MÉDECINE INTENSIVE RÉANIMATION
CHU NANTES

CENTRE HOSPITALIER
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Intubation trachéale

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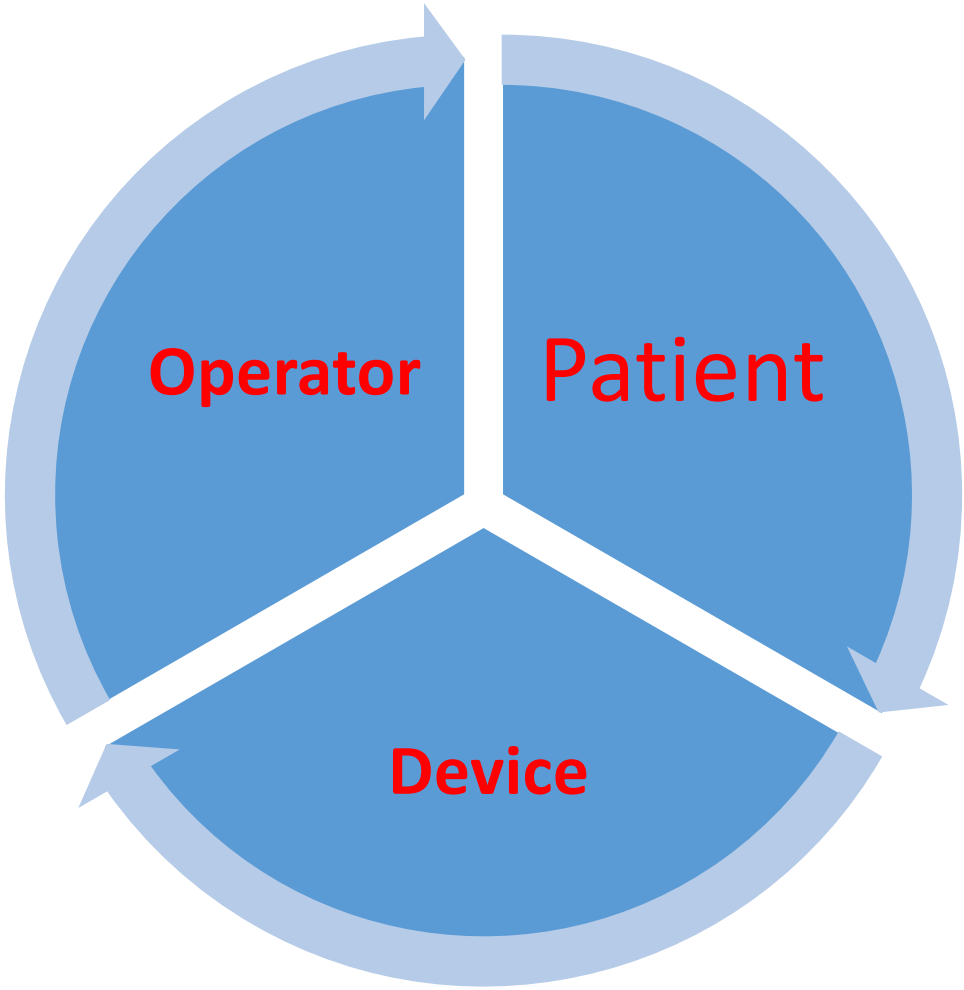
Conflits d’intérêt:

- French Ministry of Health:
  - HYPERION Trial: TTM at 33° or 37° after non-shockable cardiac arrest
- LAERDAL Fondation:
  - HYPERION Trial: TTM at 33° or 37° after non-shockable cardiac arrest

Intubation en soins critiques / réanimation



Intubation trachéale

- Préparation
  - Aspiration, drogues, respirateur, sédation, curares
  - Optimisation hémodynamique
  - Checklist: *Jaber ICM 2010*……. mais *Janz Chest 2017*
- Préoxygénation
- exPosition
  - Pas de Sellick: *Birenbaum JAMA Surgery 2018*
- auscultation Pulmonaire

Pré-oxygénation

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Video Laryngoscopy vs Direct Laryngoscopy on Successful First-Pass Orotracheal Intubation Among ICU Patients

A Randomized Clinical Trial

Régression médiane SpO2 minimale

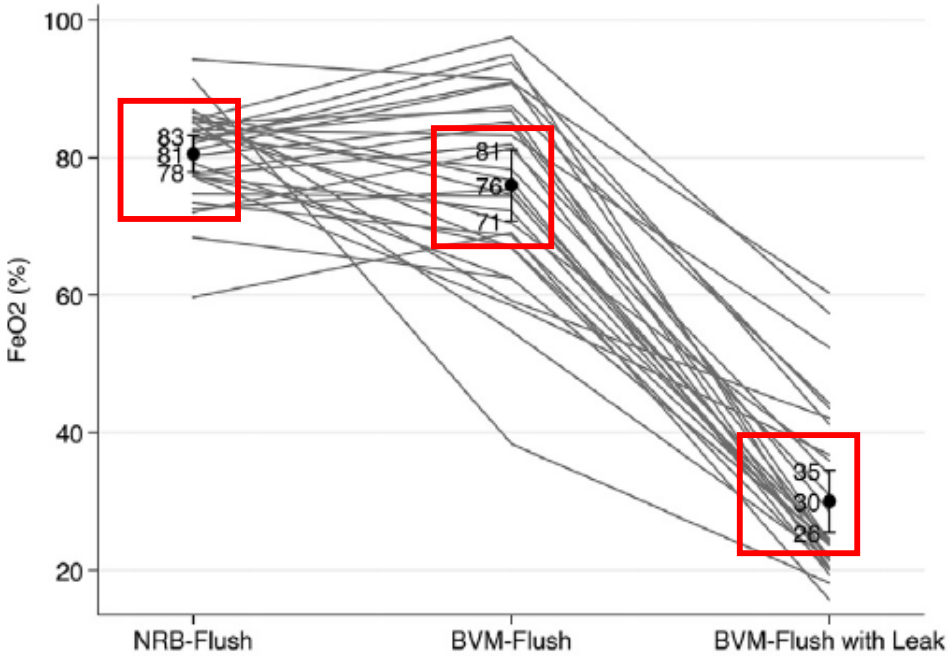
Characteristics	BVM N=157	NIV N=71	HFNO N=20	NRB N=71	P value
SAPS II, mean±SD	60±22	58±22	51±20	58±21	0.38
Body mass index, kg·m^{-2}, mean±SD	26 ±7	28 ±9	26 ±5	25 ±5	0.16
Main reason for ETI, n (%)					
- Neurological	49 (31%)	6 (9%)	2 (10%)	24 (34%)	
- Respiratory	42 (27%)	50 (70%)	16 (80%)	10 (14%)	0.001
- Hemodynamic	48 (31%)	13 (18%)	2 (10%)	29 (41%)	
- Other	18 (12%)	2 (3%)	0 (0%)	8 (11%)	
PaO_2/FiO_2 at ETI, mean±SD	156±178	101±64	107±52	169±157	0.01

Bailly. Under review.

Characteristics	Univariate analysis		Multivariate analysis	
	Coefficient [95%CI]	P value	Coefficient [95%CI]	P value
Age	-0.04 [-0.13-0.04]	0.29		
Female gender	0 [-2.67;2.67]	1.00		
SAPSII	-0.09 [-0.15;-0.03]	0.005	-0.06 [-0.11;-0.005]	0.03
SOFA score	-0.3 [-0.66;0.06]	0.1		
Baseline SpO_2	0.9 [0.71;1.09]	<0.001	0.91 [0.71;1.10]	<0.001
Duration of preoxygenation, min		0.43		
<5				
≥5 and <9	1			
≥9	-2 [-5.07;1.07]			
	-1 [-3.88;1.88]			
Duration of ETI[a]	0 [-0.53;0.53]	1		
Number of laryngoscopies		0.01		0.01
1	1		1	
2	-5 [-8.45;-1.55]		-4.79 [-7.86;-1.73]	
3 or more	1 [-4.44;6.44]		1.21 [-3.64;6.06]	
Main reason for intubation		0.001		
Neurological	1			
Respiratory	-7 [-10.41;-3.59]			
Cardiovascular	-4 [-7.59;-0.41]			
Other	-1 [-6.13;4.13]			
Use of a tracheal tube introducer	1 [-2.99;4.99]	0.62		
Successful first-pass ETI by a non-expert	2 [-0.74;4.74]	0.15		
Preoxygenation device		0.08		0.29
BVM	1		1	
NIV	-4 [-7.31;-0.69]		-2.48 [-5.28;-0.32]	
HFNO	-3 [-8.4;2.4]		-2.66 [-7.18;1.85]	
NRB	0 [-3.29;3.29]		-1.23 [-4.01;1.54]	

Preoxygenation With Flush Rate Oxygen: Comparing the Nonrebreather Mask With the Bag-Valve Mask

Brian E. Driver, MD*; Lauren R. Klein, MD; Krista Carlson, MS; Justin Harrington, MD; Robert F. Reardon, MD; Matthew E. Prekker, MD



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Video Laryngoscopy vs Direct Laryngoscopy on Successful First-Pass Orotracheal Intubation Among ICU Patients

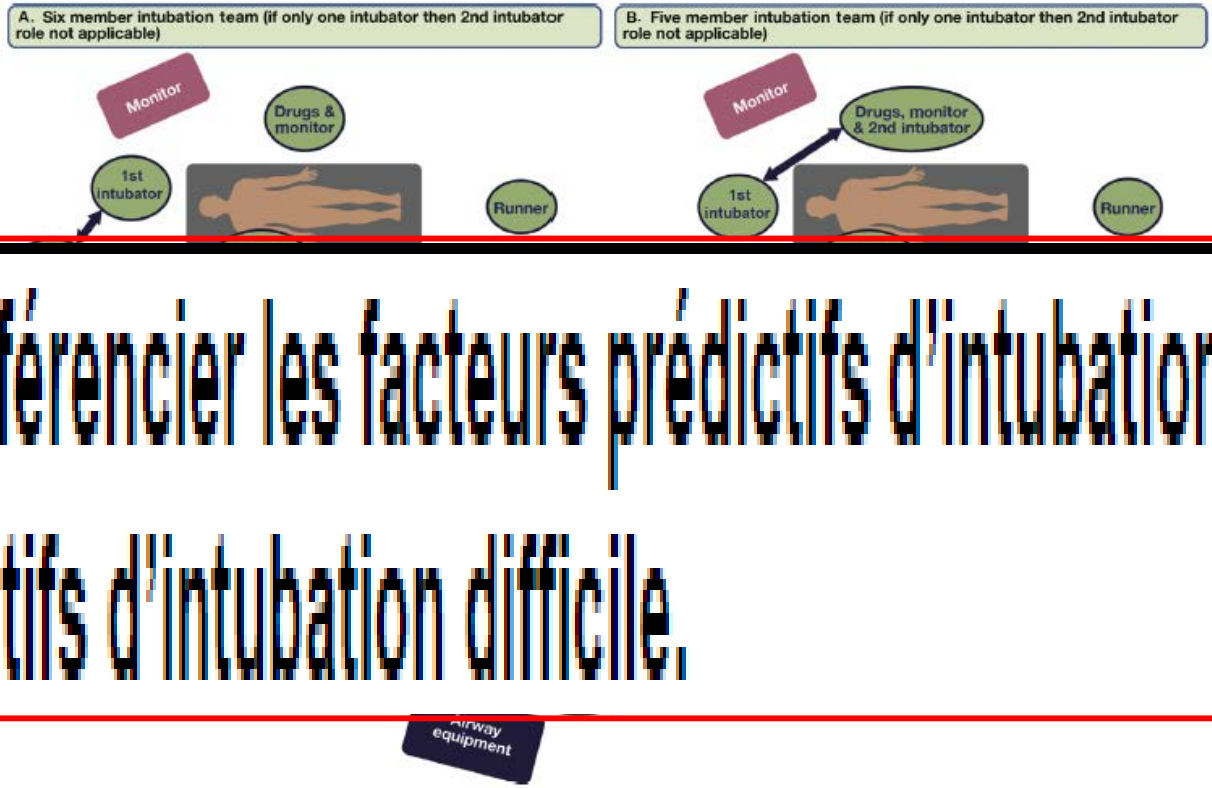
A Randomized Clinical Trial

Patient ayant un épisode SpO2<90% durant la procédure

	aOR [IC95%]	P value
Baseline SpO_2	0.72 [0.65-0.80]	<0.001
Preoxygenation device		0.02
Bag valve mask	1	
Non-invasive ventilation	0.10 [0.01-0.80]	
High-flow nasal oxygen	5.75 [1.15-28.76]	
Non-rebreathing mask	1.10 [0.25-4.92]	

Bailly. R2.

Exposition



R1.3 - Il faut différencier les facteurs prédictifs d'intubation compliquée des facteurs prédictifs d'intubation difficile.

Fig 1. The composition and roles of the intubation team. During an intubation procedure, the discrete functional roles can be described as: (1) first intubator; (2) drug administrator (drugs); (3) observer of patient's clinical state and monitors (monitor); (4) cricoid force applier (cricoid); (5) airway equipment assistant (equipment); (6) runner to fetch additional equipment or call for help; (7) second intubator; (8) team leader–coordinator (leader); and (9) manual in-line stabiliser (MILS). A single team member may perform more than one role. The detailed division of labour will depend on how many staff can be assembled. This may vary from a minimum of four staff up to six staff members. The figure describes the division of labour for teams consisting of (A) six, (B) five, and (C) four members. For each size of team, the roles change after the first failed intubation attempt, when the second intubator becomes active. If the team consists only a single intubator, the second intubator role is not included and the roles remain unchanged between intubation attempts until airway-expert help arrives, if at all. The Team Leader coordinates the team with the senior intubator. (MILS is a trauma-specific role, which must be added to any intubation team's complement).

Early Identification of Patients at Risk for Difficult Intubation in the Intensive Care Unit

Development and Validation of the MACOCHA Score in a Multicenter Cohort Study

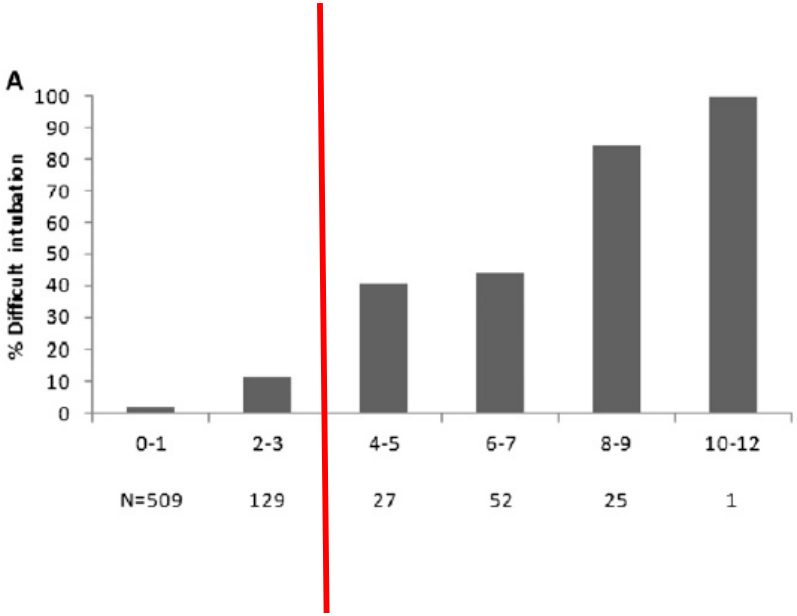
Audrey De Jong[1], Nicolas Molinari[2], Nicolas Terzi[3], Nicolas Mongardon[4], Jean-Michel Arnal[5], Christophe Guitton[6], Bernard Allaouchiche[7], Catherine Paugam-Burtz[8,9], Jean-Michel Constantin[10], Jean-Yves Lefrant[11], Marc Leone[12], Laurent Papazian[13], Karim Asehnoune[14], Nicolas Maziers[15], Elie Azoulay[15], Gael Pradel[16], Boris Jung[1,17], Samir Jaber[1,17], and AzuRéa Network for the Frida-Réa Study Group*

TABLE 5. MACOCHA SCORE CALCULATION WORKSHEET

Factors	Points
Factors related to patient	
Mallampati score III or IV	5
Obstructive sleep apnea syndrome	2
Reduced mobility of cervical spine	1
Limited mouth opening <3 cm	1
Factors related to pathology	
Coma	1
Severe hypoxemia (<80%)	1
Factor related to operator	
Nonanesthesiologist	1
Total	12

Definition of abbreviation: MACOCHA = Mallampati score III or IV, Apnea syndrome (obstructive), Cervical spine limitation, Opening mouth <3 cm, Coma, Hypoxia, Anesthesiologist nontrained.

Coded from 0 to 12: 0 = easy; 12 = very difficult.



Facial Image Analysis for Fully Automatic Prediction of Difficult Endotracheal Intubation

Gabriel Louis Cuendet*, *Student Member, IEEE*, Patrick Schoettker, Anıl Yüce, *Student Member, IEEE*, Matteo Sorci, Hua Gao, Christophe Perruchoud, and Jean-Philippe Thiran, *Senior Member, IEEE*

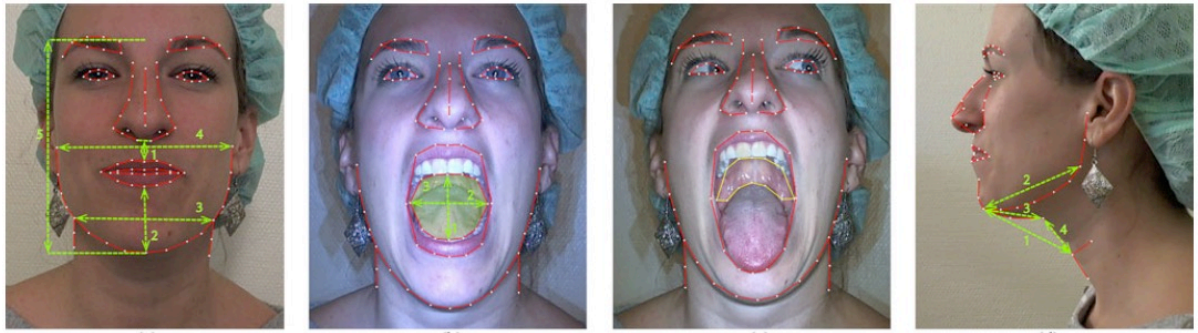
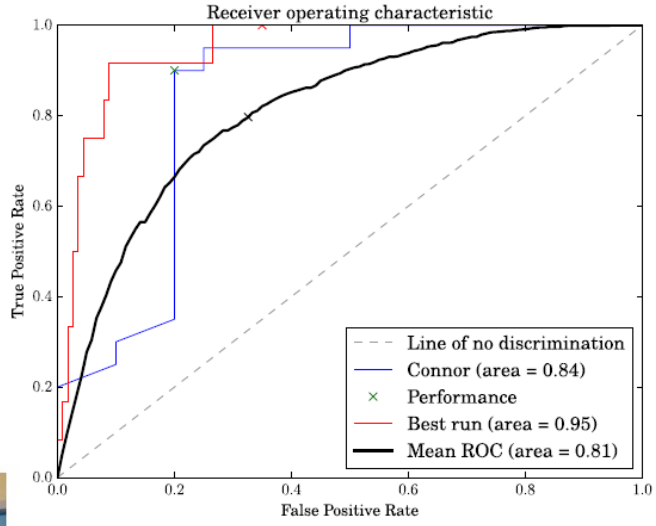
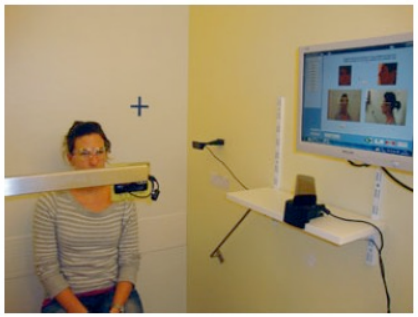


Fig. 2. Details of the four templates, each corresponding to a facial motion: (a) Frontal, neutral, 99 points. (b) Frontal, mouth open, 99 points. (c) Frontal, tongue out, 99 points. (d) Profile, neutral, 52 points. In green, the anatomical and morphological features described in Section III-B.



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Et si c’est déjà prévu…

Contents lists available at ScienceDirect

Journal of Critical Care

journal homepage: www.jccjournal.org

Pulmonary

Bronchoscopic intubation is an effective airway strategy in critically ill patients☆,☆☆,★

Kevin C Ma, MD [a], Augustine Chung, MD [b], Kerri I Aronson, MD [c], Jamuna K Krishnan, MD [c], Igor Z Barjaktarevic, MD [b], David A Berlin, MD [a], Edward J Schenck, MD [a,*]

[a] Division of Pulmonary and Critical Care Medicine, Weill Cornell Medical College, New York
[b] Division of Pulmonary and Critical Care Medicine, David Geffen School of Medicine UCLA, Los Angeles
[c] Department of Medicine, New York Presbyterian Hospital-Weill Cornell Medical College, New York

Table 1
Baseline characteristics

Characteristic	Bronchoscopic intubation (N = 52)	Laryngoscopic Intubation (N = 167)	P
Age, mean (SD)	64 (18)	68 (15)	.266
BMI, mean (SD)	28.4 (8.5)	25.9 (6.3)	.027[a]
Obese (BMI, >30), N (%)	25 (48)	51 (31)	.020[a]
APACHEII, mean (SD)	24.8 (5.6)	25 (7.7)	.881
Severe comorbidities, N (%)			
Hematologic malignancy	13 (26)	49 (30)	.597
Solid malignancy	2 (4)	21 (13)	.078
Immunocompromised	16 (32)	56 (34)	.779
Severe prior lung disease	11 (22)	24 (15)	.218
Cirrhosis	2 (4)	14 (9)	.286
Vasopressor,[b] N (%)	14 (27)	37 (22)	.478
Shock index, mean (SD)	1.15 (0.058)	1.25 (0.059)	.307

[a] Statistically significant difference by Wilcoxon rank sum test, independent *t* test, or χ^2 test where appropriate.
[b] Continuous vasopressor infusion immediately before intubation.

Table 3
Postintubation outcomes and complications

Outcome or complication	Bronchoscopic intubation (N = 52)	Laryngoscopic intubation (N = 167)	P
First-pass success	50 (96)	131 (78)	.003[a]
Death within 30 min	0 (0)	5 (3)	.207
Salvage technique	1 (2)	18 (11)	.047[a]
RMS intubation	0 (0)	7 (4)	.132
Esophageal intubation	0 (0)	2 (1)	.427
Hypotension	20 (38)	71 (43)	.605
Hypoxemia	4 (8)	9 (5)	.539
Pneumothorax	0 (0)	1 (1)	.576
In-hospital mortality	28 (54)	88 (53)	.884

Reported as N (%).
RMS indicates right mainstem.
[a] Statistically significant difference by χ^2 test.

Awake Fiberoptic or Awake Video Laryngoscopic Tracheal Intubation in Patients with Anticipated Difficult Airway Ma[illegible]agement

A Rando[illegible]ical Trial

Charl[illegible] [illegible]te Thøgersen, M.D.,† Arash Afshari, M.D., Ph.D.,‡
An[illegible] [illegible].D.,§ Mona R. Gätke, M.D., Ph.D.‖

	McGrath® VL Intubation (n = 41)	*P* Value
[illegible]	[illegible]678]	0.17*
Numbe[illegible]	[illegible]9]	—
1		0.64
2		—
3		—
Amount of remifentanil, μg/kg/min of IBW, median [range]		
Propofol bolus, mg, median [range]	0 [0–60]	

INTUBATION ORALE

Bloc opératoire

Anaesthesia 2015, 70, 400–406 doi:10.1111/anae.13016

Original Article

Fibreopt[illegible]opic (C-MAC® D-BLADE) nasal awake intub[illegible]ia*

A. [illegible] [illegible]Groeben[5]

[illegible]ical Care Medicine and Pain Therapy, [illegible]facial Surgery, Kliniken Essen-Mitte,

INTUBATION NASALE

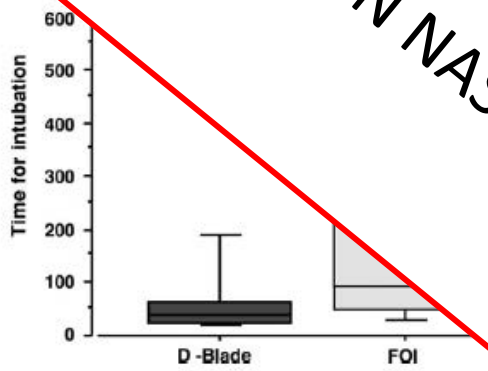


Figure 4 Time for intubation in patients randomly assigned to videolaryngoscopic (dark grey; n = 48) or fibreoptic (FOI; pale grey; n = 48) nasal intubation. Horizontal line = median; boxes = IQR; whiskers = 10th–90th percentiles.

Intubation « difficile » inattendue

Quels outils ?

Masque laryngé

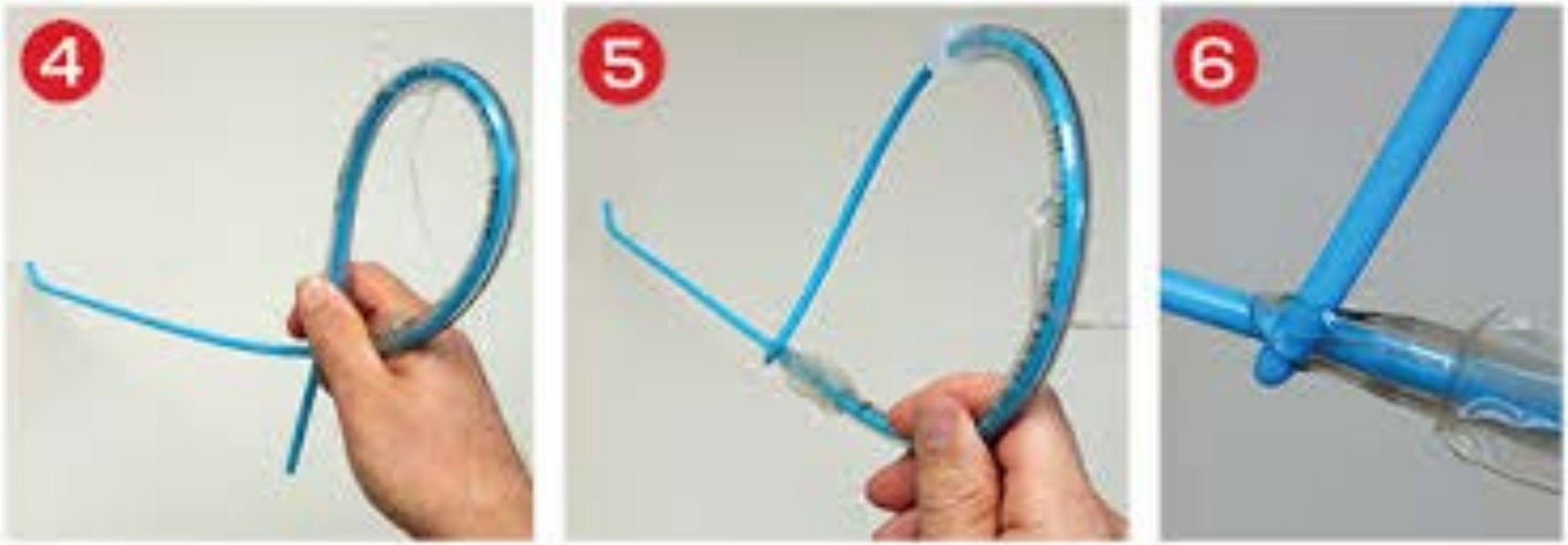
Stylet

BURP

Bougie

Scalpel/CRICO/FONA

Vidéolaryngoscope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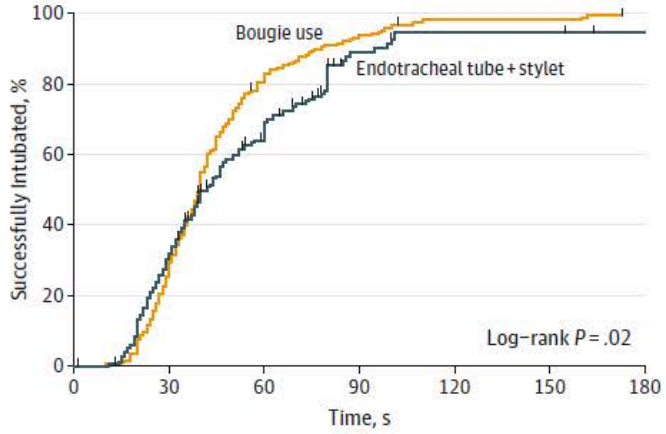
Effect of Use of a Bougie vs Endotracheal Tube and Stylet on First-Attempt Intubation Success Among Patients With Difficult Airways Undergoing Emergency Intubation

A Randomized Clinical Trial

Brian E. Driver, MD; Matthew E. Prekker, MD; Lauren R. Klein, MD; Robert F. Reardon, MD; James R. Miner, MD; Erik T. Fagerstrom, BA; Mitchell R. Cleghorn, BS; John W. McGill, MD; Jon B. Cole, MD

Figure 2. Duration of the First Intubation Attempt Until Successful Intubation Using a Bougie vs Endotracheal Tube + Stylet Among Patients With 1 or More Difficult Airway Characteristics



No. at risk							
Bougie	198	146	37	13	3	3	0
Endotracheal tube + stylet	182	127	56	9	3	3	1

Table 3. Trial Outcomes Among Patients Admitted to the Emergency Department Undergoing Orotracheal Intubation Using a Bougie vs an Endotracheal Tube + Stylet

Outcome	Bougie Group		Endotracheal Tube + Stylet Group		Difference (95% CI)	*P* Value	Interaction *P* Value[a]
	No. With Event/ Total No. of Patients	% (95% CI)	No. With Event/ Total No. of Patients	% (95% CI)			
Primary Outcome							
First-attempt intubation success, patients with any difficult airway characteristic (n = 380)	191/198	96 (93 to 99)	150/182	82 (76 to 88)	14 (8 to 20)	<.001	.36
Planned Secondary Outcomes							
Patients with any difficult airway characteristic (n = 380)							
First-attempt intubation success without hypoxemia[b]	156/191	82 (76 to 87)	123/177	69 (63 to 76)	12 (3 to 21)	.006	.61
First-attempt duration, median (IQR), s[c]	39 (29 to 52)		40 (27 to 63)		−1 (−6 to 3)	.50	.17
All patients (N = 757)							
First-attempt intubation success, overall	373/381	98 (96 to 99)	328/376	87 (83 to 90)	11 (7 to 14)	<.001	NA
First-attempt intubation success without hypoxemia[b]	317/371	85 (81 to 89)	282/366	77 (72 to 81)	8 (3 to 14)	.003	NA
First-attempt duration, median (IQR), s[c]	38 (29 to 51)		36 (25 to 54)		1 (4 to −1)	.24	NA

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Video Laryngoscopy vs Direct Laryngoscopy on Successful First-Pass Orotracheal Intubation Among ICU Patients

A Randomized Clinical Trial

Jean Baptiste Lascarrou, MD; Julie Boisrame-Helms, MD, PhD; Arthur Bailly, MD; Aurelie Le Thuaut, MSc; Toufik Kamel, MD; Emmanuelle Mercier, MD; Jean-Damien Ricard, MD, PhD; Virginie Lemiale, MD; Gwenhael Colin, MD; Jean Paul Mira, MD, PhD; Ferhat Meziani, MD, PhD; Jonathan Messika, MD; Pierre Francois Dequin, MD, PhD; Thierry Boulain, MD; Elie Azoulay, MD, PhD; Benoit Champigneulle, MD; Jean Reignier, MD, PhD; for the Clinical Research in Intensive Care and Sepsis (CRICS) Group

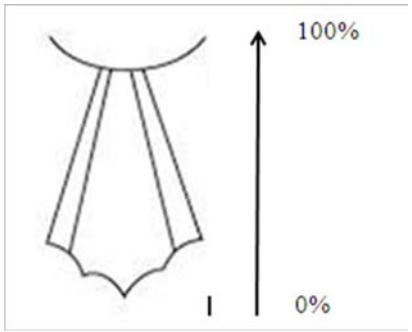
	Video Laryngoscopy (n = 186)	Direct Laryngoscopy (n = 185)
Demographics[a]		
BMI, mean (SD)[b]	26.2 (6.7)	26.6 (7.2)
Simplified Acute Physiologic Score II, mean (SD)[c]	58.0 (21.0)	57.7 (21.8)
No. (%)		
Normal health status	24 (12.9)	22 (11.9)
Moderate activity limitation	90 (48.3)	103 (55.7)
Severe activity limitation due to chronic disease	70 (37.6)	56 (30.3)
Bedridden	2 (1.1)	4 (2.2)
Charlson comorbidity index, mean (SD)[d]	2.9 (2.1)	3.0 (2.1)
Diagnosis at admission to the intensive care unit,		
Acute respiratory failure	73 (39.2)	86 (46.5)
Trauma	35 (18.8)	37 (20.0)
Other[e]	45 (24.2)	44 (23.8)
Reason for intubation, No. (%)		
Neurological failure	71 (38.2)	76 (41.1)
Respiratory failure	52 (28.0)	51 (27.6)
Circulatory failure	3 (1.6)	4 (2.2)
Other	13 (7.0)	9 (4.9)
Sequential Organ Failure Assessment score, mean (SD)[f]	7 (4)	7 (3)
Heart rate, mean (SD)	107 (28)	101 (25)
Serum lactic acid, mean (SD), mmoL/L	3.1 (3.1)	3.0 (3.3)

No difference

	No./Total (%) of Patients[a]			
	[illegible]copy	Direct Laryngoscopy	Absolute Difference (95% CI), %	*P* Value
Primary Outcome: Successful First-Pass [illegible]				
Intention-to-treat analysis		130/185 (70.3)	−2.5 (−11.9 to 6.9)	.60
Per-protocol analysis	[illegible]	[illegible]/182 (71.4)	−2.5 (−12.3 to 6.4)	.54

	No./Total (%) of Patients[a]			
	Video Laryngoscopy	Direct Laryngoscopy	Absolute Difference (95% CI), %	*P* Value
Secondary Outcomes				
Cormack-Lehane grade[b]				
1	133/176 (75.6)	93/177 (52.5)	23.1 (13.3 to 32.7)	<.001
2	25/176 (14.2)	51/177 (28.8)	−14.6 (−23.0 to −6.2)	
3	10/176 (5.7)	20/177 (11.3)	−5.6 (−11.4 to 0.2)	
4	8/176 (4.5)	13/177 (7.3)	−2.8 (−7.7 to 2.1)	
Percentage of glottic opening score, median (IQR)[c]	100 (80 to 100)	80 (50 to 100)	20 (0 to 20)	<.001
Maneuvers during first-attempt laryngoscopy				
Head elevation	38/183 (20.8)	46/181 (25.4)	−4.6 (−13.3 to 4.0)	.29
BURP maneuver[d]	26/183 (14.2)	28/181 (15.5)	−1.3 (−8.6 to 6.0)	.73
Sellick maneuver[e]	28/184 (15.2)	38/181 (21.0)	−5.8 (−13.6 to 2.1)	.15
After first-attempt laryngoscopy	22/184 (12.0)	10/181 (5.5)	6.5 (0.7 to 12.2)	.03
After second- to fifth-attempt laryngoscopy	27/73 (37.0)	24/66 (36.4)	0.6 (−25.9 to 27.1)	.94

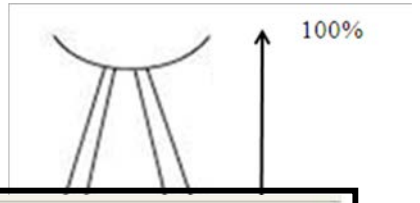
POGO Score



Cormack-Lehane grade[b]				
1	133/176 (75.6)	93/177 (52.5)	23.1 (13.3 to 32.7)	<.001
2	25/176 (14.2)	51/177 (28.8)	−14.6 (−23.0 to −6.2)	
3	10/176 (5.7)	20/177 (11.3)	−5.6 (−11.4 to 0.2)	
4	8/176 (4.5)	13/177 (7.3)	−2.8 (−7.7 to 2.1)	
Percentage of glottic opening score, median (IQR)[c]	100 (80 to 100)	80 (50 to 100)	20 (0 to 20)	<.001

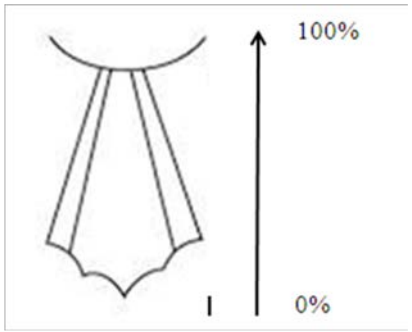
	No./Total (%) of Patients[a]			
	Video Laryngoscopy	Direct Laryngoscopy	Absolute Difference (95% CI), %	*P* Value
Secondary Outcomes				
Cormack-Lehane grade[b]				
1	133/176 (75.6)	93/177 (52.5)	23.1 (13.3 to 32.7)	<.001
2	25/176 (14.2)	51/177 (28.8)	−14.6 (−23.0 to −6.2)	
3	10/176 (5.7)	20/177 (11.3)	−5.6 (−11.4 to 0.2)	
4	8/176 (4.5)	13/177 (7.3)	−2.8 (−7.7 to 2.1)	
Percentage of glottic opening score, [illegible]	100 (80 to 100)	80 (50 to 100)	20 (0 to 20)	<.001
Reason for intubation failure[f]				
Glottis not seen	13/58 (22.4)	36/51 (70.6)	−48.2 (−64.6 to −31.7)	
Failure of tracheal catheterization	41/58 (70.7)	12/51 (23.5)	47.2 (30.6 to 63.7)	
Adverse event[g]	1/58 (1.7)	2/51 (3.9)	−2.2 (−8.5 to 4.1)	<.001
Laryngeal obstruction	1/58 (1.7)	1/51 (2.0)	−0.3 (−5.3 to 4.8)	
Technical failure (battery, other)	2/58 (3.4)	0	3.4 (−1.2 to 8.1)	
[illegible]	[illegible]	[illegible]	[illegible]	
No. of intubation attempts, median (range)	1 (1 to 4)	1 (1 to 5)	0 (0 to 0)	.68
Difficult intubation[h]	14/186 (7.5)	14/185 (7.6)	−0.1 (−5.5 to 5.4)	.99
Duration of intubation, median (IQR), min	3 (2 to 4)	3 (2 to 4)	0 (0 to 0)	.95
Need for facial mask ventilation after first-attempt laryngoscopy	16/73 (21.9)	15/66 (22.7)	−0.8 (−30.1 to 28.5)	.91
Need for gum elastic bougie	49/257 (19.1)	34/247 (13.8)	5.3 (2.2 to 25.4)	.11
After first-attempt laryngoscopy	22/184 (12.0)	10/181 (5.5)	6.5 (0.7 to 12.2)	.03
After second- to fifth-attempt laryngoscopy	27/73 (37.0)	24/66 (36.4)	0.6 (−25.9 to 27.1)	.94

POGO Score



	No./Total (%) of Patients[a]			
	Video Laryngoscopy	Direct Laryngoscopy	Absolute Difference (95% CI), %	*P* Value
Secondary Outcomes				
Cormack-Lehane grade[b]				
1	133/176 (75.6)	93/177 (52.5)	23.1 (13.3 to 32.7)	<.001
2	25/176 (14.2)	51/177 (28.8)	−14.6 (−23.0 to −6.2)	
3	10/176 (5.7)	20/177 (11.3)	−5.6 (−11.4 to 0.2)	
4	8/176 (4.5)	13/177 (7.3)	−2.8 (−7.7 to 2.1)	
Percentage of glottic opening score, median (IQR)[c]	100 (80 to 100)	80 (50 to 100)	20 (0 to 20)	<.001
Maneuvers during first-attempt laryngoscopy				
Head elevation	38/183 (20.8)	46/181 (25.4)	−4.6 (−13.3 to 4.0)	.29
BURP maneuver[d]	26/183 (14.2)	28/181 (15.5)	−1.3 (−8.6 to 6.0)	.73
Sellick maneuver[e]	28/184 (15.2)	38/181 (21.0)	−5.8 (−13.6 to 2.1)	.15
Difficult intubation[h]	14/186 (7.5)	14/185 (7.6)	−0.1 (−5.5 to 5.4)	.99
Failure of tracheal catheterization	41/58 (70.7)	12/51 (23.5)	47.2 (30.6 to 63.7)	<.001
Adverse event[g]	1/58 (1.7)	2/51 (3.9)	−2.2 (−8.5 to 4.1)	
Laryngeal obstruction	1/58 (1.7)	1/51 (2.0)	−0.3 (−5.3 to 4.8)	
Technical failure (battery, other)	2/58 (3.4)	0	3.4 (−1.2 to 8.1)	
No. of intubation attempts, median (range)	1 (1 to 4)	1 (1 to 5)	0 (0 to 0)	.68
Difficult intubation[h]	14/186 (7.5)	14/185 (7.6)	−0.1 (−5.5 to 5.4)	.99
Duration of intubation, median (IQR), min	3 (2 to 4)	3 (2 to 4)	0 (0 to 0)	.95
Need for facial mask ventilation after first-attempt laryngoscopy	16/73 (21.9)	15/66 (22.7)	−0.8 (−30.1 to 28.5)	.91
Need for gum elastic bougie	49/257 (19.1)	34/247 (13.8)	5.3 (2.2 to 25.4)	.11
After first-attempt laryngoscopy	22/184 (12.0)	10/181 (5.5)	6.5 (0.7 to 12.2)	.03
After second- to fifth-attempt laryngoscopy	27/73 (37.0)	24/66 (36.4)	0.6 (−25.9 to 27.1)	.94

POGO Score



JAMA | Original Investigation

Effect of Use of a Bougie vs Endotracheal Tube and Stylet on First-Attempt Intubation Success Among Patients With Difficult Airways Undergoing Emergency Intubation

A Randomized Clinical Trial

Brian E. Driver, MD; Matthew E. Prekker, MD; Lauren R. Klein, MD; Robert F. Reardon, MD; James R. Miner, MD; Erik T. Fagerstrom, BA; Mitchell R. Cleghorn, BS; John W. McGill, MD; Jon B. Cole, MD

Outcome	Bougie Group		Endotracheal Tube + Stylet Group		Difference (95% CI)	*P* Value	Interaction *P* Value[a]
	No. With Event/ Total No. of Patients	% (95% CI)	No. With Event/ Total No. of Patients	% (95% CI)			
Primary Outcome							
First-attempt intubation success, patients with any difficult airway characteristic (n = 380)	191/198	96 (93 to 99)	150/182	82 (76 to 88)	14 (8 to 20)	<.001	.36
Planned Secondary Outcomes							
Patients with any difficult airway characteristic (n = 380)							
First-attempt intubation success without hypoxemia[b]	156/191	82 (76 to 87)	123/177	69 (63 to 76)	12 (3 to 21)	.006	.61
First-attempt duration, median (IQR), s[c]	39 (29 to 52)		40 (27 to 63)		−1 (−6 to 3)	.50	.17
All patients (N = 757)							
First-attempt intubation success, overall	373/381	98 (96 to 99)	328/376	87 (83 to 90)	11 (7 to 14)	<.001	NA
First-attempt intubation success when C-MAC used, all patients	356/362	98 (96 to 99)	321/366	88 (84 to 91)	11 (7 to 14)	<.001	.46
Grade 1	265/269	99 (96 to 100)	258/269	96 (93 to 98)	3 (0 to 5)	.07	.04
Grade 2	72/74	97 (91 to 100)	41/62	66 (53 to 78)	31 (19 to 44)	<.001	.13
Grade 3	26/27	96 (81 to 100)	11/23	48 (27 to 69)	48 (27 to 71)	<.001	.17
Grade 4	3/3	100 (29 to 100)	2/5	40 (5 to 85)	60 (17 to 100)	.09	.78
First-attempt intubation success by actual first device entered into mouth after laryngoscope, all patients[e]	392/402	98 (95 to 99)	309/355	87 (83 to 90)	10 (7 to 14)	<.001	NA
First-attempt duration if first attempt successful, median (IQR), s[c]	38 (29 to 51)		34 (23 to 47)		4 (2 to 7)	<.001	.03

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Gao, Y.X., et al., *Video versus direct laryngoscopy on successful first-pass endotracheal intubation in ICU patients.* World J Emerg Med, 2018. **9**(2): p. 99-104.

Huang, H.B., et al., *Video Laryngoscopy for Endotracheal Intubation of Critically Ill Adults: A Systemic Review and Meta-Analysis.* Chest, 2017. **152**(3): p. 510-517.

Savino, P.B., et al., *Direct Versus Video Laryngoscopy for Prehospital Intubation: A Systematic Review and Meta-analysis.* Acad Emerg Med, 2017. **24**(8): p. 1018-1026.

Zhao, B.C., T.Y. Huang, and K.X. Liu, *Video laryngoscopy for ICU intubation: a meta-analysis of randomised trials.* Intensive Care Med, 2017. **43**(6): p. 947-948.

A deliberately restricted laryngeal view with the GlideScope® video laryngoscope is associated with faster and easier tracheal intubation when compared with a full glottic view: a randomized clinical trial

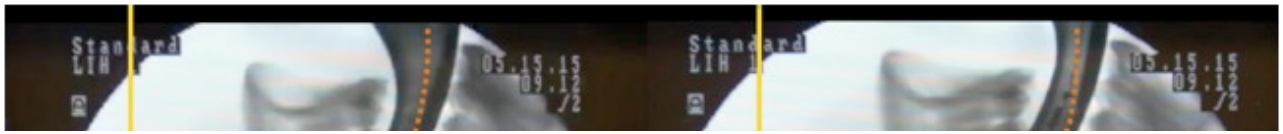


Table 2 Study results

Parameter	Group F (full view) n = 80 unless otherwise specified	Group R (restricted view) n = 80 unless otherwise specified	Hodges-Lehmann estimate of median difference [95% confidence intervals]	P value	Cluster-adjusted P value
Time to intubate, sec, median [IQR]	36 [27-48]	27 [22-36]	9 [5 to13]	< 0.001	0.002
Time to obtain view, sec, median [IQR]	10 [7-14]	10 [7-12] (3-23)	0 [-1 to 2]	0.46	0.002[1]
VAS score of ease of intubation, mm, median [IQR] {0=easy, 100=difficult}	50 [17-65]	14 [6-42]	20 [10 to 31]	< 0.001	0.001
1st attempt success, n (%)	76 (95)	79 (99)	—	0.37	0.26
SpO_2 immediately following intubation, %, median [IQR]	n = 78: 99 [98-99]	n = 79: 99 (98-99)	0 [0 to 0]	0.23	N/A[2]
POGO %, median [IQR]	70 [50-90]	10 [10-20]	55 [50 to 60]	< 0.001	0.001

GlideScope GVL video laryngoscope (Group R). Only part of the

Difficult Airway Characteristics Associated with First-Attempt Failure at Intubation Using Video Laryngoscopy in the Intensive Care Unit

Raj Joshi[1,2], Cameron D. Hypes[1,2], Jeremy Greenberg[1,2], Linda Snyder[1], Josh Malo[1], John W. Bloom[1,3], Harsharon Chopra[3], John C. Sakles[2], and Jarrod M. Mosier[1,2]

Characteristic	First-Attempt Failure (*n* = 166)	First-Attempt Success (*n* = 740)	*P* Value*	Univariate Analysis	
				Crude OR	95% CI
None	22 (13.3)	177 (23.9)	0.003	—	—
Blood in airway	37 (22.3)	84 (11.4)	<0.001	2.24	1.46–3.44
Vomit in airway	14 (8.4)	42 (5.7)	0.21	1.53	0.82–2.87
Cervical immobility	10 (6)	16 (2.2)	0.02	2.90	1.29–6.51
Facial/neck trauma	2 (1.2)	5 (0.7)	0.62	1.79	0.34–9.32
Airway edema	20 (12)	34 (4.7)	0.001	2.84	1.59–5.08
Small mandible	28 (16.9)	96 (13)	0.21	1.36	0.86–2.15
Obesity	63 (38)	195 (26.4)	0.004	1.71	1.20–2.43
Large tongue	26 (15.7)	71 (9.6)	0.03	1.75	1.08–2.84
Short neck	52 (31.3)	150 (20.3)	0.003	1.79	1.23–2.61
Limited mouth opening†	24 (17.3)	64 (10.1)	0.03	1.85	1.11–3.09
Secretions†	42 (30.2)	115 (18.1)	0.002	1.95	1.29–2.96

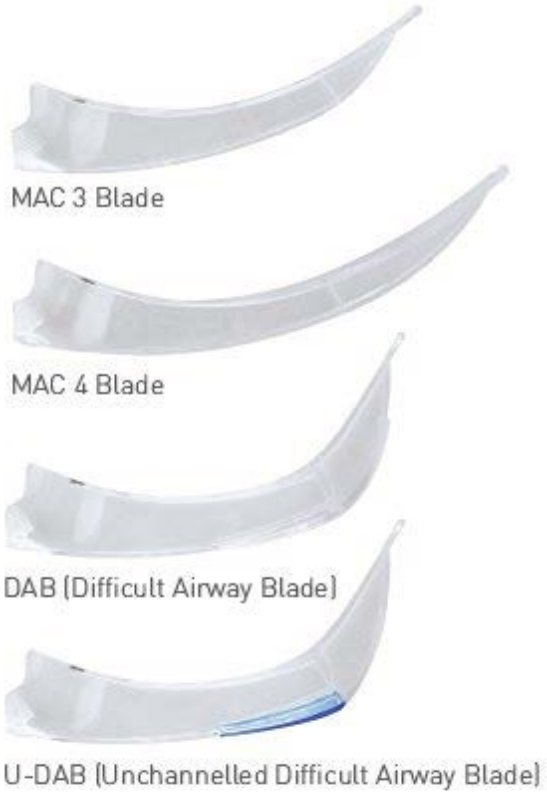
Des nouveautés tous les jours…

ac

Difficult ir

- Glides

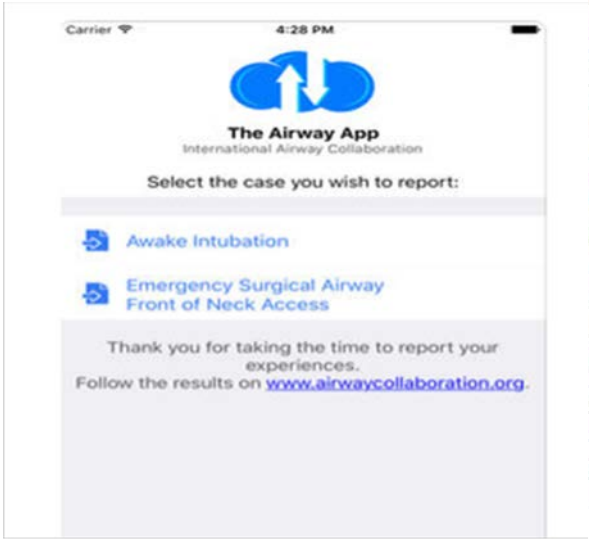
→ C-MAC
APA



th channel blade

Airtaq
KingVision
AWS 200

Quelques minutes plus tard…



South Africa	19
USA	19
Canada	18
Australia	10
Netherlands	7
UK	6
New Zealand	3
Germany	2
Sudan	2
Sweden	2
Belgium	1
Chile	1
Czech Republic	1
Denmark	1
Haiti	1
Ireland	1
India	1
Italy	1
Portugal	1
Saudi Arabia	1
Turkey	1

Neuromuscular Blockade Improves First-Attempt Success for Intubation in the Intensive Care Unit

A Propensity Matched Analysis

Jarrod M. Mosier[1,2], John C. Sakles[2], Uwe Stolz[2], Cameron D. Hypes[1,2], Harsharon Chopra[3], Josh Malo[1], and John W. Bloom[1]

Outcome	Paralytic		No Paralytic		*P* Value
	% (*n*/*N*)	95% CI	% (*n*/*N*)	95% CI	
First attempt success,	80.9 (401/496)	77–84	69.6 (117/168)	62–76	0.003
More than two attempts	3.6 (18)	2.2–5.7	5.4 (9)	2.5–9.9	0.36
CL I or II	82.1 (407/496)	78–85	78.0 (131/168)	71–84	0.26
POGO score, mean	72%	69–75	69%	63–74	0.29

Definition of abbreviations: CI = confidence interval; CL = Cormack-Lehane grade of view; POGO = percentage of glottic opening.

Table 6. Video laryngoscopy subgroup

Outcome	Paralytic	95% CI	No Paralytic	95% CI	*P* Value
First attempt success, % (*n*/*N*)	84.6 (334/395)	81–88%	69.1 (103/149)	61–76%	<0.001
CL I or II, % (*n*/*N*)	86.6 (343/395)	83–90%	77.9 (116/149)	70–84%	0.02
POGO score, mean %	77	74–79%	71	65–76%	0.05

Definition of abbreviations: CI = confidence interval; CL = Cormack-Lehane; POGO = percentage of glottic opening.

BJA

British Journal of Anaesthesia, ■ (■): 1–30 (2017)

doi: 10.1016/j.bja.2017.10.021
Special Article

SPECIAL ARTICLE

Guidelines for the management of tracheal intubation in critically ill adults

A. Higgs[1,*], B. A. McGrath[2], C. Goddard[3], J. Rangasami[4], G. Suntharalingam[5], R. Gale[6], T. M. Cook[7] and on behalf of Difficult Airway Society, Intensive Care Society, Faculty of Intensive Care Medicine, Royal College of Anaesthetists

The All India Difficult Airway Association 2016 guidelines for tracheal intubation in the Intensive Care Unit

Sheila Nainan Myatra, Syed Moied Ahmed[1], Pankaj Kundra[2], Rakesh Garg[3], Venkateswaran Ramkumar[4], Apeksh Patwa[5,6], Amit Shah[5,6], Ubaradka S Raveendra[7], Sumalatha Radhakrishna Shetty[7], Jeson Rajan Doctor, Dilip K Pawar[8], Singaravelu Ramesh[9], Sabyasachi Das[10], Jigeeshu Vasishtha Divatia

Department of Anaesthesiology, Critical Care and Pain, Tata Memorial Hospital, Mumbai, Maharashtra, [1]Department of Anaesthesiology and Critical Care, J N Medical College and Hospital, AMU, Aligarh, Uttar Pradesh, [2]Department of Anaesthesiology and Critical Care, JIPMER, Puducherry, [3]Department of Onco-Anaesthesiology and Palliative Medicine, Dr. BRAIRCH, All India Institute of Medical Sciences, [8]Department of Anaesthesia, All India Institute of Medical Sciences, New Delhi, [4]Department of Anaesthesiology, Kasturba Medical College, Manipal, [7]Department of Anaesthesiology and Critical Care, K S Hegde Medical Academy, Nitte University, Mangalore, Karnataka, [5]Kailash Cancer Hospital and Research Centre, [6]Department of Anaesthesia, Vadodara Institute of Neurological Sciences, Vadodara, Gujarat, [9]Department of Anaesthesia, Kanchi Kamakoti CHILDS Trust Hospital, Chennai, Tamil Nadu, [10]Department of Anaesthesiology, North Bengal Medical College, Darjeeling, West Bengal, India

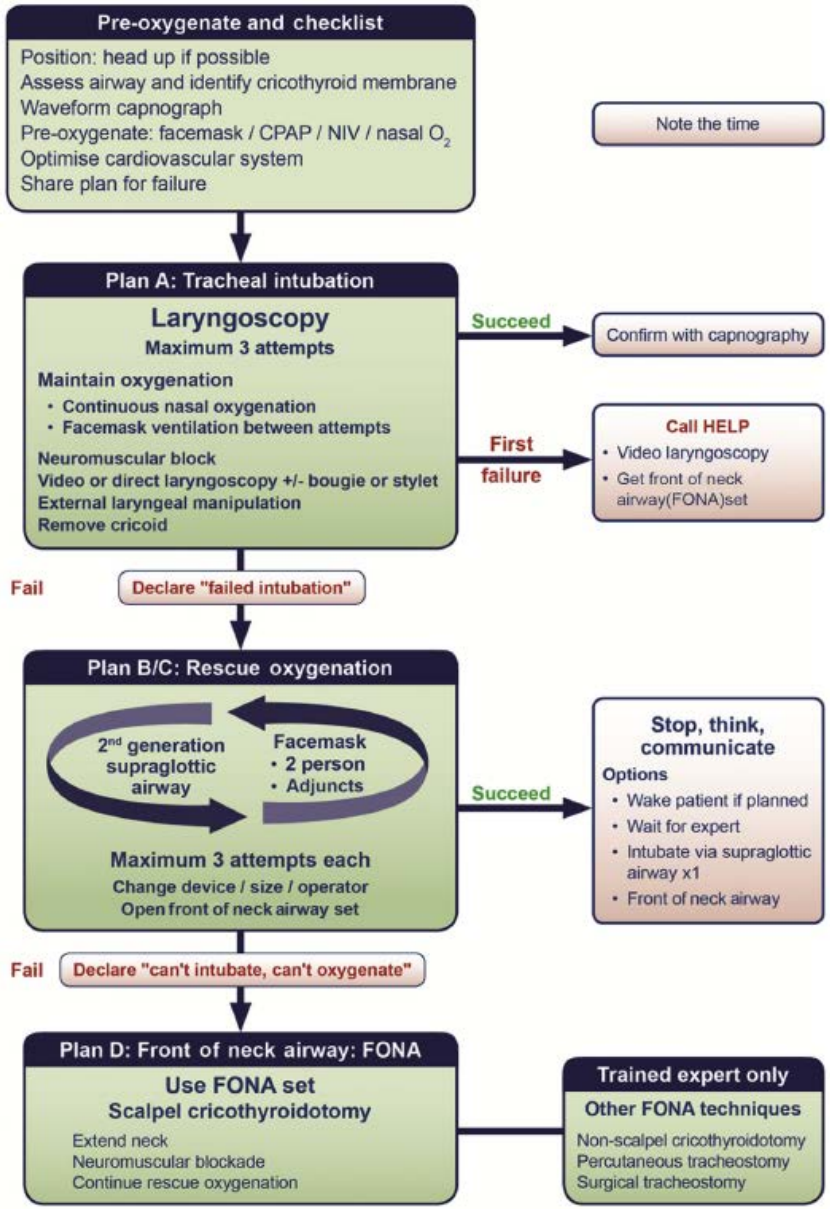
Recommandations Formalisées d'Experts

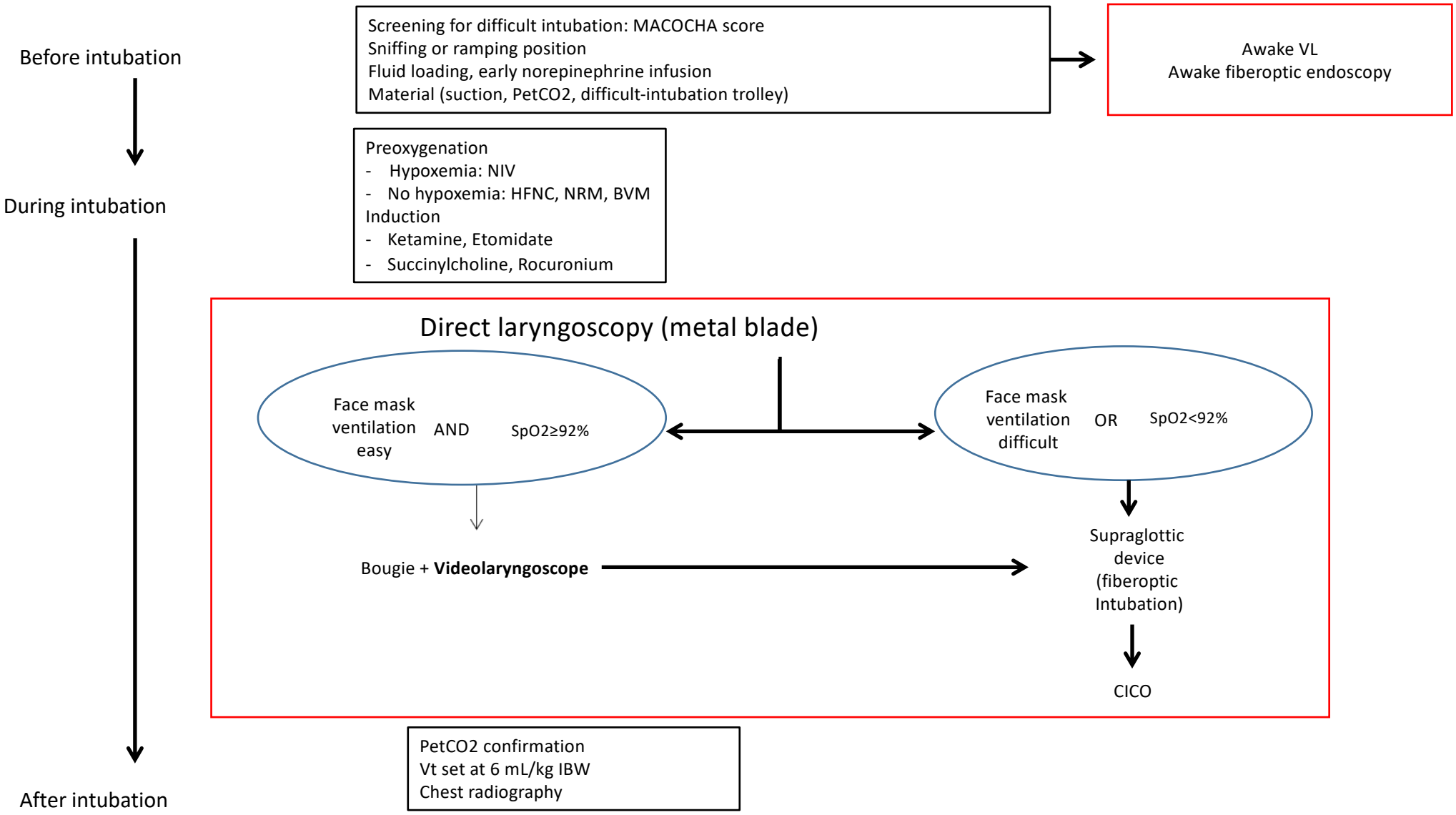
INTUBATION ET EXTUBATION DU PATIENT DE REANIMATION

RFE commune SFAR- SRLF
Société Française d'Anesthésie et de Réanimation
Société de Réanimation de Langue Française

En collaboration avec les Sociétés SFMU, GFRUP, ADARPEF, SKR
Société Française de Médecine d'Urgence, Groupe Francophone de Réanimation et Urgences Pédiatrique, Association Des Anesthésistes-Réanimateurs Pédiatriques d'Expression Française, Société Kinesitherapeutes de Réanimation

INTUBATION AND EXTUBATION OF THE ICU PATIENT


Pre-oxygenate and checklist
Position: head up if possible
Assess airway and identify cricothyroid membrane
Waveform capnograph
Pre-oxygenate: facemask / CPAP / NIV / nasal O_2
Optimise cardiovascular system
Share plan for failure
Note the time
Plan A: Tracheal intubation
Laryngoscopy
Maximum 3 attempts
Maintain oxygenation
• Continuous nasal oxygenation
• Facemask ventilation between attempts
Neuromuscular block
Video or direct laryngoscopy +/- bougie or stylet
External laryngeal manipulation
Remove cricoid
Succeed
Confirm with capnography
First failure
Call HELP
• Video laryngoscopy
• Get front of neck airway(FONA)set
Fail
Declare "failed intubation"
Plan B/C: Rescue oxygenation
2nd generation supraglottic airway
Facemask
• 2 person
• Adjuncts
Maximum 3 attempts each
Change device / size / operator
Open front of neck airway set
Succeed
Stop, think, communicate
Options
• Wake patient if planned
• Wait for expert
• Intubate via supraglottic airway x1
• Front of neck airway
Fail
Declare "can't intubate, can't oxygenate"
Plan D: Front of neck airway: FONA
Use FONA set
Scalpel cricothyroidotomy
Extend neck
Neuromuscular blockade
Continue rescue oxygenation
Trained expert only
Other FONA techniques
Non-scalpel cricothyroidotomy
Percutaneous tracheostomy
Surgical tracheostomy


Before intubation
During intubation
After intubation
Screening for difficult intubation: MACOCHA score
Sniffing or ramping position
Fluid loading, early norepinephrine infusion
Material (suction, PetCO2, difficult-intubation trolley)
Awake VL
Awake fiberoptic endoscopy
Preoxygenation
- Hypoxemia: NIV
- No hypoxemia: HFNC, NRM, BVM
Induction
- Ketamine, Etomidate
- Succinylcholine, Rocuronium
Direct laryngoscopy (metal blade)
Face mask ventilation easy AND SpO2≥92%
Face mask ventilation difficult OR SpO2<92%
Bougie + Videolaryngoscope
Supraglottic device (fiberoptic Intubation)
CICO
PetCO2 confirmation
Vt set at 6 mL/kg IBW
Chest radiography

« Take Away Message »

- Prendre quelques minutes (secondes) pour évaluer la situation
- Optimiser la pré-oxygénation et la première laryngoscopie
- Avoir des outils (mais pas trop) en cas d'intubation difficile
  - Mandrin long > stylet
  - Masque facial
  - Vidéolaryngoscope
  - Masque laryngé
  - « FONA » kit

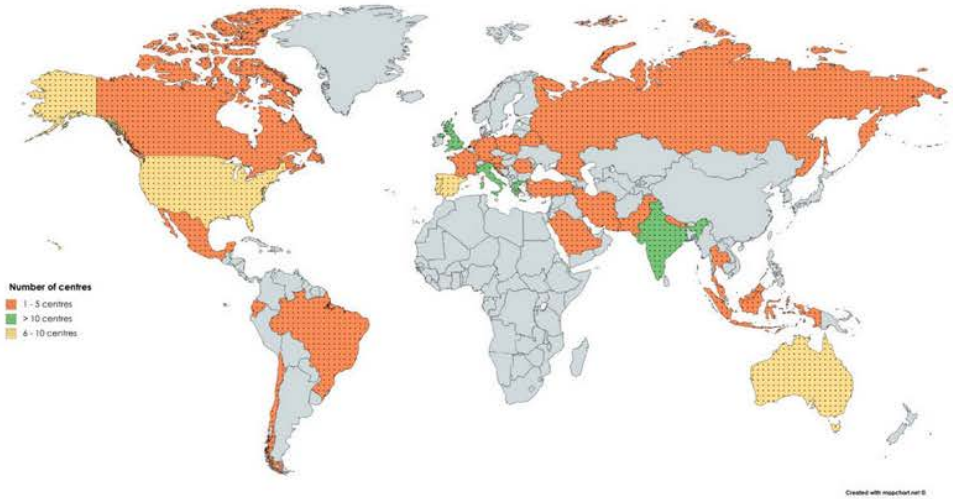
Questions, remarques à:  @JBLascarrou

INternational observational study To Understand the impact and BEst practices of airway management in critically ill patients (INTUBE)

Max 20 patients / 8 semaines / note information

Endorsed by:

Total number of registered centres: **251**



Questions, remarques à: @JBLascarrou ou jeanbaptiste.lascarrou@chu-nantes.fr

3472 patients

0.55 inhalation

JAMA Surgery | Original Investigation

Effect of Cricoid Pressure Compared With a Sham Procedure in the Rapid Sequence Induction of Anesthesia

The IRIS Randomized Clinical Trial

Aurélie Birenbaum, MD; David Hajage, MD, PhD; Sabine Roche, MD; Alexandre Ntouba, MD; Mathilde Eurin, MD; Philippe Cuvillon, MD, PhD; Aurélien Rohn, MD; Vincent Compere, MD, PhD; Dan Benhamou, MD; Matthieu Biais, MD, PhD; Remi Menut, MD; Sabiha Benachi, MD; François Lenfant, MD, PhD; Bruno Riou, MD, PhD

Table 2. Tracheal Intubation and Extubation

Variable	No. (%) Sellick Group (n = 1735)	Sham Group (n = 1736)	P Value
Tracheal intubation			
Intubation time, median (IQR), s	27 (19-40)	23 (15-37)	<.001
Intubation time >30 s	792 (47)	677 (40)	<.001
Missing values, No.	42	49	NA
Operator			
Senior anesthesiologist	184 (11)	162 (9)	.33
Junior anesthesiologist	439 (25)	465 (27)	
Senior nurse anesthetist	990 (57)	970 (56)	
Junior nurse anesthetists	109 (6)	125 (7)	
Missing values, No.	13	14	NA
Use of a bougie	536 (21)	546 (21)	.63
Missing values, No.	1	0	NA
No. of attempts			
1	1585 (92)	1589 (92)	.19
2	119 (7)	126 (7)	
>2	28 (2)	18 (1)	
Missing values, No.	3	3	NA
More than 1 operator	70 (4)	82 (5)	.32
Missing values, No.	5	4	NA
Cormack and Lehane grade			
1	1285 (74)	1381 (80)	<.001
2	270 (16)	256 (15)	
3	133 (8)	76 (4)	
4	42 (2)	17 (1)	
Missing values, No.	5	6	NA
Interruption of the cricoid pressure	246 (14)	86 (5)	<.001