**Writing Group Response**

We appreciate the insightful question provided by Drs. Ozcifci and Durak in response to the 2025 Pediatric Advanced Life Support Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. The authors identify an important area for clarification regarding the minimum atropine dose for bradycardia with cardiopulmonary compromise due to increased vagal tone or atrioventricular block (0.1 mg minimum; 0.02 mg/kg standard dose) versus no minimum dose (0.02 mg/kg standard dose) as a premedication for endotracheal intubation.

With regards to the utilization of atropine as a premedication for emergency intubation, the evidence has largely been observational, including extrapolation from experience with elective intubation in the operating theatre. As the authors correctly identify, prior PALS recommendations advised that the minimum dose of atropine should be 0.1 mg for infants < 10kg to avoid paradoxical bradycardia observed with smaller doses. These recommendations were based on a 1971 study of 79 patients undergoing elective surgery, of whom 5 participants were between 6 weeks and 3 years of age.[1] These infants and children had small and statistically insignificant decreases in heart rate after receiving doses of atropine ranging from 0.0018 to 0.0036 mg/kg (approximately 10% to 20% of the recommended dose) for atropine as a pretreatment for intubation. In 2015, a prospective, observational study of 60 infants <15 kg undergoing elective surgery who all received <0.1 mg of atropine before intubation found that no patient experienced paradoxical bradycardia or arrhythmias.[2] Based on these new data, the minimum dose for premedication for emergency intubation was removed from the 2015 guidelines.

The recommendation to administer atropine to patients with bradycardia with cardiopulmonary compromise due to increased vagal tone or atrioventricular block has remained unchanged since 2005 when guidelines stated "If bradycardia is due to vagal stimulation, give atropine (Class I)." Box 6: First dose: 0.02 mg/kg, may repeat (minimum dose: 0.1mg…). In the absence of evidence to support the efficacy of doses <0.1 mg for this indication, the writing groups have felt they could not remove minimum dosing for bradycardia with cardiopulmonary compromise because of the risk of not effectively reversing bradycardia during acute decompensation.

We do not anticipate future dose standardization across clinical indications given the lack of current available evidence in the literature. However, should data be published which supports the use of atropine doses < 0.1 mg for bradycardia with cardiopulmonary compromise, current recommendations may be revised.

Sincerely yours,

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References

1. Dauchot P, Gravenstein JS. Effects of atropine on the electrocardiogram in different age groups. *Clin Pharmacol Ther*. 1971;12:274-280. doi: 10.1002/cpt1971122part1274
2. Eisa L, Passi Y, Lerman J, Raczka M, Heard C. Do small doses of atropine (<0.1 mg) cause bradycardia in young children? *Arch Dis Child*. 2015;100:684-688. doi: 10.1136/archdischild-2014-307868

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