



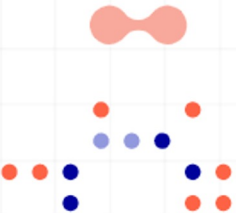
R.E.D.

Research Education Dissemination

anesthesia solutions

Reducing Postoperative Reintubations (POR) Through a Risk Assessment Aid

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Preop

- Pt scheduled for mastectomy
- History: asthma and chronic marijuana smoker- smoked the morning of the surgery
- Team decided to move forward with LMA



Intraop

- Tachycardia and desaturation upon emergence
- Suspected a laryngospasm
- Decision was made to pull the LMA and intubate



Postop

- Stayed in ICU overnight intubated
- Extubated the next morning



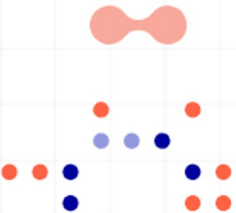
The purpose of this project is to develop a risk assessment aid based on the most current POR risk factors and treatment recommendations



Definitions

POR: Unplanned placement of an endotracheal tube or similar airway device within 30 days after surgery with general anesthesia⁽²⁾

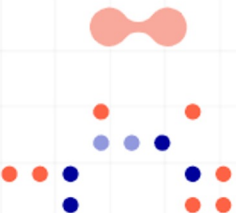
Delphi Study: A methodology which generates a dependable, anonymous consensus from a group of experts through an iterative process of questionnaires combined with controlled feedback⁽¹³⁾





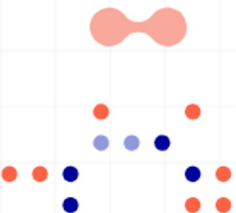
Expected outcome of research

- Identify common POR risk factors and treatment recommendations through an extensive Literature Review
- Conduct a Delphi Study in order to gain expert opinions on POR risk factors established through analyzing ACS NSQIP data
- Develop a risk assessment aid and standardized treatment recommendations (based on the patient's risk level) utilizing the literature review and Delphi Study results





- Incidence of POR in surgical patients: 1.6% ⁽¹⁾
- Financial impact: \$26,718 per incident ⁽¹¹⁾
- Morbidity and mortality
 - 17 day increase in hospital stay ⁽¹⁾
- Decreased patient satisfaction with prolonged hospitalization ⁽¹⁷⁾





Literature Review

- PubMed, Cochrane Review, CINAHL, OVID



Delphi Study

- Three rounds
- Evaluating POR Risk Factors from NSQIP Database



Compose Risk Assessment Aid

- Collating data from the Delphi Study and Literature Review in a visually appealing way



	Age	Race	Gender	Inpatient Status	Smoking	COPD	HTN requiring medication	CHF	Dependent functional status	Weight loss	Sepsis	Systemic Inflammatory Response Syndrome (SIRS)
	5	3	3	4	4	4	3	4	3	3	5	4
	4	4	1	4	4	4	3	3	2	5	5	5
	1	1	1	3	4	4	2	3	4	1	4	4
	5	4	4	5	5	4	3	5	5	3	5	5
	4	3	3	4	5	5	4	5	5	3	5	4
	4	3	3	4	5	5	4	4	5	3	4	4
	4	3	5	4	4	5	4	4	4	4	4	4
	1	1	1	2	2	4	2	2	1	1	4	4
	3	3	2	4	5	5	4	5	5	3	4	4
	4			4	4		4	4	4		4	4
	4	4	5	5	5	5	4	4	5	3	5	4
Percentage agreeing 4 or 5 (sample size 11)	72%	27%	27%	72%	90%	90%	54%	72%	72%	18%	100%	100%
Included in round 2?	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes

	ASA Status	Elevated BUN	Elevated WBC	Dyspnea	Anesthesia Type-General	Extended length of surgery	Surgical blood loss	Surgery type: Cardiac	Surgery type: Neuro	Surgery type: ENT	Emergent surgery
	4	4	4	5	5	5	4	4	5	5	5
	4	2	3	4	5	3	4	4	2	1	5
	5	4	2	5	4	5	5	5	5	5	5
	5	3	3	5	5	4	4	4	3	5	5
	5	4	3	5	5	5	5	5	5	5	5
	4	3	4	4	4	4	4	4	4	4	5
	5	4	4	4	5	5	5	5	5	5	5
	3	2	2	4	2	2	3	4	4	2	4
	4	3	3	4	3	4	3	4	4	3	4
	4	4	4	4	4	4	4	4	4	4	4
	5	3	3	4	4	4	4	4	3	3	5
Percentage agreeing 4 or 5 (sample size 11)	90%	45%	36%	100%	81%	81%	81%	100%	72%	63%	100%
Included in round 2?	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes

Round 1 Delphi Study



	Emergent Surgery	COPD	Sepsis	ASA Status	Dyspnea	Smoking	Cardiac Surgery	Systemic Inflammatory Response Syndrome (SIRS)	General Anesthesia	Surgical Blood Loss	Extended Length of Surgery
Amount of 3	7	3	7	5	4	2	2	4	1	0	4
Amount of 2	4	8	4	5	8	6	7	4	4	6	7
Amount of 1	1	1	1	2	0	4	3	4	7	6	1
Highest Consensus	58%	66%	58%	41%	66%	50%	58%	33%	58%	50%	58%
Did the Delphi Study yield a majority?	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Does the literature review back this up?	Yes	Yes	Yes	Yes (Backs up "Severe")	Yes	Yes	No	Not enough information	yes	Not enough information	Yes
Severity?	Severe	Moderate	Severe	Determine in Round 3	Moderate	Determine in Round 3	Moderate	Determine in Round 3	Mild	Determine in Round 3	Moderate

Round 2 Delphi Study

	ASA Status 3 or 4	Smoking	Systemic Inflammatory Response Syndrome (SIRS)	Surgical Blood Loss
Amount of Severe (3)	5	4	5	2
Amount of Moderate (2)	7	7	6	5
Amount of Minor (1)	1	2	2	6
Highest Consensus (%)	54%	54%	46%	46%
Should include in Infographic according to Delphi?	Yes	Yes	Yes	Yes
Severity?	Moderate	Moderate	Moderate	Minor

Round 3 Delphi Study

POSTOPERATIVE REINTUBATION (POR) RISK ASSESSMENT AID



POR definition: unplanned placement of an endotracheal tube or similar airway device within 30 days after surgery with general anesthesia (ACS NSQIP, 2015)

RISK STRATIFICATION

MILD

- GENERAL ANESTHESIA
- SURGICAL BLOOD LOSS



MODERATE

- COPD
- DYSPNEA
- SMOKING
- CARDIAC SURGERY
- EXTENDED LENGTH OF SURGERY
- ASA STATUS 3 OR HIGHER
- SYSTEMIC INFLAMMATORY RESPONSE SYNDROME

SEVERE

- EMERGENT SURGERY
- SEPSIS

MODERATE RISK: >2 MILD OR MODERATE RISK FACTORS

HIGH RISK: >3 MILD/MODERATE RISK FACTORS OR 1 SEVERE RISK FACTOR

TREATMENT RECOMMENDATIONS

Moderate risk: choose one treatment during each phase of the perioperative period

Severe risk: choose > 6 treatments, one during each phase of the perioperative period

*indicates highly supported recommendations



For additional details and references, scan QR code



TREATMENT RECOMMENDATIONS CONT.

• Prior to Admission

- Utilize a risk assessment tool
- Smoking cessation 4 weeks before surgery
- CXR- consider postponing elective surgery if findings are abnormal
- Inspiratory muscle training using incentive spirometry 2 weeks before surgery
- Optimize severe anemia

• Preoperative

- Targeted treatment for pulmonary diseases (CPAP for OSA, Salbutamol for asthma)
- 30 minutes of prophylactic chest physiotherapy

• Intraoperative

- Type of anesthetic: avoid GA and ETT for high-risk patients
 - Alternatives: regional anesthesia, LMA
 - If GA with ETT is necessary: use low tidal volumes (6-8 ml/kg) with PEEP of 5 cmH₂O.
 - Add recruitment maneuvers and increase PEEP if ventilation is inadequate
- Neuromuscular blockade: use short/intermediate agents, utilize nerve stimulator to assess the level of block, reverse with Sugammadex*
- Goal-directed fluid management

• Postoperative

- Prophylactic CPAP or HFNC after major abdominal and thoracic surgery
- CPAP during the initial postoperative period for OSA patients
- Mobilization and clearance of secretions: elevate the head of the bed, consider prophylactic mucolytic treatment, encourage early ambulation
- Ensure adequate pain control: utilize regional anesthesia to decrease the amount of narcotics administered



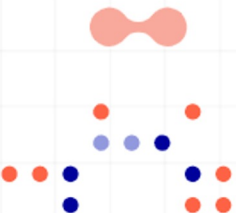
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Recommendations:

- Implementation of this risk assessment aid via educational sessions with emphasis on EBP and importance of preventing POR
- Use of visual aids in anesthesia work areas (such as the break room and anesthesia storeroom) to remind providers of the implementation
- Future implementation teams should assess pre- and post-educational perceptions of POR as well as the effectiveness of the POR risk assessment aid





Future directions in research



References

