

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Adverse Event Definitions (Quebec Guidelines)

Adverse Event	Definition
Oxygen Desaturation	Oxygen desaturation occurs AND one or more interventions are performed with the intention of improving the saturation. The interventions include: (a) Verbal cues (b) Tactile stimulation (c) Airway repositioning (d) Suctioning (e) Supplementing or increasing oxygen delivery (f) Oral or nasal airway (g) Application of positive pressure with bag mask but <i>without</i> assisted ventilation (h) Application of bag mask <i>with</i> assisted ventilation (i) Tracheal intubation
Vomiting	The expulsion of gastric contents through the mouth or nose that occurs during either the Sedation phase (to include Induction and Maintenance) or the ED Recovery phase of sedation. If the timing and extent of vomiting presents a suspicion or confirmation of clinically apparent pulmonary aspiration, this adverse event must also be documented
Apnea	Cessation or pause of ventilatory effort AND one or more interventions are performed with the intention of stimulating or assisting ventilation. The interventions include: (a) Verbal cues (b) Tactile stimulation (c) Airway repositioning (d) Application of bag mask <i>with</i> assisted ventilation (e) Tracheal intubation
Partial Airway Obstruction	Manifested by the presence of one or more of the following: a) Stridor b) Snoring and/or c) Chest wall and suprasternal retractions AND one or more of the following interventions are performed with the intention of relieving partial airway obstruction (a) Airway repositioning (b) Suctioning (c) Oral or nasal airway (d) Application of positive pressure with bag mask but <i>without</i> assisted ventilation
Myoclonus	Involuntary, short contraction of some muscle fibers, of a whole muscle, or of different muscles of one group, leading to short observable movements of the corresponding body parts, usually not longer than 1/10 th of a second (100 milliseconds) AND required an intervention, administration of medications or interfered with the procedure
Paradoxical Response	Unanticipated restlessness or agitation in response to the administration of sedation drugs occurring during the Sedation phase AND results in the unplanned administration of reversal agents or alternative sedation drug(s), or results in a delay in the completion or discontinuation of the procedure
Hypotension	Systolic blood pressure less than the 5 th percentile for age as defined by the American Heart Association for Pediatric Advanced Life Support AND one or more intervention is performed with the intention of improving the blood pressure. These interventions include administration of: (a) IV Fluid (b) Chest compressions (c) Administration of medications
Seizure	Temporary abnormal electro-physiologic phenomenon of the brain that manifests as involuntary contractions or series of contractions of the voluntary muscles. The contraction can be prolonged (tonic) or repeated (tonic-clonic). An extreme form of muscle rigidity with shaking can resemble seizure activity but

Adverse Event	Definition
	confirming this would require the use of electroencephalography (EEG).
Laryngospasm	Complete airway obstruction WITH oxygen desaturation due to involuntary and sustained closure of the vocal cords preventing effective ventilation that REQUIRES positive pressure ventilation with or without neuromuscular blockade to overcome the symptom.
Clinically Apparent Pulmonary Aspiration	Suspicion OR confirmation of oropharyngeal or gastric contents in the trachea during the sedation or immediate post-Sedation phase AND the appearance of respiratory signs and symptoms that were not present prior to the sedation. The new signs and symptoms must present before the end of the ED Recovery phase (see Figure 1 for Sedation Time Intervals). The patient must have <u>one or more</u> sign or symptom in <u>any</u> of the following three categories: (i) <u>Physical Signs</u> : Cough, crackles/rales, decreased breath sounds, tachypnea, wheezing, ronchi, respiratory distress (ii) <u>Oxygen Requirement</u> : Decrease in oxygen saturation from baseline requiring supplemental oxygen (iii) <u>Chest X-ray Findings</u> : Focal infiltrate or consolidation
Bradycardia	Heart rate less than 2 standard deviations below normal for age as described by the American Heart Association during the Sedation phase (includes Induction and Maintenance) or Physiologic Recovery phase. <u>AND</u> One or more intervention is performed with the intention of improving heart rate and cardiac output. The interventions include: (a) Tactile stimulation (b) Supplemental oxygen (c) Application of positive pressure with bag mask but <i>without</i> ventilation (CPAP) (d) Tracheal intubation (e) Chest compressions (f) Administration of medications
Complete Airway Obstruction	Ventilatory effort with NO air exchange manifested by ALL of the following: a) Absence of upper airway (e.g. stridor or snoring) and breath sounds on auscultation b) Loss of CO ₂ waveform (when capnography is used) AND one or more of the following interventions are performed with the intention of relieving complete airway obstruction (a) Airway repositioning (b) Suctioning (c) Oral or nasal airway placement (d) Application of positive pressure with bag mask but <i>without</i> assisted ventilation (CPAP) (e) Application of bag mask <i>with</i> assisted ventilation (f) Tracheal intubation (g) Administration of additional sedation agents (h) Administration of neuromuscular blockade agents
Muscle Rigidity	Involuntary muscle stiffening in extension that can be associated with shaking <u>AND</u> interferes with the procedure, requiring an intervention or administration of medications.
Permanent Neurological Injury	A neurologic deficit that was not present prior to sedation and does not resolve
Death	The irreversible cessation of cerebral function, spontaneous function of the respiratory system and spontaneous function of the circulatory system

eTable 2. Median Dose of Sedation Medication by Sedation Group

	Ketamine mg/kg (Q1, Q3)	Midazolam mg/kg (Q1, Q3)	Propofol mg/kg (Q1, Q3)	Fentanyl mcg/kg (Q1, Q3)
Ketamine (n=3916)	1.5 (1.0, 2.0)	-	-	-
Ketamine + Midazolam (n=246)	1.2 (1.0, 1.6)	0.05 (0.03, 0.05)	-	-
Ketamine + Fentanyl (n=219)	1.1 (1.0, 1.8)	-	-	1.0 (0.8, 1.4)
Ketamine + Propofol (n=851)	0.9 (0.6, 1.0)	-	1.5 (1.0, 2.4)	-
Propofol + Fentanyl (n=726)	-	-	2.7 (2.0, 3.6)	1.0 (0.9, 1.5)
Propofol (n=244)	-	-	3.2 (2.3, 4.6)	-

eTable 3. Observed Associations Between Risk Factors and Adverse Sedation Outcomes (N=6295)

Variables	Serious Events n (%)			Significant Interventions n (%)			Oxygen Desaturation n (%)			Vomiting n (%)		
	Present (n=69)	Absent (n=6226)	P value	Present (n=86)	Absent (n=6209)	P value	Present (n=353)	Absent (n=5942)	P value	Present (n=328)	Absent (n=5967)	P value
Sex (male)	53 (76.8)	4137 (66.4)	0.07	60 (69.8)	4130 (66.5)	0.53	243 (68.8)	3947 (66.4)	0.35	225 (66.6)	3965 (66.4)	0.42
Age (mean, SD)	10.3 (4.5)	8.0 (4.6)	< 0.001	10.3 (4.7)	8.0 (4.6)	< 0.001	8.7 (4.7)	7.9 (4.6)	0.001	9.1 (3.7)	7.9 (4.6)	0.001
Sedation medication			<0.001			0.001			<0.001			<0.001
- Ketamine	17 (24.6)	3899 (94.2)		37 (43.0)	3879 (62.4)		192 (54.4)	3724 (62.7)		253 (77.1)	3663 (61.4)	
- Ketamine + Midaz	4 (5.8)	242 (5.8)		5 (5.8)	241 (3.9)		19 (5.4)	227 (3.8)		19 (5.8)	227 (3.8)	
- Ketamine + Propofol	18 (26.1)	833 (20.1)		21 (24.4)	830 (13.4)		76 (8.9)	775 (13.0)		21 (6.4)	830 (13.9)	
- Propofol + Fentanyl	13 (18.8)	713 (17.1)		9 (10.5)	717 (11.5)		18 (5.1)	708 (11.9)		1 (0.3)	725 (12.1)	
- Ketamine + Fentanyl	7 (13.2)	212 (5.1)		9 (10.5)	210 (3.4)		31 (8.8)	188 (3.2)		33 (10.1)	186 (3.1)	
- Propofol	9 (13.0)	235 (5.7)		5 (5.8)	239 (3.8)		8 (2.3)	236 (4.0)		0 (0.0)	244 (4.1)	
- Other	1 (1.4)	92 (2.2)		0 (0.0)	93 (1.5)		9 (2.5)	84 (1.4)		1 (0.3)	92 (1.5)	
NPO Solid ≤ 6 hrs ^a	39 (56.5)	5144 (82.6)	0.37	50 (58.1)	5133 (82.7)	0.20	186 (52.7)	4997 (84.1)	0.29	172 (52.4)	5011 (84.0)	0.54
NPO liquid ≤ 2 hrs ^b	11 (15.9)	299 (4.8)	1.00	16 (18.6)	294 (4.7)	0.50	49 (13.9)	261 (4.4)	0.36	54 (16.4)	256 (4.2)	0.75
ASA classification			0.83			1.00			0.37			0.67
- 1	65 (94.2)	5862 (94.2)		82 (95.3)	5845 (93.9)		324 (91.8)	5603 (94.3)		303 (92.4)	5624 (94.3)	
- 2	4 (5.8)	347 (5.6)		4 (4.7)	347 (5.6)		28 (7.9)	323 (5.4)		24 (7.3)	327 (5.5)	
- 3	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		1 (0.3)	12 (0.2)		1 (0.3)	12 (0.2)	
- 4	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
- 5	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
Underlying health risk	2 (0.03)	199 (3.2)	1.00	2 (2.3)	199 (3.2)	1.00	17 (4.8)	184 (3.1)	0.07	11 (3.3)	190 (3.2)	0.87
Respiratory illness ^c	5 (7.2)	511 (8.2)	0.77	7 (8.1)	509 (8.2)	0.98	29 (8.2)	487 (8.2)	0.99	23 (7.0)	493 (8.3)	0.37
Pre-procedure Opioid	34 (49.3)	1778 (28.6)	<0.001	45 (52.3)	1767 (28.4)	<0.001	157 (44.4)	1655 (27.8)	<0.001	122 (37.2)	1690 (28.3)	0.001

Variables	Serious Events n (%)			Significant Interventions n (%)			Oxygen Desaturation n (%)			Vomiting n (%)		
	Present (n=69)	Absent (n=6226)	P value	Present (n=86)	Absent (n=6209)	P value	Present (n=353)	Absent (n=5942)	P value	Present (n=328)	Absent (n=5967)	P value
Procedure type			0.11			0.62			0.01			0.36
- Foreign body removal	0 (0.0)	222 (3.6)		3 (3.5)	219 (3.5)		6 (1.7)	216 (3.6)		13 (4.0)	209 (3.5)	
- Abscess I+D	1 (1.4)	321 (5.1)		3 (3.5)	319 (5.1)		9 (2.5)	313 (5.3)		12 (3.6)	310 (5.2)	
- Laceration repair	7 (10.1)	1021 (16.4)		12 (13.9)	1016 (16.4)		52 (14.7)	976 (16.4)		55 (16.8)	973 (16.3)	
- Lumbar puncture	3 (4.3)	147 (2.4)		0 (0.0)	0 (0.0)		12 (3.4)	138 (2.3)		4 (1.2)	146 (2.4)	
- Orthopedic reduction	54 (78.3)	4094 (65.7)		64 (74.4)	4084 (65.8)		240 (68.0)	3908 (65.8)		227 (69.2)	3921 (65.7)	
- Other	4 (5.8)	421 (6.8)		4 (4.6)	421 (6.8)		34 (9.6)	391 (6.6)		17 (5.2)	408 (6.8)	
Pre-procedure anti-emetic										85 (25.9)	1866 (31.3)	0.04
Pre-oxygenation ^d							37 (10.5)	1233 (20.7)	<0.001			

^a missing data n=112; ^b missing data n=112; ^cmissing data n=2 ^d missing data n=4

eTable 4: Multivariable Penalized Logistic Regression Analyses Examining Risk Factors for Sedation-Related Adverse Events

Variables	Odds Ratio	95% Confidence Interval	P value
Dependent variable: serious adverse events (number of events=68)^a			
Sedation medication			<0.001
- Ketamine	REF		
- Ketamine + Fentanyl	6.5	2.5 to 15.2	
- Ketamine + Midazolam	3.6	1.1 to 9.5	
- Ketamine + Propofol	4.4	2.3 to 8.7	
- Others	2.6	0.3 to 10.7	
- Propofol + Fentanyl	3.2	1.4 to 6.7	
- Propofol	5.6	2.3 to 13.1	
Age in 5 years	1.3	0.9 to 1.8	0.09
Male	1.3	0.8 to 2.4	0.34
Pre-procedural opioid	1.6	1.0 to 2.7	0.06
Procedure type			0.30
- Orthopedic reduction	REF		
- Foreign body removal	0.4	0.0 to 3.3	
- Abscess incision + drainage	0.7	0.1 to 2.7	
- Laceration repair	1.5	0.6 to 3.3	
- Lumbar puncture	3.6	0.9 to 10.3	
- Other	1.3	0.4 to 3.1	
Dependent variable: significant intervention (Number of events=85)^b			
Sedation medication			0.001
- Ketamine	REF		
- Ketamine + Fentanyl	4.0	1.8 to 8.1	
- Ketamine + Midazolam	2.1	0.7 to 4.8	
- Ketamine + Propofol	2.2	1.2 to 3.8	
- Others	0.4	0.0 to 3.0	
- Propofol + Fentanyl	0.8	0.3 to 1.6	
- Propofol	1.2	0.4 to 2.9	
Age in 5 years	1.8	1.3 to 2.5	<0.0001
Male	0.9	0.6 to 1.5	0.70
ASA classification	0.8	0.2 to 1.7	0.54
Pre-procedural opioid	2.2	1.4 to 3.5	0.001
NPO solids > 6 hours	1.1	0.7 to 1.6	0.81
NPO liquids > 2 hours	2.6	0.7 to 22.8	0.23
Underlying health risk	0.8	0.2 to 2.2	0.64
Current respiratory illness	1.2	0.5 to 2.5	0.59
Procedure type			0.13
- Orthopedic reduction	REF		
- Foreign body removal	2.9	0.8 to 8.0	

Variables	Odds Ratio	95% Confidence Interval	P value
- Abscess incision + drainage	1.7	0.5 to 4.7	
- Laceration repair	2.4	1.1 to 4.7	
- Lumbar puncture	0.6	0.0 to 4.6	
- Other	1.3	0.4 to 3.1	
Dependent variable: oxygen desaturation (number of events=339)^c			
Sedation medication			<0.001
- Ketamine	Ref		
- Ketamine + Fentanyl	2.5	1.5 to 3.8	
- Ketamine + Midazolam	1.6	0.9 to 2.5	
- Ketamine + Propofol	2.2	1.6 to 3.0	
- Others	1.8	0.8 to 3.4	
- Propofol + Fentanyl	0.8	0.5 to 1.5	
- Propofol	0.8	0.3 to 1.6	
Age in 5 years	1.3	1.1 to 1.5	0.002
Male	1.1	0.9 to 1.4	0.44
ASA classification	1.2	0.8 to 1.7	0.38
Pre-procedural opioid	2.1	1.6 to 2.6	<0.0001
NPO solids > 6 hours	0.9	0.7 to 1.2	0.49
NPO liquids > 2 hours	1.1	0.6 to 2.0	0.75
Underlying health risk	1.4	0.8 to 2.3	0.22
Current respiratory illness	1.0	0.7 to 1.5	0.96
Procedure type			<0.001
- Orthopedic reduction	REF		
- Foreign body removal	0.9	0.4 to 2.0	
- Abscess incision + drainage	1.0	0.5 to 1.9	
- Laceration repair	1.6	1.1 to 2.3	
- Lumbar puncture	2.8	1.4 to 5.1	
- Other	2.1	1.4 to 3.1	
Pre-oxygenation	0.4	0.2 to 0.6	<0.0001
Dependent variable: vomiting (number of events=322)^d			
Sedation medication			<0.001
- Ketamine	REF		
- Ketamine + Fentanyl	1.9	1.2 to 2.8	
- Ketamine + Midazolam	0.9	0.5 to 1.4	
- Ketamine + Propofol	0.3	0.2 to 0.4	
- Others	0.1	0.0 to 0.5	
- Propofol ± Fentanyl	0.02	0.002 to 0.05	
- Propofol	0.01	<0.001 to 0.09	
Age in 5 years	1.8	1.5 to 2.0	<0.0001
Male	1.0	0.8 to 1.3	0.99
ASA classification	1.2	0.8 to 1.7	0.35
Pre-procedural opioid	1.5	1.1 to 1.9	0.003
NPO solids > 6 hours	0.9	0.7 to 1.2	0.54

Variables	Odds Ratio	95% Confidence Interval	P value
NPO liquids > 2 hours	0.9	0.6 to 1.7	0.83
Underlying health risk	0.9	0.5 to 1.6	0.78
Procedure type			0.05
- Orthopedic reduction	REF		
- Foreign body removal	1.8	0.9 to 3.1	
- Abscess incision + drainage	1.3	0.7 to 2.3	
- Laceration repair	1.7	1.2 to 2.4	
- Lumbar puncture	0.9	0.3 to 2.1	
- Other	0.9	0.5 to 1.5	
Pre-procedure anti-emetics	0.5	0.4 to 0.7	<0.0001

^aTotal events n=69, however 1 patient was excluded from the analysis due to missing data on fasting duration; c-statistic=0.75 Hosmer Lemeshow test: P-value=0.66

^bTotal events n=86, however 1 patient was excluded from the analysis due to missing data on fasting duration; c-statistic=0.74, Hosmer Lemeshow test: P-value=0.50

^cTotal events n=353, however 14 patients were excluded from the analysis due to missing data on fasting duration; c-statistic=0.69, Hosmer Lemeshow test: P-value=0.13

^dTotal events n=328, however 6 patients were excluded from the analysis due missing data on fasting duration; c-statistic=0.76, Hosmer Lemeshow test: P-value=0.18

eTable 5. Sensitivity Analyses of Sedation Medication Effect Comparing Penalized and Random Effects Logistic Regression Analysis

Penalized logistic regression (not accounting for center effect)				Random effects logistic regression (accounting for center effect)			
Sedation medication	Odds Ratio	95% Confidence Interval	P value	Sedation medication	Odds Ratio	95% Confidence Interval	P value
Serious adverse events^a							
Sedation Medication			<0.001	Sedation Medication			<0.001
Ketamine + Fentanyl	6.48	2.52 to 15.22		Ketamine + Fentanyl	7.48	2.73 to 20.48	
Ketamine + Midaz	3.59	1.10 to 9.45		Ketamine + Midaz	2.19	0.67 to 7.19	
Ketamine + Propofol	4.42	2.25 to 8.74		Ketamine + Propofol	5.88	2.51 to 13.77	
Other	2.62	0.29 to 10.75		Other	1.85	0.24 to 14.49	
Propofol + Fentanyl	3.15	1.45 to 6.74		Propofol + Fentanyl	4.29	1.81 to 10.18	
Propofol	5.59	2.27 to 13.08		Propofol	6.79	2.71 to 17.03	
Significant Intervention^b							
Sedation Medication			0.001	Sedation Medication			0.001
Ketamine + Fentanyl	3.97	1.77 to 8.14		Ketamine + Fentanyl	3.88	1.78 to 8.50	
Ketamine + Midaz	2.08	0.74 to 4.79		Ketamine + Midaz	1.96	0.75 to 5.11	
Ketamine + Propofol	2.18	1.24 to 3.77		Ketamine + Propofol	2.20	1.24 to 3.92	
Other	0.42	0.003 to 3.03		Propofol + Fentanyl	0.73	0.32 to 1.64	
Propofol + Fentanyl	0.76	0.32 to 1.59		Propofol + other	0.85	0.32 to 2.28	
Propofol	1.19	0.41 to 2.87					
Oxygen Desaturation^c							
Sedation Medication			<0.001	Sedation Medication			0.001
Ketamine + Fentanyl	2.46	1.54 to 3.80		Ketamine + Fentanyl	1.89	1.15 to 3.10	
Ketamine + Midaz	1.58	0.93 to 2.52		Ketamine + Midaz	1.95	1.14 to 3.34	
Ketamine + Propofol	2.22	1.64 to 2.99		Ketamine + Propofol	1.87	1.28 to 2.73	
Other	1.79	0.83 to 3.45		Other	1.60	0.76 to 3.35	
Propofol + Fentanyl	0.85	0.46 to 1.49		Propofol ± Fentanyl	0.73	0.42 to 1.24	
Propofol	0.78	0.34 to 1.56					

Vomiting^d							
Sedation Medication			<0.001	Sedation Medication			<0.001
Ketamine + Fentanyl	1.87	1.21 to 2.82		Ketamine + Fentanyl	1.48	0.94 to 2.33	
Ketamine + Midaz	0.89	0.53 to 1.42		Ketamine + Midaz	0.82	0.49 to 1.37	
Ketamine + Propofol	0.25	0.15 to 0.39		Ketamine + Propofol	0.23	0.14 to 0.39	
Other	0.15	0.02 to 0.53		Other	0.09	0.01 to 0.66	
Propofol + Fentanyl	0.02	0.002 to 0.05		Propofol ± Fentanyl	0.01	0.001 to 0.07	
Propofol alone	0.01	<0.001 to 0.09					

^aOther risk factors included in both serious event models are: age, gender, pre-procedural opioid, and procedure type. For the random intercept model, the procedure type variable is categorized as: foreign body removal + incision and drainage of abscess, laceration repair, orthopedic reduction, lumbar puncture, and others.

^bOther risk factors included in both significant intervention models are: age, gender, ASA classification, NPO solid compliance, NPO fluid compliance, pre-procedural opioid, underlying health risk, respiratory illness and procedure type. For the random intercept model, the procedure type variable is categorized as: foreign body removal, incision and drainage of abscess, laceration repair, orthopedic reduction, and others.

^cOther risk factors included in both oxygen desaturation models are: age, gender, ASA classification, NPO solid compliance, NPO fluid compliance, pre-procedural opioid, underlying health risk, respiratory illness, procedure type, and pre-oxygenation.

^dOther risk factors included in both vomiting models are: age, gender, ASA classification, NPO solid compliance, NPO fluid compliance, pre-procedural opioid, underlying health risk, procedure type, and pre-procedural anti-emetics.

eTable 6. Multivariable Penalized Logistic Regression Analysis of Patients Receiving Ketamine Only (N=3916), Examining the Effect of Ketamine Dose on Outcomes

Risk Factors	Odds Ratio	95% Confidence Interval	P value
Dependent variable: serious adverse events (number of events= 17)^a			
Ketamine dose (mg/kg)	0.75	0.27 to 1.60	0.46
Age (years)	1.13	1.00 to 1.28	0.03
Pre-procedural opioid administered	3.11	1.14 to 9.08	0.02
Procedure type			0.68
- Orthopedic reduction	REF		
- Foreign body removal	1.45	0.01 to 13.71	
- Abscess incision + drainage	3.43	0.35 to 16.84	
- Laceration repair	2.58	0.53 to 10.27	
- Lumbar puncture	2.22	0.02 to 20.00	
- Other	1.84	0.20 to 8.09	
Dependent variable: significant interventions (number of events=37)^b			
Ketamine dose (mg/kg)	1.13	0.68 to 1.69	0.57
Age (years)	1.15	1.06 to 1.25	0.001
Pre-procedural opioid administered	3.35	1.59 to 7.24	0.001
NPO solids > 6 hours	0.91	0.47 to 1.76	0.77
NPO liquids > 2 hours	1.32	0.34 to 12.00	0.72
Procedure type			0.57
- Orthopedic reduction	REF		
- Foreign body removal	5.67	1.35 to 18.83	
- Abscess incision + drainage	4.36	1.07 to 13.75	
- Laceration repair	2.53	0.88 to 6.76	
- Lumbar puncture	1.33	0.01 to 10.70	
- Other	0.96	0.11 to 3.86	
Dependent variable: oxygen desaturation (number of events=184)^c			
Ketamine dose (mg/kg)	1.31	1.08 to 1.57	0.004
Age (years)	1.08	1.04 to 1.13	<0.0001
Male	0.90	0.66 to 1.23	0.49
ASA classification	1.26	0.71 to 1.98	0.37
Pre-procedural opioid administered	3.05	2.16 to 4.29	<0.0001
NPO solids > 6 hours	0.94	0.69 to 1.27	0.68

Risk Factors	Odds Ratio	95% Confidence Interval	P value
NPO liquids > 2 hours	1.19	0.61 to 2.65	0.63
Underlying health risk	0.78	0.25 to 1.88	0.62
Current respiratory illness	0.83	0.43 to 1.45	0.53
Procedure type			<0.001
- Orthopedic reduction	REF		
- Foreign body removal	1.48	0.58 to 3.24	
- Incision and drainage of abscess	1.56	0.68 to 3.15	
- Laceration repair	1.63	1.01 to 2.59	
- Lumbar puncture	5.16	2.46 to 10.05	
- Other	1.57	0.85 to 2.73	
Pre-procedural oxygenation	1.21	0.63 to 2.14	0.54
Dependent variable: vomiting (number of events n=248)^d			
Ketamine dose (mg/kg)	1.28	1.08 to 1.50	0.004
Age (years)	1.15	1.11 to 1.19	<0.0001
Male	0.96	0.73 to 1.28	0.79
ASA classification	1.17	0.71 to 1.79	0.50
Pre-procedural opioid administered	1.42	1.05 to 1.92	0.02
NPO solids > 6 hours	0.88	0.67 to 1.15	0.34
NPO liquids > 2 hours	0.81	0.47 to 1.46	0.45
Underlying health risk	0.67	0.24 to 1.48	0.37
Procedure type			0.07
- Orthopedic reduction	REF		
- Foreign body removal	2.03	1.05 to 3.67	0.03
- Incision and drainage of abscess	1.37	0.70 to 2.49	0.33
- Laceration repair	1.66	1.10 to 2.49	0.01
- Lumbar puncture	1.12	0.36 to 2.71	0.82
- Other	0.87	0.45 to 1.55	0.65
Pre-procedural anti-emetics administered	0.50	0.38 to 0.67	<0.0001

^ac statistic: 0.72, Hosmer and Lemeshow Goodness of Fit Test p-value: 0.69

^bc statistic: 0.73, Hosmer and Lemeshow Goodness of Fit Test p-value: 0.79

^cTotal events n=192, however 8 patients who experienced an event had missing data for one or more variables, so were excluded from this analysis; c statistic: 0.69, Hosmer and Lemeshow Goodness of Fit Test p-value: 0.19

^dTotal events n=253, however 5 patients who experienced an event had missing data for one or more variables, so were excluded from this analysis; c statistic: 0.70, Hosmer and Lemeshow Goodness of Fit Test p-value: 0.08

eTable 7. Duration of Sedation and ED LOS by Sedation Medication

	Duration of sedation Median (Q1, Q3)	ED LOS Median (Q1, Q3)
Ketamine (n=3916)	71 (50, 100)	85 (62, 120)
Ketamine + Midazolam (n=246)	77 (51, 120)	106 (77, 139)
Ketamine + Fentanyl (n=219)	117 (84, 145)	132 (100, 164)
Ketamine + Propofol (n=851)	82 (56, 109)	97 (72, 124)
Propofol + Fentanyl (n=726)	51 (31, 80)	78 (51, 112)
Propofol (n=244)	51 (45, 126)	67 (43, 196)

LOS=Length of Stay