

## “To Intubate or not to Intubate, is that the question”? Why Controlled Ventilation with a Bag-Valve Device is Better in the Pre-hospital Environment

Recent research has brought into question pre-hospital emergency intubation and ALS care in general. Discussing the research and theorizing the “whys” of the results should help all EMS providers to create the best possible environment of care. Pre-hospital cardiac arrest survival rates are highest in those cities that have the lowest number of paramedics per population. At the extreme, this could be interpreted to mean that certain ALS interventions somehow worsen patients’ chances of survival. With the exception of defibrillation, very little research has been done that demonstrates improved outcomes from specific ALS interventions (e.g. intubation, IVs, IV medications). It has been, rightly or wrongly, assumed that these interventions are beneficial, but are we sure?

One sub-study of the Ontario Pre-hospital Advanced Life Support Study (OPALS) looked at pre-hospital cardiac arrest and found that patients did no better when treated by ALS providers than they did when treated by a rapid first response (non-ALS) system with AEDs. In fact, there was a trend for them doing worse. Well-performed CPR in conjunction with defibrillation is associated with a 400% increase in survival from cardiac arrest. ANYTHING that interrupts CPR (intubation, starting IV’s, pausing to analyze a rhythm, etc.) will decrease that number. So even if the interventions improve survival by, say 50%, interrupting CPR is so bad that the improvement will never be seen.

Focusing on airway management, there are a number of studies demonstrating that pre-hospital providers CAN perform endotracheal intubation. Only recently, however, has the attention turned to the question of “does it make a difference.”

In the realm of pre-hospital airway management, the focus has been on trauma. A large “all comers” trauma study at Hopkins, patients matched for severity who were intubated pre-hospitally did worse than patients intubated on ED arrival. The same result was found by Wang et al in Pittsburgh when they looked at non-lethally head injured patients. Both

the Gausche pediatric study and the San Diego rapid sequence intubation trial found a trend towards worse outcomes in patients intubated in the pre-hospital environment. So why do patients do worse?

When intubating a patient in the ED, there is a team of three to five people maximizing the chances of success. There is a bed that can be adjusted, two suction systems (both working), good lighting and you have someone watching the cardiac monitor and pulse-ox. You have maximum control of the environment.

When you intubate a patient in the field, it’s usually you and a partner, maybe a third provider if you are doing first response. The suction will always fail right when you need it, the lighting is terrible, you are sitting in mud, and it’s raining. The monitors won’t pick up and the battery will die. If the patient vomits, he will likely aspirate. You have minimum control over the environment and the patient is always crashing. In other words, while you may be great at intubating patients, the pre-hospital environment itself puts the patient at significant risk for a bad outcome.

### What does all this mean?

**Focus on good CPR.** If you are oxygenating and ventilating a patient, don’t interrupt compressions for intubation. If you can place an LMA or Combitube without interrupting CPR, consider doing so. Interrupt CPR as little as possible for your rhythm interpretations.

**Consider your environment** Do your procedures put the patient at increased risk? Do you have enough people to do an intubation? Is your patient at risk for hypoxia and aspiration?

**More and better research is needed in the pre-hospital environment.** Access journals, on-line research, and meetings to find out what the current best evidence is. Participate in studies. Most of all, always question what you are doing and keep an open mind.

*Note: This article is reproduced in part from an original article by Jonnathan Busko MD written for O-Two Medical Technologies Inc.*