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## Articles

### **“To Intubate or not to Intubate, that is the question”.**

Recent research and an article in the popular press (Bob Davis in USA Today: "Inverse Lifesaving Function") have begun to call into question intubation and ALS care in general. Discussing the research and theorizing the "whys" of the results should help us all as EMS providers to create the best possible environment of care. The article published in USA Today observed that pre-hospital cardiac arrest survival rates are highest in those cities that have the lowest number of paramedics per population<sup>1</sup>. 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). We have always assumed that these interventions are beneficial, but are we sure? The only way to know is to do research.

The Ontario Pre-hospital Advanced Life Support Study (OPALS) is the largest and most definitive trial on the impact of ALS care. One sub-study looking at pre-hospital cardiac arrest<sup>2</sup> 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. Why is that? A discussion at the 2005 National Association of EMS Physicians annual meeting<sup>3</sup> suggested an answer. 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<sup>4</sup>, 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<sup>5</sup> in Pittsburgh when they looked at non-lethally head injured patients. Both the Gausche pediatric study<sup>6</sup> and the San Diego rapid sequence intubation trial<sup>7,8</sup> 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 3-5 people maximizing the chances of success. There is a bed that can be adjusted, 2 suction systems (both working), good lighting, no rain, and you are not upside down in a ditch. 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.

This is only one explanation. But the San Diego RSI trial did note that patients had significant periods of hypoxia and associated hemodynamic instability<sup>8</sup> during their RSI. I suspect this does not reflect on the procedures or the providers but rather the environment in which we work.

**What does all this mean?**

- A) We need to 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.
- B) Consider your environment and whether 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?
- C) We need more and better research about what we're doing 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.

## References

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