population: Newborn infants immediately after birth who received chest compressions
- Intervention: Any lower concentrations of O₂
- Comparators: 100% O₂ as the ventilation gas
- Outcomes:
 - Critical: Survival, neurological outcomes
 - Important: Any other reported short- or long-term outcomes, including time to ROSC
- Study designs: RCTs, nonrandomized studies (non-RCTs, interrupted time series, controlled before-and-after studies, cohort studies), and case series were eligible for inclusion. Manikin, computer model and animal studies were also eligible for inclusion. Conference abstracts and unpublished studies (eg, trial protocols) were excluded.
- Time frame: All years and all languages were included as long as there was an English abstract. The literature search was updated to November 22, 2021.

Summary of Evidence

No human studies that compared any other oxygen concentration with 100% O₂ during chest compressions were identified. Six animal studies comparing 21% with

100% inspired O₂ concentrations during chest compressions after asphyxial cardiac arrest were identified. Overall, they found no differences in time to ROSC, mortality, inflammation, or oxidative stress.^{304–309} Further description is included in the full online CoSTR.³⁰³

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The available evidence from animal studies suggests that resuscitation using 21% O₂ during chest compressions is feasible and results in similar short-term outcomes. However, the animal studies examined only asphyxia-induced asystole of brief duration in animals lacking other underlying pathological conditions, and there are no human infant data. The available evidence was insufficient to warrant a new SysRev or to suggest the need to alter the current treatment recommendation.

Treatment Recommendations

The 2015 good practice statement remains unchanged:

Despite animal evidence showing no advantage to the use of 100% oxygen, by the time resuscitation of a newborn infant has reached the stage of chest compressions, the steps of trying to achieve ROSC using effective ventilation with low-concentration oxygen should have been attempted. Thus, it would seem prudent to try increasing the supplementary oxygen concentration (good practice statement).²²¹

Neonatal Chest Compression Technique (Other Techniques Versus 2-Thumb Technique; ScopRev)**Rationale for Review**

A 2015 ILCOR SysRev examined evidence for a 2-thumb technique compared with a 2-finger technique for neonatal chest compressions and recommended a 2-thumb technique on the basis of very low-certainty evidence from nonrandomized studies and a single manikin study.²²¹ Surveillance of resuscitation literature identified more recent studies examining other techniques. A ScopRev was initiated from a priority list from the ILCOR NLS Task Force and has been published.³⁰⁰ See the ILCOR website for the full online CoSTR.³¹⁰

PICOST

- Population: Newborn infants immediately after birth who received chest compressions
- Intervention: Use of any other technique (2-finger or other technique) for chest compressions
- Comparator: 2-thumb technique for chest compressions
- Outcomes:
 - Critical: Survival and neurological outcomes
 - Important: Any other reported short- or long-term outcomes, including time to ROSC
- Study designs: RCTs, nonrandomized studies (non-RCTs, interrupted time series, controlled