**Supplemental Digital Content 2. Question 1a, (Query 1): What is the frequency of succinylcholine administration in hospital-based operating suites (including delivery suites) and emergency departments?**

## Eligibility

Additional records identified through other sources (Cochrane, EMBASE, and hand

search of personal files) (n=9,693)
(n =10)

Records identified through PubMed database searching
(n=7,681)

## Identification

Studies included in qualitative synthesis
(n = 12)

Full-text articles excluded no specific data on sux use frequency

(n=46)

(n = 28)

Records excluded
(n=285)

Records screened
(n=343)

Records remaining after non-human, non-English abstracts, non US or Canadian experience, and duplicates removed (n=343)

(n = )

## Included

Full-text articles assessed for eligibility
(n=58)

## Screening

Literature Search Summary: Only publications that included a denominator for estimation of succinylcholine (sux) administration rate were examined in detail. Both prospective and retrospective cohorts were reported. The number of subjects that received sux in the cohort varied from 24 to 5,064. The rate of sux administration varied between 0.7% and 94.3%. Highest sux use rate was reported in a 42−month, prospective observational cohort of airway management in a tertiary care hospital emergency department (ED). (Reference 8 ) Three studies reported succinylcholine administration in the operating room (OR) as part of airway management during general anesthesia. (References 7,9, 10) Five studies performed in the ED,), one in the Pediatric Intensive Care Unit (PICU) and one in the Neonatal Intensive Care Unit (NICU), reported administration of sux to facilitate placement of endotracheal tubes. No studies reported on obstetrics (OB) patients. Studies were designed to determine which drug facilitated endotracheal intubation. Therefore, the cohorts reported were a small part of the entire population of hospitalized patients; no estimate of the overall rate of sux administration per patient per unit of time could be made. All studies had a high risk of bias from lack of randomization, allocation concealment, and blinding.

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| Article | # GettingSux | Frequency% OR/OB | Frequency %ICU/NICU | Frequency %ED | EvidenceLevel | Bias |
| 1. West JR et al. Peri-intubation factors affecting emergency physician choice of paralytic agent for rapid sequence intubation of trauma patients. Am J Emerg Med 2017 doi: 10.016/j.ajem.2017.11.038 | 148 | na\* | na | 69% Retrospective cohort of all patients 18 y or older, over 5 years, undergoing intubation in the emergency department. | 4 | Adhered to the guidelines to reduce bias in retrospective studies, endorsed by the American College of Emergency Physicians (Kaji AH et al. Ann Emerg Med 2014;64:292-8). |
| 2. Patanwala AE, Sakles JC. Effect of weight on first pass success and neuromuscular blocking agent dose for rapid sequence intubation in the emergency department. Emerg Med J 2017; 34(11):739-743 doi. 10.1136/emermed-2017-206762 | 496 | na | na | 56%Retrospective cohort over 30 months of all consecutive patients who underwent rapid sequence intubation by emergency department personnel. Only the patient’s 1st intubation during study period was included. No patients < 18 y old.  | 4 | The Strengthening Reporting of Observational Studies in Epidemiology criteria for reporting observational studies were followed (von Elm et al. PLoS Med2007; 4:e296). |
| 3. Tarquino KM et al. Current medication practice and tracheal intubation safety outcomes from a prospective multicenter observational cohort study. Pediatr Crit Care Med 2015;16:210-8 | 24 | na | 0.7 (of a total of 3,366 tracheal intubations in 19 PICU prospective study-National emergency airway registry for children/na | na | 4 | \* |
| 4. Riazi S et al. Malignant hyperthermia in Canada: Characteristics of index anesthetics in 129 malignant hyperthermia susceptible probands. Anesth Analg 2014;118:381-7 | 71 | 55 of MH§ cohort/na | na | na | 3 | \* |
| 5. Patanwala AE et al. Succinylcholine is associated with increased mortality when used for rapid sequence intubation of severely brain injured patients in the emergency department. Pharmacotherapy 2016;36:57-63 | 149 | na | na | 63.9 in 1 ED of 233 patients-retrospective cohort | 4 | \* |
| 6. Dexter F et al. Estimate of the relative risk of succinylcholine for triggering malignant hyperthermia. Anesth Analg 2013;116:118-22 | na | 5.8 of all AIMS¶ recorded anestheticsJefferson includes OB, endoscopy, radiology, no sugam-madex available | na | na | 4 | \* |
| 7. Aldrete JA et al. Analysis of anesthetic-related morbidity in human recipients of renal homografts. Anesth Analg 1971;50:321-329 | 33 (sux alone) | 12.7 of renal transplants from one center/na | na | na | 4 | \* |
| 8. Zed PJ et al. Intubating conditions and hemodynamic effects of etomidate for rapid sequence intubation in the emergency department: an observational cohort study. Acad Emerg Med 2006;13:378-83 | 493 | Na | na | 94.3 (prospective, 42 months tertiary care ED) | 4 | \* |
| 9. Lazzell VA et al. The incidence of masseter muscle rigidity after succinylcholine in infants and children CanJAnaesth1994;41:475-479 | 5,064 | 90 prospective non-randomized cohort for 10 months for ETT°/na | na | na | 4 | \* |
| 10. Istvan J et al. Rapid sequence induction for appendectomies: a retrospective case-review analysis. CanJAnesth 2010;57:330-6 | 198 | 80 (1 yr retrospective for RSI⌃ for appendectomy/na | na | na | 4 | \* |
| 11. Lemyre B et al. Atropine, fentanyl and succinylcholine for non-urgent intubations in newborns. Arch Dis Child Fetal Neonatal Ed. 2009; 94:F439-42  | 60 | Na | na/82 (prospectivetwo level 3 Canadian NICUs for non-urgent intubation) | na | 4 | \* |
| 12. Dufour DG et al. Rapid sequence intubation in the emergency department J Emerg Med. 1995;13:705-10 | 213 | Na | na | 42 (retrospective, all cases with endotracheal intubation over 28 months) | 4 | \* |
| Other Unpublished Data: University Health Network, University of Toronto (Personal communication from S. Riazi, August 16, 2017) | 470 vials | 2.03/na | na | na | 5 | Retrospective, pharmacy information, no guarantee vials were administered to actual patients |
| Summary | 6,305 | 12.7-90%/na | 0.7% of PICU/82% of NICU | 42, 63.9, 94.3 | 3 or 4 |  |

\*na=not available

§MH=malignant hyperthermia

§AIMS=advanced information management system

°ETT=endotracheal tube

⌃RSI=rapid sequence induction