



Advisory 17-06 Pediatric BVM Use

To: Agency Leadership

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Date: September 12, 2017

Effective ventilation is extremely important when treating our critically ill patients. While assisting ventilations, both hyperventilation (too fast) and overventilation (too much) have dramatic negative consequences. Hyperventilation can be controlled by decreasing the rate of ventilations to 6-10 per minute in an adult and closely monitoring capnography with a goal EtCO₂ of 35-45 mmHg in the non-arrest patient. Overventilation is harder to control as providers will often inadvertently provide a large amount of volume under high pressure with each ventilation. This results in increased intrathoracic pressure, gastric distention, and the potential for aspiration while decreasing cardiac output and blood pressure.

Ventilation should be performed using a volume of 6-7 ml/kg of ideal body weight (which is based on the patient's height). Thus an adult should receive between 400-600 ml of volume per ventilation regardless of their total body weight. Unfortunately, adult BVM's have a volume of 1000 ml or more, making the system design such that we are giving a tool to our providers that is prone to result in overventilation. An engineering solution to this problem is to use a pediatric BVM which has a volume of approximately 550 ml. By using a pediatric BVM we are far less likely to overventilate with too much volume, and with careful practice, ventilate at a rate of 6-10 per minute to decrease the risk of hyperventilation.

An important study done by Siegler and et al, published this year in Prehospital Emergency Care found that providers using pediatric BVMs more frequently delivered the appropriate lung protective volumes. Given this evidence, in consultation with their Medical Director, agencies may choose to use pediatric BVM's for all adults requiring ventilation. As Part 800 requires that an ambulance carry an adult BVM, an adult BVM must remain on an ambulance; however this requirement does not extend to first response fire departments who are not required to carry the items outlined in Part 800.

This change may aid in providing lung-protective ventilation and decrease the risk of overventilation. Certainly, adult BVM's may continue to be utilized, but attention should be paid to the volume of air being delivered. For pediatric patients they should continue to be ventilated using a pediatric BVM, however extreme care should be used to assure only a volume necessary to achieve chest rise is used. This Advisory authorizes this practice within the region, but in no way requires it. The decision to do so is ultimately under the purview of the agency Medical Director.

With any questions, please do not hesitate to contact our office.

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