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**Prehospital Intubations Are Associated With Elevated Cuff Pressures:  
A Cross-Sectional Study Characterizing ETT Cuff Pressures at the UMMMC University  
Emergency Department**

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**Background:** Emergency medical services (EMS) providers are trained to place endotracheal tubes (ETT) in the field when indicated. ETT cuffs are traditionally inflated with 10cc of air to provide adequate seal against the tracheal lumen. There is relatively extensive literature suggesting that many ETTs are inflated well beyond the accepted safe pressures of 20-30cmH<sub>2</sub>O, leading to potential complications including ischemia, necrosis, scarring, and stenosis of the tracheal wall. EMS providers in our system currently do not check ETT cuff pressures and UMass Memorial Medical Center (UMMMC) does not routinely record this data. We hypothesized that the average ETT cuff pressure of patients arriving at the UMMMC University Emergency Department (ED) who were intubated by EMS exceeds the safe pressure range.

**Objectives:** While ETT cuff inflation is necessary to close the system thus preventing air leaks and aspiration, there is evidence to suggest that over-inflated ETT cuffs can cause long-term complications. The purpose of this study is to characterize the cuff pressures for ETTs placed by EMS providers in our system.

**Methods:** This project was a single center prospective observational study. ETT cuff pressures were measured and recorded for all adult patients intubated by EMS providers prior to arrival at a large urban tertiary care center. All measurements were performed by respiratory therapists utilizing the AG Cuffill device. Results including the patient demographics, cuff pressure, tube size, and EMS service were recorded.

**Results:** At this time, 38 out of the 44 cuff pressures needed to reach clinical significance have been collected and the results discussed here are preliminary. Two cuff pressures fall within the 20-30cmH<sub>2</sub>O range, 2 fall below 20cmH<sub>2</sub>O, and the remaining 34 are above 30cmH<sub>2</sub>O. Twenty-four of these are undetectably greater than 100cmH<sub>2</sub>O and since a specific pressure could not be determined we used 100 for calculations. The current mean cuff pressure is 83.2 cmH<sub>2</sub>O. The median and mode cuff pressures are 100 cmH<sub>2</sub>O and 100 cmH<sub>2</sub>O, respectively.

**Conclusion:** Preliminary results indicate that our initial hypothesis is correct. Although final statistical analysis has not been completed, the overwhelming number of elevated cuff pressures point to the conclusion that prehospital intubations are associated with elevated cuff pressures which may be predisposing the patients to negative side effects.