ARTICLE:

- Country: USA
- Funding Sources: No funding or support was received.

PURPOSE:

- Research Question(s): What is / are the primary questions being addressed by this study? Usually found just before the methods.
  What is the effect of paralytic type and dose on first-attempt intubation success in the ED?

- Hypothesis: What is the anticipated outcome or alternatively, the null hypothesis (there will be no difference between groups).
  Higher doses of rocuronium produce similar intubation success rates to succinylcholine.

DESIGN:

- Study Design: Retrospective evaluation of information collected prospectively in a quality improvement database.

- Dependent / outcome Variable(s): What is the variable of interest / outcome being studied.
  First-time intubation success, number of intubation attempts required for successful intubation,

- Independent / research Variable: What is the variable that is modified among groups?
  Paralytic type, paralytic dose
SETTING / SUBJECTS:

- **Research Setting:** Inpatient / outpatient, rural / urban, academic / community, EM / non-EM, etc.
40-bed academic, tertiary care ED with annual census of 70,000 patient. Level I trauma center. EM residency program.

- **Subjects:**
  
  - **Study population:** Who was studied (eg: all adults presenting with chest pain, all children with wheezing, etc).
  
  All consecutive patients intubated in the ED during the study period.
  
  - **Inclusion / Exclusion criteria:** Are there any important inclusion or exclusion criteria, especially those that may affect generalizability.
  
  Patients were excluded if they were younger than 18 years of age, did not receive RSI, received medications other than etomidate for induction or succinylcholine or rocuronium for paralysis, or had missing documentation in the database or medical record.
  
  - **Number (control / intervention groups):** Number of subjects in each group.
  
  Of 621 patients intubated during study period, 327 were included in the final analysis. There were 113 (35%) patients in the succinylcholine group and 214 (65%) patients in the rocuronium group.
  
  - **Demographics:** Age, sex, race, etc.
  
  Succinylcholine and rocuronium groups were similar for age (47.4 ± 20.6 / 46.7 ± 21), weight in kg (82.5 ± 24.3 / 78.5 ± 19), BMI ( 27.4 ± 8.1 / 26.2 ± 5.9) and trauma (53% / 55%).
  
  - **Attrition:** Did patients exit the study or were patients lost to follow up.
  
  No attrition.

METHODS:

- **Interventions:** What, if any, interventions were performed among the study groups.
  
  Administration of succinylcholine versus rocuronium. Agent and dose chosen by EP performing intubation.

- **Study Groups:** What were the various study groups (eg: control / placebo, intervention 1, intervention 2, etc)

  Patients who received succinylcholine and patients who received rocuronium.

- **Instruments:** What devices, special equipment, surveys, rating scales, etc. were utilized.
  
  Paper form used for quality database that collects information including patient age, sex, reason for intubation, medications used for RSI, presence of difficult airway predictors, device use, EP experience by year of residency training, laryngeal view, success of intubation, and number of intubation attempts.

- **Data Collection:** Who collected data? What was their training? Was there consistency among data collectors? Were there changes to data collection / study protocol during the period of the study.
Data were collected prospectively by EP performing intubation on paper data form. The formation was then entered into computer database by the EP who manages the database. Some data including patient height, weight, and drug dose were obtained by the investigators from the medical record.

DATA ANALYSIS:
- **Level of Data:** Categorical, Nonparametric
- **Statistics Used:** Fisher’s exact test, Wilcox rank-sum test, univariate logistic regression analyses, multivariate logistic regression.
- What, if any, variables were controlled for?: Do the results adjust for confounding variables? Age, BMI, sex, laryngeal view, difficult airway predictors, physician experience, device used.

RESULTS:
- **Brief answers to research questions:** What were the conclusions made by the authors? Do they answer the original research questions? Do you think their conclusions are valid based on the data reported? First attempt intubation was similar between the succinylcholine and rocuronium groups (72.6 v. 72.9%). The median number of intubation attempts was also similar (IQR = 1-2 vs 1).
- Additional findings: Are there any additional findings other than the primary research questions discussed? Were these expected or unexpected based on the study design? The only variable predictive of first attempt intubation success was laryngeal view with more success with Grade 1 or 2 compared to Grade 3 or 4 using the Cormack-Lehane classification. The median dose of rocuronium used in this study was 1.19 mg/kg which is higher than the commonly recommended.
- Limitations: Are their important limitations identified by the authors? Do you see any other important limitations? Do these limitations significantly alter the conclusion or the applicability of the study? Did not collect information regarding intubating conditions or provider satisfaction with the paralytic used. Did not collect information regarding complications or drug-related adverse effects. Did not collect data regarding time between drug administration and intubation attempt.

IMPLICATIONS FOR PRACTICE:
- Applicable to this clinical practice: Is the study population generalizable to the population likely to be affected by this intervention / outcome in your clinical practice? If not, what setting may this be applicable to?
Yes, this is applicable to clinical practice. It is likely generalizable to our ED because it took place in a similarly-sized academic tertiary care ED with an EM residency program.

- **Feasible (cost, resources, etc):** Is this an intervention that would be reasonable to institute in clinical practice? Are instruments / medications available? Does the study adequately assess risks and unforeseen outcomes? Is the intervention cost / resource effective? Does the study account for cost / benefit? Are there more effective treatments available?

  Administering either rocuronium or succinylchoine is feasible. Both are easily accessible in the critical care rooms. This study, however, does not address the complications associated with each agent, and this information would be helpful in determining which agent to make first-choice.

- **Clinically Relevant:** Is this intervention likely to make a clinically significant impact on your patients if instituted? That is, some interventions may show statistically significant changes without making an impact that is clinically important.

  This article concludes that succinylcholine and rocuronium have similar first-attempt intubation success rates and median number of intubation attempts, so from that standpoint it seems to not matter which agent is chosen. It would be helpful to have data regarding complications before determining which drug should be first choice.

**LEVEL OF EVIDENCE / DECISION FOR USE:**

- Background       Consider Replication       Ready for use

- **Level of Evidence:**
  
  Ia Evidence obtained from meta-analysis of randomized controlled trials
  Ib Evidence obtained from at least one RCT
  Iia Evidence obtained from at least one well-designed controlled study without randomization
  X Iib Evidence obtained from at least one other type of well-designed quasi-experimental study
  III Well-designed non-experimental studies
  IV Expert committee reports, opinions of experts