FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

TIPS and TRICKS … v predikci DAM, možnosti a algoritmy

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ARK FNUSA + LF MU

Život zachraňující výkony

VIII. konference Akutně.cz

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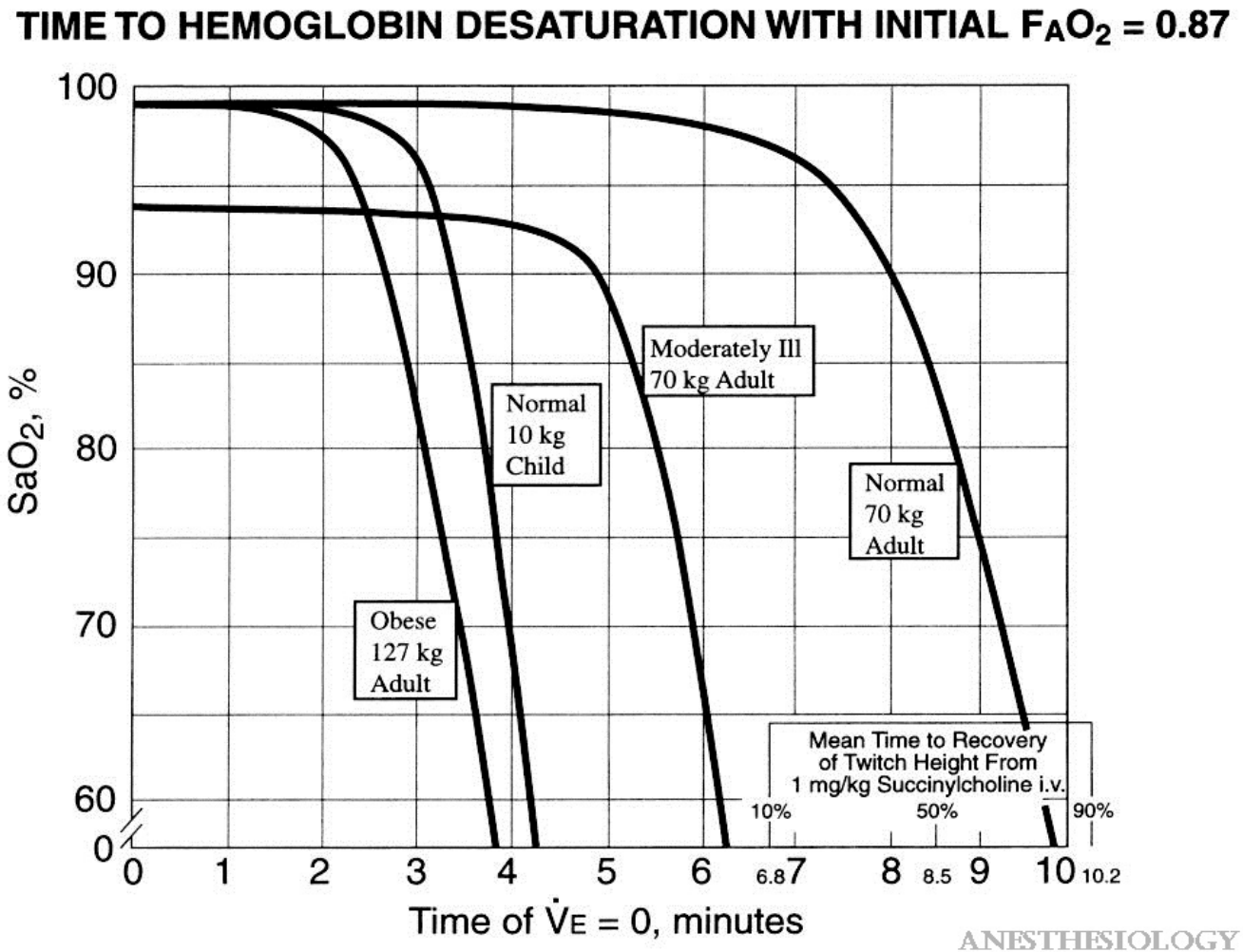
Apnoe a oxygenace



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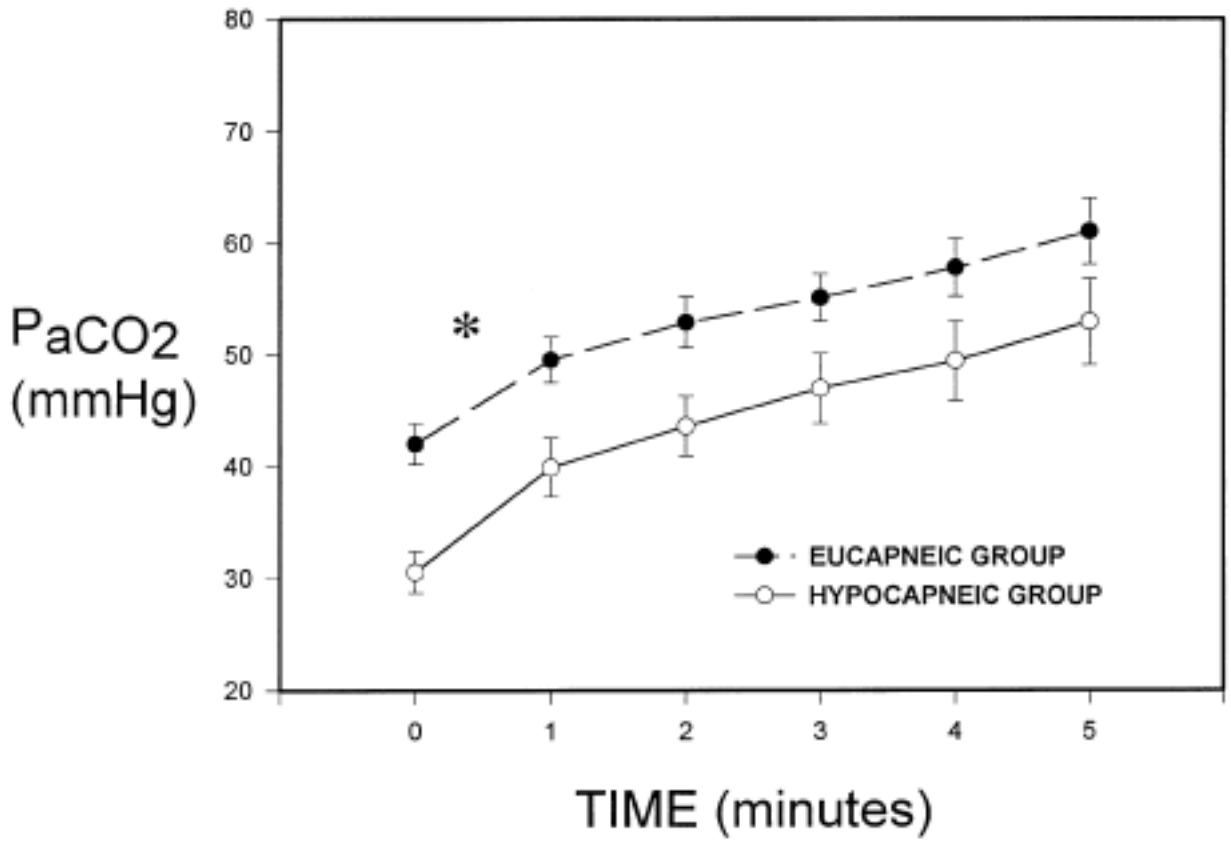
Apnoe a hyperkapnie



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Pečlivě

- **pečlivá volba priorit**
- pečlivé vyšetření dýchacích cest
  … odhalí některé (70% spolehlivost)
- pečlivá preoxygenace
  … získá několik minut navíc (u zdravých)
- pečlivá příprava plánu, polohy a pomůcek

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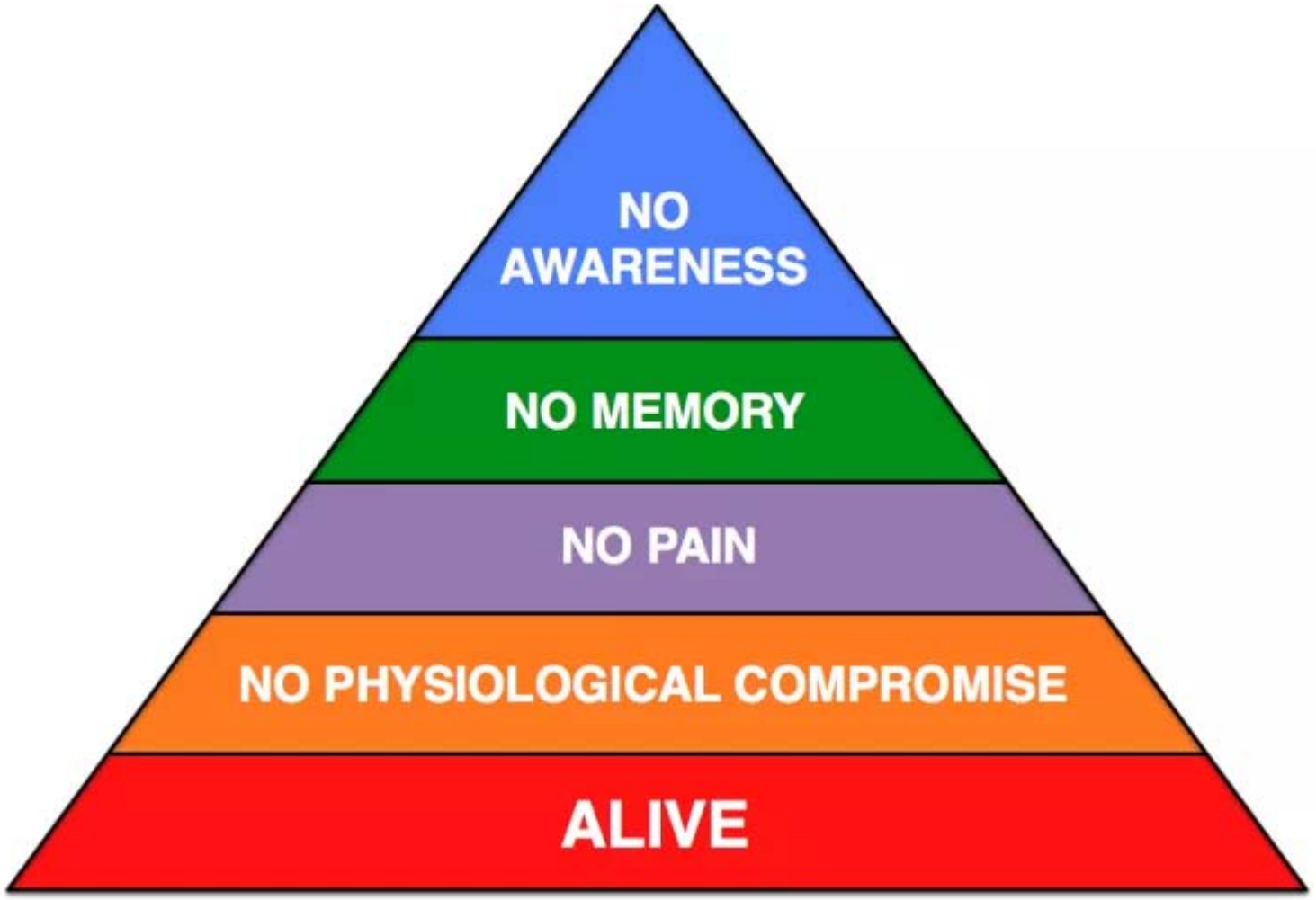
Priority



http://emcrit.org/podcasts/intubation-patient-shock/

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Pečlivě

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Airway Examination Component	Nonreassuring Findings
Length of upper incisors	Relatively long
Relationship of maxillary and mandibular incisors during normal jaw closure	Prominent "overbite" (maxillary incisors anterior to mandibular incisors)
Relationship of maxillary and mandibular incisors during voluntary protrusion of mandible	Patient cannot bring mandibular incisors anterior to (in front of) maxillary incisors
Interincisor distance	Less than 3 cm
Visibility of uvula	Not visible when tongue is protruded with patient in sitting position (*e.g.*, Mallampati class >2)
Shape of palate	Highly arched or very narrow
Compliance of mandibular space	Stiff, indurated, occupied by mass, or nonresilient
Thyromental distance	Less than three ordinary finger breadths
Length of neck	Short
Thickness of neck	Thick
Range of motion of head and neck	Patient cannot touch tip of chin to chest or cannot extend neck

This table displays some findings of the airway physical examination that may suggest the presence of a difficult intubation. The decision to examine some or all of the airway components shown on this table is dependent on the clinical context and judgment of the practitioner. The table is not intended as a mandatory or exhaustive list of the components of an airway examination. The order of presentation in this table follows the "line of sight" that occurs during conventional oral laryngoscopy.

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Otevření úst

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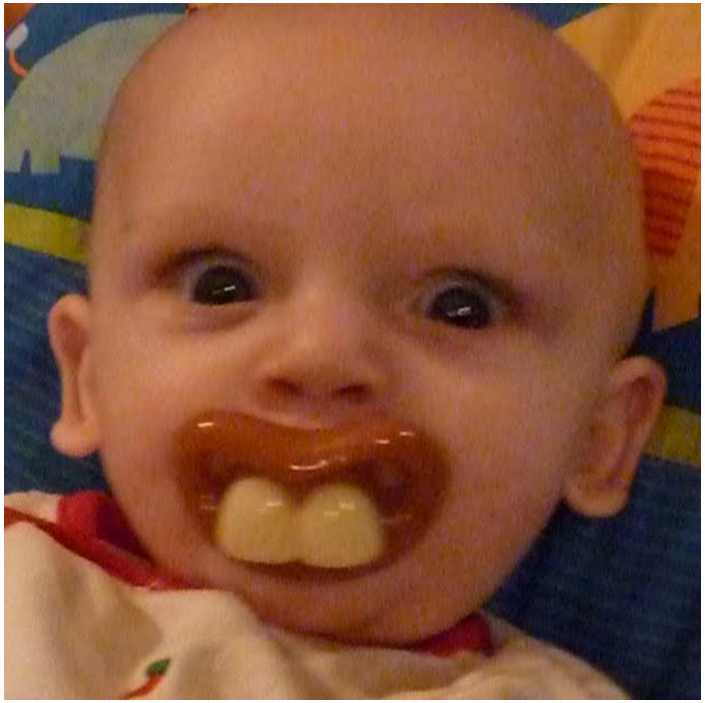
Chrup



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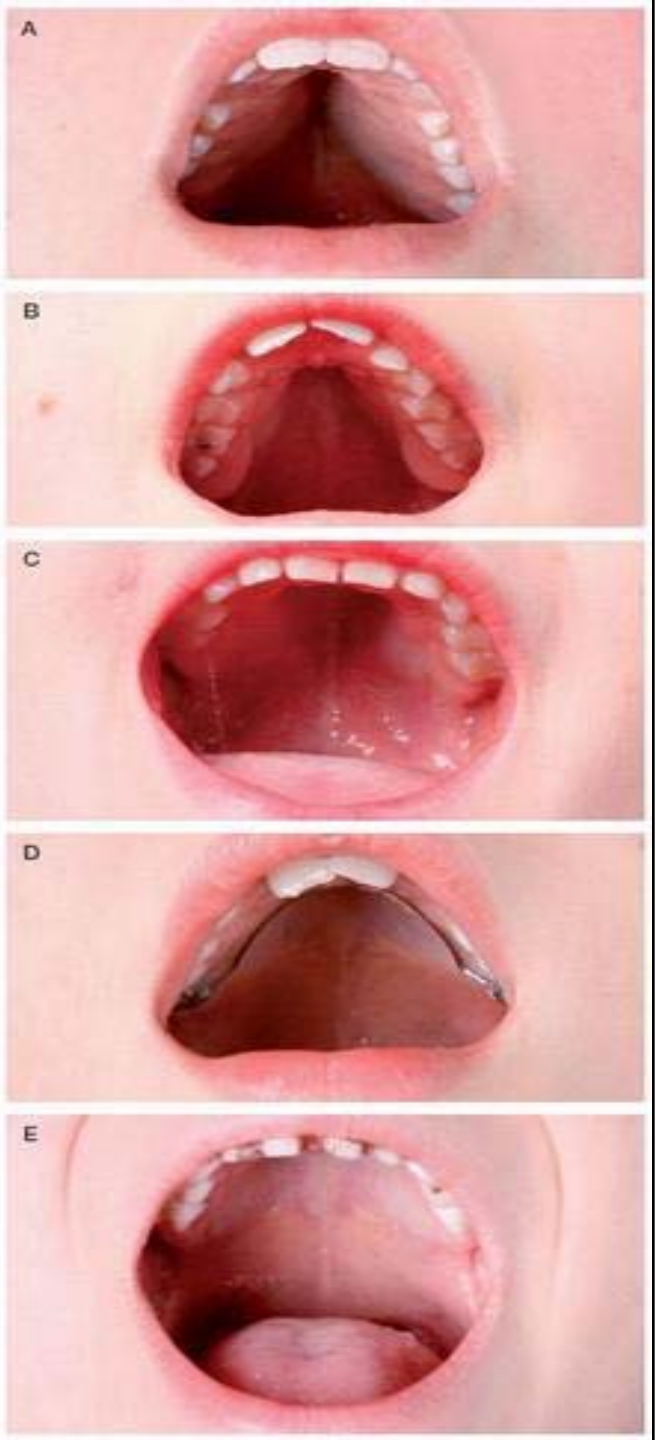
Patro



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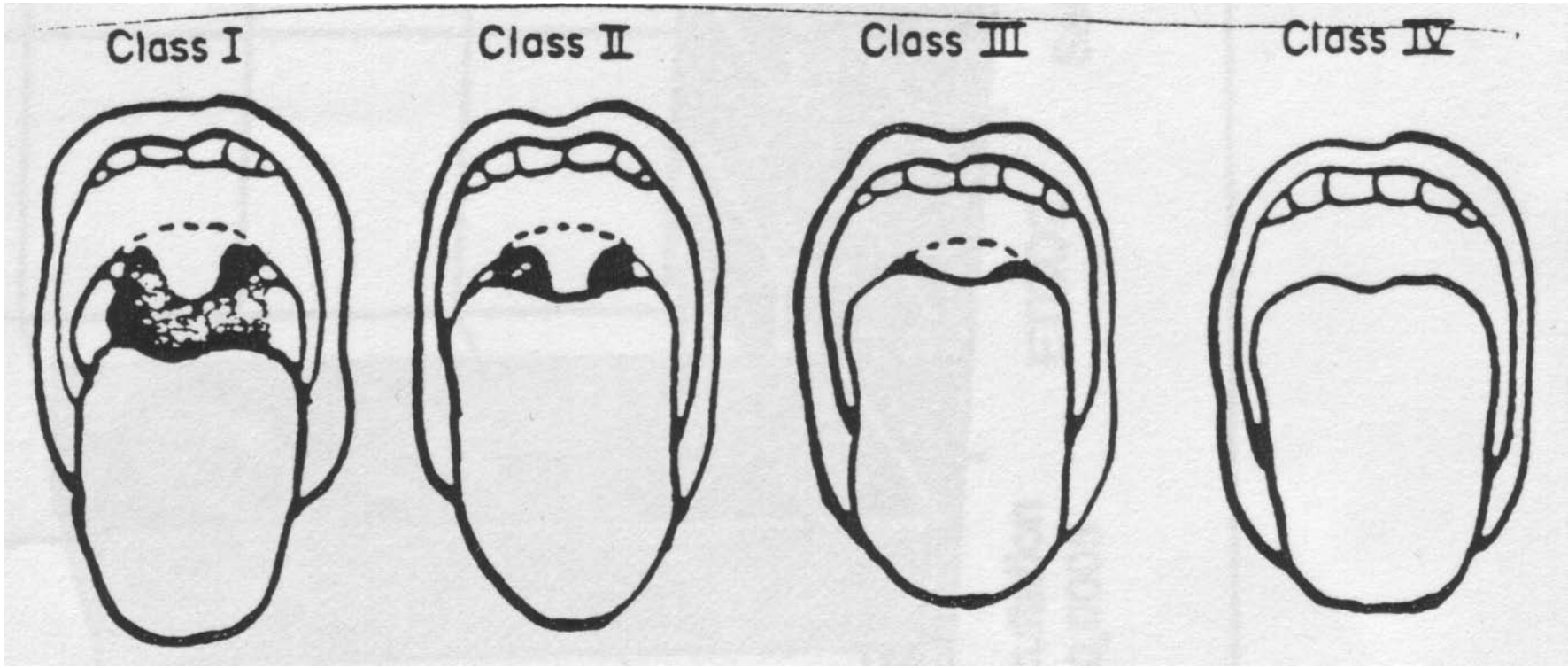
Mallanpati



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Mobilita C páteře

Neck Mobility:

With patient sitting upright, place one index finger on the patient's chin and one index finger on the occipital bone. Ask the patien to completely extend the head on the neck. The finger on the chin is (CM= cervical mobility):

☐ Higher than the one on the occipital bone
CM normal (Grade 1

☐ Same level
CM some limitation (Grade 2)

☐ Lower than the one on the occipital bone
CM moderate/severe limitation (Grade 3)

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Vyšetření krku

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Pečlivě

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- pečlivé vyšetření dýchacích cest
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- pečlivá příprava plánu, polohy a pomůcek

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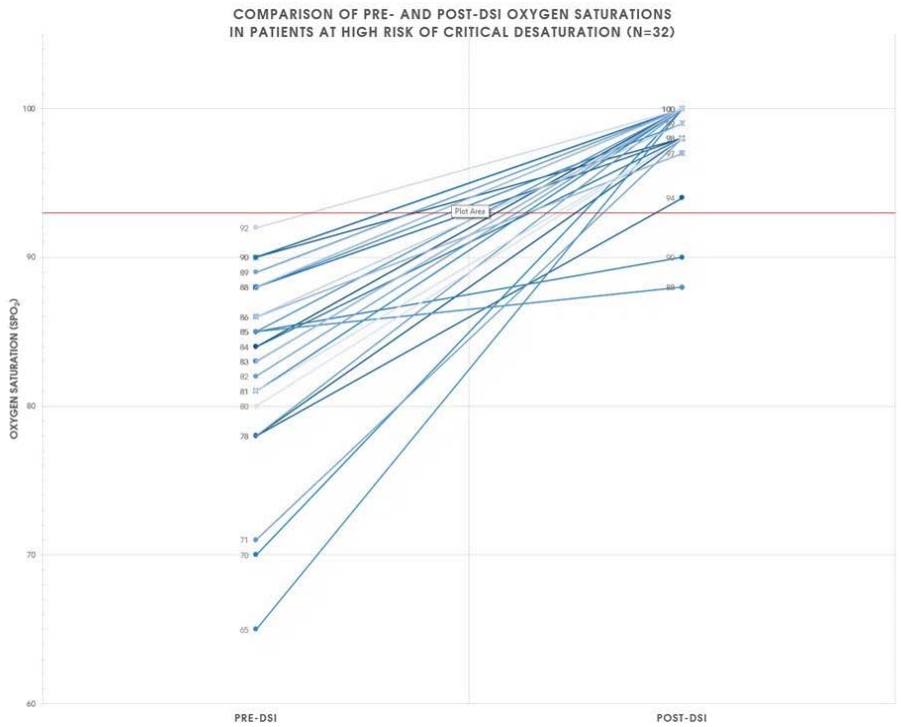
Preoxygenace

- 3minuty, 8 l/min
- 8 hlubokých dechů těsnící maskou
- NIV



http://emcrit.org/DSI

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Pečlivě

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  … získá několik minut navíc (u zdravých)
- **pečlivá příprava plánu, polohy a pomůcek**

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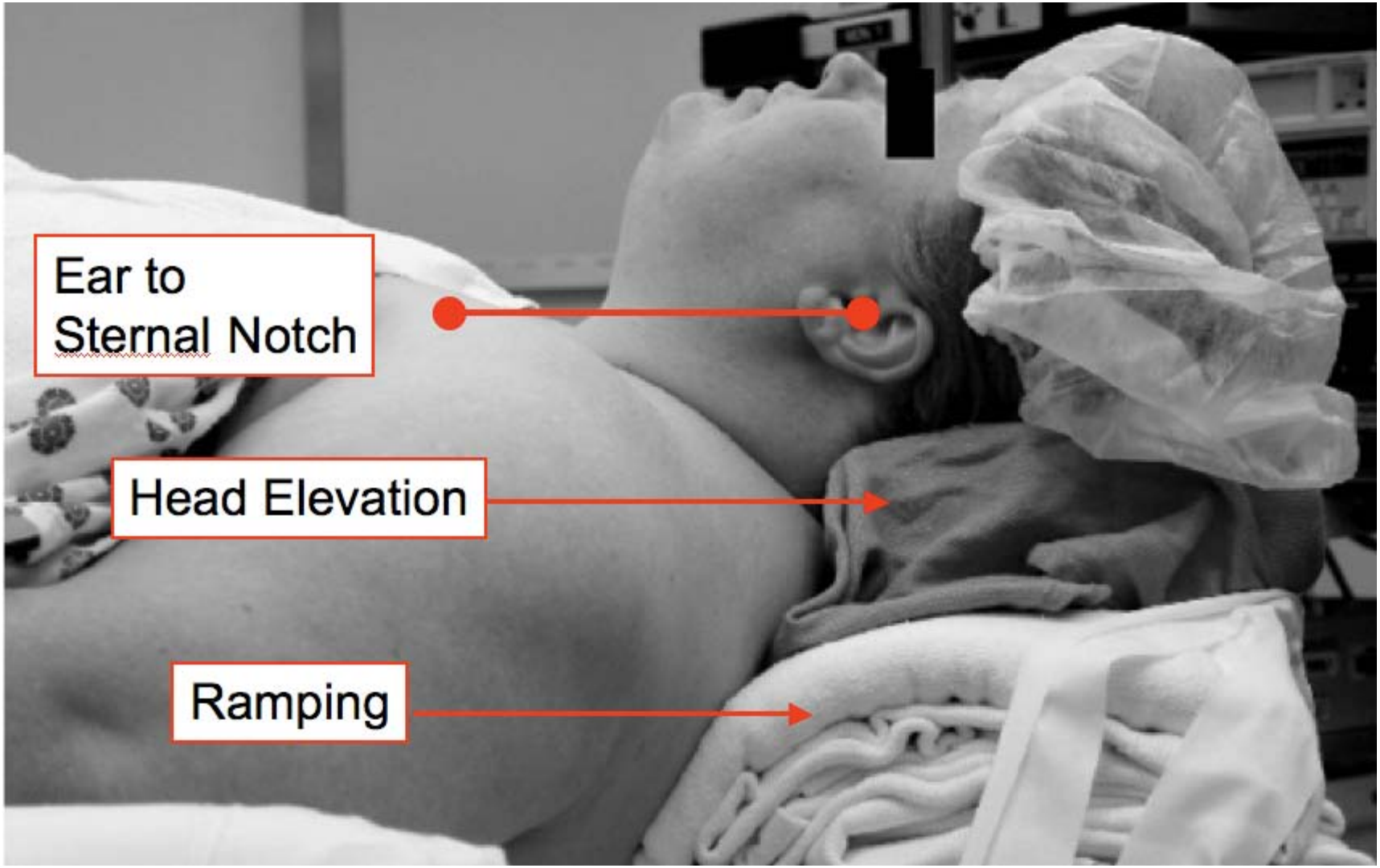
Polohování před intubací



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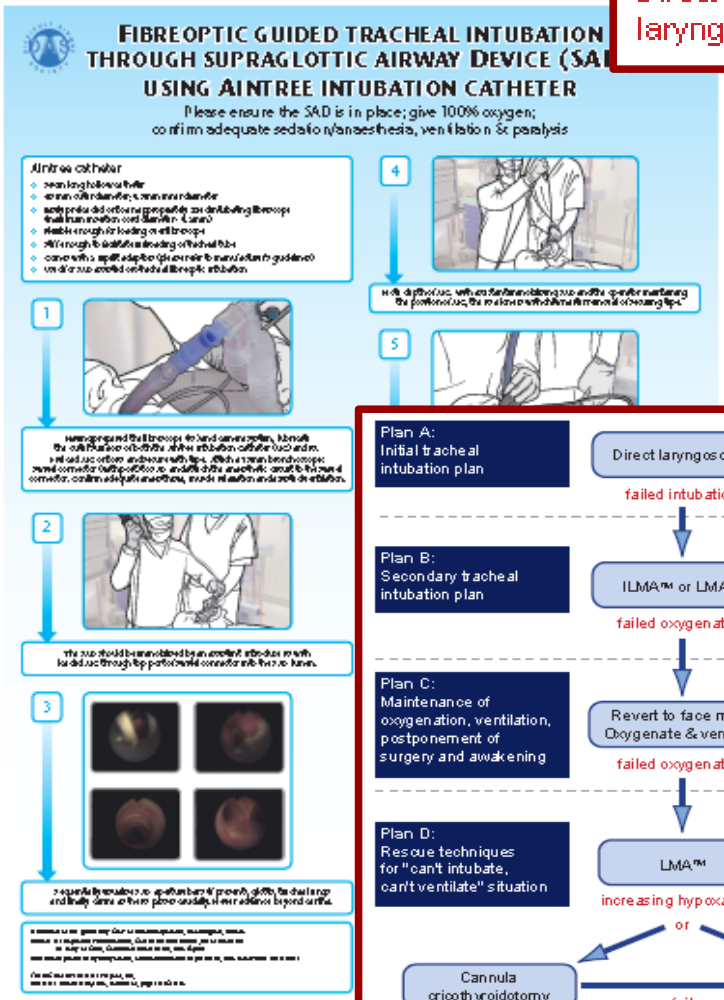
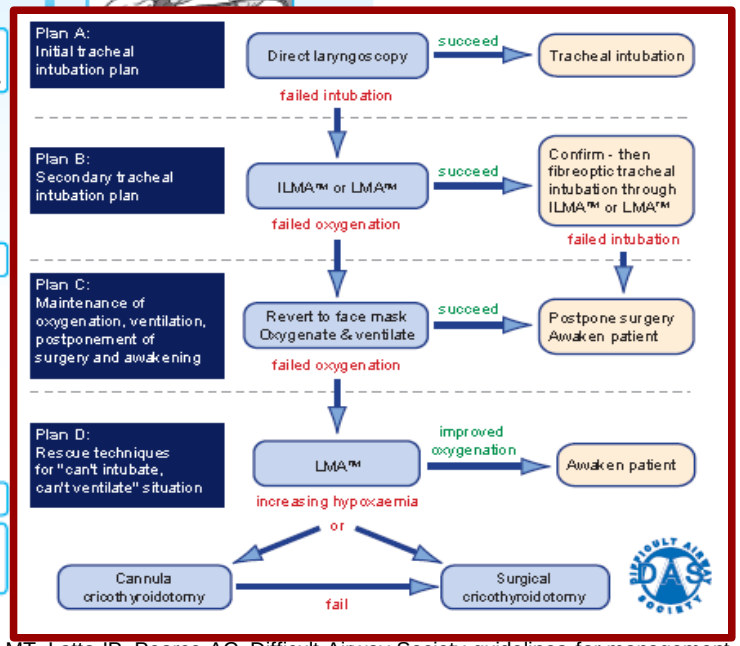
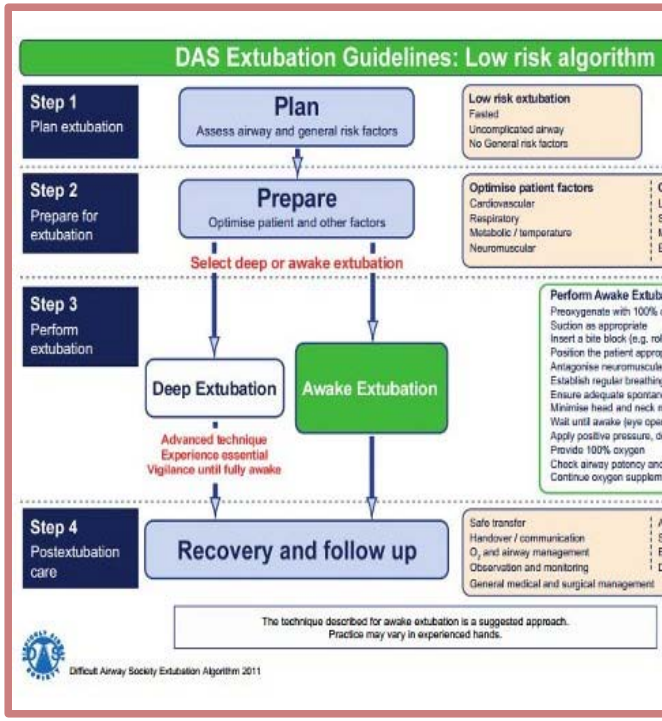
DAS 2004 → 2015

Direct laryngoscopy → Any problems → Call for help







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Management of unanticipated difficult tracheal intubation in adults

2015

Plan A: Facemask ventilation and tracheal intubation

- Optimise head and neck position
- Preoxygenate
- Adequate neuromuscular blockade
- Direct / Video Laryngoscopy (maximum 3+1 attempts)
- External laryngeal manipulation
- Bougie
- Remove cricoid pressure
- Maintain oxygenation and anaesthesia

If in difficulty → call for help

Succeed → Confirm tracheal intubation with capnography

Declare failed intubation

Plan B: Maintaining oxygenation: SAD insertion

- 2nd generation device recommended
- Change device or size (maximum 3 attempts)
- Oxygenate and ventilate

Succeed →

STOP AND THINK

Options (consider risks and benefits):

1. Wake the patient up
2. Intubate trachea via the SAD
3. Proceed without intubating the trachea
4. Tracheostomy or cricothyroidotomy

Declare failed SAD ventilation

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

This flowchart forms part of the DAS Guidelines for unanticipated difficult intubation in adults 2015 and should be used in conjunction with the text.

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DIFFICULT AIRWAY ALGORITHM

1. Assess the likelihood and clinical impact of basic management problems:

A. Difficult intubation

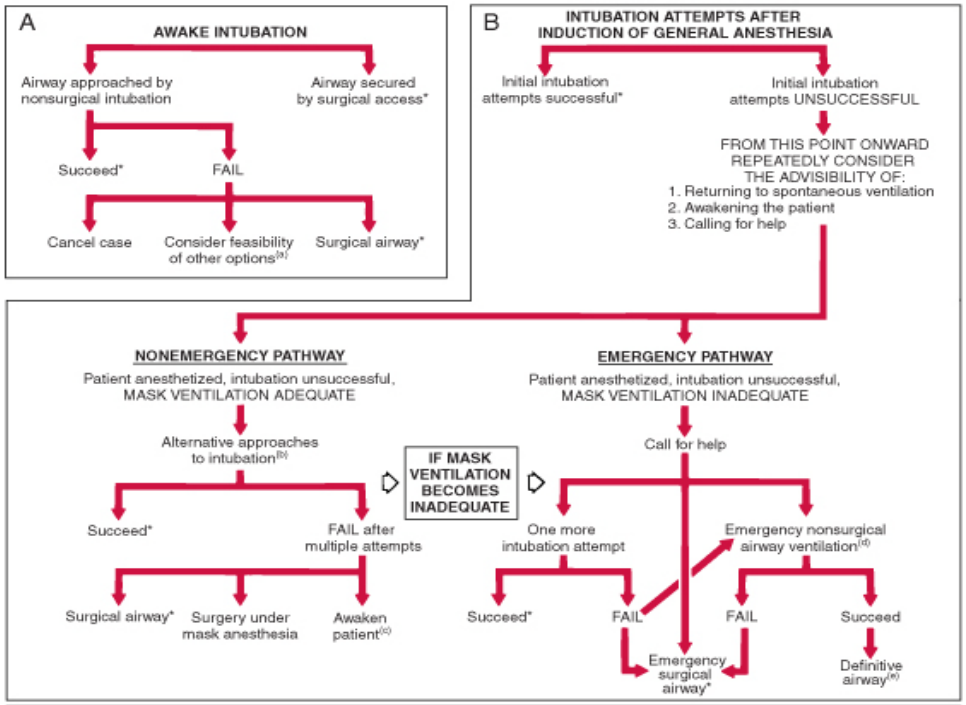
B. Difficult ventilation

C. Difficulty with patient cooperation or consent

2. Consider the relative merits and feasibility of management choices:

A	Nonsurgical technique for initial approach to intubation	vs	Nonsurgical technique for initial approach to intubation
B	Awake intubation	vs	Intubation attempts after induction of general anesthesia
C	Preservation of spontaneous ventilation	vs	Ablation of spontaneous ventilation

3. Develop primary and alternative strategies:



*** CONFIRM INTUBATION WITH EXHALED CO_2**

(a) Other options include, but are not limited to: surgery under mask anesthesia, surgery under local anesthesia infiltration or regional nerve blockade, or intubation attempts after induction of general anesthesia.

(b) Alternate approaches to difficult intubation include, but are not limited to: use of different laryngoscope blades, awake intubation, blind oral or nasal intubation, fiberoptic intubation, intubating stylet or tube changer, light wand, retrograde intubation, and surgical airway access.

(c) See awake intubation.

(d) Options for emergency nonsurgical airway ventilation include, but are not limited to: transtracheal jet ventilation, laryngeal mask ventilation, or esophageal-tracheal combitube ventilation.

(e) Options for establishing a definitive airway include, but are not limited to: returning to awake state with spontaneous ventilation, tracheotomy, or endotracheal intubation.

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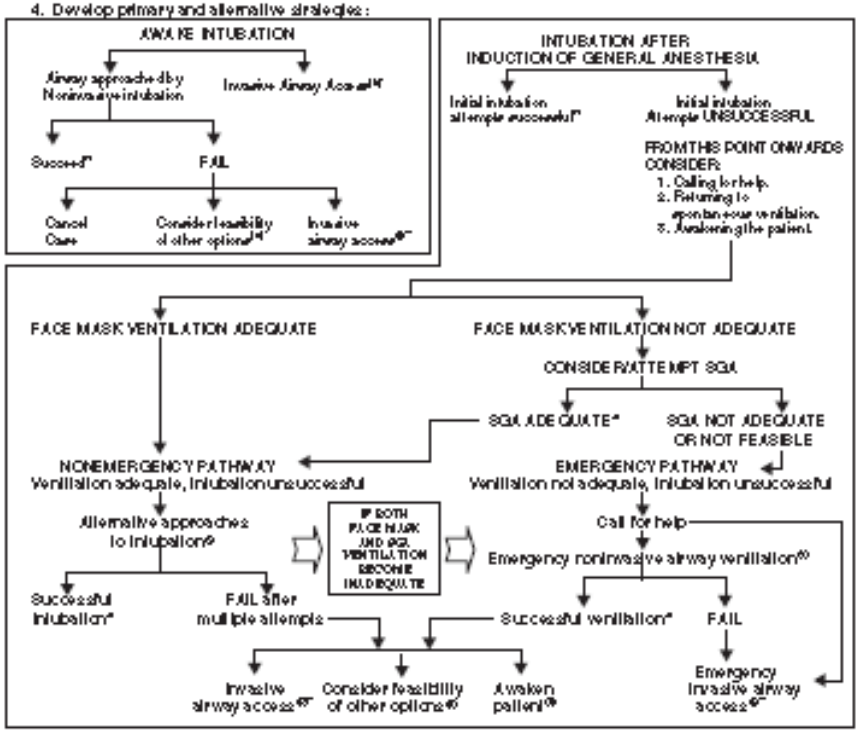
DIFFICULT AIRWAY ALGORITHM

1. Assess the likelihood and clinical impact of basic management problems:
   - Difficulty with patient cooperation or consent
   - Difficult mask ventilation
   - Difficult supraglottic airway placement
   - Difficult laryngoscopy
   - Difficult intubation
   - Difficult surgical airway access
2. Actively pursue opportunities to deliver supplemental oxygen throughout the process of difficult airway management.
3. Consider the relative merits and feasibility of basic management choices:
   - Awake intubation vs. intubation after induction of general anesthesia
   - Non-invasive technique vs. invasive technique for the initial approach to intubation
   - Video-assisted laryngoscopy as an initial approach to intubation
   - Preservation vs. ablation of spontaneous ventilation
4. Develop primary and alternative strategies:



*Confirm ventilation, tracheal intubation, or SGA placement with exhaled CO_2.

a. Other options include (but are not limited to): surgery utilizing face mask or supraglottic airway (SGA) anesthesia (e.g., LMA, ILMA, laryngeal tube), local anesthesia infiltration or regional nerve blockade. Pursuit of these options usually implies that mask ventilation will not be problematic. Therefore, these options may be of limited value if this step in the algorithm has been reached via the Emergency Pathway.

b. Invasive airway access includes surgical or percutaneous airway, jet ventilation, and retrograde intubation.

c. Alternative difficult intubation approaches include (but are not limited to): video-assisted laryngoscopy, alternative laryngoscope blades, SGA (e.g., LMA or ILMA) as an intubation conduit (with or without fiberoptic guidance), fiberoptic intubation, intubating stylet or tube changer, light wand, and blind oral or nasal intubation.

d. Consider re-preparation of the patient for awake intubation or canceling surgery.

e. Emergency non-invasive airway ventilation consists of a SGA.

Fig. 1. Difficult Airway Algorithm.

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Airway management

Vír

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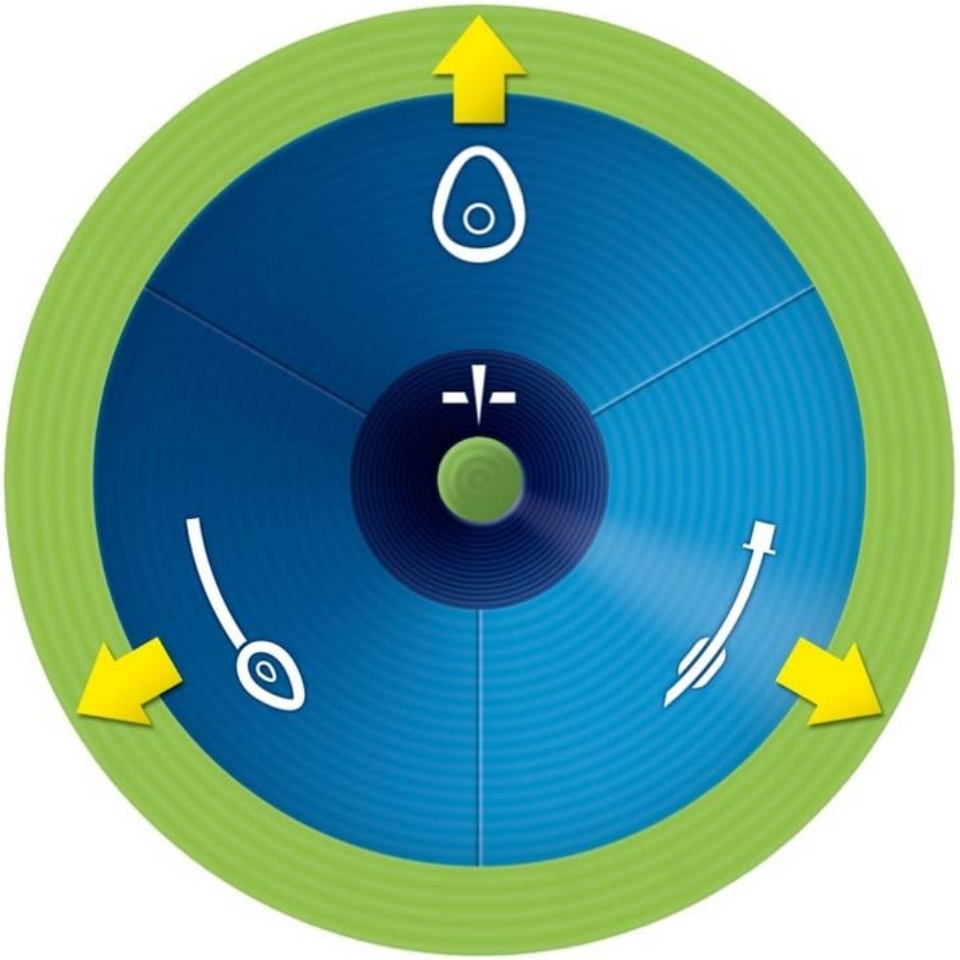
Udržet O2/CO2

- 3 nechirurgické postupy
  - obličejová maska
  - supraglotické
  - intubace



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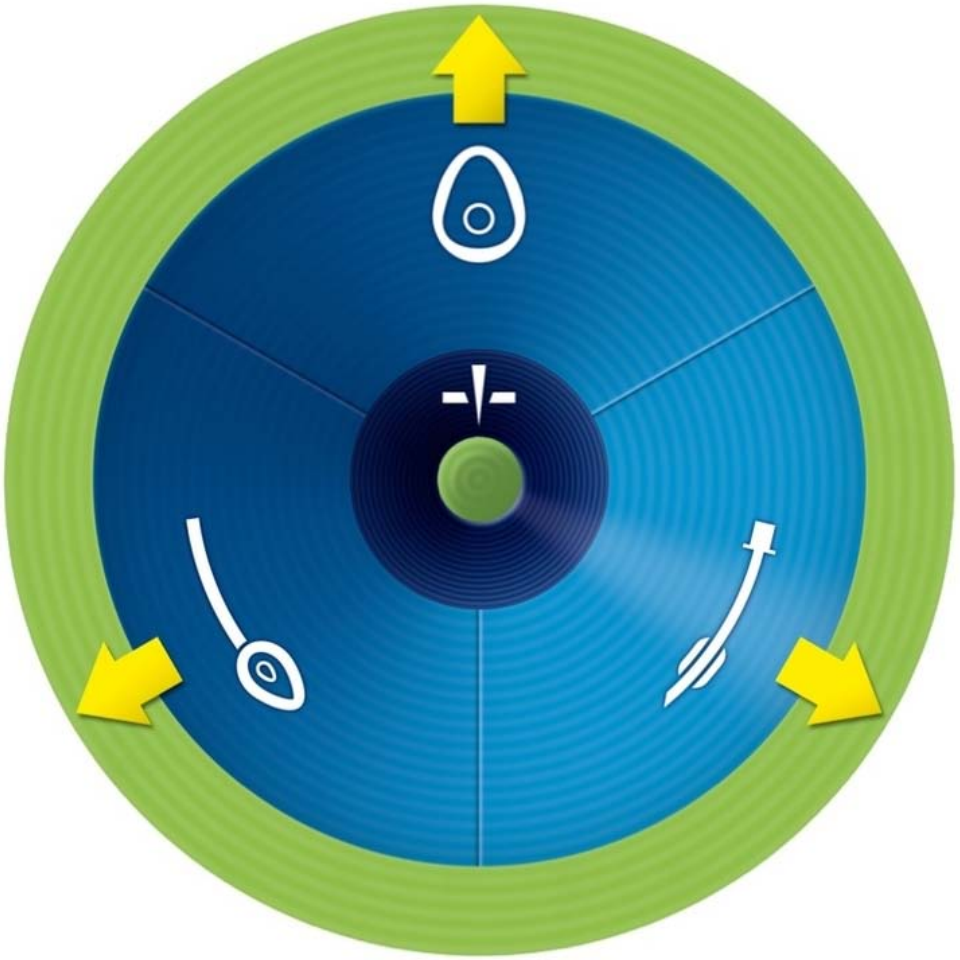
Udržet O2/CO2

- 3 nechirurgické postupy
- 1 chirurgický postup



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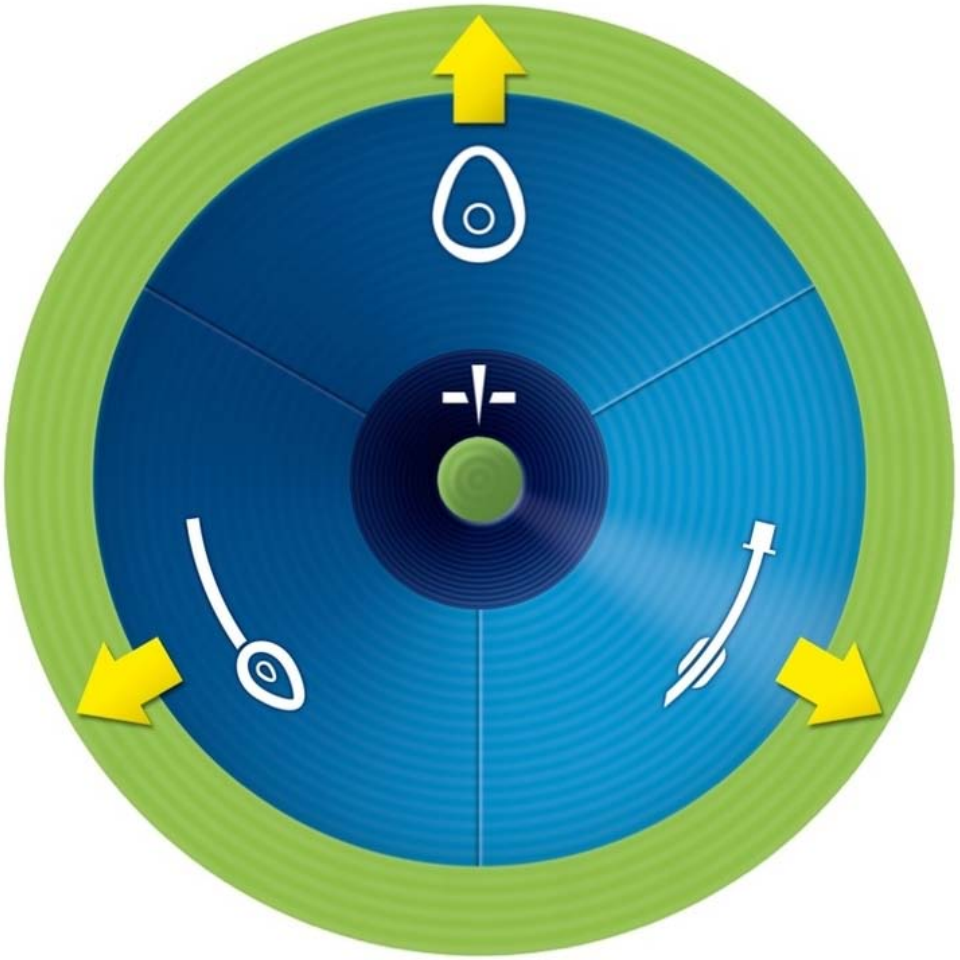
Udržet O2/CO2

- 3 nechirurgické postupy
- 1 chirurgický postup

- dostat pacienta do bezpečí



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Koniotomie

- Trigrem k provedení je nemožnost zajistit dýchací cesty třemi nechirurgickými technikami
- Desaturace není trigrem,
  ale stresorem během provedení.
- Čas, který máme k dispozici, než pacient desaturuje, je znám až retrospektivně.

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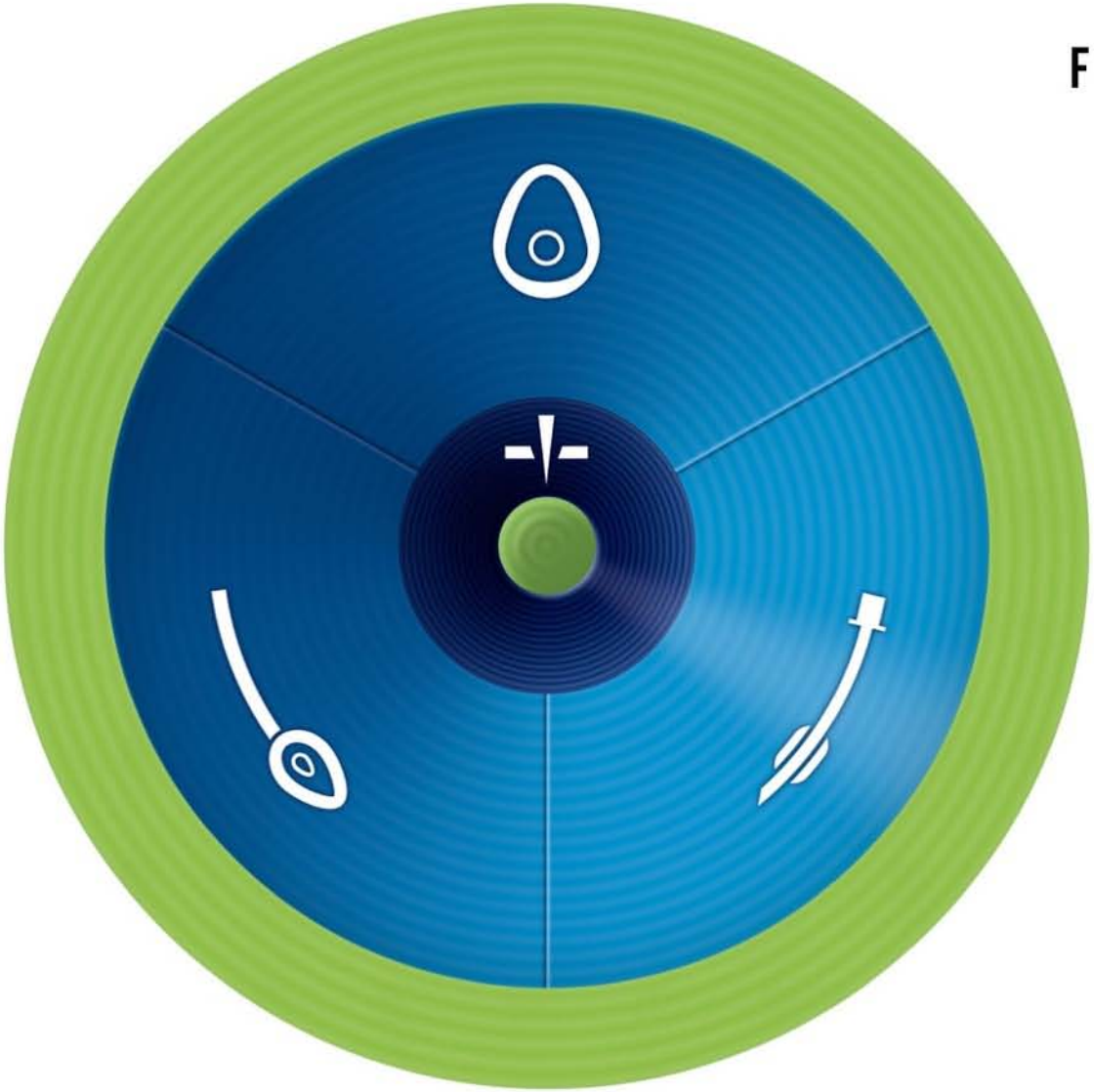
Nedělej 2x to stejné

VORTEX OPTIMISATION STRATEGIES

	FACE MASK	LARYNGEAL MASK AIRWAY	ENDOTRACHEAL TUBE
1. Manipulation Head & Neck	Sniffing Position/Jaw Thrust/Bed Height		
	Dentures In		Dentures Out
Larynx	Laryngeal Manipulation (incl. ease cricoid)		
Device	2 hands	Twist Cuff Inflation	Rotate
2. Adjuncts	OPA NPA	Introducer Bougie Laryngoscope	Stylette Bougie Magill Forceps
3. Size/Type	FM	LMA	Blade/Handle/VL ETT
4. Suction			
5. Pharyngeal Muscle Tone	Prospect of recovery: consider reverse BZD's, opioids, NMBD's GZ or No prospect recovery: consider adequacy anaesthesia/m. relaxation		

THE VORTEX



FOR EACH LIFELINE CONSIDER:

MANIPULATIONS:
- HEAD & NECK
- LARYNX
- DEVICE

ADJUNCTS

SIZE / TYPE

SUCTION / O_2 FLOW

MUSCLE TONE

MAXIMUM THREE ATTEMPTS AT EACH LIFELINE (UNLESS GAMECHANGER)
AT LEAST ONE ATTEMPT SHOULD BE BY MOST EXPERIENCED CLINICIAN
CICO STATUS ESCALATES WITH UNSUCCESSFUL BEST EFFORT AT ANY LIFELINE

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Literatura

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