



VŠEOBECNÁ FAKULTNÍ
NEMOCNICE V PRAZE



1. LÉKAŘSKÁ
FAKULTA
Univerzita Karlova

 **KARIM**
1.LF UK A VFN V PRAZE

Predikce DAM, algoritmy, videolaryngoskopie

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Obtížná intubace

- Incidence obtížné OTI:
 - Na OS: 5-10 %
 - Na JIP+UP: **až 27 %**
- Selhání OTI: 0,15-0,6 %

[Cochrane Database Syst Rev.](#) 2018; 2018(5): CD008874.

Published online 2018 May 15. doi: [10.1002/14651858.CD008874.pub2](https://doi.org/10.1002/14651858.CD008874.pub2)

PMCID: PMC6404686

PMID: [29761867](https://pubmed.ncbi.nlm.nih.gov/29761867/)

Airway physical examination tests for detection of difficult airway management in apparently normal adult patients

Monitoring Editor: [Dominik Roth](#), [Nathan L Pace](#), [Anna Lee](#), [Karen Hovhannisyan](#), [Alexandra-Maria Warenits](#), [Jasmin Arrich](#), [Harald Herkner](#),[✉] and Cochrane Anaesthesia Group

> [Anaesth Intensive Care.](#) 2012 Jan;40(1):120-7. doi: [10.1177/0310057X1204000113](https://doi.org/10.1177/0310057X1204000113).

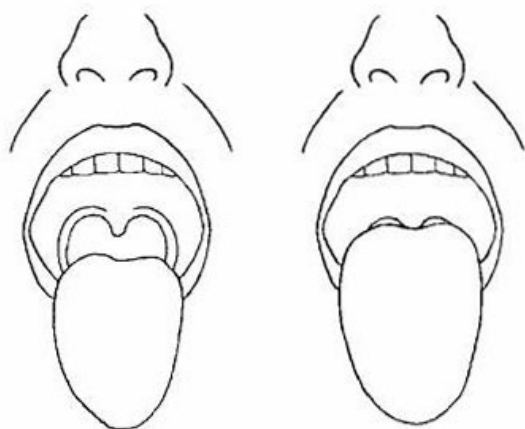
Incidence of difficult intubation in intensive care patients: analysis of contributing factors

Jan F Heuer¹, Thomas A Barwing, Juergen Barwing, Sebastian G Russo, Elisa Bleckmann, Michael Quintel, Onnen Moerer

Predikce, skórování

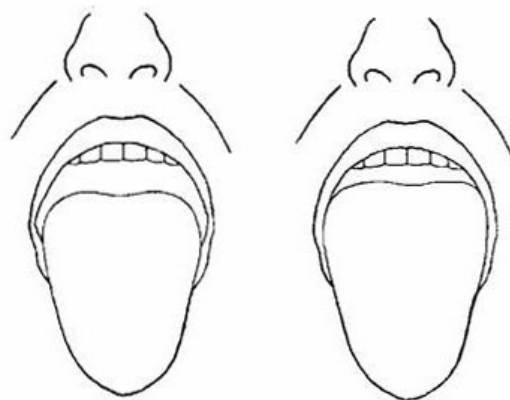


Predikce, skórování - Mallampati



CLASS I

CLASS II



CLASS III

CLASS IV

Class I



Class II



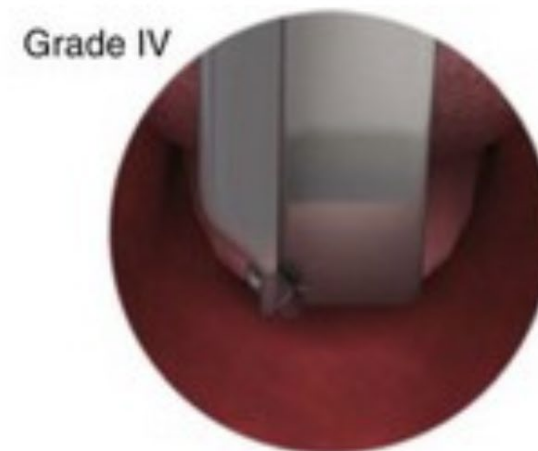
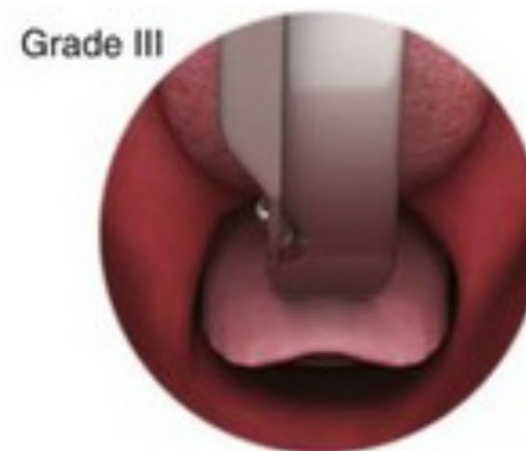
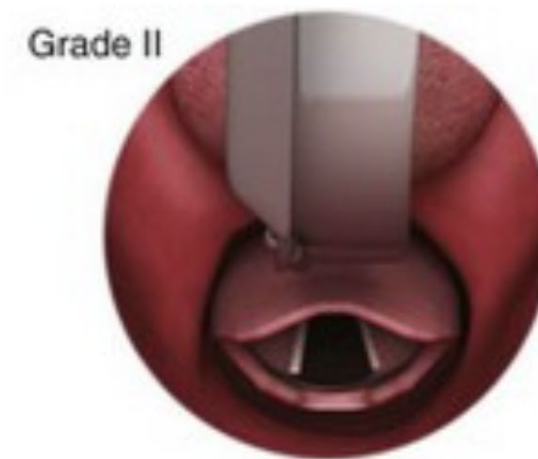
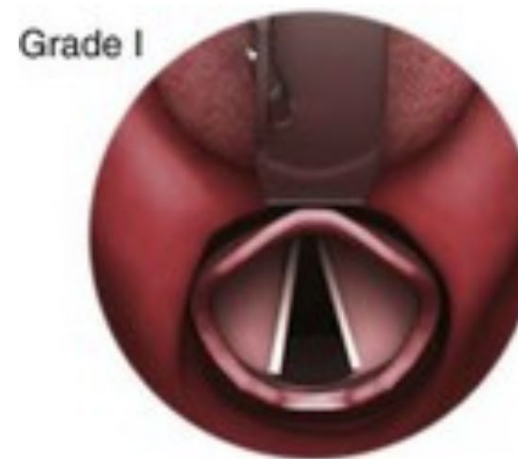
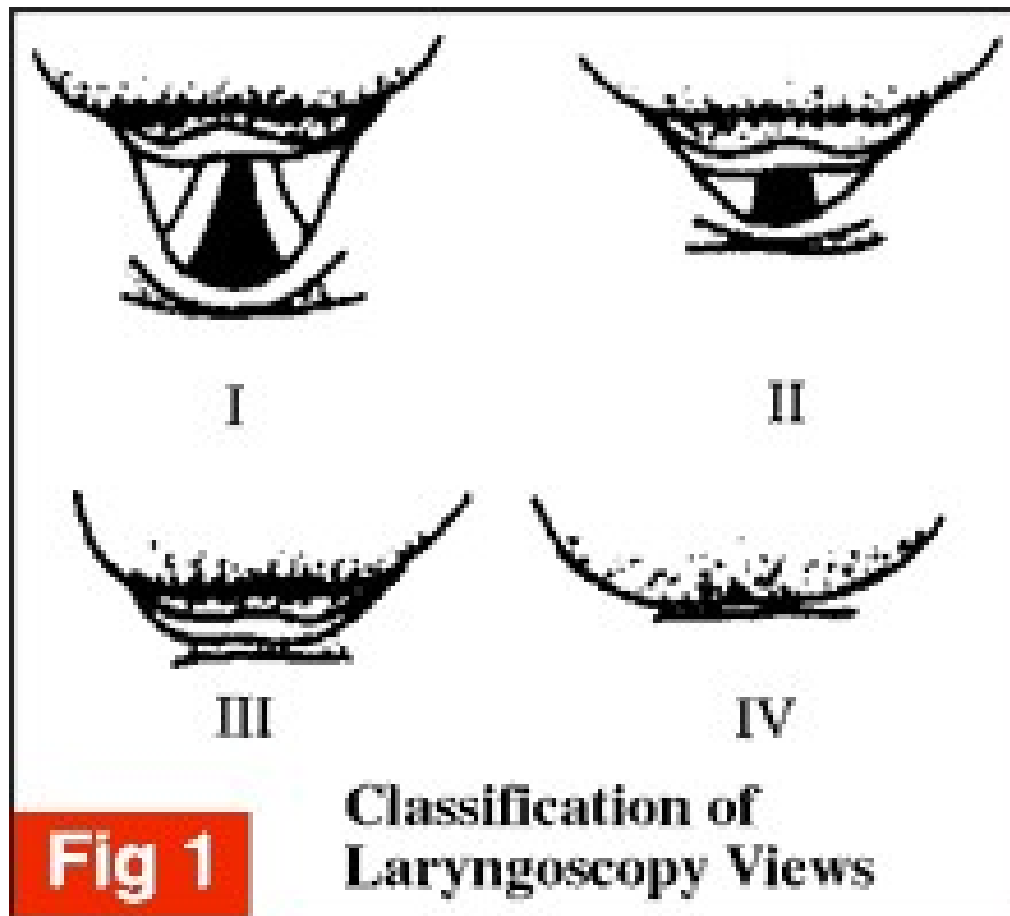
Class III



Class IV



Predikce, skórování - Cormack–Lehane skóre



Predikce, skórování - LEMON score

- **L - Look externally** (úraz obličeje, velké řezáky)
- **E - Evaluation** – pravidlo 3-3-2 (vzdálenost mezi řezáky < 3 prsty, vzdálenost hyoid-mentální > 3 prsty, vzdálenost štítné žlázy k ústům > 2 prsty)
- **M - Mallampati** – (skóre ≥ 3)
- **O - Obstruction** (přítomnost obstrukce DC)
- **N - Neck mobility** (rozsah pohybu krku)

EVALUATION CRITERIA	POINTS
L = Look externally	
Facial trauma	1
Large incisors	1
Beard or mustache	1
Large tongue	1
E = Evaluate the 3-3-2 rule	
Incisor distance—3 fingerbreadths	1
Hyoid-mental distance—3 fingerbreadths	1
Thyroid-to-mouth distance—2 fingerbreadths	1
M = Mallampati (Mallampati score ≥ 3)	1
O = Obstruction (presence of any condition such as epiglottitis, peritonsillar abscess, trauma)	1
N = Neck mobility (limited neck mobility)	1
Total	10

Predikce, skórování - MACOCHA

MACOCHA Score

Patient Factors	M allampati Class III/IV Airway 5	Pathology Factors	C oma 1	
	Obstructive Sleep A pnea 2		Severe H ypoxemia (SaO ₂ <80%) 1	
	Decreased C -Spine Mobility 1		Operator Factors	Non- A nesthesiologist 1
	Limited Mouth O pening (≤3 cm) 1			

Predikce **není** spolehlivá

Mallampati 1 **≠** snadná OTI

= > **preoxygenace**

TIME TO HEMOGLOBIN DESATURATION WITH INITIAL $F_{A_{O_2}} = 0.87$

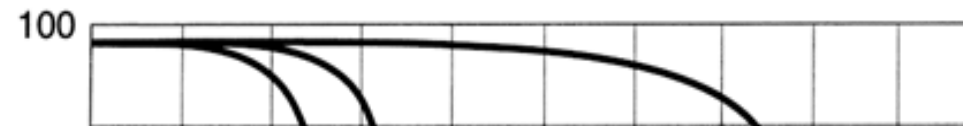


Table 2 Apnoea time required to reduce oxyhaemoglobin saturation (Sa_{O_2}) to 85 % for a standard adult, standard 10-kg infant and obese adult, both with and without preoxygenation

	Time (s) to $Sa_{O_2} = 0.85$	
	$F_{A_{O_2}initial} = 0.133$	$F_{A_{O_2}initial} = 0.87$
Standard adult (70 kg)	84	502
Standard infant (10 kg)	41	180
Obese adult (127 kg)	46	171

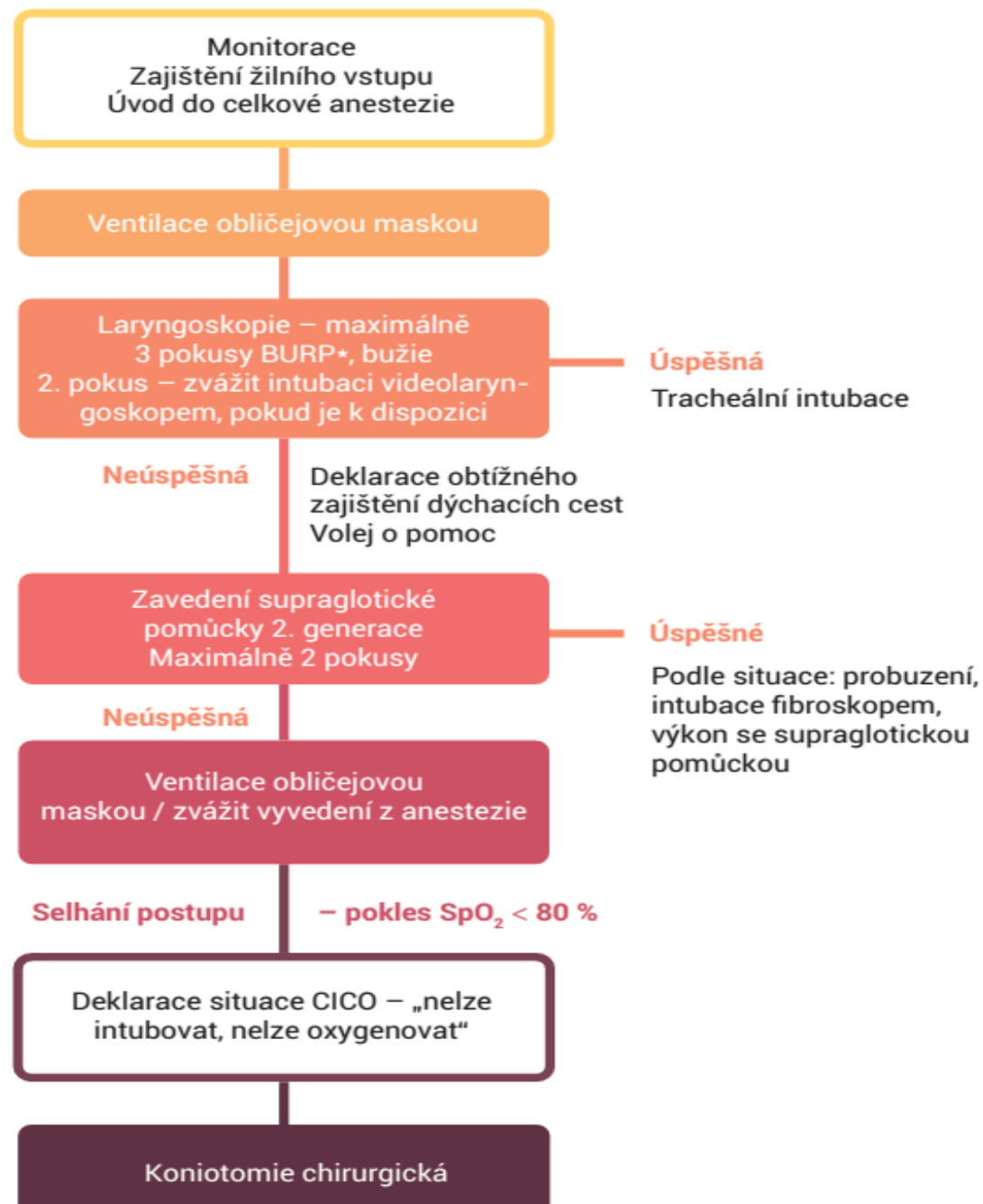
Time of $\dot{V}_E = 0$, minutes

Preoxygenace

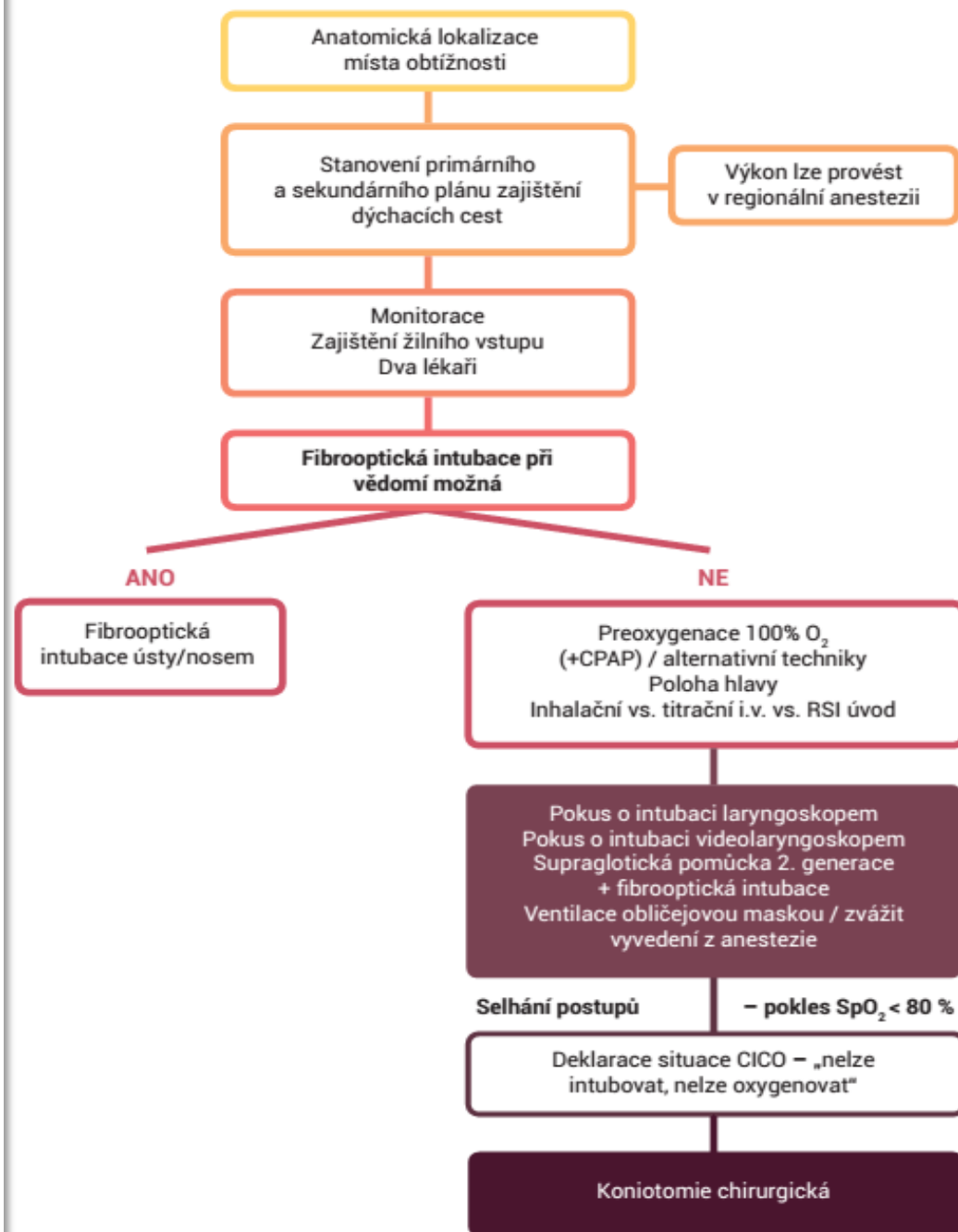
- varianty
 - 3 minuty dýchání s O₂ 10 l/min
 - 8 hlubokých vdechů během 1 minuty
 - **cílové etO₂ 90 %**
- Anti-Trendelenburgova poloha
- CPAP/NIV
- Apnoická oxygenace (airway/HFNO/brýle O₂)



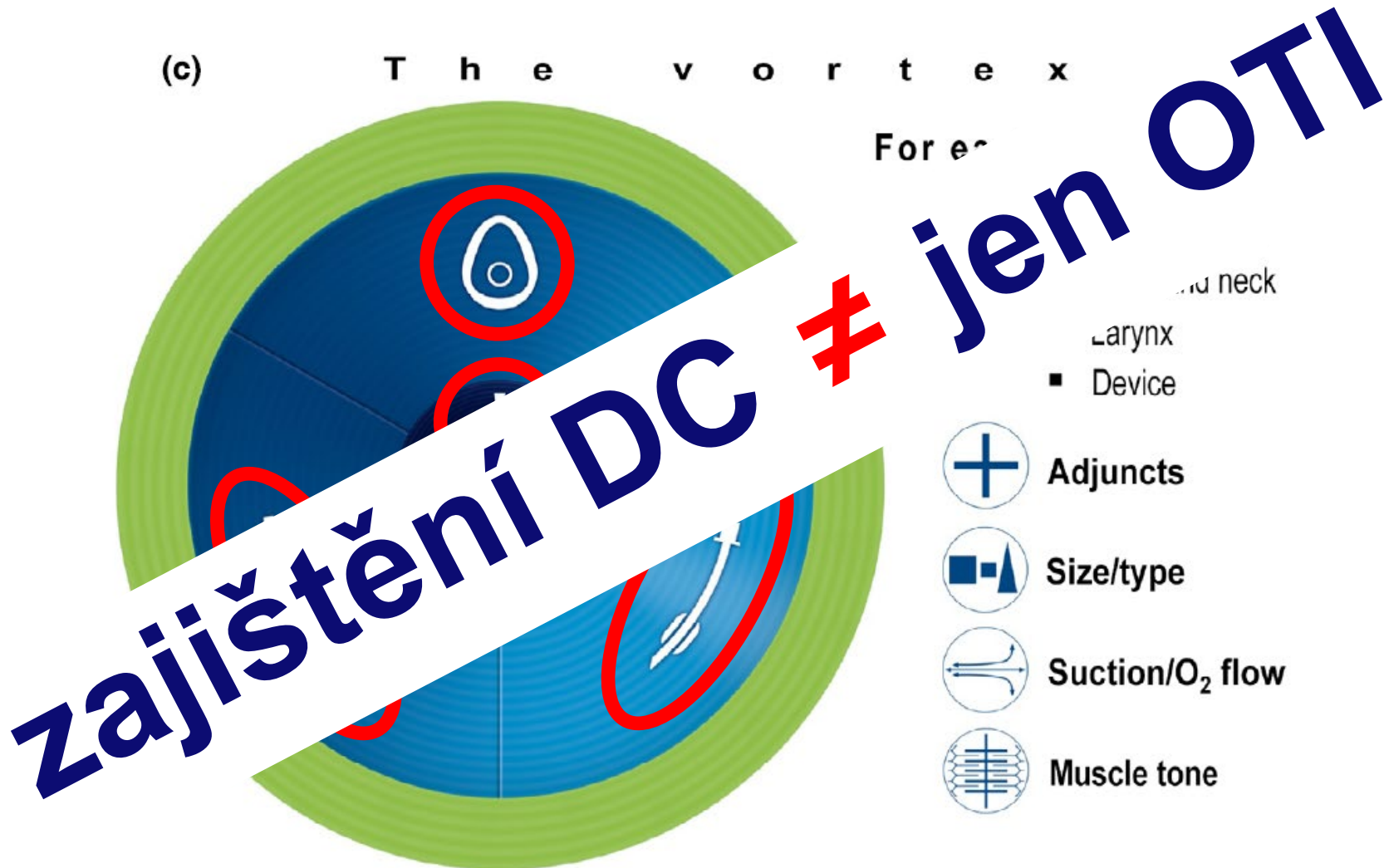
NEOČEKÁVANÉ OBTÍŽNÉ ZAJIŠTĚNÍ DÝCHACÍCH CEST U DOSPĚLÝCH



OČEKÁVANÉ OBTÍŽNÉ ZAJIŠTĚNÍ DÝCHACÍCH CEST U DOSPĚLÉHO PACIENTA



Jednoduše a rychle



Maximum three attempts at each lifeline (unless gamechanger)
at least one attempt should be by most experienced clinician

Cannot Intubate, Cannot Oxygenate status escalates with unsuccessful best effort at any lifeline or with unsuccessful attempts at any two consecutive lifelines



Jak nemít obtížné zajištění DC

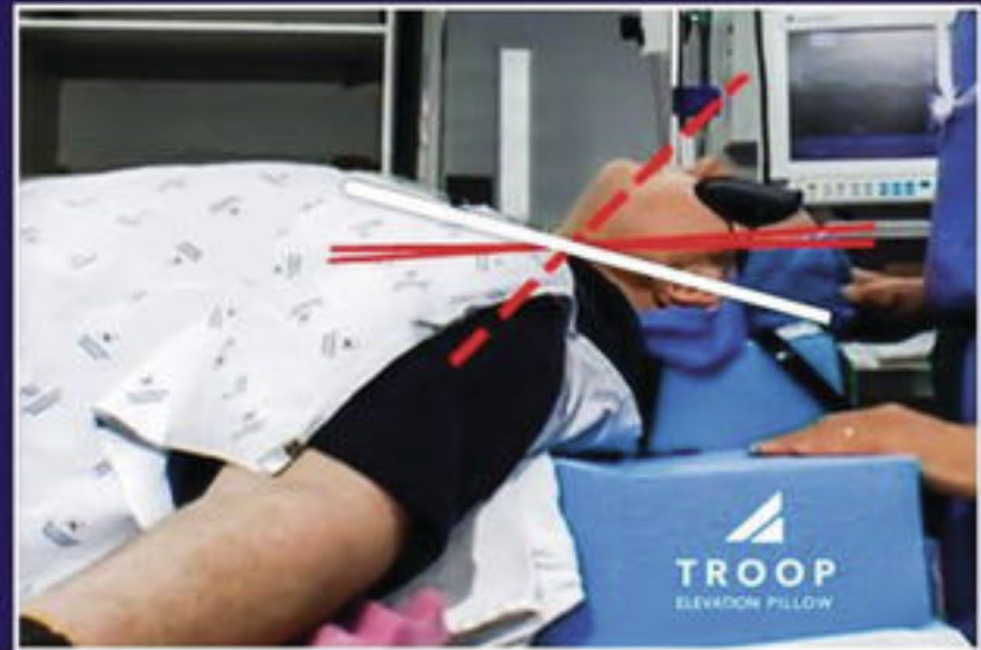
- **RAMP**, BURP, GUM bugie, VICE grip



BAD AIRWAY POSITIONING

(6'0" | 375 Lbs patient)

AIRWAY AXES MISALIGNED ON
HEAD CRADLE ONLY



GOOD AIRWAY POSITIONING

(same patient)

ON TROOP ELEVATION PILLOW + HEAD CRADLE
AIRWAY AXES BEGINNING TO ALIGN

Jak nemít obtížné zajištění DC

- RAMP, BURP, GUMMEL, VICE



Procedures

Direct laryngoscopy

LD + mandibular advancement

LD + BURP

LD + AM *BURP

Laryngeal vision



Cormack-Lehane

III
**

II

II

I
*

Backward Upward Rightward Pressure

Jak nemít obtížné zajištění DC

- RAMP, BURP, **GUM bugie**, VICE grip

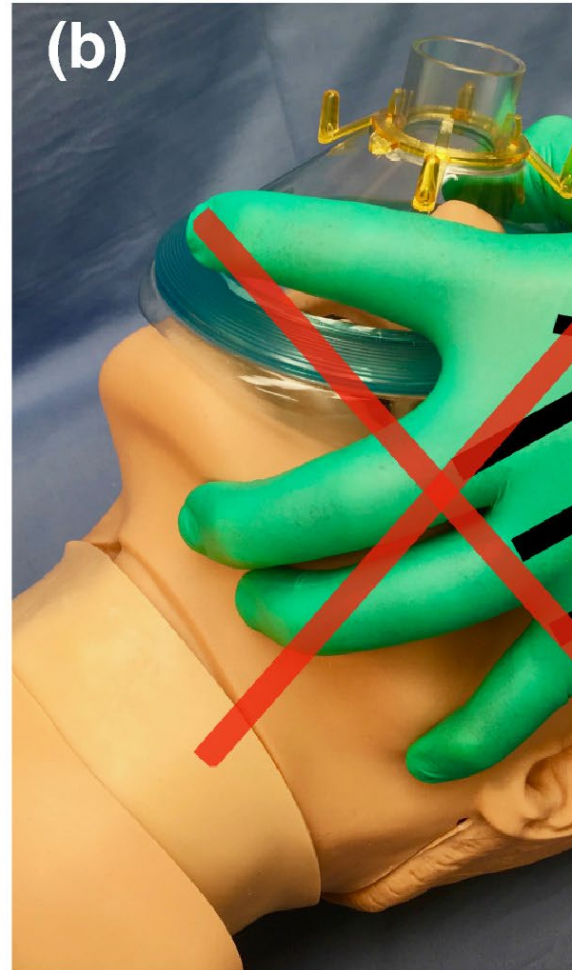
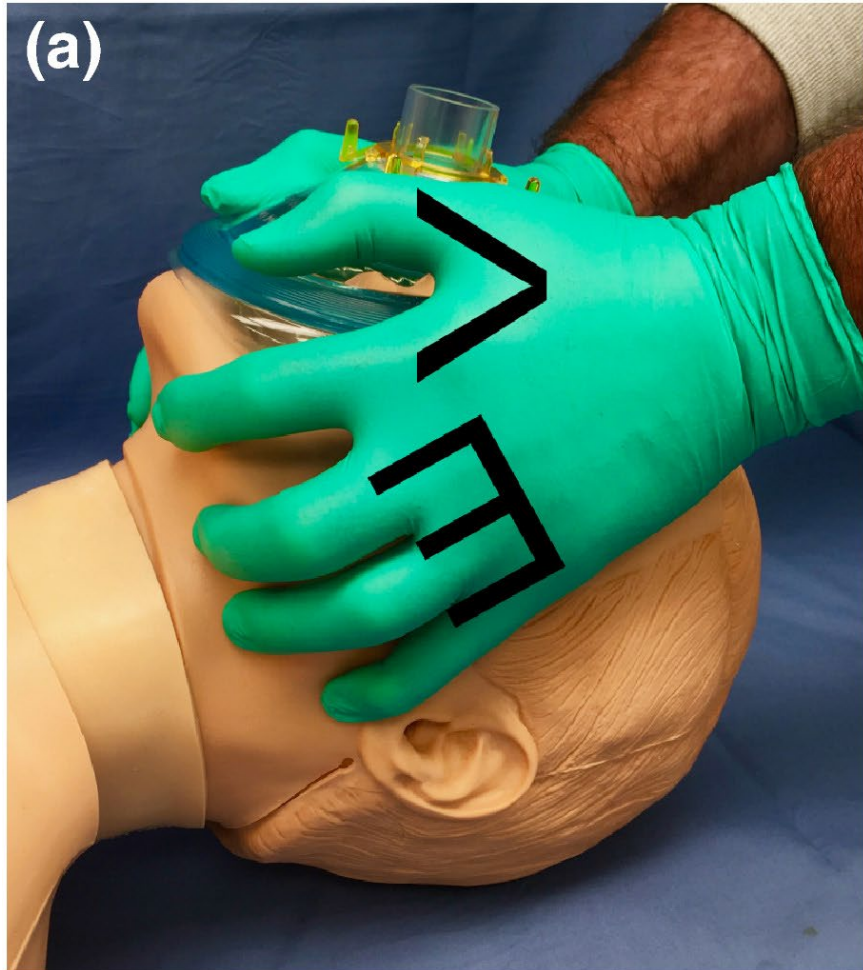
Základy úspěchu:

- Pozice Macintosh lžice ve vallecule
- Laryngeální tlak (BURP – technika snižuje grade 3 z 9.2% na 1.6%)
(Takahata, 1997)
- Rotace ETT proti směru hodinových ručiček při zavádění. (Hinds a Michalek, 2007)
- Úspěšnost 94.3% i když nejsou hlasové vazy viditelné (grade 3)
(Hodzovic, 2003)



Jak nemít obtížné zajištění DC

- RAMP, BURP, GUM bugie, **VICE**

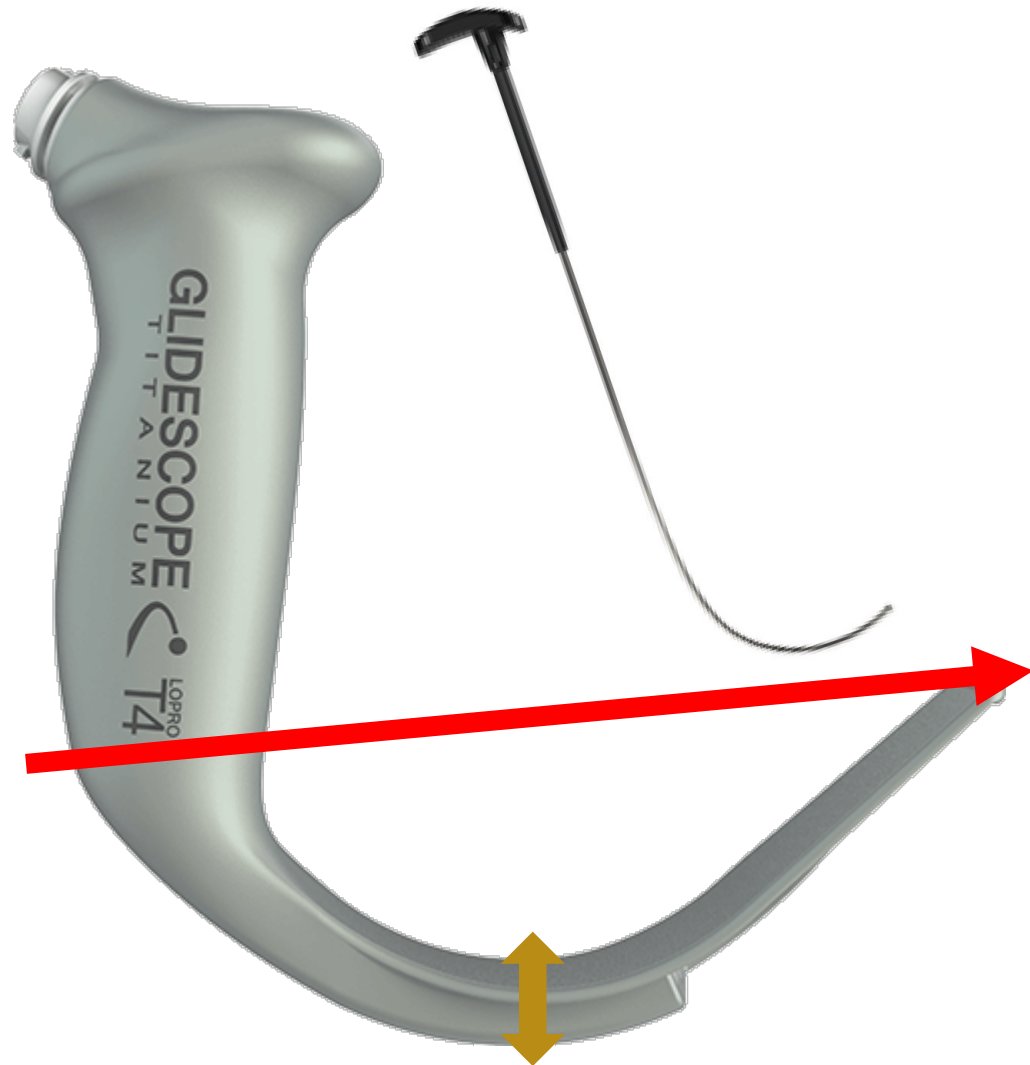


6 Cognitive aid: two-hand vice (V-E) grip

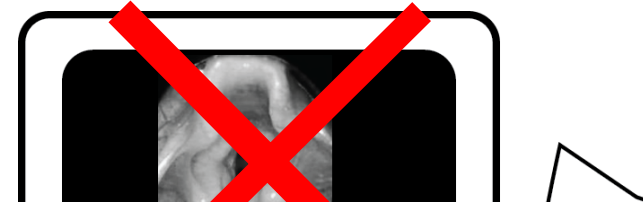


Intubace videolaryngoskopem

.... za roh! vždy se ZAVADĚČEM

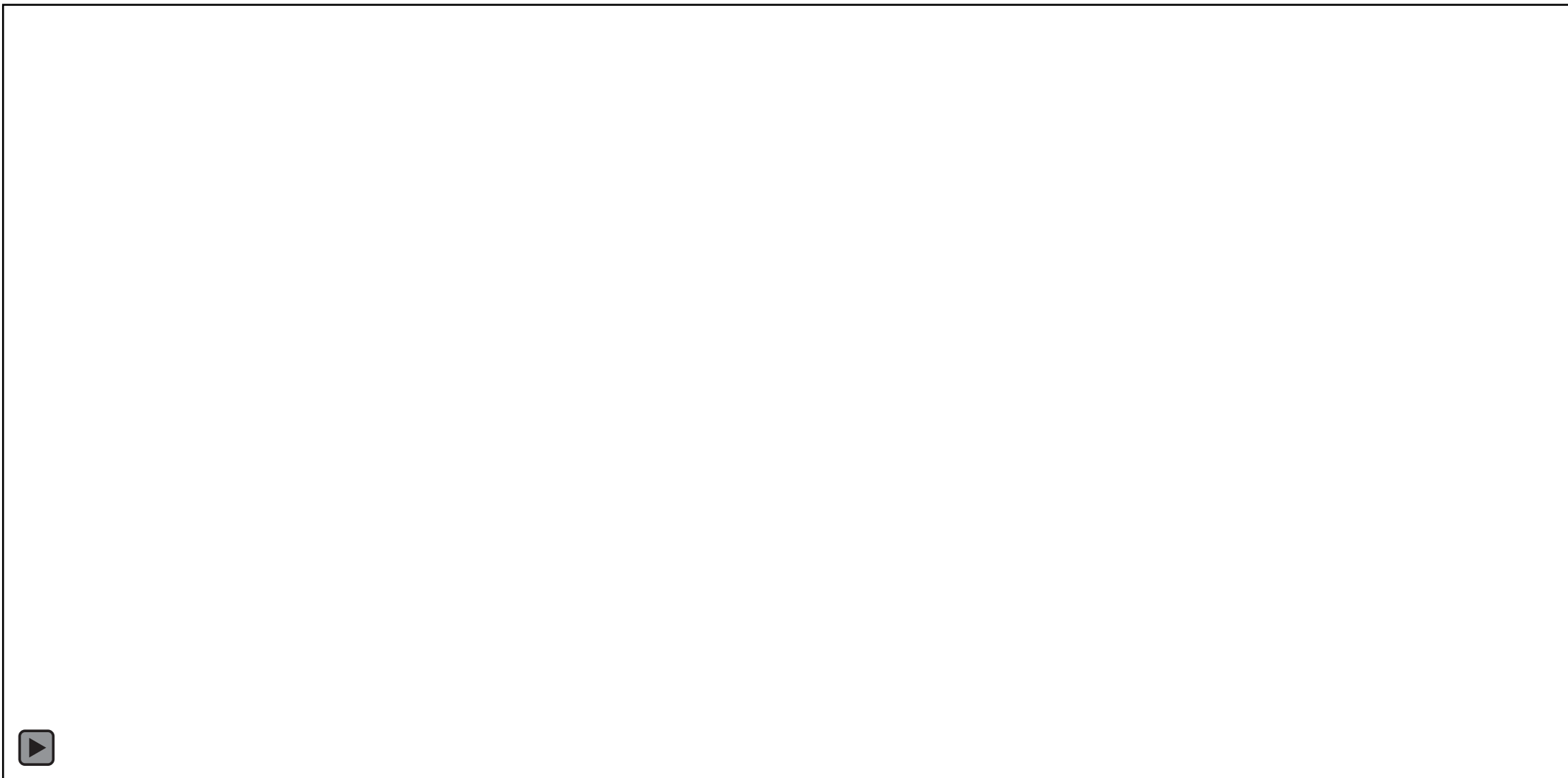


Jak na VLS?



- Neutrální poloha
- Zavádění středem
- Ne moc hluboko
- BURP
- Tah za čelist

CAVE: Vidět neznamená zaintubovat!



Závěr

- Obtížnou OTI **nelze vždy předpokládat**
- **Pomůcky, plán**
- **Preoxygenace** dává čas navíc (**etO₂ 90 %**)
- Vidět neznamená zaintubovat
- **Zajištění DC \neq jen OTI**

(c)

T h e v o r t e x



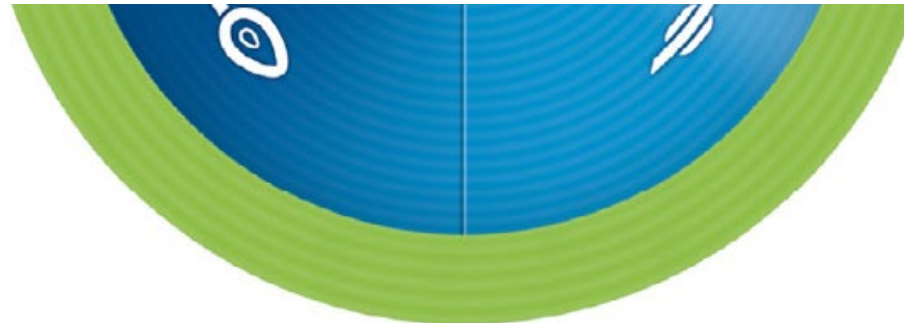
For each lifeline consider:



Manipulations:

- Head and neck
- Larynx
- Device

Děkuji za pozornost.



Suction/O₂ flow



Muscle tone

Maximum three attempts at each lifeline (unless gamechanger)

at least one attempt should be by most experienced clinician

Cannot Intubate, Cannot Oxygenate status escalates with unsuccessful best effort at any lifeline or with unsuccessful attempts at any two consecutive lifelines



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