



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

Ok, I know I promised that we'd talk about making your first intubation attempt your best attempt, but some 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 prehospital cardiac arrest survival rates are highest in those cities that have the lowest number of paramedics per population <1>. 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 Prehospital Advanced Life Support Study (OPALS) is the largest and most definitive trial on the impact of ALS care. One substudy looking at prehospital cardiac arrest <2> 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 <3> suggests 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 prehospital 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 prehospital airway management, the focus has been on trauma. A large "all comers" trauma study at Hopkins <4>, patients matched for severity who were intubated prehospitally did worse than patients intubated on ED arrival. The same result was found by Wang et al <5> in Pittsburgh when they looked at non-lethally head injured patients. Both the Gausche pediatric study <6> and the San Diego rapid sequence intubation trial <7,8> found a trend towards worse outcomes in patients intubated prehospitally. So why do patients do worse?

When I intubate a patient in the ED, I have a team of 3-5 people with me maximizing my chances of success. I have a bed I can adjust, 2 suction systems (both working), good lighting, no rain, and I'm not upside down in a ditch. I have someone watching my cardiac monitor and pulse-ox. I have maximum control of the environment.

When I intubate a patient in the field, it's usually me and a partner, maybe a third provider if I'm doing first response, my suction will always fail right when I need it, the lighting is terrible, I'm sitting in mud, and it's raining. My monitors won't pick up and my battery will die. If the patient vomits, he will likely aspirate. I have minimum control over the environment and the patient is always crashing. In other words, while you may be great at intubating patients, the prehospital 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 <8> 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 prehospital 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.

I'll be back in a month to talk about positioning and making your first attempt your best attempt. As always, please send your thoughts, comments, suggestions and solutions to streetsense@otwo.com.

Always remember, it's not YOUR emergency. Stay safe.

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- 2) Stiell IG, Wells GA, Field B, Spaite DW, et al. Advanced Cardiac Life Support in Out-of-Hospital Cardiac Arrest. NEJM,2004;351:647-656
- 3) Spaite D. OPALS—All we now know. C.J. Shanaberger Memorial Lecture and Keynote Address. NAEMSP 2005 Annual Meeting; Jan 14, 2005. Naples, FL.
- 4) Bochicchio GV, Ilahi O, Joshi M, Bochicchio K, et al. Endotracheal intubation in the field does not improve outcome in trauma patients who present without an acutely lethal traumatic brain injury. J Trauma 2003;54:307-311.
- 5) Wang HE, Peitzman AB, Cassidy LD, Adleson PD, Yealy DM. Out-of-hospital endotracheal intubation and outcome after traumatic brain injury. Annals Emerg Med 2005;44:439-450.
- 6) Gausche M, Lewis RJ, Stratton SJ, Haynes BE et al. Effect of out-of-hospital pediatric endotracheal intubation on survival and neurological outcome: a controlled clinical trial. JAMA 2000;283:783-90.
- 7) Ochs M, Davis D, Hoyt D, Bailey D, et al. Paramedic-performed rapid sequence intubation of patients with sever head injuries. Annals Emerg Med 2002;40:159-67.
- 8) Davis DP, Hoyt DB, Ochs M, Fortiage D et al. The effect of paramedic rapid sequence intubation on outcome in patients with severe traumatic brain injury. J. Trauma 2003;54:444-453