La gestione delle vie aeree: sempre e solo intubazione ?

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INDICAZIONE ALL'INTUBAZIONE

Le 3 domande fondamentali:

1. Il paziente mantiene e protegge le vie aeree?

2. Il paziente riesce a mantenere la ventilazione e l'ossigenazione?

3. Qual è il decorso clinico previsto per questo paziente?

Da dove partiamo?

Ci sono pazienti che devono essere intubati…e li intubiamo.

Ci sono pazienti che devono essere intubati ….e non riusciamo ad intubarli.

Come mai non siamo riusciti a gestire le vie aeree in modo definitivo?

Non intubo perché…

- Abilità operatore
- Dispositivi disponibili
- Farmaci disponibili
- Setting d’intervento
- Distanza ospedale

Intubazione e Trauma Cranico (1)

PLoS One. 2015 Oct 23;10(10):e0141034. doi: 10.1371/journal.pone.0141034. eCollection 2015.

Experience in Prehospital Endotracheal Intubation Significantly Influences Mortality of Patients with Severe Traumatic Brain Injury: A Systematic Review and Meta-Analysis.

Bossers SM[1], Schwarte LA[2], Loer SA[1], Twisk JW[3], Boer C[4], Schober P[2].

Author information

Abstract

BACKGROUND: Patients with severe traumatic brain injury (TBI) are at high risk for airway obstruction and hypoxia at the accident scene, and routine prehospital endotracheal intubation has been widely advocated. However, the effects on outcome are unclear. We therefore aim to determine effects of prehospital intubation on mortality and hypothesize that such effects may depend on the emergency medical service providers' skill and experience in performing this intervention.

METHODS AND FINDINGS: PubMed, Embase and Web of Science were searched without restrictions up to July 2015. Studies comparing effects of prehospital intubation versus non-invasive airway management on mortality in non-paediatric patients with severe TBI were selected for the systematic review. Results were pooled across a subset of studies that met predefined quality criteria. Random effects meta-analysis, stratified by experience, was used to obtain pooled estimates of the effect of prehospital intubation on mortality. Meta-regression was used to formally assess differences between experience groups. Mortality was the main outcome measure, and odds ratios refer to the odds of mortality in patients undergoing prehospital intubation versus odds of mortality in patients who are not intubated in the field. The study was registered at the International Prospective Register of Systematic Reviews (PROSPERO) with number CRD42014015506. The search provided 733 studies, of which 6 studies including data from 4772 patients met inclusion and quality criteria for the meta-analysis. Prehospital intubation by providers with limited experience was associated with an approximately twofold increase in the odds of mortality (OR 2.33, 95% CI 1.61 to 3.38, p<0.001). In contrast, there was no evidence for higher mortality in patients who were intubated by providers with extended level of training (OR 0.75, 95% CI 0.52 to 1.08, p = 0.126). Meta-regression confirmed that experience is a significant predictor of mortality (p = 0.009).

CONCLUSIONS: Effects of prehospital endotracheal intubation depend on the experience of prehospital healthcare providers. Intubation by paramedics who are not well skilled to do so markedly increases mortality, suggesting that routine prehospital intubation of TBI patients should be abandoned in emergency medical services in which providers do not have ample training, skill and experience in performing this intervention.

PMID: 26496440 PMCID: PMC4619807 DOI: 10.1371/journal.pone.0141034

Intubazione e Trauma Cranico (2)

Scand J Trauma Resusc Emerg Med. 2017 Sep 15;25(1):94. doi: 10.1186/s13049-017-0438-1.

Physician-staffed helicopter emergency medical service has a beneficial impact on the incidence of prehospital hypoxia and secured airways on patients with severe traumatic brain injury.

Pakkanen T[1,2], Kämäräinen A[3], Huhtala H[4], Silfvast T[5], Nurmi J[6], Virkkunen I[7], Yli-Hankala A[8,9].

⊕ Author information

Abstract

BACKGROUND: After traumatic brain injury (TBI), hypotension, hypoxia and hypercapnia have been shown to result in secondary brain injury that can lead to increased mortality and disability. Effective prehospital assessment and treatment by emergency medical service (EMS) is considered essential for favourable outcome. The aim of this study was to evaluate the effect of a physician-staffed helicopter emergency medical service (HEMS) in the treatment of TBI patients.

METHODS: This was a retrospective cohort study. Prehospital data from two periods were collected: before (EMS group) and after (HEMS group) the implementation of a physician-staffed HEMS. Unconscious prehospital patients due to severe TBI were included in the study. Unconsciousness was defined as a Glasgow coma scale (GCS) score ≤ 8 and was documented either on-scene, during transportation or by an on-call neurosurgeon on hospital admission. Modified Glasgow Outcome Score (GOS) was used for assessment of six-month neurological outcome and good neurological outcome was defined as GOS 4-5.

RESULTS: Data from 181 patients in the EMS group and 85 patients in the HEMS group were available for neurological outcome analyses. The baseline characteristics and the first recorded vital signs of the two cohorts were similar. Good neurological outcome was more frequent in the HEMS group; 42% of the HEMS managed patients and 28% ($p = 0.022$) of the EMS managed patients had a good neurological recovery. The airway was more frequently secured in the HEMS group ($p < 0.001$). On arrival at the emergency department, the patients in the HEMS group were less often hypoxic ($p = 0.024$). In univariate analysis HEMS period, lower age and secured airway were associated with good neurological outcome.

CONCLUSION: The introduction of a physician-staffed HEMS unit resulted in decreased incidence of prehospital hypoxia and increased the number of secured airways. This may have contributed to the observed improved neurological outcome during the HEMS period.

TRIAL REGISTRATION: ClinicalTrials.gov IDNCT02659046. Registered January 15th, 2016.

KEYWORDS: Airway management (MeSH); Critical care (MeSH); Emergency medical services (MeSH); Endotracheal intubation (MeSH); Glasgow outcome scale (MeSH); Patient outcome assessment (MeSH); Prehospital emergency care (MeSH); Traumatic brain injury (MeSH)

PMID: 28915898 PMCID: PMC5603088 DOI: 10.1186/s13049-017-0438-1

Intubazione e ACC (1)

Resuscitation. 2018 Apr 22;128:16-23. doi: 10.1016/j.resuscitation.2018.04.024. [Epub ahead of print]

Timing of advanced airway management by emergency medical services personnel following out-of-hospital cardiac arrest: A population-based cohort study.

Izawa J[1], Iwami T[2], Gibo K[3], Okubo M[4], Kajino K[5], Kiyohara K[6], Nishiyama C[7], Nishiuchi T[8], Hayashi Y[9], Kiguchi T[2], Kobayashi D[2], Komukai S[10], Kawamura T[2], Callaway CW[4], Kitamura T[11].

⊕ Author information

Abstract

BACKGROUND: Early prehospital advanced airway management (AAM) by emergency medical services (EMS) personnel has been intended to improve patient outcomes from out-of-hospital cardiac arrest (OHCA). However, few studies examine the effectiveness of early prehospital AAM. We investigated whether early prehospital AAM was associated with functionally favourable survival after adult OHCA.

METHODS: We conducted a population-based cohort study of OHCA in Osaka, Japan, between 2005 and 2012. We included all consecutive, non-traumatic adult OHCA in which EMS personnel performed cardiopulmonary resuscitation (CPR) and AAM. Main exposure was time from CPR to AAM. Primary outcome was functionally favourable survival at one-month. As the primary analysis, we estimated adjusted odds ratio (OR) of time from CPR to AAM using multivariable logistic regression in the original cohort. In the secondary analysis, we divided the time from CPR to AAM into early (0-4min) and late (5-29min). We calculated propensity scores (PS) for early AAM and performed PS-matching.

RESULTS: We included 27,471 patients who received prehospital AAM by EMS personnel. In this original cohort, time from CPR to AAM was inversely associated with functionally favourable survival (adjusted OR 0.90 for one-increment of minute, 95% confidence interval [CI] 0.87-0.94). In the PS-matched cohort of 17,022 patients, early AAM, compared to late AAM, was associated with functionally favourable survival: 2.2% vs 1.4%; adjusted OR 1.58 (95% CI 1.24-2.02).

CONCLUSIONS: Earlier prehospital AAM by EMS personnel was associated with functionally better survival among adult patients who received AAM.

KEYWORDS: Emergency medical technicians; Heart arrest; Intubation

PMID: 29689354 DOI: 10.1016/j.resuscitation.2018.04.024

Intubazione e ACC (2)

Emerg Med Australas. 2018 May 11. doi: 10.1111/1742-6723.13107. [Epub ahead of print]

Influence of prehospital airway management on neurological outcome in patients transferred to a heart attack centre following out-of-hospital cardiac arrest.

Edwards T[1], Williams J[2], Cottee M[3].

⊕ Author information

Abstract

OBJECTIVE: To describe the association between prehospital airway management and neurological outcomes in patients transferred by the ambulance service directly to a heart attack centre (HAC) post-return of spontaneous circulation (ROSC).

METHODS: A retrospective observational cohort study in which ambulance records were reviewed to determine prehospital airway management strategy and collect physiological and demographic data. HAC notes were obtained to determine in-hospital management and quantify neurological outcome via the cerebral performance category (CPC) scale. Statistical analyses were performed via χ^2 -test, Mann-Whitney U-test, odds ratios and binomial logistic regression.

RESULTS: Two hundred and twenty patients were included between August 2013 and August 2014, with complete outcome data obtained for 209. Median age of patients with complete outcome data was 67 years and 71.3% were male (n = 149). Airway management was provided using a supraglottic airway (SGA) in 72.7% of cases (n = 152) with the remainder undergoing endotracheal intubation (ETI). There was no significant difference in the proportion of patients who had a good neurological outcome (CPC 1 and 2) at discharge between the SGA and ETI groups (P = 0.29). Binomial logistic regression incorporating factors known to influence outcome demonstrated no significant difference in neurological outcomes between the SGA and ETI groups (adjusted OR 0.73, 95% CI 0.34-1.56).

CONCLUSION: In this observational study, there was no significant difference in the proportion of good neurological outcomes in patients managed with SGA versus ETI during cardiac arrest and in the post-ROSC transfer phase. Further research is required to provide more definitive evidence in relation to the optimal airway management strategy in out-of-hospital cardiac arrest.

KEYWORDS: acute coronary syndrome; airway management; emergency medical services; resuscitation

PMID: 29752776 DOI: 10.1111/1742-6723.13107

Intubazione e ACC (3)

Resuscitation. 2015 Aug;93:20-6. doi: 10.1016/j.resuscitation.2015.05.007. Epub 2015 May 23.

Endotracheal intubation versus supraglottic airway placement in out-of-hospital cardiac arrest: A meta-analysis.

Benoit JL[1], Gerecht RB[2], Steuerwald MT[2], McMullan JT[2].

⊕ Author information

Abstract

OBJECTIVE: Overall survival from out-of-hospital cardiac arrest (OHCA) is less than 10%. After initial bag-valve mask ventilation, 80% of patients receive an advanced airway, either by endotracheal intubation (ETI) or placement of a supraglottic airway (SGA). The objective of this meta-analysis was to compare patient outcomes for these two advanced airway methods in OHCA patients treated by Emergency Medical Services (EMS).

METHODS: A dual-reviewer search was conducted in PubMed, Scopus, and the Cochrane Database to identify all relevant peer-reviewed articles for inclusion in the meta-analysis. Exclusion criteria were traumatic arrests, pediatric patients, physician/nurse intubators, rapid sequence intubation, video devices, and older airway devices. Outcomes were (1) return of spontaneous circulation (ROSC), (2) survival to hospital admission, (3) survival to hospital discharge, and (4) neurologically intact survival to hospital discharge. Results were adjusted for covariates when available and combined using the random effects model.

RESULTS: From 3,454 titles, 10 observational studies fulfilled all criteria, representing 34,533 ETI patients and 41,116 SGA patients. Important covariates were similar between groups. Patients who received ETI had statistically significant higher odds of ROSC (odds ratio [OR] 1.28, 95% confidence interval [CI] 1.05-1.55), survival to hospital admission (OR 1.34, CI 1.03-1.75), and neurologically intact survival (OR 1.33, CI 1.09-1.61) compared to SGA. Survival to hospital discharge was not statistically different (OR 1.15, CI 0.97-1.37).

CONCLUSIONS: Patients with OHCA who receive ETI by EMS are more likely to obtain ROSC, survive to hospital admission, and survive neurologically intact when compared to SGA.

KEYWORDS: Airway management; Emergency medical services; Endotracheal intubation; Out-of-hospital cardiac arrest; Prehospital; Supraglottic airway

PMID: 26006743 DOI: 10.1016/j.resuscitation.2015.05.007

VIA AEREA FALLITA

Clinicamente, la via aerea fallita si presenta in due modi:

1. ***Non riesci ad intubare, ma riesci ad ossigenare***: c'è il tempo per valutare ed eseguire altre manovre in quanto il paziente è ossigenato.

2. ***Non riesci ad intubare, non riesci ad ossigenare***: non c'è tempo sufficiente per valutare o tentare altre manovre e la via aerea deve essere assicurata immediatamente a causa dell'incapacità di mantenere la saturazione d'ossigeno mediante la tecnica pallone-maschera o con un presidio sovraglottico.

VIA AEREA DIFFICILE (1)

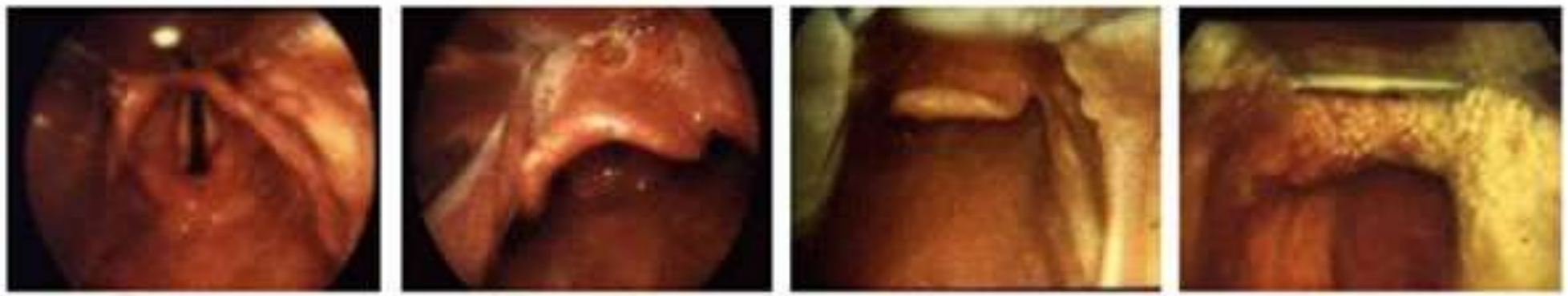
- Idealmente qualcosa che si può PREVEDERE…prima che sia troppo tardi.
- Qualcosa che può accadere di SPERIMENTARE (tentativo fallito da parte di operatore esperto)

VIA AEREA DIFFICILE (2)

Nella pratica clinica, le vie aeree difficili hanno 4 dimensioni:

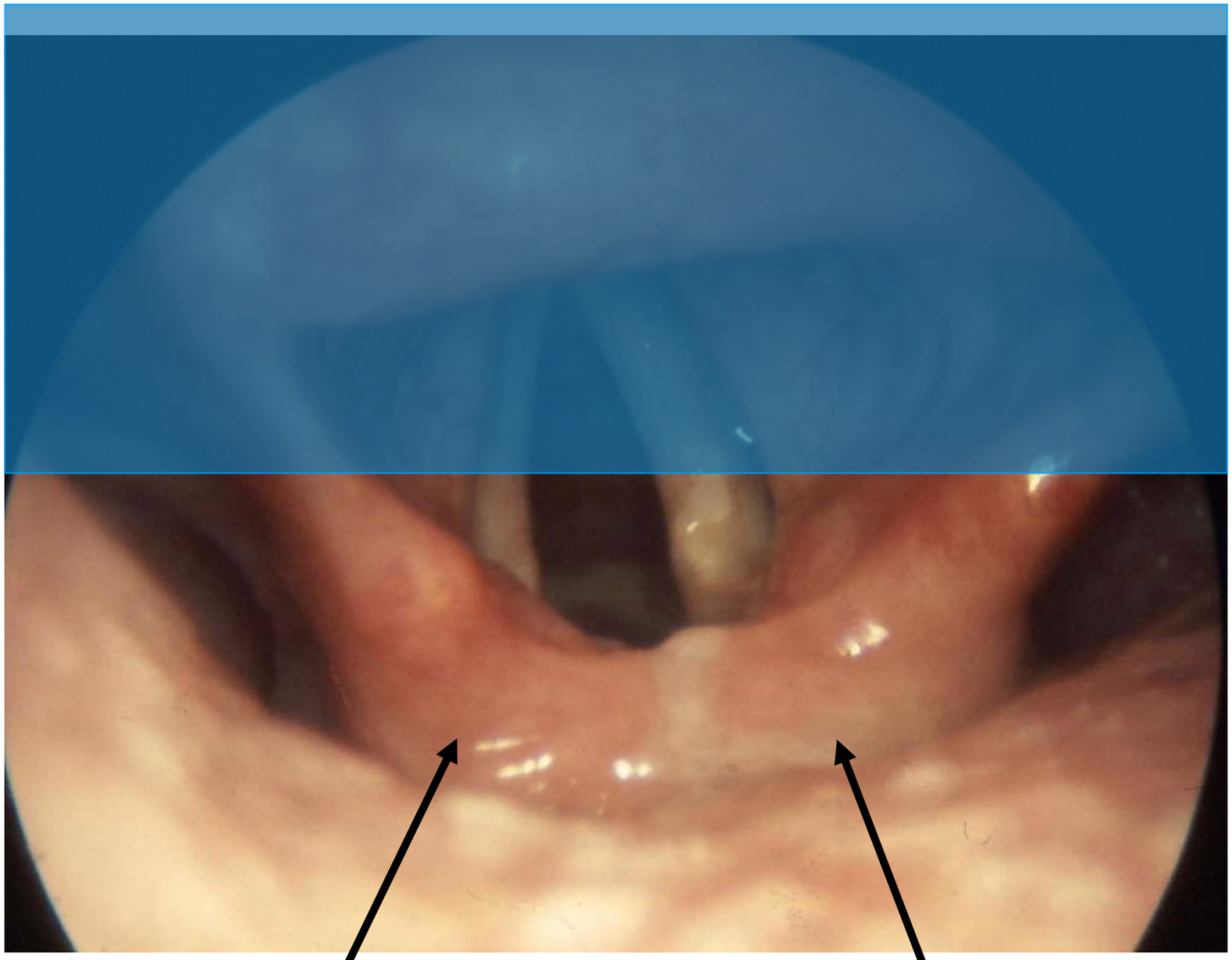
1. Difficoltà alla laringoscopia
2. Difficoltà nella ventilazione pallone-maschera
3. Difficoltà nell'utilizzo dei presidi sovraglottici (PSG)
4. Difficoltà nella cricotirotomia

IL NOSTRO OBIETTIVO…



BENE?

MALE?



LE CARTILAGINI POSTERIORI

LE 4 (5) DIMENSIONI…

LEMONS
(Difficult Laryngoscopy)

MOANS
(Difficult BMV)

The Difficult Airway

RODS
(Difficult EGD)

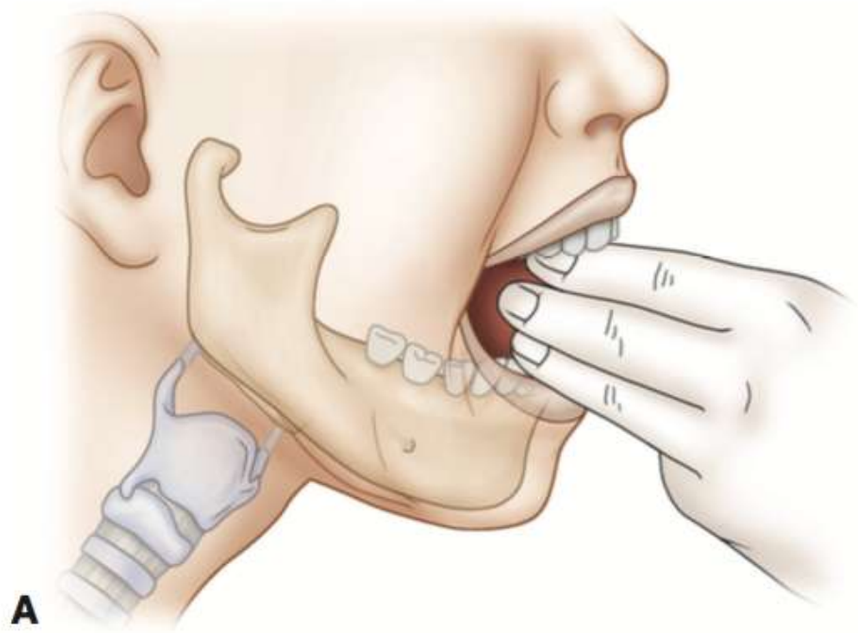
SMART
(Difficult Cricothyrotomy)

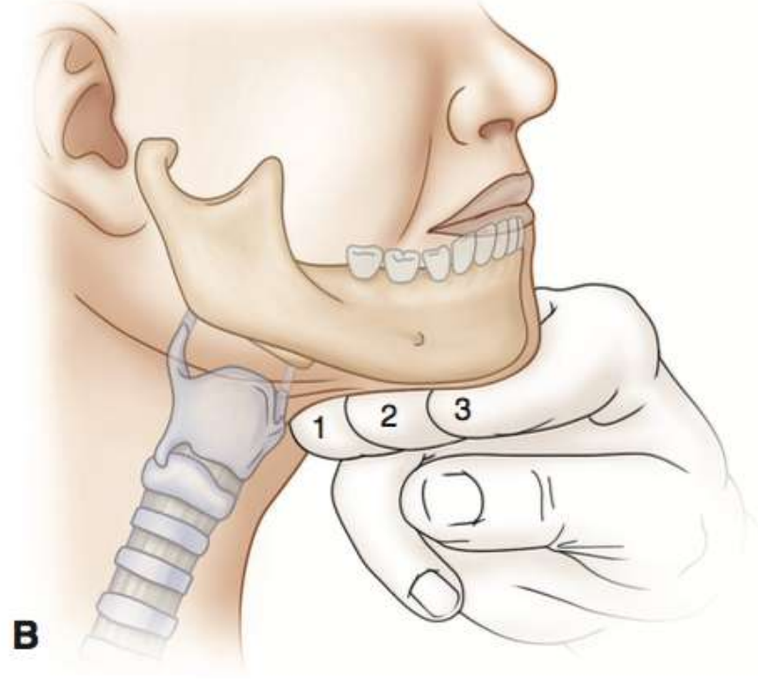
L.E.M.O.N.S.

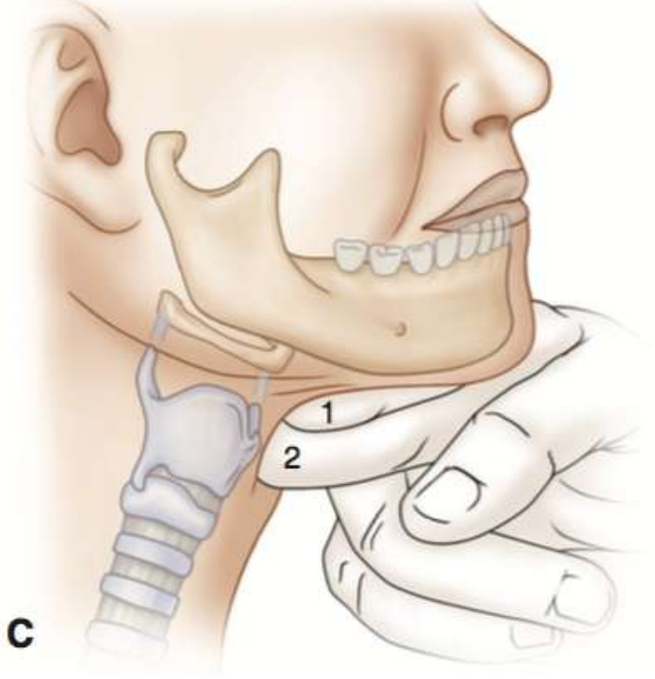
- Look externally
- Evaluate (3-3-2)
- Mallampati
- Obstruction/Obesity
- Neck mobility
- Saturation/Situation

LOOK EXTERNALLY

EVALUATE 3-3-2



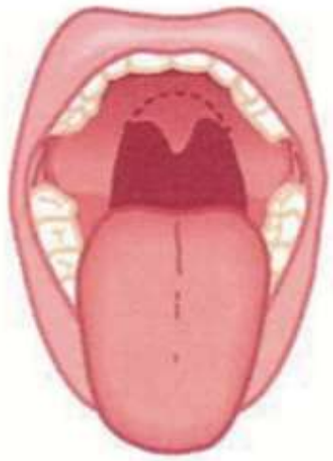




MALLAMPATI

Class I: soft palate, uvula, fauces, pillars visible

No difficulty

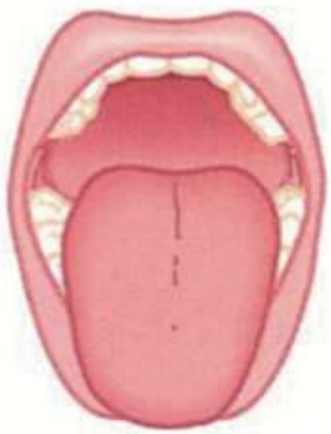


Class II: soft palate, uvula, fauces visible

No difficulty

Class III: soft palate, base of uvula visible

Moderate difficulty



Class IV: hard palate only visible

Severe difficulty

OBSTRUCTION/OBESITY

I quattro segni chiave:

1. Disfonia (a patata bollente in bocca)
2. Deglutizione difficoltosa
3. Stridore
4. Dispnea

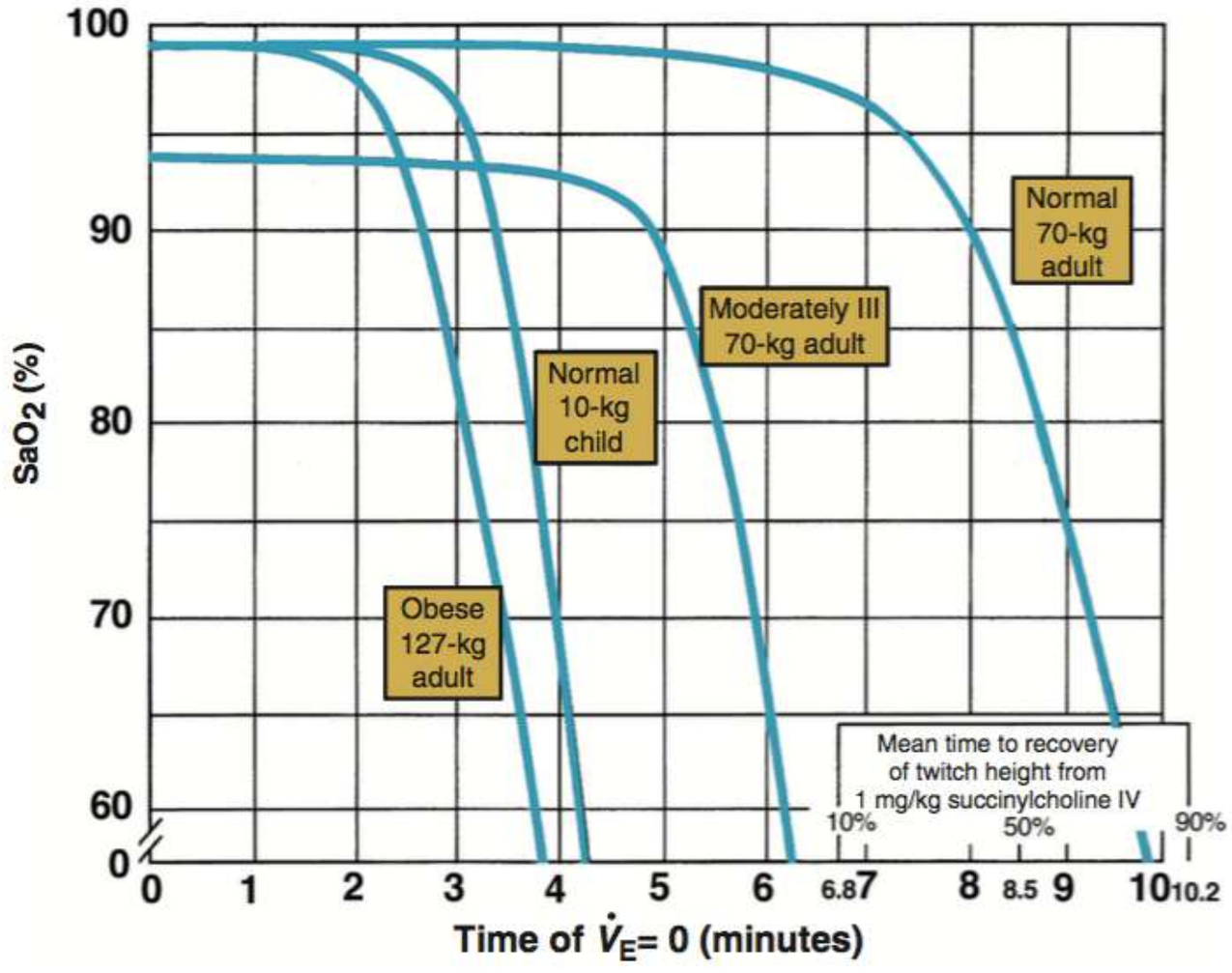
NECK MOBILITY

SATURATION

Ossigeno —> riserva

Riserva —> tempo

Tempo —> difficoltà



SITUATION

Molti esempi…soprattutto in ambito extraospedaliero:

- Paziente incastrato (o con postura obbligata)
- Scarsa visibilità (o troppa luce)
- Operatore solo
- Pz a terra vs pz in ambulanza vs pz in PS
- Durata del trasporto (rapido, lungo)

SITUAZIONE EVOLUTIVA

H.E.A.V.E.N.

HEAVEN Criteria

Criteria	Definitions
Hypoxemia	O2 ≤93% at time of initial laryngoscopy
Extremes of Size	Pediatric patient ≤8 years of age or clinical obesity
Anatomic Challenge	Trauma, mass, swelling, foreign body, or other structural abnormality limiting laryngoscopic view
Vomit/Blood/Fluid	Fluid present in the pharynx/hypopharynx at time of laryngoscopy
Exsanguination	Suspected anemia potentially accelerating desaturation during RSI associated apnea
Neck	Limited cervical range of motion due to immobilization or arthritis

J Emerg Med. 2018 Jan 10. pii: S0736-4679(17)31171-X. doi: 10.1016/j.jemermed.2017.12.005. [Epub ahead of print]

A Novel Difficult-Airway Prediction Tool for Emergency Airway Management: Validation of the HEAVEN Criteria in a Large Air Medical Cohort.

Kuzmack E[1], Inglis T[1], Olvera D[2], Wolfe A[2], Seng K[1], Davis D[3].

M.O.A.N.S.

- Mask seal-Male sex
- Obesity
- Age (età> 55 anni)
- No teeth
- Stiff (rigidità da aumentata pressione)

R.O.D.S.

- Restricted mouth opening
- Obsruction/Obesity
- Distrupted or distorted airway
- Stiff

I-gel O_2 resus pack, a rescue device in case of severe facial injury and difficult intubation

Fabio Baratto, MD [a], Giulia Gabellini, MD [a], Anrdea Paoli, MD [b], Annalisa Boscolo, MD [a,*]

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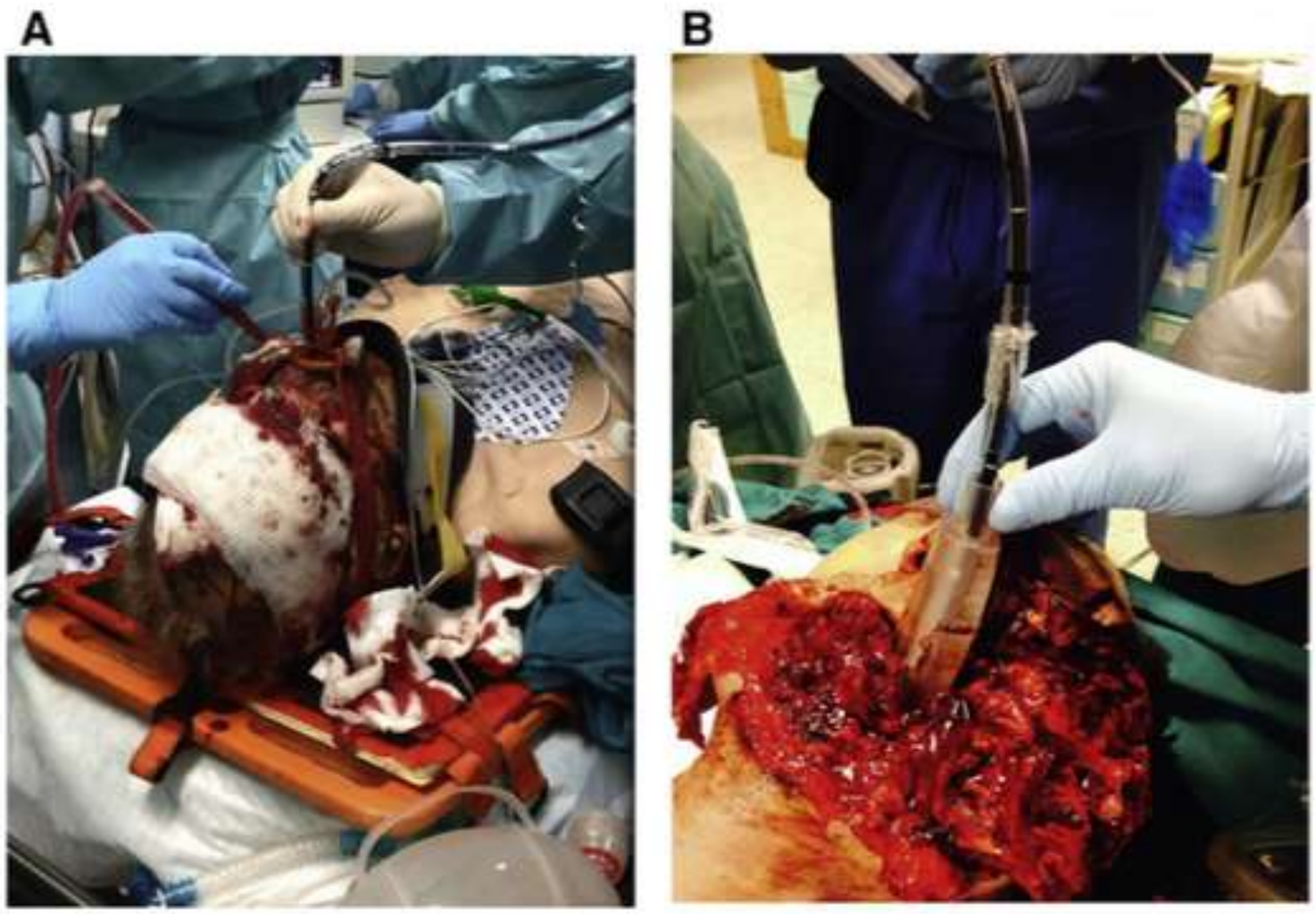
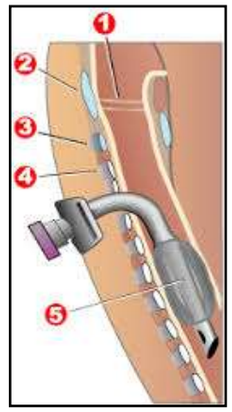


S.M.A.R.T.



- Surgery (recent or remote)
- Mass
- Access/anatomy
- Radiation (and other deformity or scarring)
- Tumor

LINEE GUIDA SIAARTI

SOCIETÀ ITALIANA DI ANESTESIA ANALGESIA
RIANIMAZIONE E TERAPIA INTENSIVA

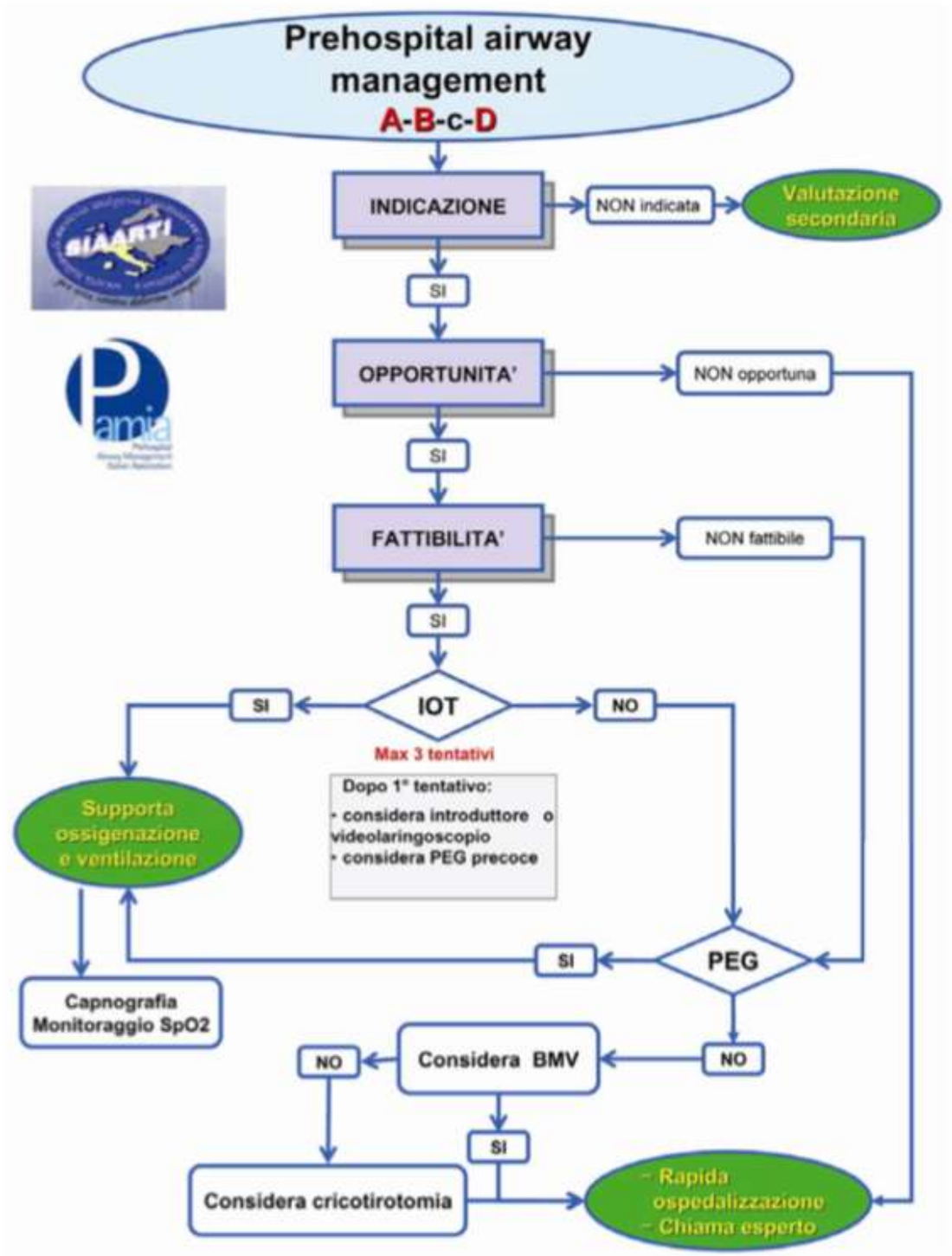
9 Ottobre 2010
Prot. n. 143 SIAARTI 2009/2012

Linee-guida per la gestione preospedaliera delle vie aeree

SIAARTI – Dr. Maurizio Menarini – Prof. Flavia Petrini – D.ssa Elena Bigi – Dr. Paolo Donato – Dr. Alessandro di Filippo per il GdS Vie aeree difficili e per il GdS Emergenze

PAMIA – Dr. Giulio Giovanni Desiderio – CPSI Enrico Benedetto – Dr. Simone Baroncini

ALGORITMO SIAARTI



LINEE GUIDA DAS 2015 (1)

BJA

British Journal of Anaesthesia, 115 (6): 827–48 (2015)

doi: 10.1093/bja/aev371
Advance Access Publication Date: 10 November 2015
Special Article

SPECIAL ARTICLE

Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults†

C. Frerk[1,*], V. S. Mitchell[2], A. F. McNarry[3], C. Mendonca[4], R. Bhagrath[5], A. Patel[6], E. P. O'Sullivan[7], N. M. Woodall[8] and I. Ahmad[9], Difficult Airway Society intubation guidelines working group

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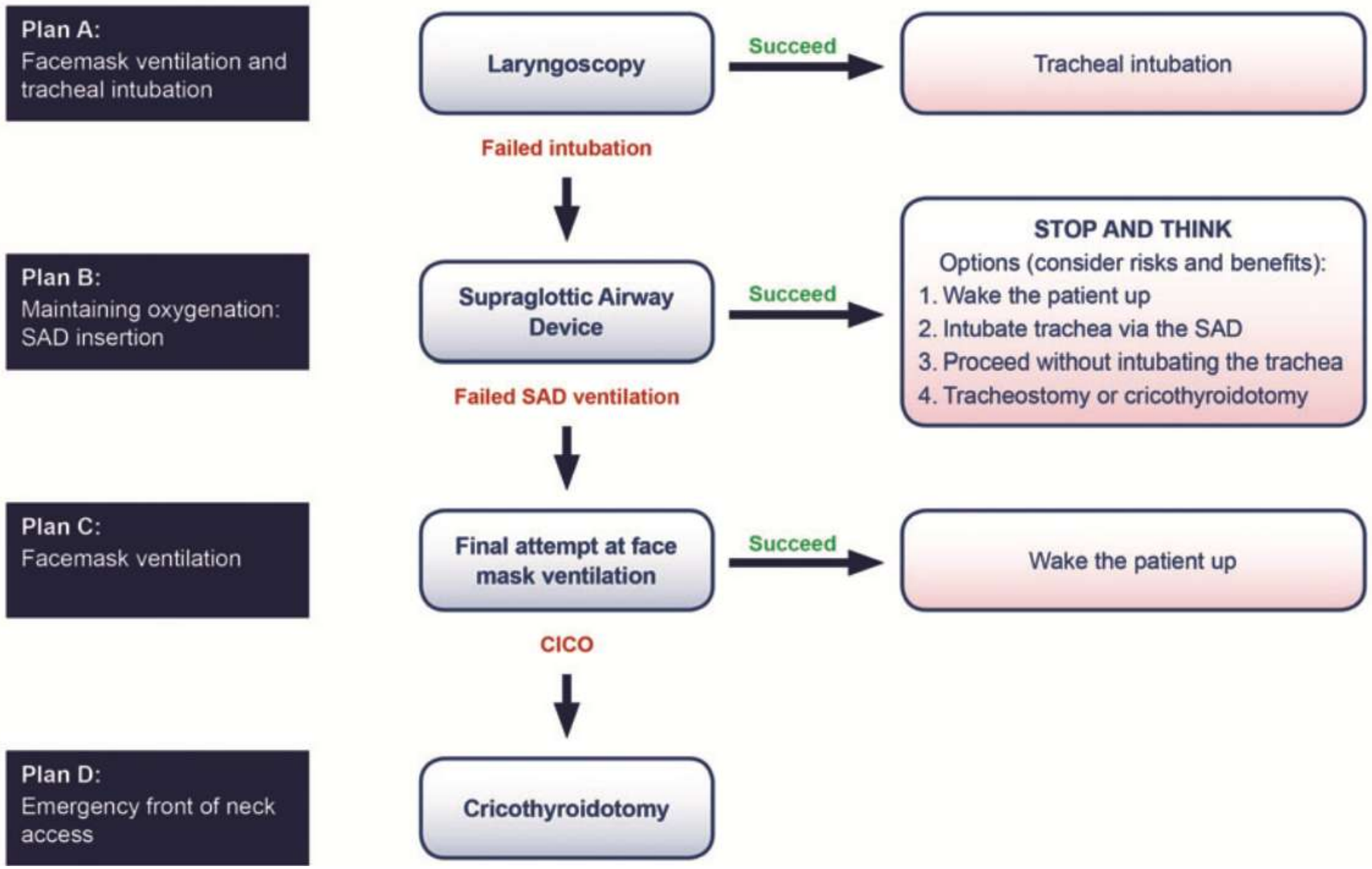
*Corresponding author. E-mail: chris.frerk@ngh.nhs.uk

LINEE GUIDA DAS 2015 (2)

DAS Difficult intubation guidelines – overview



Plan C: Facemask ventilation

If facemask ventilation impossible, paralyse
Final attempt at facemask ventilation
Use 2 person technique and adjuncts

Succeed → Wake the patient up

Declare CICO

Plan D: Emergency front of neck access

Scalpel cricothyroidotomy

Post-operative care and follow up

- Formulate immediate airway management plan
- Monitor for complications
- Complete airway alert form
- Explain to the patient in person and in writing
- Send written report to GP and local database

Can't Intubate, Can't Oxygenate (CICO) in critically ill adults

CALL FOR HELP

Declare "Can't Intubate, Can't Oxygenate"

Plan D: Front Of Neck Airway: FONA

Extend neck

Ensure neuromuscular blockade

Continue rescue oxygenation

Exclude oxygen failure and blocked circuit

Scalpel cricothyroidotomy

Equipment: 1. Scalpel (wide blade e.g. number 10 or 20)

[illegible]

3. Tube (cuffed 5.0-6.0mm ID)

Laryngeal handshake to identify cricothyroid membrane

Palpable cricothyroid membrane

Transverse stab incision through cricothyroid membrane

Turn blade through 90° (sharp edge towards the feet)

Slide Coudé tip of bougie along blade into trachea

Railroad lubricated cuffed tube into trachea

[illegible]

Secure tube

Impalpable cricothyroid membrane

Make a large midline vertical incision

[illegible]

Identify and stabilise the larynx

Proceed with technique for palpable cricothyroid membrane as above

Trained expert only

Other FONA techniques

Trained expert only

Other FONA techniques

Non-scalpel cricothyroidotomy

Percutaneous tracheostomy

Surgical tracheostomy

Non-scalpel cricothyroidotomy

Percutaneous tracheostomy

Surgical tracheostomy

Int J Emerg Med. 2018 Mar 16;11(1):19. doi: 10.1186/s12245-018-0178-7.

Success rates of pre-hospital difficult airway management: a quality control study evaluating an in-hospital training program.

Trimmel H[1,2], Beywinkler C[3], Hornung S[3], Kreutziger J[4], Voelckel WG[5,6,7].

⊕ Author information

Abstract

BACKGROUND: Competence in emergency airway management is key in order to improve patient safety and outcome. The scope of compulsory training for emergency physicians or paramedics is quite limited, especially in Austria. The purpose of this study was to review the difficult airway management performance of an emergency medical service (EMS) in a region that has implemented a more thorough training program than current regulations require, comprising 3 months of initial training and supervised emergency practice and 3 days/month of on-going in-hospital training as previously reported.

METHODS: This is a subgroup analysis of pre-hospital airway interventions performed by non-anesthesiologist EMS physicians between 2006 and 2016. The dataset is part of a retrospective quality control study performed in the ground EMS system of Wiener Neustadt, Austria. Difficult airway missions recorded in the electronic database were matched with the hospital information system and analyzed.

RESULTS: Nine hundred thirty-three of 23060 ground EMS patients (4%) required an airway intervention. In 48 cases, transient bag-mask-valve ventilation was sufficient, and 5 patients needed repositioning of a pre-existing tracheostomy cannula. Eight hundred thirty-six of 877 patients (95.3%) were successfully intubated within two attempts; in 3 patients, a supraglottic airway device was employed first line. Management of 41 patients with failed tracheal intubation comprised laryngeal tubes (n = 21), intubating laryngeal mask (n = 11), ongoing bag-mask-valve ventilation (n = 8), and crico-thyrotomy (n = 1). There was no cannot intubate/cannot ventilate situation. Blood gas analysis at admission revealed hypoxemia in 2 and/or hypercapnia in 11 cases.

CONCLUSION: During the 11-year study period, difficult airways were encountered in 5% but sufficiently managed in all patients. Thus, the training regime presented might be a feasible and beneficial model for training of non-anesthesiologist emergency physicians as well as paramedics.

KEYWORDS: Airway management; Austria; Bag-mask-valve ventilation; Crico-thyrotomy; Difficult airway algorithm; Emergency physician; Prehospital care; Supraglottic airway; Tracheal intubation

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Scandinavian SSAI clinical practice guideline on pre-hospital airway management.

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Abstract

BACKGROUND: The Scandinavian society of anaesthesiology and intensive care medicine task force on pre-hospital airway management was asked to formulate recommendations following standards for trustworthy clinical practice guidelines.

METHODS: The literature was systematically reviewed and the grading of recommendations assessment, development and evaluation (GRADE) system was applied to move from evidence to recommendations.

RESULTS: We recommend that all emergency medical service (EMS) providers consider to: apply basic airway manoeuvres and airway adjuncts (good practice recommendation); turn unconscious non-trauma patients into the recovery position when advanced airway management is unavailable (good practice recommendation); turn unconscious trauma patients to the lateral trauma position while maintaining spinal alignment when advanced airway management is unavailable [strong recommendation, low quality of evidence (QoE)]. We suggest that intermediately trained providers use a supraglottic airway device (SAD) or basic airway manoeuvres on patients in cardiac arrest (weak recommendation, low QoE). We recommend that advanced trained providers consider using an SAD in selected indications or as a rescue device after failed endotracheal intubation (ETI) (good practice recommendation). We recommend that ETI should only be performed by advanced trained providers (strong recommendation, low QoE). We suggest that videolaryngoscopy is considered for ETI when direct laryngoscopy fails or is expected to be difficult (weak recommendation, low QoE). We suggest that advanced trained providers apply cricothyroidotomy in 'cannot intubate, cannot ventilate' situations (weak recommendation, low QoE).

CONCLUSION: This guideline for pre-hospital airway management includes a combination of techniques applied in a stepwise fashion appropriate to patient clinical status and provider training.

Comment in

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CONCLUDENDO…

- Le 5 “A” dell’intubazione difficile…
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GRAZIE PER LA VOSTRA ATTENZIONE