Accès aux voies aériennes et médecine d'urgence « tour d'horizon »

YAMOUSSOUKRO, SARAF, 2018

Dominique Pateron

Service des Urgences

Hôpital Saint-Antoine & Sorbonne Université

Frédéric Adnet

Urgences - SAMU 93

Hôpital Avicenne & Université Paris 13, Bobigny

Intubation aux urgences: tendances actuelles

Techniques, Success, and Adverse Events of Emergency Department Adult Intubations

Calvin A. Brown, III, MD*; Aaron E. Bair, MD; Daniel J. Pallin, MD, MPH; Ron M. Walls, MD; on behalf of the NEAR III Investigators

- Travail observationnel, multicentrique
- 17.583 intubations
- 2002 à 2012
- Etiologies principales
  - Trauma crânien
  - ACR
  - Comas médicaux

Ann Emerg Med 2014, Dec 19.

Circonstances d'intubation en urgence

Table 1.
Prehospital diagnosis of study patients (N=691).

Diagnosis	No.	%
Illness		
Cardiac arrest	333	48.2
Neurologic medical distress	198	28.1
Cerebrovascular accident	26	3.8
Seizure	23	3.3
Toxic ingestion	94	13.6
Unknown	65	9.4
Respiratory distress	64	9.3
Collapse	22	3.2
Injury	64	9.3
Multiply injured patients	22	3.2
Head trauma	31	4.5
Burn	11	1.6

Adnet, *Ann Emerg Med*, 1998

Circonstances d'intubation en urgence

650 patients intubés hors ACR

Reasons for emergency intubation		
Comatose	162 (69%)	162 (69%)
Shock	31 (13%)	26 (11%)
Acute respiratory failure	37 (16%)	41 (17%)
Other	4 (2%)	6 (3%)

Jabre & Adnet, *Lancet*, 2009

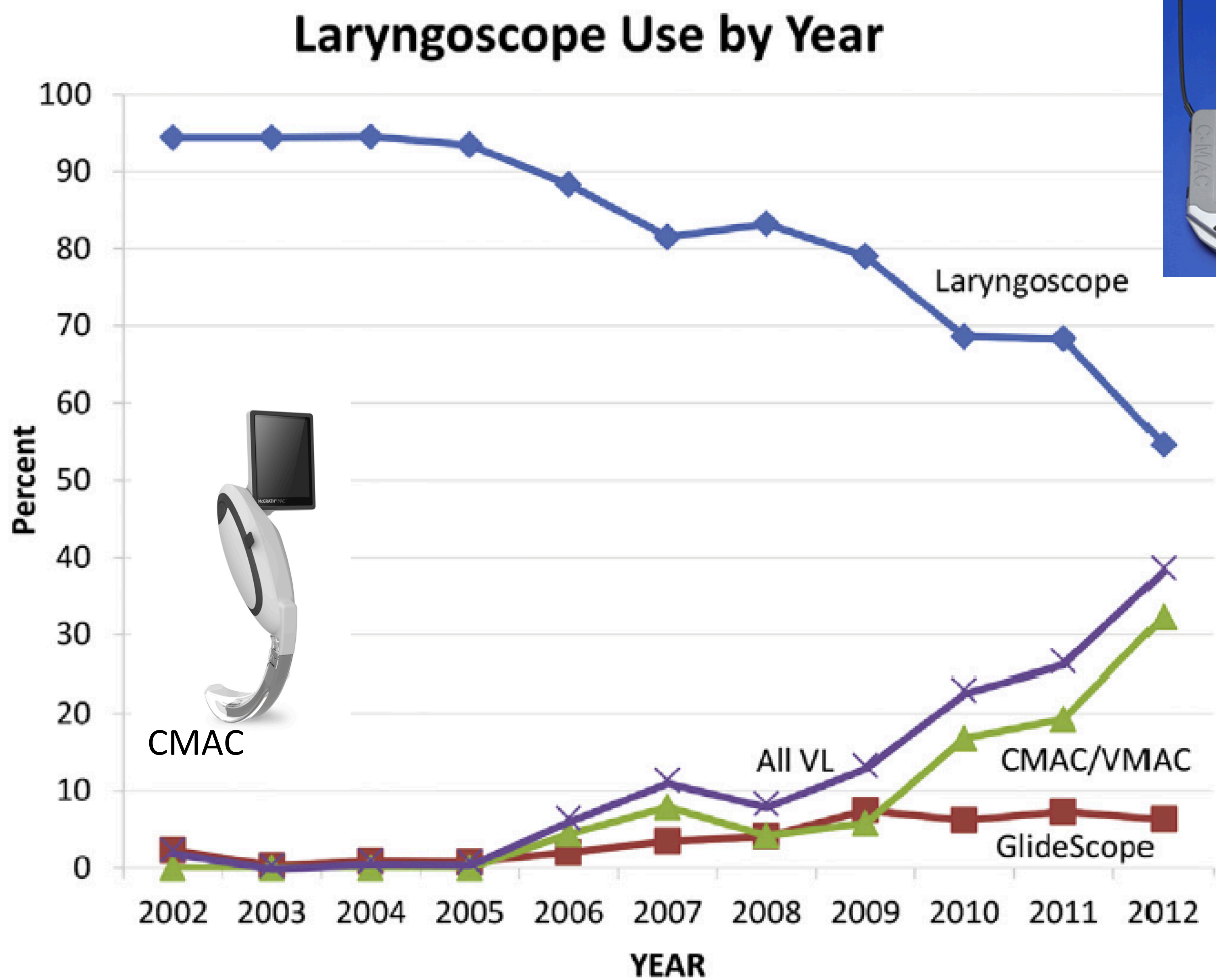

Figure 2. Laryngoscope use by year. *VL*, video laryngoscope.

Ann Emerg Med 2014, Dec 19.

Vidéo-laryngoscopie

Glidescope®	Mac Grath®	Airtraq®	Airwayscope®	LMA Ctrach®

Vidéo-laryngoscopie

Publications (travaux originaux) PubMed par catégorie

	Glidescope®	Mac Grath®	Airtraq®	AirwayScope®	LMA CTrach®
Publications	112	10	61	9	14
Intubation difficile	57	8	35	1	5
Urgence	11	0	8	2	5
Préhospitalier	6	0	5	0	1

Termes MeSh sauf * : intubation : 5.035 ; intubation difficile* : 614, urgence : 10.521 ; préhospitalier : 5.351 25 Novembre 2014

Vidéo-laryngoscopie

J Intensive Care Med. 2015 Jan;30(1):44-8. doi: 10.1177/0885066613492641. Epub 2013 Jun 13.

Video laryngoscopy is associated with increased first pass success and decreased rate of esophageal intubations during urgent endotracheal intubation in a medical intensive care unit when compared to direct laryngoscopy.

Lakticova V[1], Koenig SJ[2], Narasimhan M[2], Mayo PH[2].

…aux originaux) PubMed par catégorie

	[illegible]	[illegible]	Airtraq®	AirwayScope®	LMA CTrach®
Publications	[illegible]	[illegible]	[illegible]	9	14
Intubation difficile	57	[illegible]	[illegible]	[illegible]	5
Urgence	11	0	[illegible]	[illegible]	[illegible]
Préhospitalier	6	0	5	[illegible]	[illegible]

Termes MeSh sauf * : intubation : 5.035 ; intubation difficile* : 614, urgence : 10.521 ; préhospitali… 5.351 25 Novembre 2014

Vidéo-laryngoscopie

J Intensive Care Med. 2015 Jan;30(1):44-8. doi: 10.1177/08850666613

Video laryngoscopy is associated with inc... intubations during urgent endotracheal ... laryngoscopy.

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...reased rate of esophageal ...are unit when compared to direct

...aux originaux) PubMed par catégorie

Publications			14
Intubation difficile			5
Urg...			
		5	

... ; intubation difficile* : 614, urgence : 10.521 ; préhospitalier...

March 13, 2015

GlideScope VL Improves Success of Urgent Intubation by Critical Care Physicians

Calvin A. Brown III, MD, FAAEM reviewing Silverberg MJ et al. Crit Care Med 2015 Mar.

A systematic review of the role of videolaryngoscopy in successful orotracheal intubation

BMC Anesthesiology

Abstract

Background: The purpose of our study was to organize the literature regarding the efficacy of modern videolaryngoscopes in oral endotracheal intubation, then perform a quality assessment according to recommended external criteria and make recommendations for use.

Methods: Inclusion criteria included devices with recent studies of human subjects. A total of 980 articles were returned in the initial search and 65 additional items were identified using cited references. After exclusion of articles failing to meet study criteria, 77 articles remained. Data were extracted according to the rate of successful intubation and improvement of glottic view compared with direct laryngoscopy. Studies were classified according to whether they primarily examined subjects with normal airways, possessing risk factors for difficult direct laryngoscopy, or following difficult or failed direct laryngoscopy.

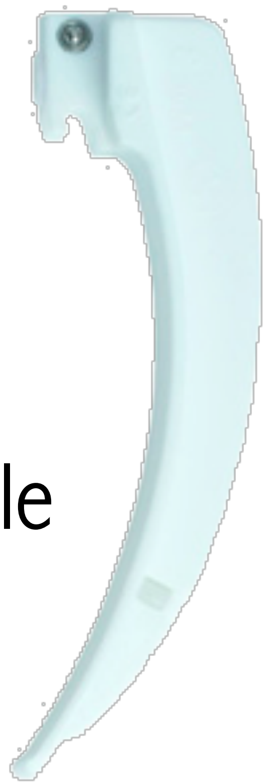
Results: The evidence of efficacy for videolaryngoscopy in the difficult airway is limited. What evidence exists is both randomized prospective and observational in nature, requiring a scheme that evaluates both forms and allows recommendations to be made.

Conclusions: In patients at higher risk of difficult laryngoscopy we recommend the use of the Airtraq, CTrach, GlideScope, Pentax AWS and V-MAC to achieve successful intubation. In difficult direct laryngoscopy (C&L >/= 3) we cautiously recommend the use of the Airtraq, Bonfils, Bullard, CTrach, GlideScope, and Pentax AWS, by an operator with reasonable prior experience, to achieve successful intubation when used in accordance with the ASA practice guidelines for management of the difficult airway. There is additional evidence to support the use of the Airtraq, Bonfils, CTrach, GlideScope, McGrath, and Pentax AWS following failed intubation via direct laryngoscopy to achieve successful intubation. Future investigation would benefit from precise qualification of the subjects under study, and an improvement in overall methodology to include randomization and blinding.

Keywords: Laryngoscopy, Airway management, Intubation, Technology

Lame de laryngoscope

- Lame métallique > lame plastique
- Lame métallique : usage unique = réutilisable



Amour, *Anesthesiology*, 2010 ; Buleon, Eur J Anesth, 2013 ; Jabre, *Ann Emerg Med*, 2011

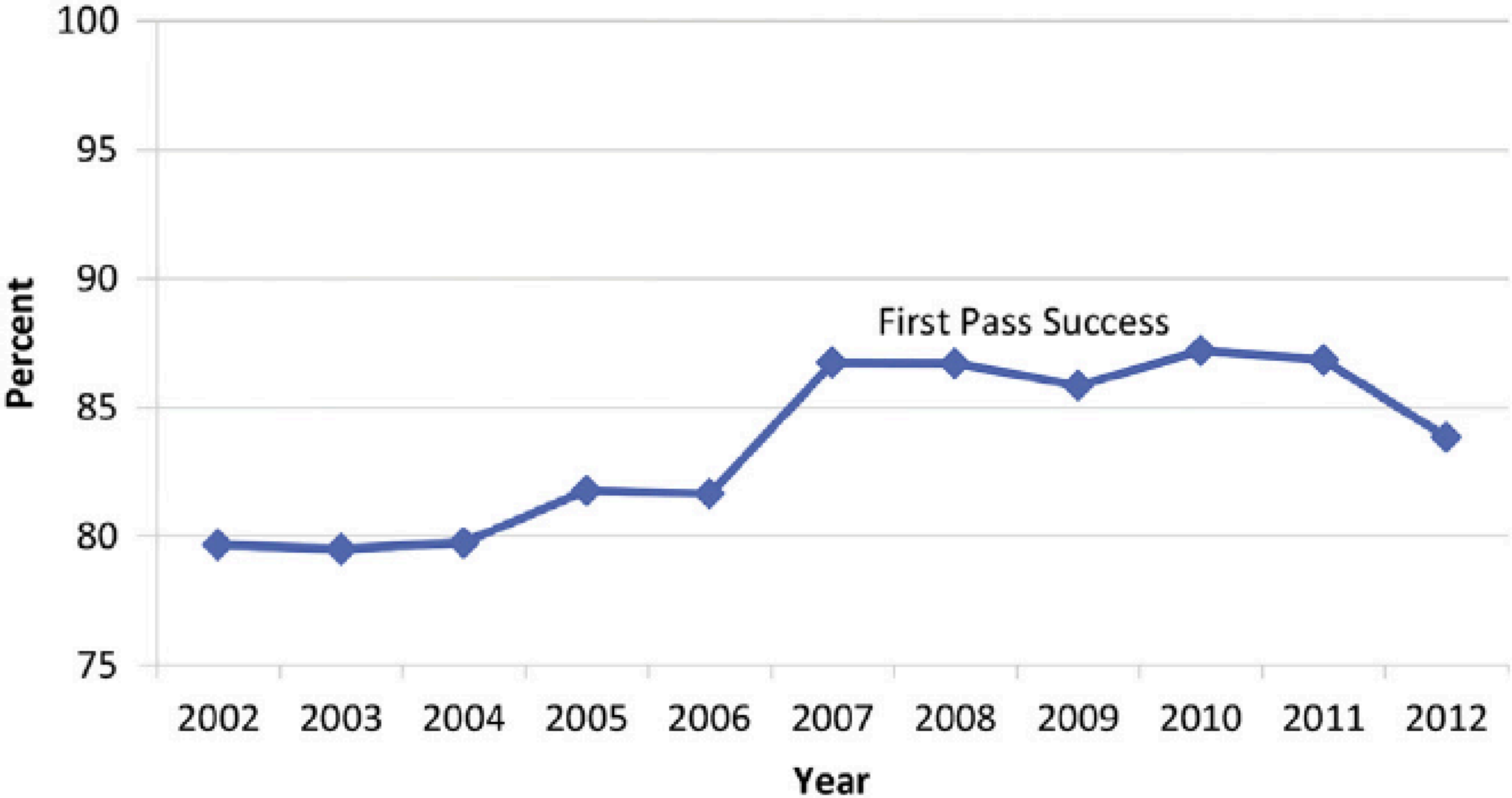
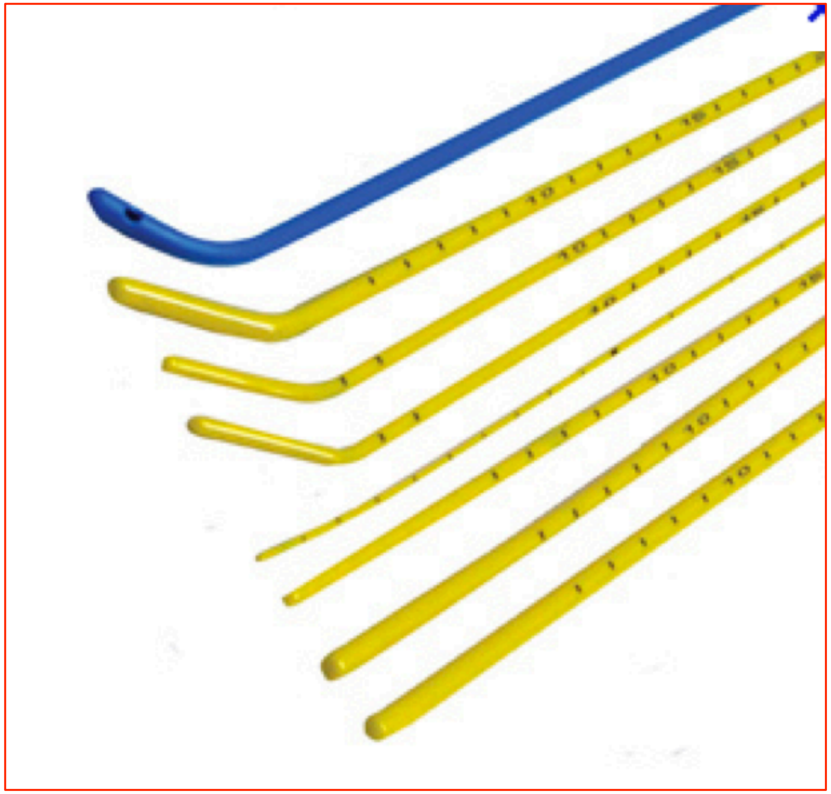


Figure 4. Time-trended first-attempt success by year.

Ann Emerg Med 2014, Dec 19.

Intubation difficile et morbidité

Mandrin d'Eschmann



- Matériel de première intention en cas de mauvaise visualisation
- Utilisable avec les V-laryngoscopes
- Obligatoire dans les kits d'intubation en urgence

Incidence de l'intubation difficile & site

2.674 intubations préhospitalières

Intubations difficiles : 60 (6%)

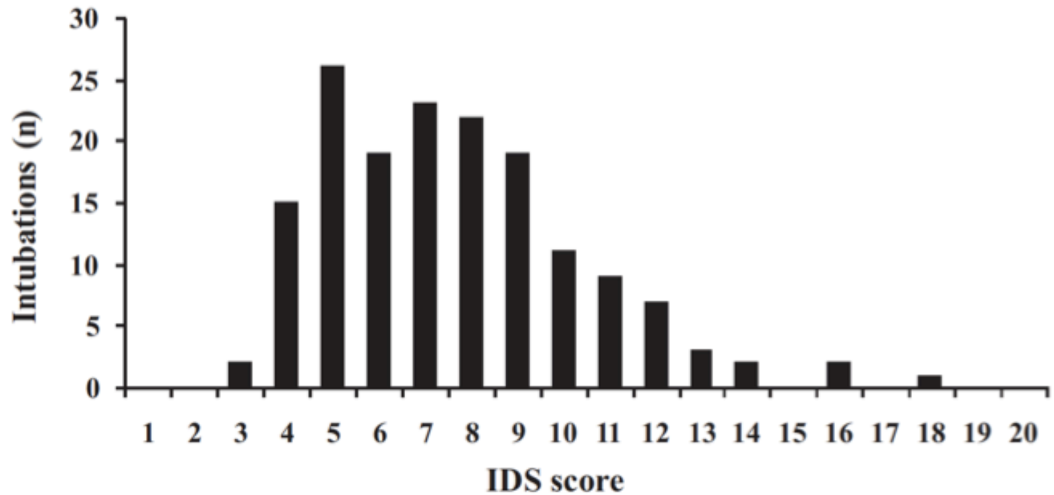


Fig. 2. Distribution of the IDS values of the 160 difficult intubations recorded during the study period. IDS = intubation difficulty scale.

Table 2. Distribution of the Intubation Difficulty Scale Subcomponents in the 160 Patients

Parameter	N = 160
N1: Number of attempt >1 (n)	
1	26
2	47
3	50
4	21
5	10
6	6
Number of operators >1 (n)	
0	73
1	74
2	13
Number of alternative techniques (n)	
1	115
2	45
Cormack and Lehanne grade (n)	
I	2
II	13
III	128
IV	17
Lifting force required (n)	
Normal	33
Increased	127
Laryngeal pressure (n)	
Not applied	54
Applied	106
Vocal cord mobility (n)	
Abduction	15
Adduction	0
Not seen	145

Combes, *Anesthesiology*, 2011

Conséquences de l'intubation difficile

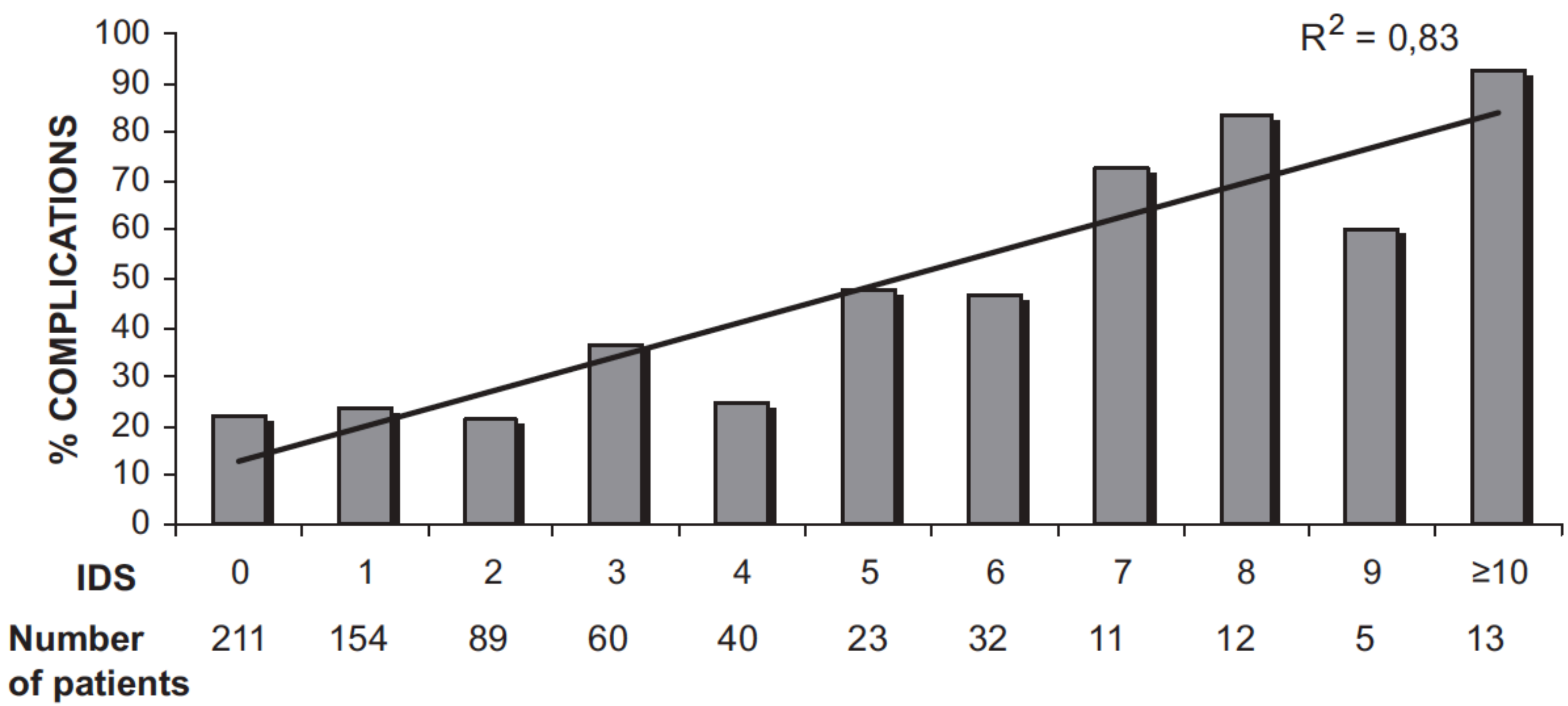


Fig. 1. Relationship between the intubation difficulty scale (IDS) score and the intubation-related complication rate.

Jabre & Adnet, *Resuscitation*, 2011

Conséquences de l'intubation difficile

Table 3. Early Complications during and within 15 Min of Intubation

Complications	N* (%)
Patients with complications	83 (52)
Oesophageal intubation	58 (36)
Vomiting	11 (7)
Pulmonary aspiration	23 (14)
Dental trauma	3 (2)
Bronchospasm or laryngospasm	3 (2)
Arterial desaturation during intubation	42 (26)
Cardiac arrest during intubation	10 (6)

Combes, *Anesthesiology*, 2011

Conséquences de l'intubation difficile

Table 3
Intubation-related complications according to intubation difficulty.

	Non difficult intubation ($N=577$)	Difficult intubation[a] ($N=73$)	*p*
Complications, *n* (%)	144 (25)	48 (66)	<0.0001
Oxygen desaturation	46 (8)	24 (33)	<0.0001
Hypotension	76 (13)	12 (16)	0.44
Cardiac arrest	12 (2.0)	7 (9.5)	0.0003
Aspiration during intubation	2 (0)	3(4)	0.01
Vomiting	8 (1)	4 (5)	0.03
Bronchospasm and/or laryngospasm	0 (0)	1 (1)	–
Mainstem intubation	13 (2)	6 (8)	0.01
Esophageal intubation	10 (2)	16 (22)	<0.0001
Dental trauma	3 (0.7)	6 (8.1)	<0.0001

[a] Difficult intubation was defined as IDS > 5.

Jabre & Adnet, *Resuscitation*, 2011

Conséquences de l'intubation difficile

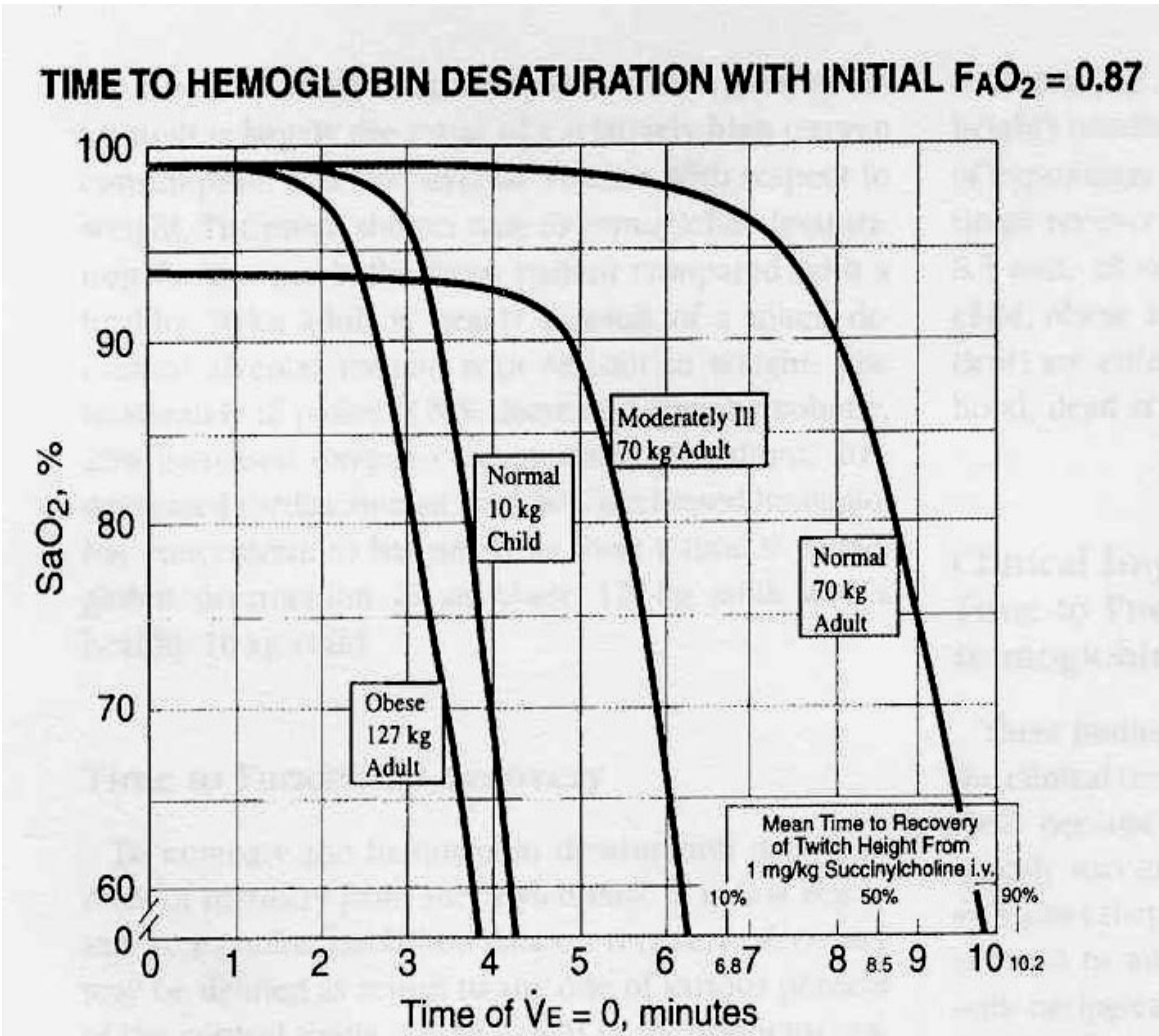
650 patients intubés en préhospitalier (KETASED)
Intubation difficile : 73 (11%)

	Intubation non difficile	Intubation difficile	p
Mortalité préhospitalière	16 (3%)	11 (15%)	< 0,0001

Facteur indépendant de mortalité : OR = 1,7 (1,1-2,6 ; p=0,01)

Jabre & Adnet, *Resuscitation*, 2011

Désaturation pendant une ISR



Benumof, *Anesthesiology*, 1997

Changement de paradigme

- Ventilation prudente au masque pendant la pause respiratoire
- Patient ventilable ou non
- Permet de débuter l’algorithme plus tôt

Vidéo-laryngoscopie

Macintosh Laryngoscope (n = 12,218)

OTI (n = 11,982)

98%

Amathieu, *Anesthesiology*, 2011

Vidéo-laryngoscopie

Macintosh Laryngoscope (n = 12,218)

OTI (n = 11,982) ←

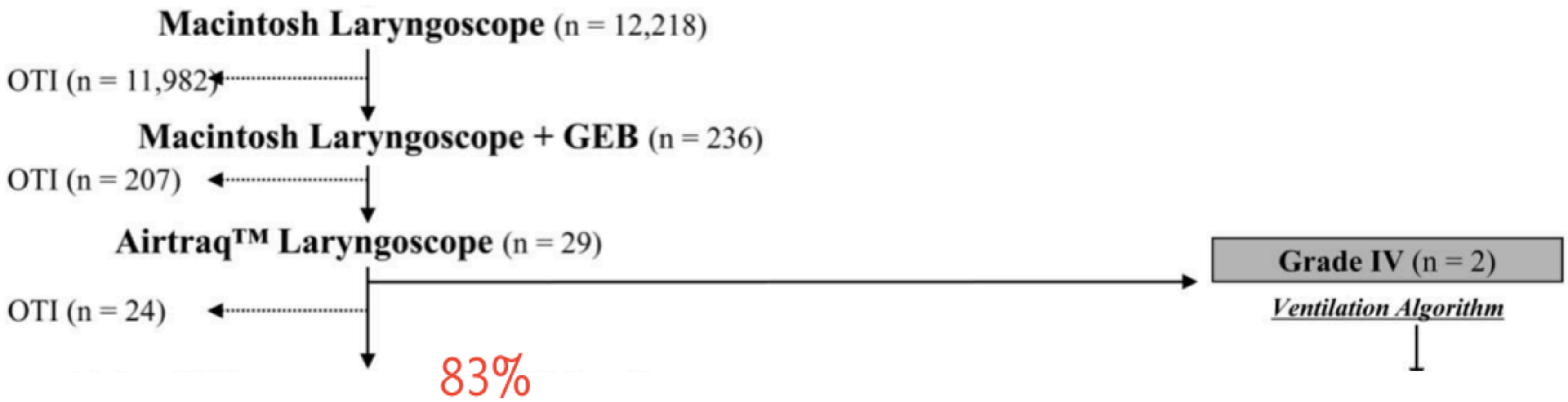
Macintosh Laryngoscope + GEB (n = 236)

OTI (n = 207) ←

88%

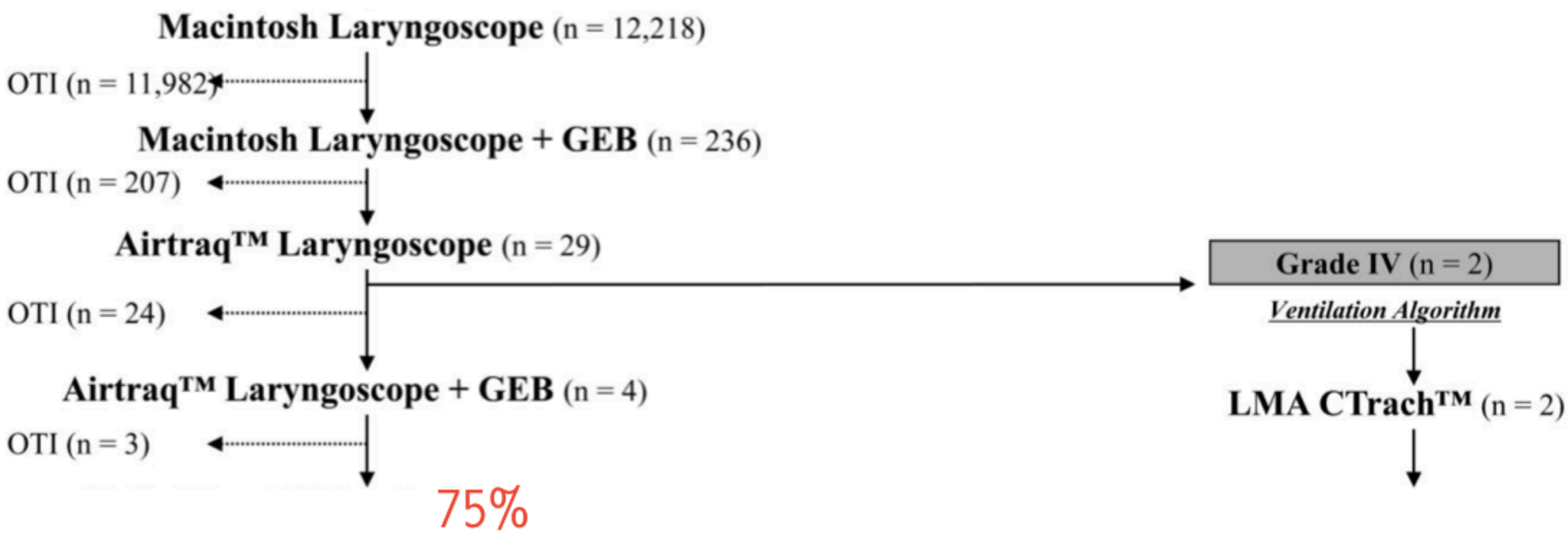
Amathieu, *Anesthesiology*, 2011

Vidéo-laryngoscopie



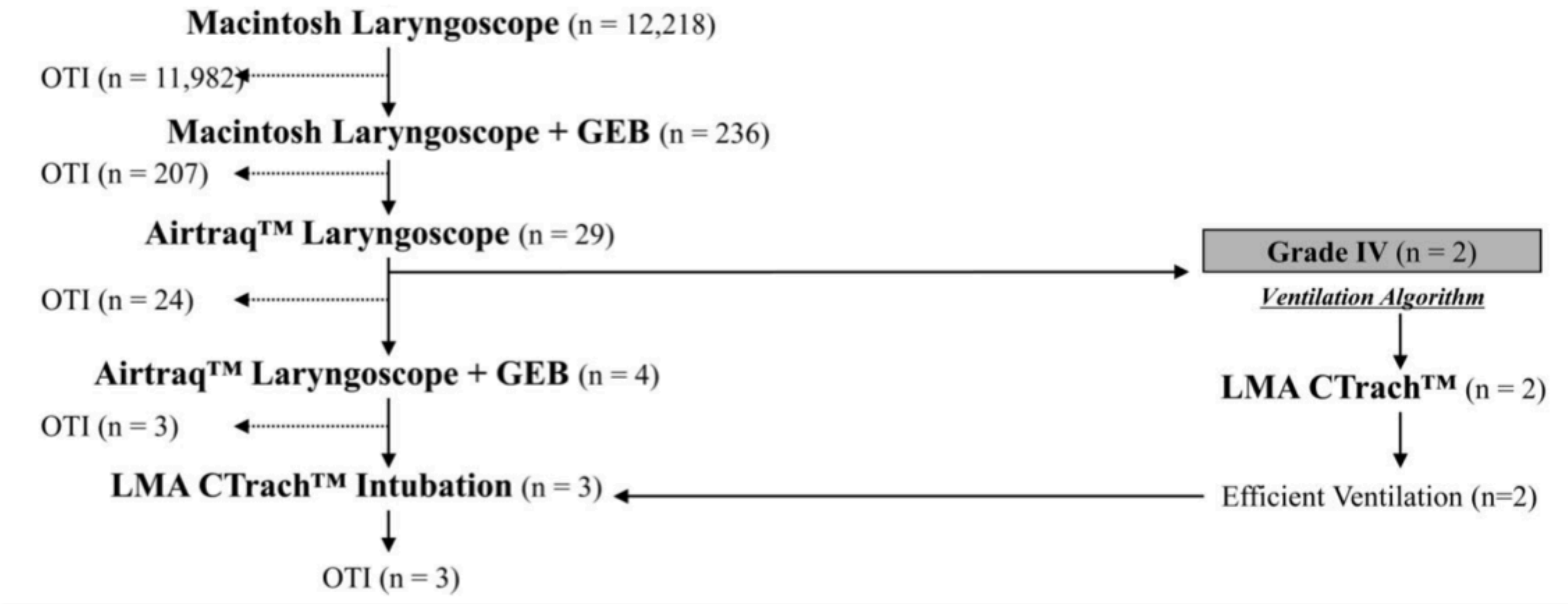
Amathieu, *Anesthesiology*, 2011

Vidéo-laryngoscopie



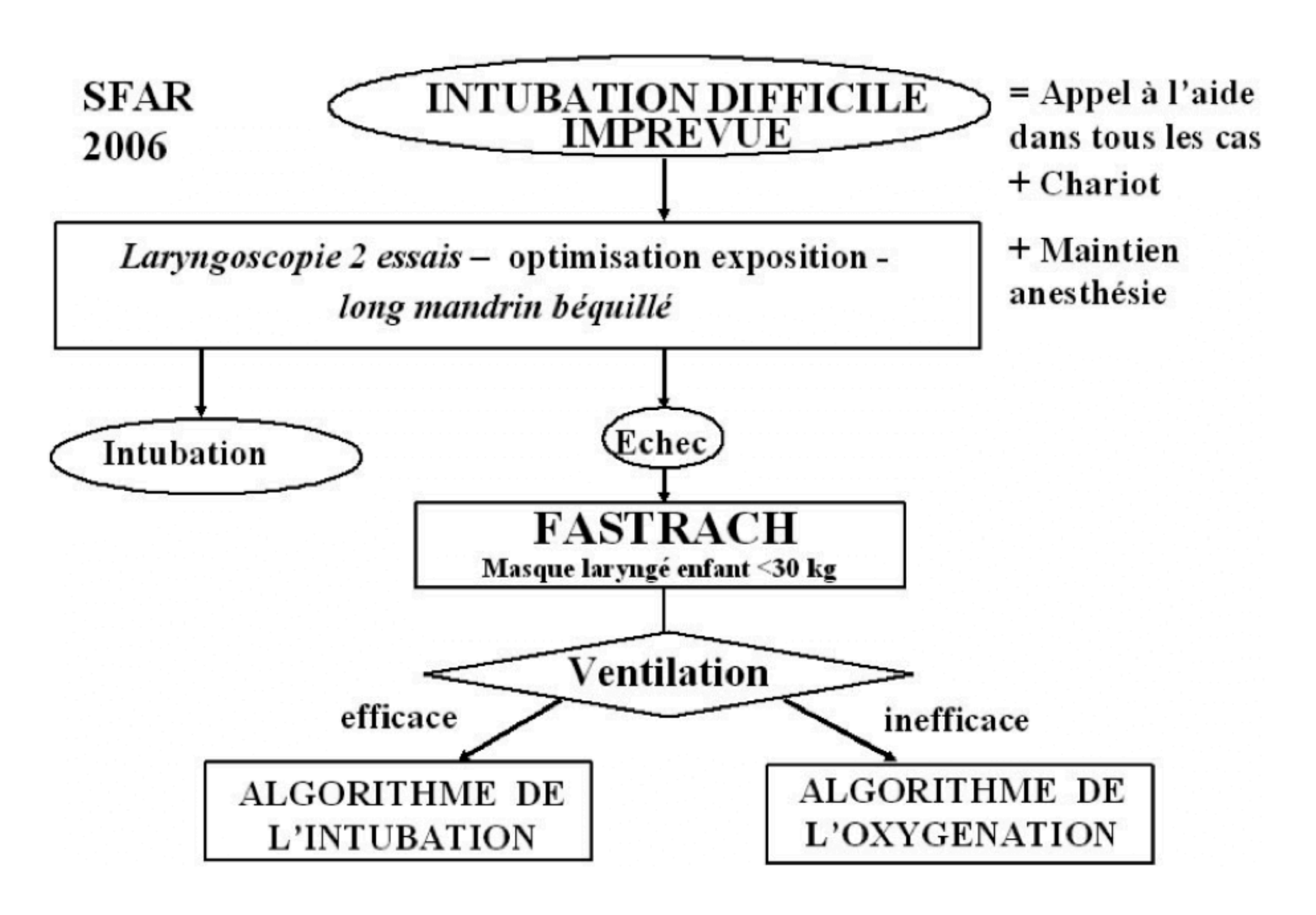
Amathieu, *Anesthesiology*, 2011

Vidéo-laryngoscopie



Amathieu, *Anesthesiology*, 2011

Intubation difficile : algorithme de référence



Nouvelles problématiques

Intubation dans l'ACR?

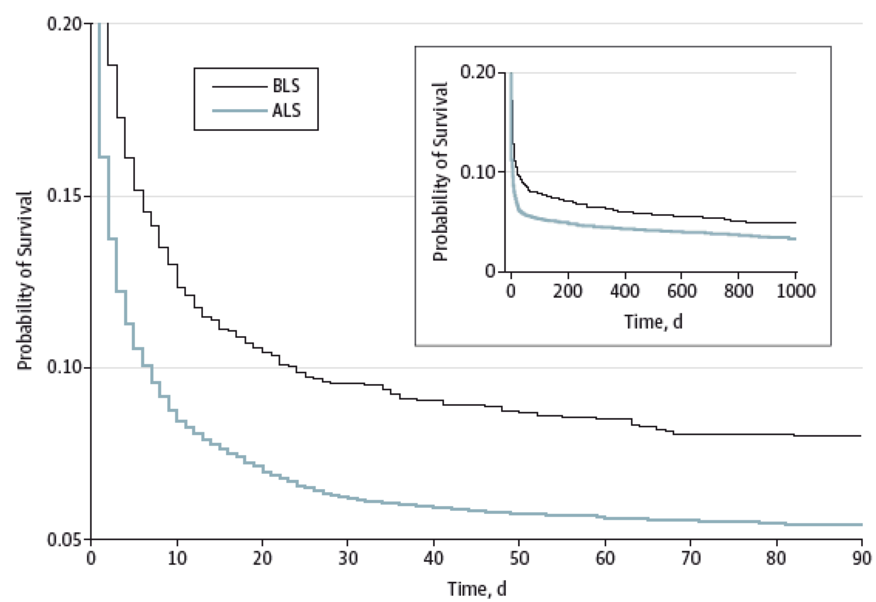
- La ventilation au cours de la prise en charge d'un ACR est débattue
- La prise en charge agressive des voies aériennes semble être associée à une morbidité importante
- L'intubation trachéale est associée à une surmortalité
- Plusieurs travaux remettent la ventilation au masque comme technique efficace

Outcomes After Out-of-Hospital Cardiac Arrest Treated by Basic vs Advanced Life Support

Prachi Sanghavi, BS; Anupam B. Jena, MD, PhD; Joseph P. Newhouse, PhD; Alan M. Zaslavsky, PhD

- Comparaison entre patients en ACR pris en charge ALS vs. BLS
- 31.292 ACR (ALS) vs. 1642 ACR (BLS)
- ALS =intubation; BLS = masque

Figure 2. Kaplan-Meier Analysis of Survival After Cardiac Arrest by Ambulance Service Level



CONCLUSIONS AND RELEVANCE Patients with out-of-hospital cardiac arrest who received BLS had higher survival at hospital discharge and at 90 days compared with those who received ALS and were less likely to experience poor neurological functioning.

JAMA Internal Medicine Published online November 24, 2014

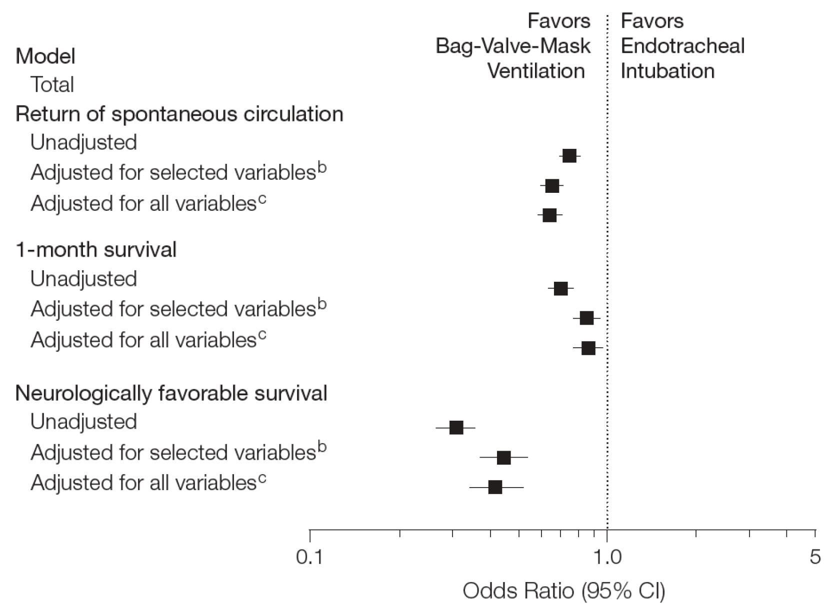
Association of Prehospital Advanced Airway Management With Neurologic Outcome and Survival in Patients With Out-of-Hospital Cardiac Arrest

Kohei Hasegawa, MD, MPH

Importance It is unclear whether advanced airway management such as endotra-

- Appariement par score de propension

- 649.359 patients
  - 367.837 masque
  - 41.972 intubation
  - 239.550 matériel supra-glottique



JAMA, January 16, 2013—Vol 309, No. 3

Emergency intubation for acutely ill and injured patients (Review)

Lecky F, Bryden D, Little R, Tong N, Moulton C

THE COCHRANE COLLABORATION®

Main results

We identified three eligible RCTs carried out in urban environments. Two trials involved adults with non-traumatic out-of-hospital cardiac arrest. One of these trials found a non-significant survival disadvantage in patients randomised to receive a physician-operated intubation versus a combi-tube (RR 0.44, 95% CI 0.09 to 1.99). The second trial detected a non-significant survival disadvantage in patients randomised to paramedic intubation versus an oesophageal gastric airway (RR 0.86, 95% CI 0.39 to 1.90). The third included study was a trial of children requiring airway intervention in the prehospital environment. The results indicated no difference in survival (OR 0.82, 95% CI 0.61 to 1.11) or neurologic outcome (OR 0.87, 95% CI 0.62 to 1.22) between paramedic intubation versus bag-valve-mask ventilation and later hospital intubation by emergency physicians; however, only 42% of the children randomised to paramedic endotracheal intubation actually received it.

Authors' conclusions

The efficacy of emergency intubation as currently practised has not been rigorously studied. The skill level of the operator may be key in determining efficacy.

In non-traumatic cardiac arrest, it is unlikely that intubation carries the same life saving benefit as early defibrillation and bystander cardiopulmonary resuscitation (CPR).

In trauma and paediatric patients, the current evidence base provides no imperative to extend the practice of prehospital intubation in urban systems.

It would be ethical and pertinent to initiate a large, high quality randomised trial comparing the efficacy of competently practised emergency intubation with basic bag-valve-mask manoeuvres (BVM) in urban adult out-of-hospital non-traumatic cardiac arrest.

Emergency intubation for acutely ill and injured patients (Review)

Ou en est-on?

- Un faisceau d’arguments entrainent les recommandations vers l’abandon de l’intubation
- La qualité de l’opérateur n’a pas été évaluée
- Pas d’études de haut niveau de preuve
- Nécessité d’évaluer nos pratiques en fournissant des arguments pour optimiser la ventilation au cours de la réanimation d’un ACR

Prise en charge initiale des voies aériennes des patients en arrêt cardiaque en préhospitalier : intubation trachéale vs. ventilation au masque

Étude CAAM

PHRC national 2013

DESIGN DE L'ÉTUDE

Recherche biomédicale hors produits de santé, de non infériorité, prospective, multicentrique, phase III, en ouvert contrôlée et randomisée

Nombre de patients à inclure :	2000 patients
Durée de participation de chaque patient :	28 jours
Durée des inclusions :	24 mois
Durée de l'étude :	24 mois et 28 jours
18 centres participants :	14 en France et 4 en Belgique
Analyses intermédiaires :	50% et 75% des inclusions

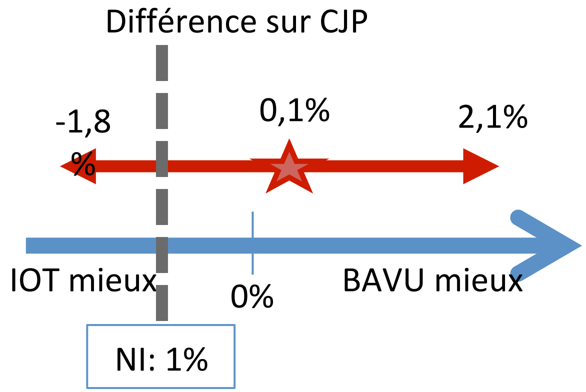
Effect of Bag-Mask Ventilation vs Endotracheal Intubation During CPR on neurological outcome

JAMA 2018
Jabre et al

Résultats

2043 patients inclus – 65 ans
68% d'origine cardiaque, 5% trauma
70% devant témoin et 50% RCP par témoin
16% rythme choquable

4% de survie avec bon pronostic neuro
39% de RACS avec IOT vs 34% (p=0,03)



Conclusion

Pas de différence significative mais résultats non concluants.
Il aurait fallu inclure 6000 malades…
D'aucuns se consolent du taux supérieur de complications dans le groupe BMV

Intubation des comas toxiques remise en question

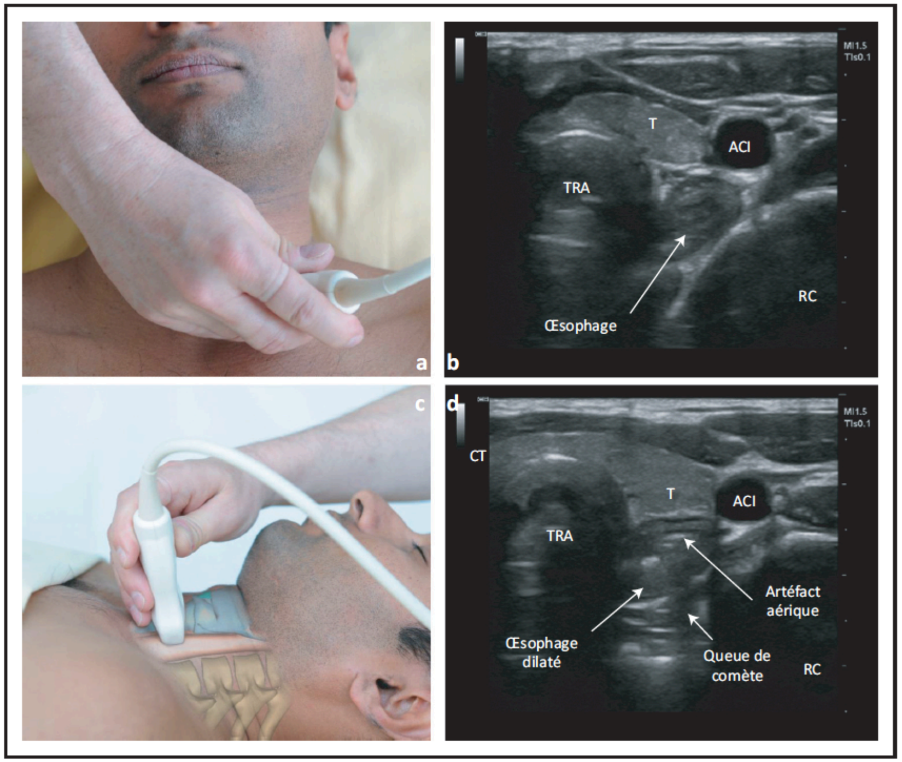
DECREASED GLASGOW COMA SCALE SCORE DOES NOT MANDATE ENDOTRACHEAL INTUBATION IN THE EMERGENCY DEPARTMENT

Russell Duncan, MBCHB, MRCS(A&E) and Shobhan Thakore, MBCHB, BMSC(HONS), FRCS(A&E) FCEM

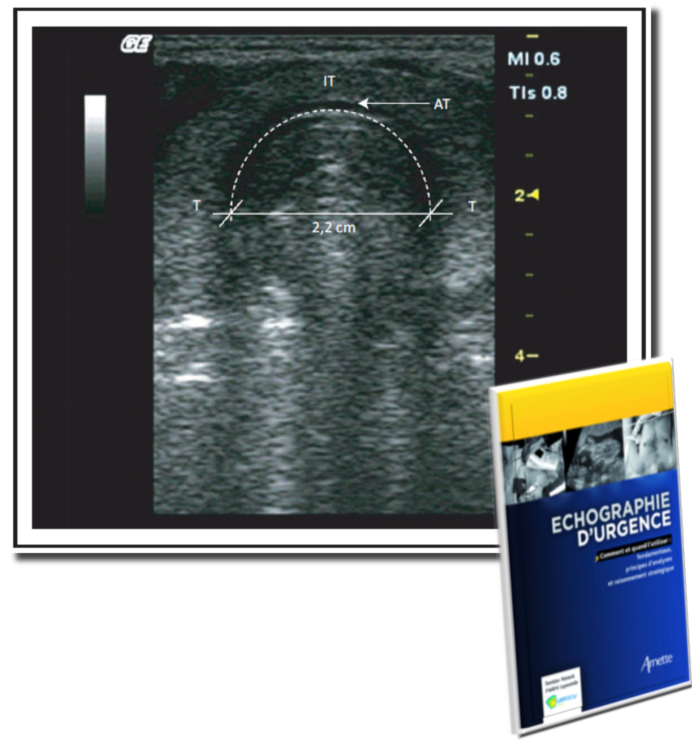
- Etude observationnelle
  - 73 patients intoxiqués
  - 12 patients avec GCS <8
    - Monitorés; surveillés
    - 6 en DLS
    - 3 sondes naso-pharyngées
    - 3 « oropharyngeal airway »
- Conclusion: ce n’est pas la peine d’intuber!

Duncan R et al. J Emerg Med 2009;4:451-455

Apport de l'échographie



Petrovic, *Echographie d'urgence*, 2013



Vérification de la position de la sonde par échographie

Table 1 Characteristics of the studies which met the inclusion criteria

Study	Years	Origin	Em/El	*n*	US sign	US probe	Probe position	Operator	Time*	TP	FP	FN	TN	Sn	Sp
Hoffmann B[27]	2014	USA	Em	101	4	7 -10 M L	ssn	EP	30 to 120	91	0	0	10	100	100
Sun JT[28]	2014	Taiwan	Em	96	1	3.75 M	ssn	EMR	10	89	1	0	6	100	86
Chou HC[13]	2013	Taiwan	Em	89	1	3.75 M C	ssn	EMR	10	82	1	0	6	100	86
Adi O[29]	2013	Malaysia	Em	107	2	10 M L	ctm to ssn	EMR	14 (6)	99	0	2	6	98	100
Abbasi S[22]	2013	Iran	Em	120	3,4,5,6	7.5-10 M L	ssn/ctm	EMR	-	100	0	6	14	94	100
Saglam C[30]	2012	Turkey	Em	69	1	10 M L	ssn	EP	< 60	62	1	2	4	97	80
Noh JK[31]	2012	Korea	Em	19	-	-	ssn	-	5	16	0	0	3	100	100
Muslu B[7]	2011	Turkey	El	150	7	9-12 M	ssn	Anesth.	3	75	0	0	75	100	100
Chou HC[14]	2011	Taiwan	Em	112	1	3.75 M C	ssn	EMR	9 (8)	94	1	1	16	99	94
Werner SL[6]	2007	Cleve- land	El	66	8	5-10 M	ssn	Physician	-	28	0	0	38	100	100
Milling TJ[23]	2007	New York	El	40	9	3-5H	ctm	EMR	-	34	0	1	5	97	100

Das SK et al. Can J Anaesth 2015