
Neočekávaný scénář

Cannot ventilate/cannot intubate

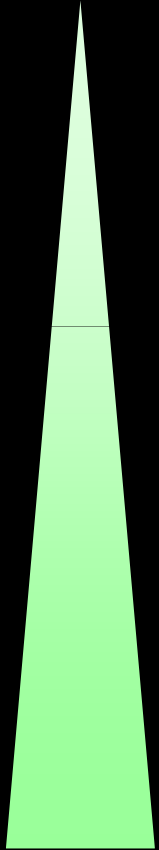
Lukáš Dadák

FAKULTNÍ
NEMOCNICE
U SV. ANNY
V BRNĚ

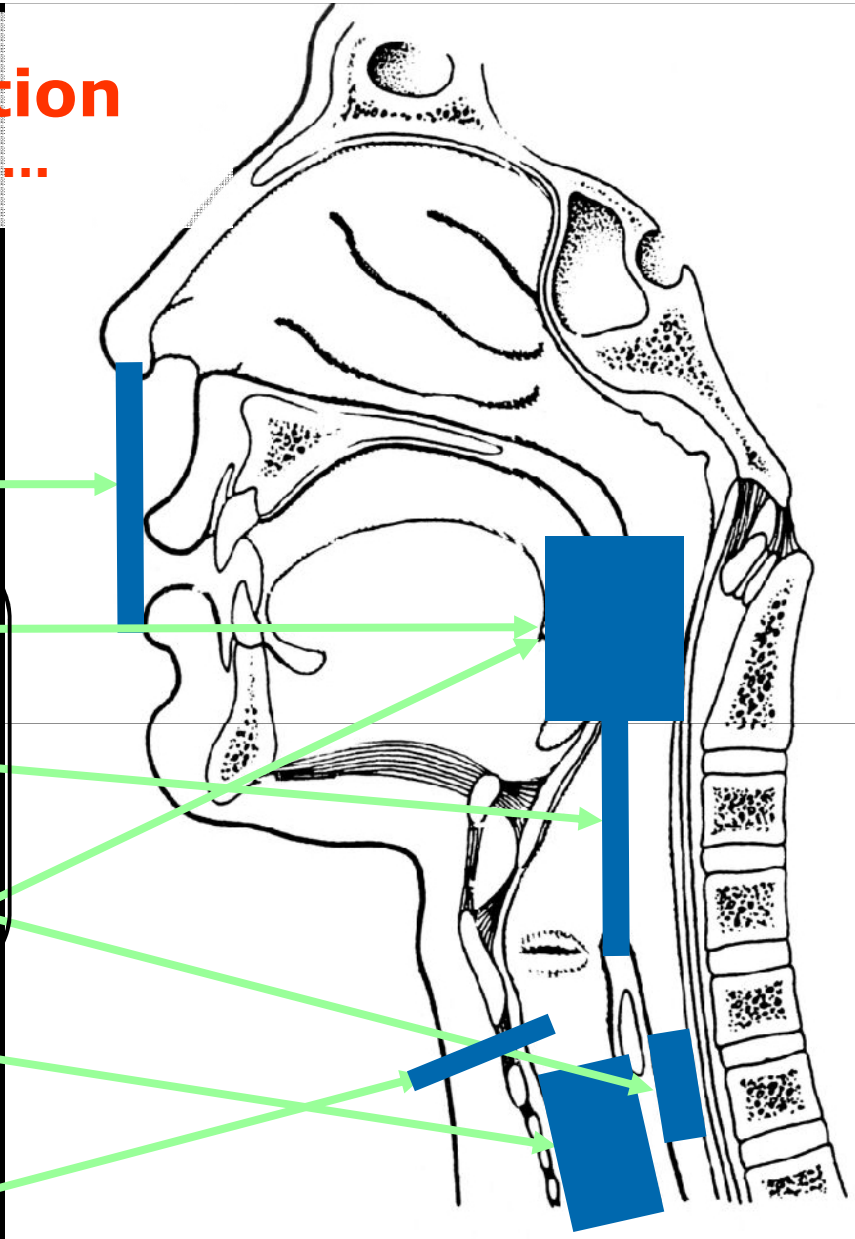


Level of airway instrumentation

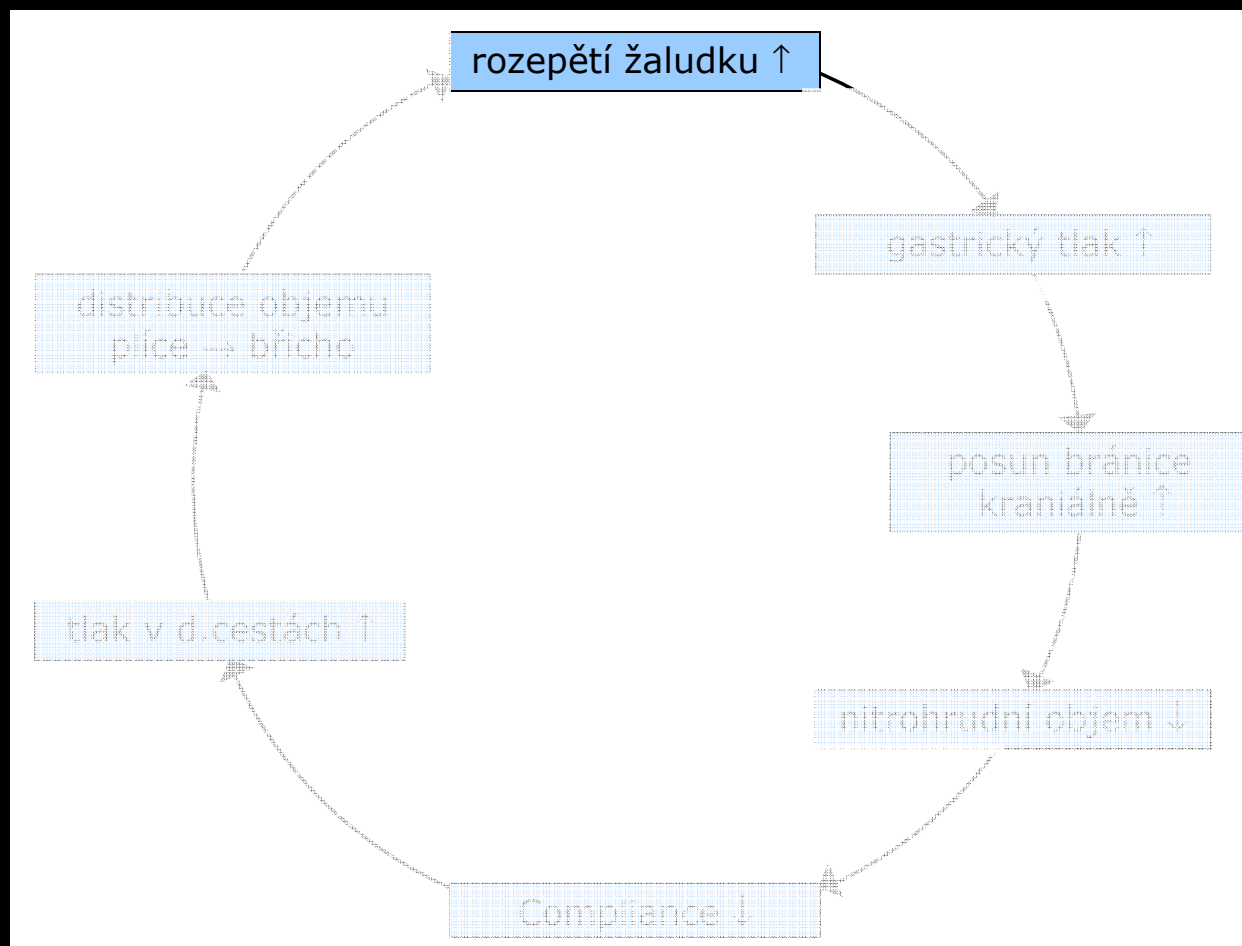
Aneb aby bylo hned od počátku jasno....



- Spontaneous Vent.
- Face Mask
- Cuffed oral airways
- Supraglottic (SGA)
- Eso. closing tube
- Tracheal tube
- Surgical airway



Selhání ventilace obličejovou maskou



Nach Wenzel et al., Resuscitation 1998; 38: 113-8

Potíže s intubací na sále a mimo něj

| | OR¹ | Out-of-hospital² |
|---------------------------------|-----------------------|------------------------------------|
| Total no. of patients | 18205 | 1106 |
| >= 3 attempts | 1.5% | 5.5 % |
| Failed | 0.3% | 2.0 % |
| Difficult or awkward intubation | 4.3% | 14.8 % |

¹ Rose DK, Cohen MM. Can J Anaesth 1994

² Timmermann et al., Resuscitation, 2006

Zajištění dýchacích cest

na sále

na urgentu,
v sanitce

plánováno

neodkladné

spont. ventilace +
preoxygenace
možná

desaturace

Nárůst komplikací prolongované intubace s časem

Table 5. Complications by Intubation Attempts

| Complication | 2 or fewer attempts (90%) | >2 attempts (10%)* |
|-----------------------|---------------------------|--------------------|
| Hypoxemia | 10.5% | 70% |
| Severe hypoxemia | 1.9% | 28% |
| Esophageal intubation | 4.8% | 51.4% |
| Regurgitation | 1.9% | 22% |
| Aspiration | 0.8% | 13% |
| Bradycardia | 1.6% | 18.5% |
| Cardiac arrest | 0.7% | 11% |

* All categories $P < 0.001$ when comparing 2 or fewer attempts to >2 attempts.

Mort TC: Emergency Tracheal Intubation: Complications Associated with Repeated Laryngoscopic Attempts. *Anesth Analg* 2004;99:607–13

To se mi nemůže stát ...

Final outcome of all reports.

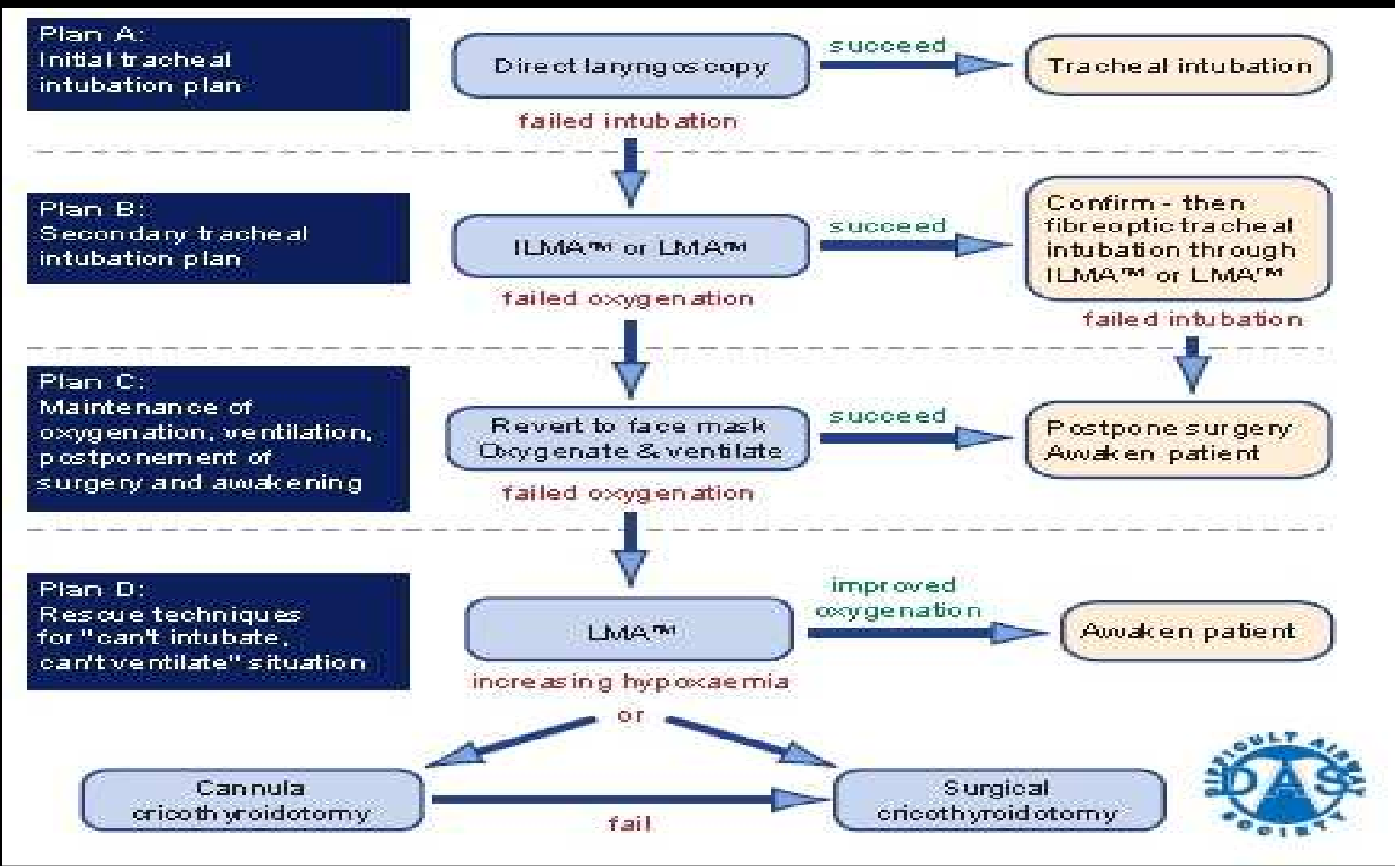
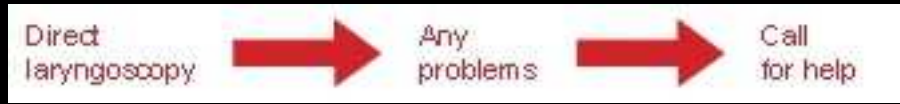
| | All reports | Anaesthesia | ICU | ED |
|----------------------|-------------|-------------|-----|----|
| Death | 38 | 16 | 18 | 4 |
| Brain damage | 8 | 3 | 4 | 1 |
| Other permanent harm | 10 | 6 | 3 | 1 |
| Full recovery | 124 | 106 | 9 | 9 |
| Unrelated death | 4 | 2 | 2 | 0 |

Specialty and grade of the practitioner managing the airway at the time of the reported emergency department event.

| Grade and specialty | Number |
|---------------------------------------------------------------------|--------|
| Consultant or Associate Specialist in anaesthesia | 7 |
| Specialist Trainee Year 7 (ST7) in anaesthesia | 1 |
| Specialist Trainee Year 6 (ST6) in critical care (non-anaesthetist) | 2 |
| Specialist Registrar (Year unrecorded) in emergency medicine | 1 |
| Specialist Trainee Year 3 (ST3) in anaesthesia | 3 |
| Acute Care Common Stem Trainee in anaesthesia (5 months experience) | 1 |

“Airway management complications during anaesthesia, in intensive care units and in emergency departments in the UK”

DAM algorithmus



Ideální DAM

nečekaného

difficult airway management (DAM) algoritmus:

- jeden
- **nejjednodušší**
- nejrychleji personálem zvládnutý
- **nejjednodušší pomůcky** – ihned po ruce
- trénovaný personál – modely, simulace, klinicky- elektivní užití alternativ k OTI v praxi op. sálu. (nejjednodušší trénink)

The LMATM in a difficult airway algorithm

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Gilles Algorithm

Induction

(unexpected DAM in OR)



Facemask ventilation



Gilles Algorithm

Induction

(unexpected DAM in OR)

Facemask ventilation

Ventilation/Oxygenation (V/O)

Impossible



Gilles Algorithm



Induction

(unexpected DAM in OR)

Facemask ventilation

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Induction

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Gilles Algorithm



Induction

(unexpected DAM in OR)

Facemask ventilation

Ventilation/Oxygenation (V/O)

Impossible

Step 1

Rescue LMA Fastrach V/O
LMA Supreme

Step 2

Trans -Tracheal V/O

+

-

Gilles Algorithm



Scenario 2

Tracheal Intubation (OTI)

+

Induction

(unexpected DAM in OR) Scenario 1

Facemask ventilation

Difficult

Ventilation/Oxygenation (V/O)

Impossible

Step 1

Rescue LMA Fastrach V/O
LMA Supreme

Step 2

Trans -Tracheal V/O

Gilles Algorithm



Induction

Scenario 2

(unexpected DAM in OR) Scenario 1

Tracheal Intubation (OTI)

Facemask ventilation

Ventilation/Oxygenation (V/O)

+

Difficult

Impossible

Direct laryngoscopy OTI

+

-

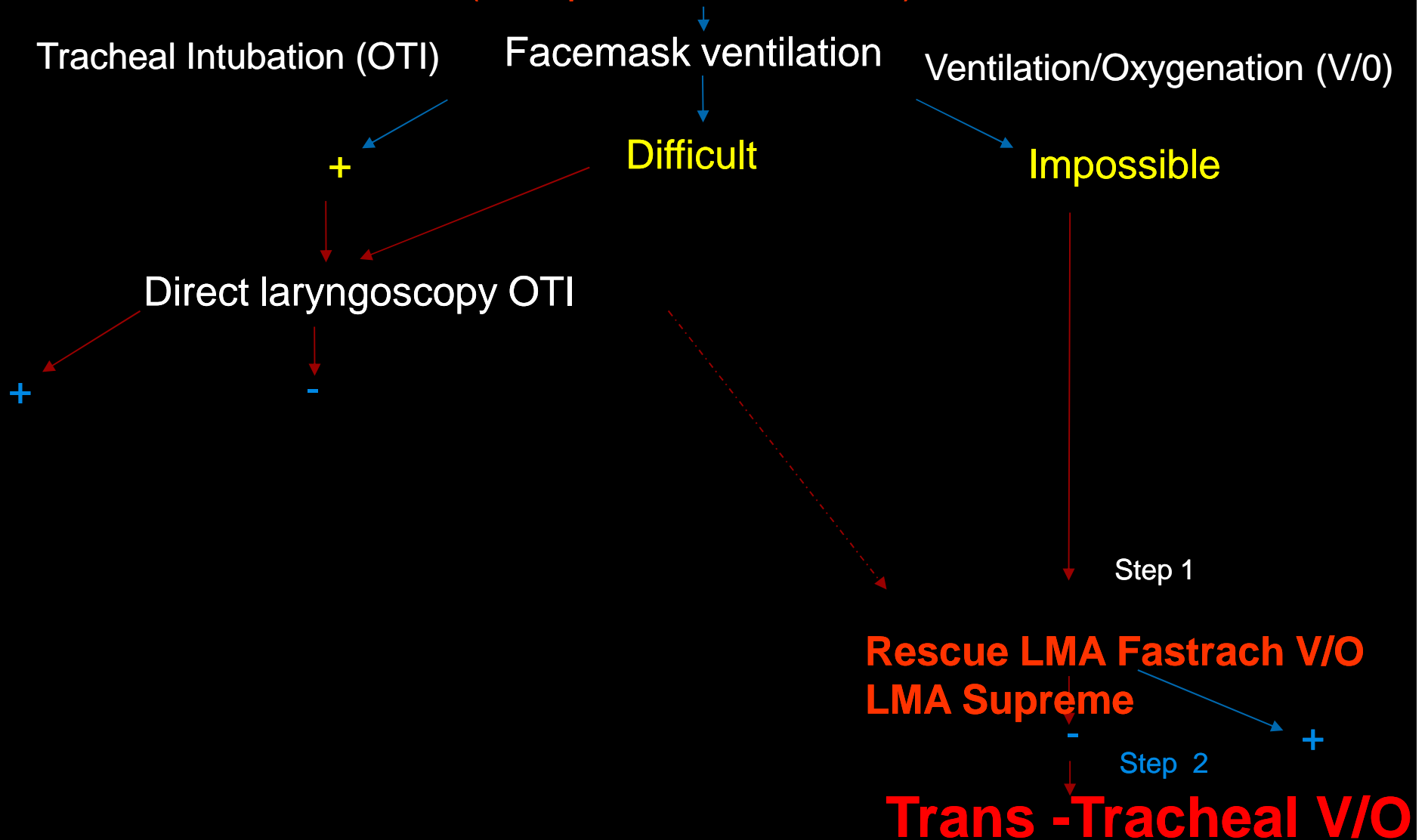
Step 1

Rescue LMA Fastrach V/O
LMA Supreme

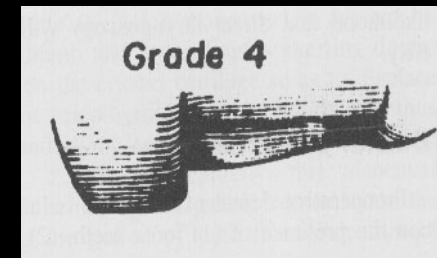
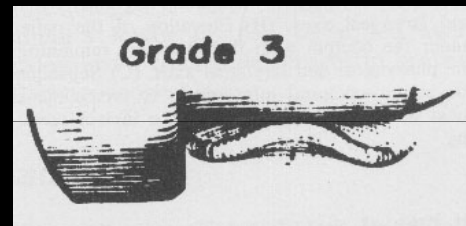
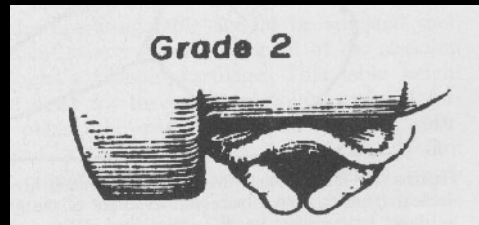
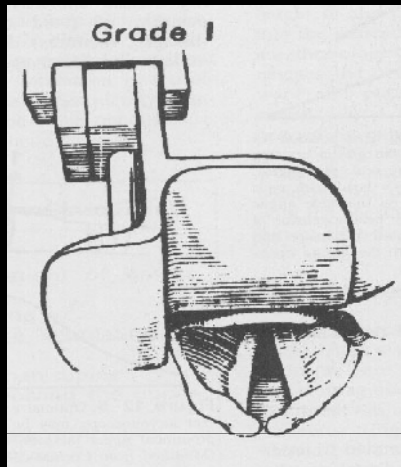
Step 2

Trans -Tracheal V/O

+



Hodnocení obtížné laryngoskopie (Cormack - Lehane)







Grade I - *plná viditelnost hlasových vazů*

Grade II - *viditelná pouze zadní část hlasových vazů*

Grade III - *viditelná pouze špička epiglotis*

Grade IV - *viditelné jen měkké patro*

Cormack-Lehane-Score

| | | OR ¹ n = 10507 | Out-of-hospital ² n = 1042 |
|-----|-------------------------------------------------------------------------------------|------------------------------|------------------------------------------|
| I |  | 85.1 % | 52.0 % |
| II |  | 8.8 % | 28.8 % |
| III |  | 5.1 % | 12.6 % |
| IV |  | 1.0 % | 6.6 % |

1 El-Ganzouri et al., Anesth Analg, 1996

2 Timmermann et al., Resuscitation, 2006

Gilles Algorithm



Induction

Scenario 2

(unexpected DAM in OR) Scenario 1

Tracheal Intubation (OTI)

Facemask ventilation

Ventilation/Oxygenation (V/O)

+

Difficult

Impossible

Direct laryngoscopy OTI

+

-

Step 1

Gum Elastic Bougie

+

-

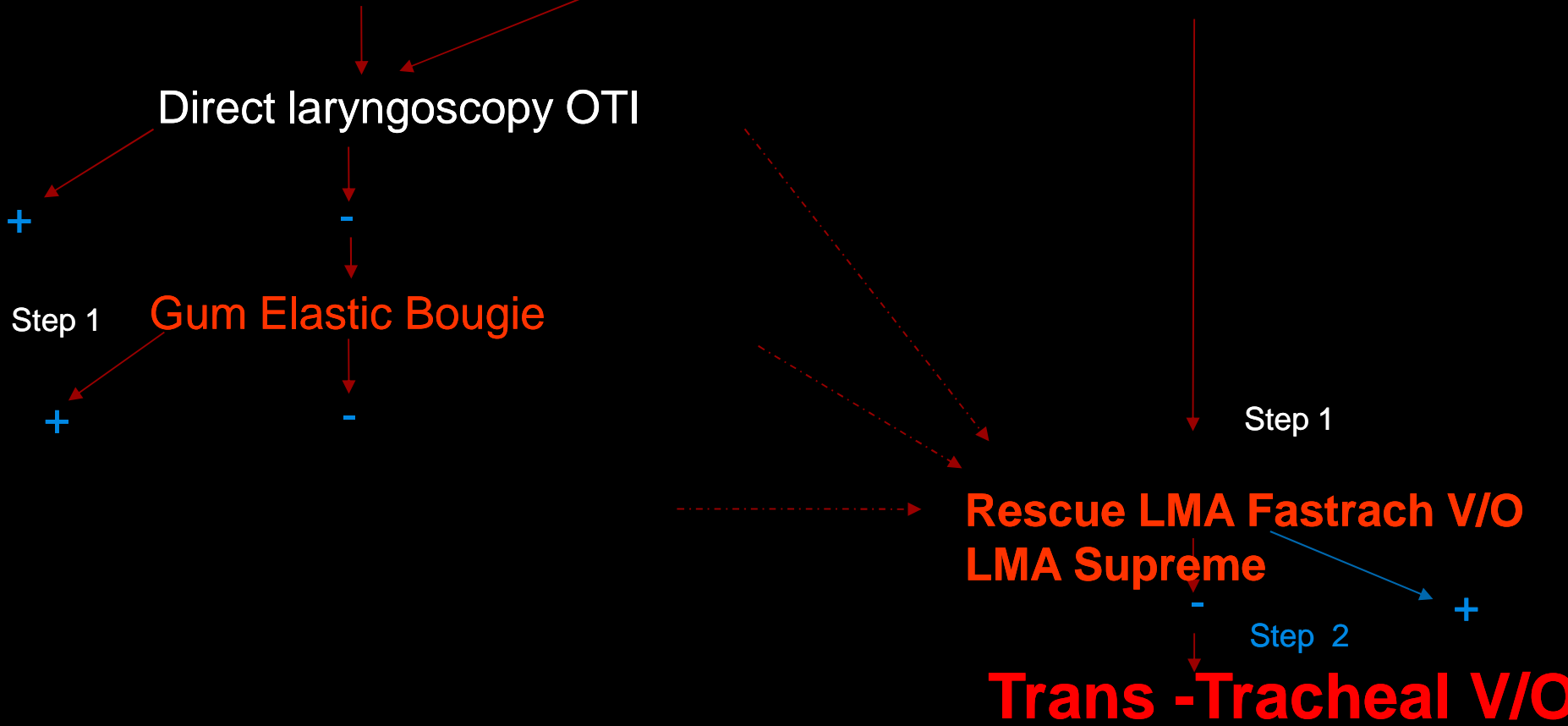
Step 1

Rescue LMA Fastrach V/O
LMA Supreme

Step 2

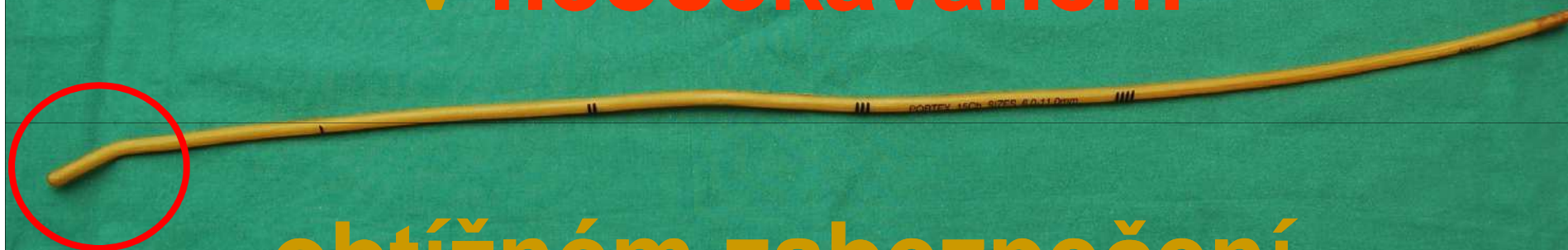
Trans -Tracheal V/O

+



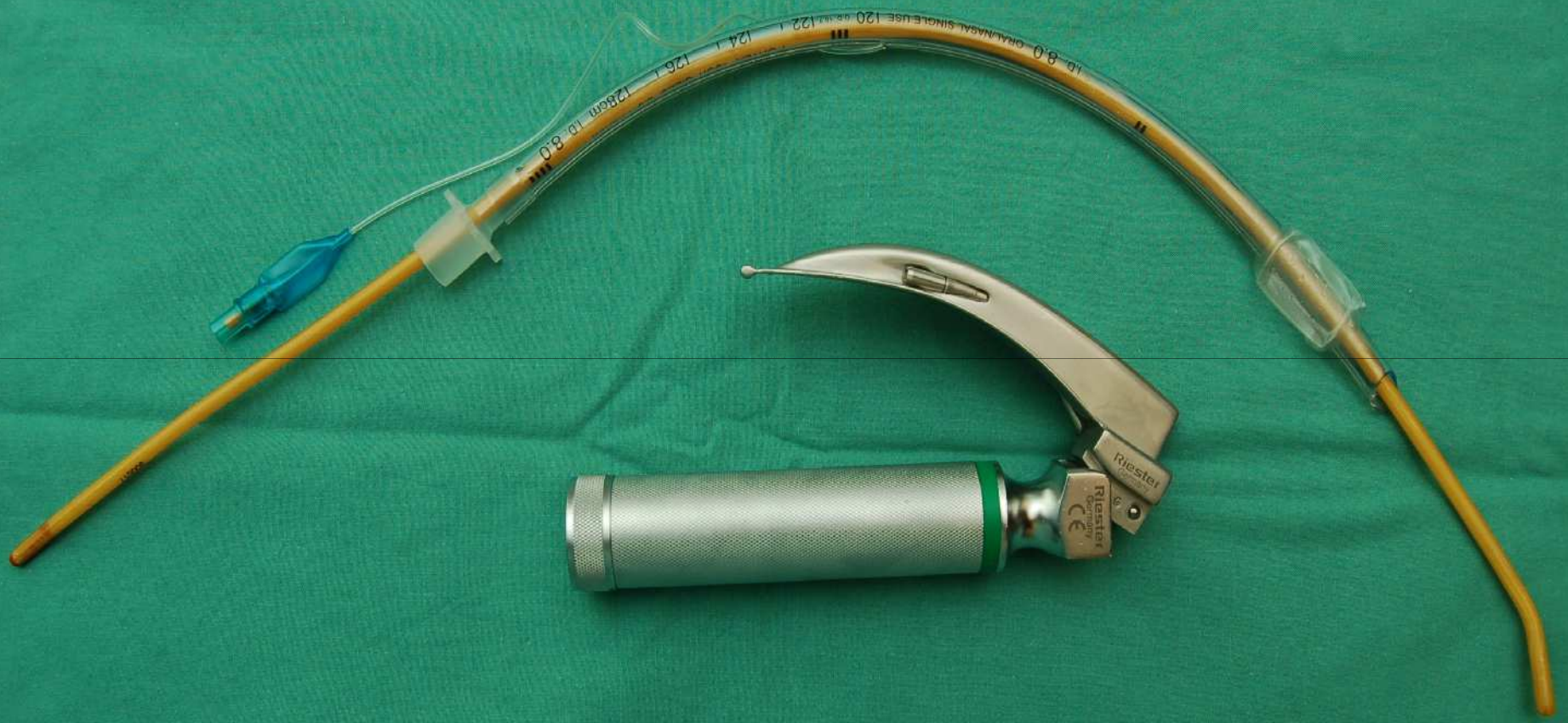
GEB-gum elastic bougie nepostradatelná pomůcka

v neočekávaném



obtížném zabezpečení
dýchacích cest

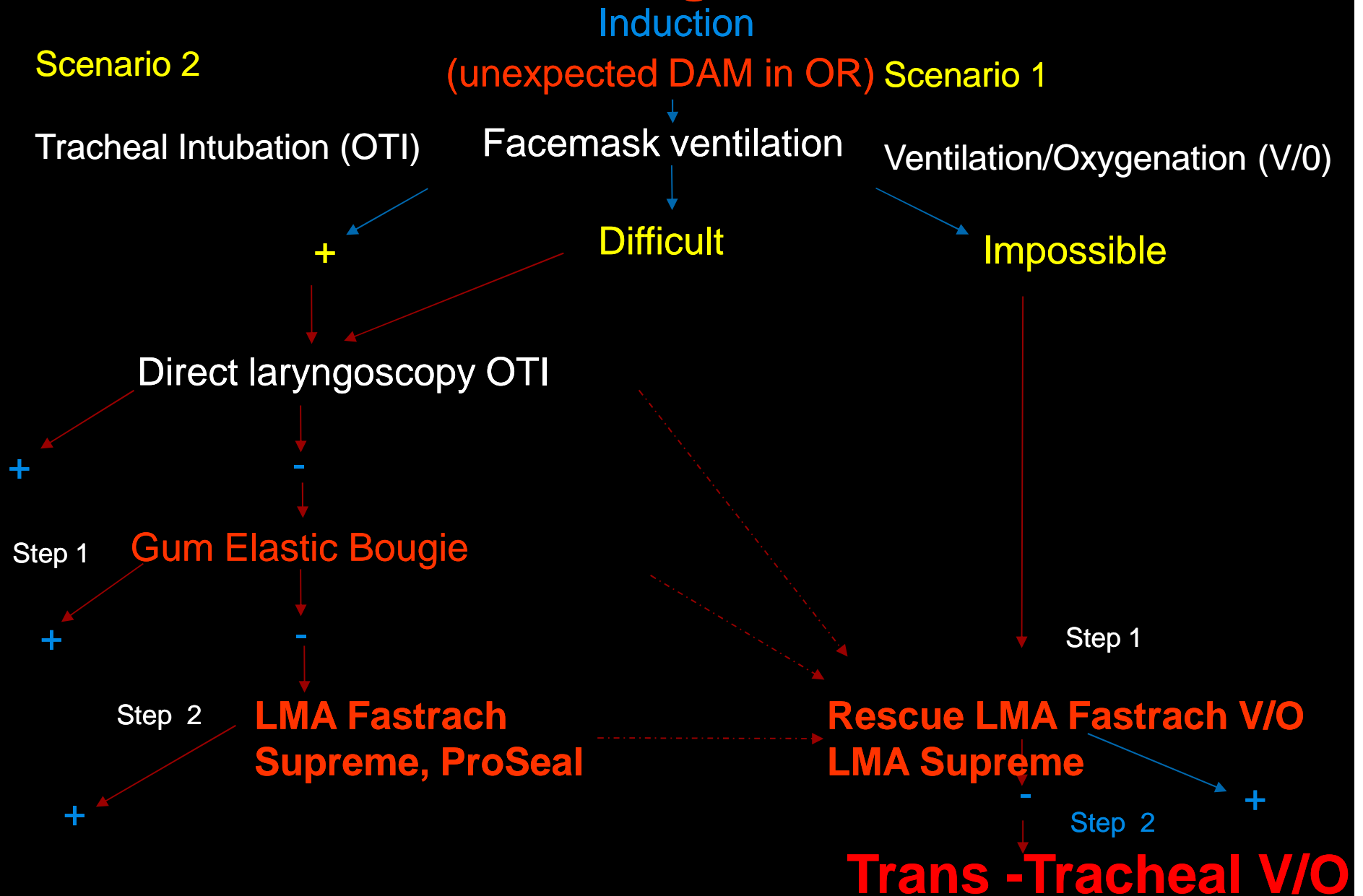
ESCHMANN







Gilles Algorithm



Metody zavedení LMA

Laryngoscope guided gum elastic bougie technique:

poprvé popsána v r. 2002:

Howarth A, Brimacombe J, Keller C.

Gum elastic bougie guided placement of the
ProSeal LMA.

Can J Anesth 2002, 49, 528-529

Laryngeální maska ProSeal (PLMA)

- **Metoda volby po selhání umístění PLMA zavaděčem či prstem**
- **Špička bužie umístěna do hypofaryngu nad horní jícnový svěrač**
- **Bužie je umístěna do gastric drain tube (GDT)**
- **Distální konec GDT se po sesunutí PLMA ocitá v korektním postavení nad horním jícnovým svěračem**



b

c

d









Závěr 1: LMA

- Rychlá, elegantní, bezpečná pomůcka v DAM - **nestyd'te se ji použít včas!!!**
- ESA Helsinky- 13 sec.airway&GIT
- Menší traumatizace pacientů
- Nutnost edukace lékařů i sester
- Nestydět se ji použít-cílem není intubovat, ale oxygenovat

Závěr 2: G.E.B.

- **GEB - elegantní pomůcka v DAM**
- **Menší traumatizace pacientů**
- **Dostupnost při každém zajištění dýchacích cest**
- **Nutnost edukace lékařů i sester**
- **4 možnosti použití
(2xBATI, 1xBALMI, 1xBACT)**