



AIRWAY INTUBATI PROJECT



PARK

**SALAD
PARK**

First Goal

INTUBATIEM

**A. GEMELLI HOSPITAL - ROME
28 SEPTEMBER 2018**

Suction Assisted Laryngoscopy and Airway Decontamination (SALAD)



airwayNautics

"Live as if you will die tomorrow; Learn as if you will live forever"

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DIFFICULT AIRWAYS MANAGEMENT: THE SALAD TRAINING SUCTION-ASSISTED LARYNGOSCOPY AIRWAY DECONTAMINATION



*James DuCanto¹, Ryan J. Thompson², Karen Serrano³,
Matthias L. Riess^{1,2}, Carmine Della Vella⁴*



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Introduction

The Suction-Assisted Laryngoscopy Airway Decontamination (SALAD) simulation system utilizes an airway mannequin that is adapted using simple hardware store equipment to allow pumping of simulated vomit into the airway. This device is used to train anesthesiologists, emergency physicians, prehospital providers, and others who face the challenges of emergency airways, facilitating competence with use of suction to manage emesis and bleeding often encountered in the management of emergency airways.

Methods

is a Nasco brand airway mannequin that is O.D. (1/8 wall) tubing is cut to appropriate acrylic glue. Garden hose connection parts drill and connected to a large fluid reservoir, allows the hand drill to achieve different nit into the system. A simple on/off switch timing and flow of simulated vomit that the



2018
5th EUROPEAN
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CONGRESS
4-7 December

DAS ASM 2018

Edinburgh, Nov 28-30



Difficult Airway Society

SUCTION ASSISTED CONTAINMENT OF RESPIRATORY DROPLETS DURING AIRWAY MANAGEMENT WITH THE SALAD TECHNIQUE



ROBERT BARRIX ¹, **CHRISTOPHER W. ROOT** ², **JAMES M. HOROWITZ** ³,
CARMINE DELLA VELLA ⁴, **JAMES DUCANTO** ⁵

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³ NYU LANGONE HEALTH, NEW YORK, UNITED STATES

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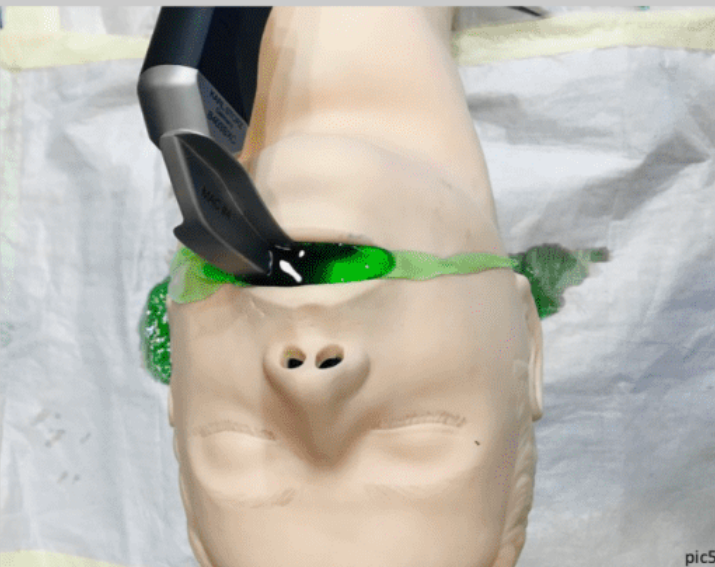
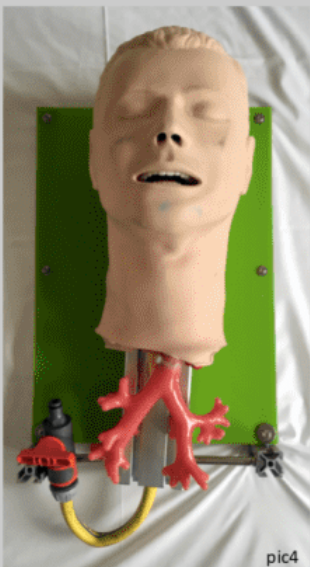
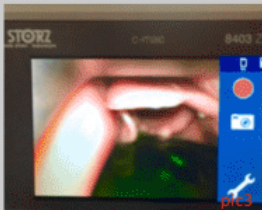
⁵ MEDICAL COLLEGE OF WISCONSIN, MILWAUKEE, UNITED STATES



How to upgrade your airway trainer to a SALAD Trainer and what your colleges think about it.

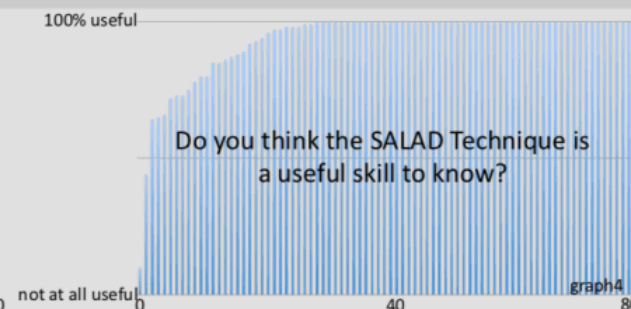
Jan Grundgeiger¹, Fabian Eppler², Hansjörg Haas¹, Simon Althaus¹, Friedrich K. Pühringer¹
¹Department of Anaesthesiology, Klinikum am Steinenberg Reutlingen, Germany
²German Red Cross EMS Reutlingen, Germany

Airway contamination decreases the first pass rate (1) and is encountered frequently peaking in up to every fourth patient in out-of-hospital cardiac arrests (2). Suction Assisted Laryngoscopy and Airway Decontamination (SALAD) is a technique to clear the mouth, oropharynx and airway entrance of contamination and therefore to ease intubation and reduce aspiration. The method was named and promoted by anaesthesiologist Jim DuCanto (@jducanto ,graph1). It consists of four steps: **1. Lead with suction to clear view 2. Place video laryngoscope 3. Park suction catheter on the left side of the blade 4. Continual suction keeps airway/view clear.** A rigid, preferable large bore suction catheter is essential for SALAD. For a demo of the technique scan graph2.



To up grade an airway mannequin two steps are mandatory. First the mannequin's airway has to be sealed to avoid leakage, this is achieved by disassembling the head and sealing all seams in the airway with transparent, permanently elastic silicon from building supplies store (pic2). This step is a mess, no fun at all and leakproofness is hardly achieved on first attempt, stick to it. Using 10ml syringes to more precisely administer the silicon makes it easier. The second step is assembling a pump-system and linking it to the oesophagus of the trainer (pic1+4). The pump-system consists of a container, filled with water and food dye (3L are plenty) in which a caravan pump (12V) is submerged. As a link between the pump and the oesophagus we used a garden hose system with a flow regulator valve, to be able to in- and decrease the amount of vomit pumped fast and smooth (pic3+5).

The SALAD Trainer was taken to Euroanaesthesia2019 in Vienna and made available to all participants at the booth of Karl Storz, Tuttlingen, Germany (pic6). Everybody interested got a tutorial as needed and as much time with the trainer as wanted. All anaesthesiologist were asked afterwards to fill in a 6 questions questionnaire, voluntarily. 82 colleges from 30 different countries answered the questionnaire. 71 (86,6%) stated that they had used the Trainer for the first time, 11 (13,4%) had used one before. Asked to rate if they liked the trainer on a scale from 0 to 100 (not at all – absolutely) the average score was 95,1 (graph3). 54 (65,8%) said they had a rigid suction catheter (e.g. Yankauer, DuCanto...) immediately available at their institution, 28 (34,2%) do not. Asked about the usefulness of the trainer from 0 to 100 (not at all useful – 100% useful) the answers reached a mean of 93,3 (graph4) The answers to the question: "How likely is it that you would recommend the SALAD Training to a friend or colleague?" are shown in tab.1 and leave 3 colleges (4%) being detractors, 58 (77,3%) promoters and 14 (18,7%) passive about the promotion of SALAD.



References

- 1 Raj Joshi, Cameron D. Hypes, Jeremy Greenberg, Linda Snyder, Josh Malo, John W. Bloom, Harsharon Chopra, John C. Sakles, Jarrod M. Mosier Difficult Airway Characteristics Associated with First-Attempt Failure at Intubation Using Video Laryngoscopy in the Intensive Care Unit Annals of the American Thoracic Society, Vol. 14, No. 3 | Mar 01, 2017
- 2 Jost, Daniel et al. What is the incidence of regurgitation during an out-of-hospital cardiac arrest? Observational study Resuscitation, Volume 96, 70 | Nov 2015

The logo for ESICM LIVES 2020 is displayed in white, bold, sans-serif font against a light blue background with a grid pattern. Below the text, there is a stylized graphic of a heart with a white ECG line overlaid on it, set against a background of horizontal, wavy bands in shades of orange, red, and yellow.

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2020

Your abstract will also be published online in the December supplementary issue of the ESICM official journal [*Intensive Care Medicine Experimental*](#), which will be available just before the digital congress on our website.

Vomitology

James DuCanto

@jducanto

Yen Chow

@TBayEDguy

Della Vella Carmine

@AirwayGladiator

Prioritization



What are the priorities of airway management ?

CRITICAL VOLUME FOR PULMONARY ACID ASPIRATION: REAPPRAISAL IN A PRIMATE MODEL

D. M. RAIDOO, D. A. ROCKE, J. G. BROCK-UTNE, A. MARSZALEK AND H. E. ENGELBRECHT

SUMMARY

We have studied, in the monkey, the critical volume for the production of severe pneumonitis following pulmonary aspiration of gastric contents. Aspiration of 0.4 ml kg^{-1} and 0.6 ml kg^{-1} at pH 1 produced mild to moderate clinical and radiological changes, but no deaths. Aspiration of 0.8 ml kg^{-1} and 1.0 ml kg^{-1} at pH 1 was associated with an increasingly severe pneumonitis. At 1.0 ml kg^{-1} , 50% of the animals died—a mortality rate considerably less than that reported previously in animal studies. If these results were to be extrapolated to humans, the critical volume for severe aspiration could be increased from 25 ml to 50 ml (0.8 ml kg^{-1}), considerably reducing the percentage of patients perceived to be "at risk".

KEY WORDS

Anaesthesia: obstetric. Complications: pulmonary aspiration.

METHODS AND RESULTS

The study was conducted following approval by the University of Natal Ethics and Professional Standards Committee. Twenty-four juvenile monkeys (*Cercopithecus aethiops*) (mean (SD) weight 2.82 (0.86) kg) were allocated randomly to four groups according to the volume of gastric aspirate administered. Animals were anaesthetized initially with ketamine 30 mg i.v., following which an orogastric tube was inserted and gastric contents aspirated. Aspirate was obtained from several animals on the morning of each study day and was pooled, and homogenized manually. The pH of the aspirate was measured and adjusted to pH 1 by addition of hydrochloric acid: whilst the aspirate was stirred continually using a magnetic stirrer, three to six drops of hydrochloric acid

(HCl) 1 mol litre^{-1} (pH 0.5) were added until the pH of the aspirate was approximately 1. Thereafter, one to six drops of HCl $0.1 \text{ mol litre}^{-1}$ (pH 1.10) were added to bring the aspirate to precisely pH 1.

Monkeys were weighed and examined clinically for signs of infection or cardiorespiratory disease. Any animal with a heart rate $> 140 \text{ beat min}^{-1}$ or a ventilatory frequency $> 40 \text{ b.p.m.}$ was excluded from the study. Following this examination, the trachea was intubated and the position of the tube verified both clinically and by chest radiography, the latter being used also to exclude pulmonary disease. Animals were allocated randomly to receive gastric aspirate of differing volumes: group I 0.4 ml kg^{-1} ; group II 0.6 ml kg^{-1} ; group III 0.8 ml kg^{-1} ; group IV 1.0 ml kg^{-1} . Aspirate was drawn up into a syringe using a 21-gauge needle which was instilled, by the same investigator (D.M.R.), into the lumen of the tracheal tube. Animals were allowed to breathe spontaneously during pulmonary instillation of gastric aspirate. Immediately upon completion of injection of aspirate, the lungs were ventilated for a period of 1 min with a tidal volume of 20 ml kg^{-1} using a Starling pump, to ensure widespread distribution of the aspirate. Following ventilation, the tracheal tube was removed and animals transferred to an observation room for 6 h. During the observation period, anaesthesia was main-

D. M. RAIDOO, B.SC., M.B., CH.B., J. G. BROCK-UTNE*, M.A., M.B., B.CH.(T.C.D.), F.F.A. (S.A.), M.D. (BERGEN), A. MARSZALEK, M.B., B.S. (POLAND) (Department of Physiology); D. A. ROCKE, M.R.C.P.(U.K.), F.F.A.(S.A.) (Department of Anaesthetics); H. E. ENGELBRECHT, M.B., CH.B., D.M.R.D., R.C.P.R.C.S., F.F.R., M.R.C.P. (Department of Radiology); University of Natal, P.O. Box 17039, Congella 4013, Republic of South Africa. Accepted for Publication: February 1, 1990.

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Correspondence to D. M. R.

COURSE

#INTUBATI

Rome October 201

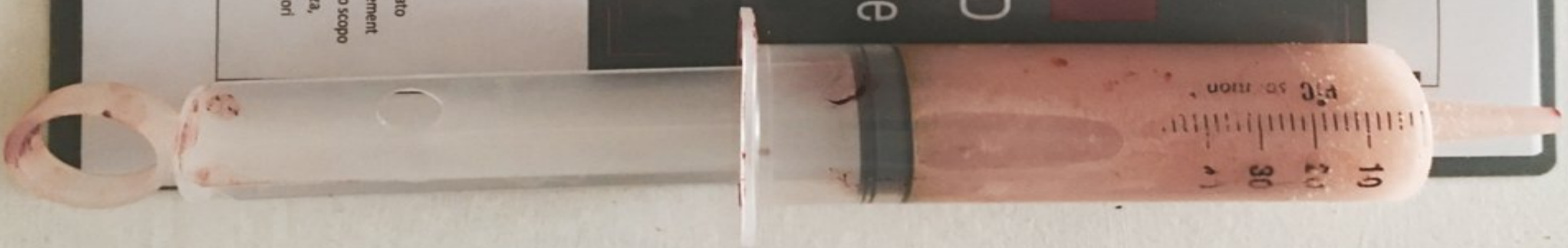
€ SALAD
Technique

BMJ

ROME 27 - 28 OCTOBER

Primo corso in Italia sulla Gestione delle Vie Aeree in Emergenza & SALAD TECHNIQUE. Nato dalla collaborazione e continua collaborazione con gli AIRWAYMANAGER e con gli AIRWAYMANAGER, gli AIRWAYMANAGER è quello che ha permesso di mettere a punto la gestione delle vie aeree in emergenza, basata sull'esperienza dei direttori scientifici de

NIKO



What is the major problem?

We are too focused on the end result ---
ventilation

Ventilation and airway decontamination are two sides of the same coin. The problem here is that we are obsessed with only one side of the coin!

Airway Decontamination is 'DARK SIDE' of Airway
Management

VENTILATION (THE "BRIGHT SIDE")



DECONTAMINATION (the "Dark Side")



The Approach The DARK SIDE



Predisposing factors increasing risk of pulmonary aspiration (Who is at increased risk of pulmonary aspiration?)

Patient factors

- Full stomach (e.g. emergency surgery)
- Diseases and symptoms known to delay gastric emptying
 - diabetes mellitus
 - increased intracranial pressure
 - hiatus hernia
 - gastrointestinal obstruction
 - recurrent regurgitation
 - dyspeptic symptoms
 - oesophageal disease (eg achalasis, pouches etc)
- History of upper gastrointestinal surgery
- Injured or receiving opioids or other drugs delaying gastric emptying
- Women in labour
- Morbid obesity

Operation factors

- Upper abdominal surgery
- Lithotomy or the head-down position
- Laparoscopic cholecystectomy

Anaesthesia factors

- Inadequate anaesthesia
- Intermittent positive pressure ventilation particularly with high airway pressures
- Prolonged anaesthesia (is there evidence for this?)
- Removal of the airway before spontaneous recovery from anaesthesia

Device factors

- Presence of a supraglottic airway inserted into the hypopharynx
- Incorrectly inserted airway
- Absence of drain/vent
- low seal with oropharynx
- low internal volume of supraglottic device
- device tip that fails to obturate the oesophageal inlet

How frequently do contaminated airways occur in resuscitation?

What is the incidence of regurgitation during an out-of-hospital cardiac arrest? Observational study

Daniel Jost, Pascal Dang Minh, Noémie Galinou, Laure Alhanati, Florence Dumas, Frédéric Lemoine and Jean-Pierre Tourtier

Resuscitation, 2015-11-01, Volume 96, Pages 70-70, Copyright © 2015

3104 OOHCA

25% before arrival

7% ETI



Airway CRAP makes everything worse

Enemy #1

**PRIORITIZE
CONTROL
OF VOMIT**

C.R.A.P. leads to PANIC





5MINUTEAIRWAY

Terren Trott

“Fluids are the ENEMY of all airway
Management” – Richard Levitan, M.D.



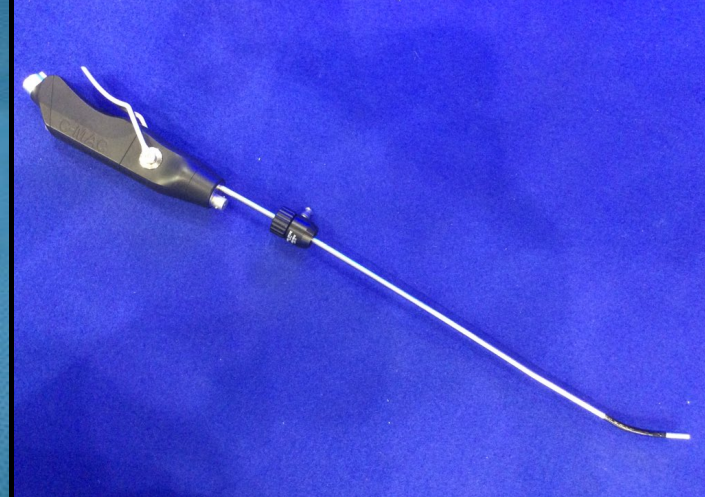
C.R.A.P. kills mask ventilation



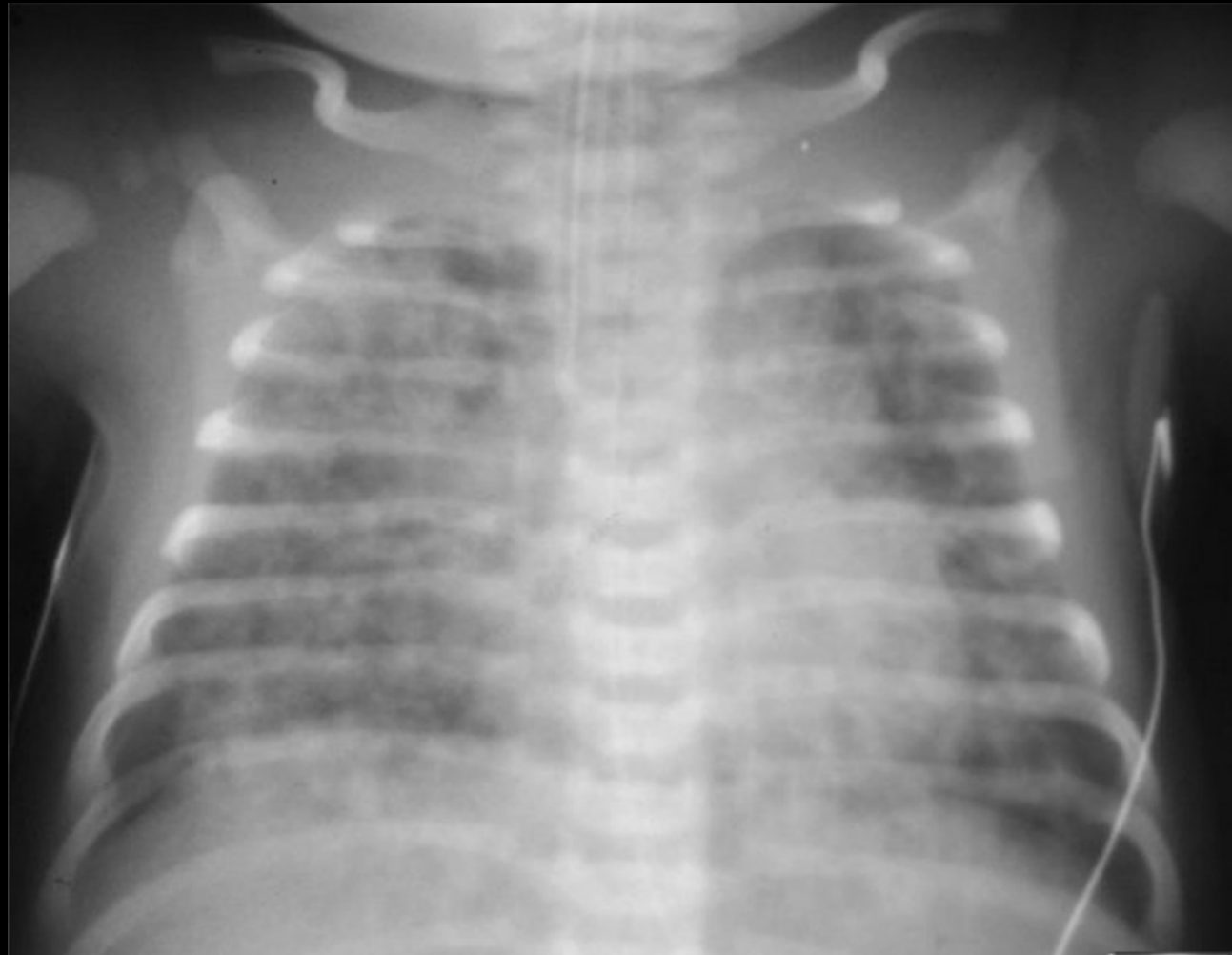
C.R.A.P. kills apneic oxygenation



C.R.A.P. kills all scopes



C.R.A.P. kills oxygenation



C.R.A.P. : Enemy to all Airway Moves

- Negates calmness ... deteriorates technical and nontechnical skills
- Negates oxygenation ... aspiration, hypoxia, no time
- Negates mask ventilation
- Negates supraglottic airways
- Negates apneic oxygenation
- Negates direct, indirect video, flexible scope, stylet scope methods

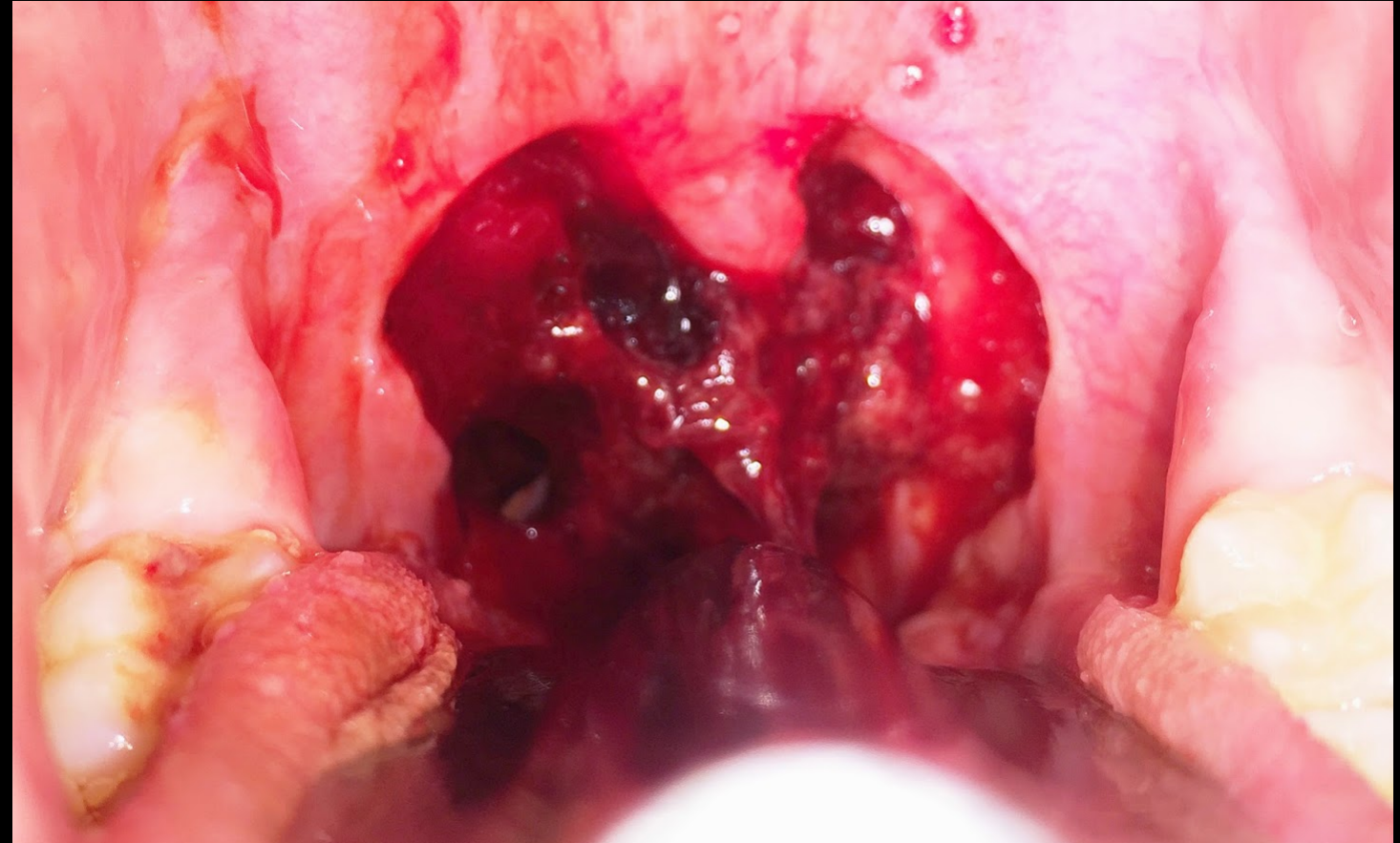
Airway contaminants

Nasal



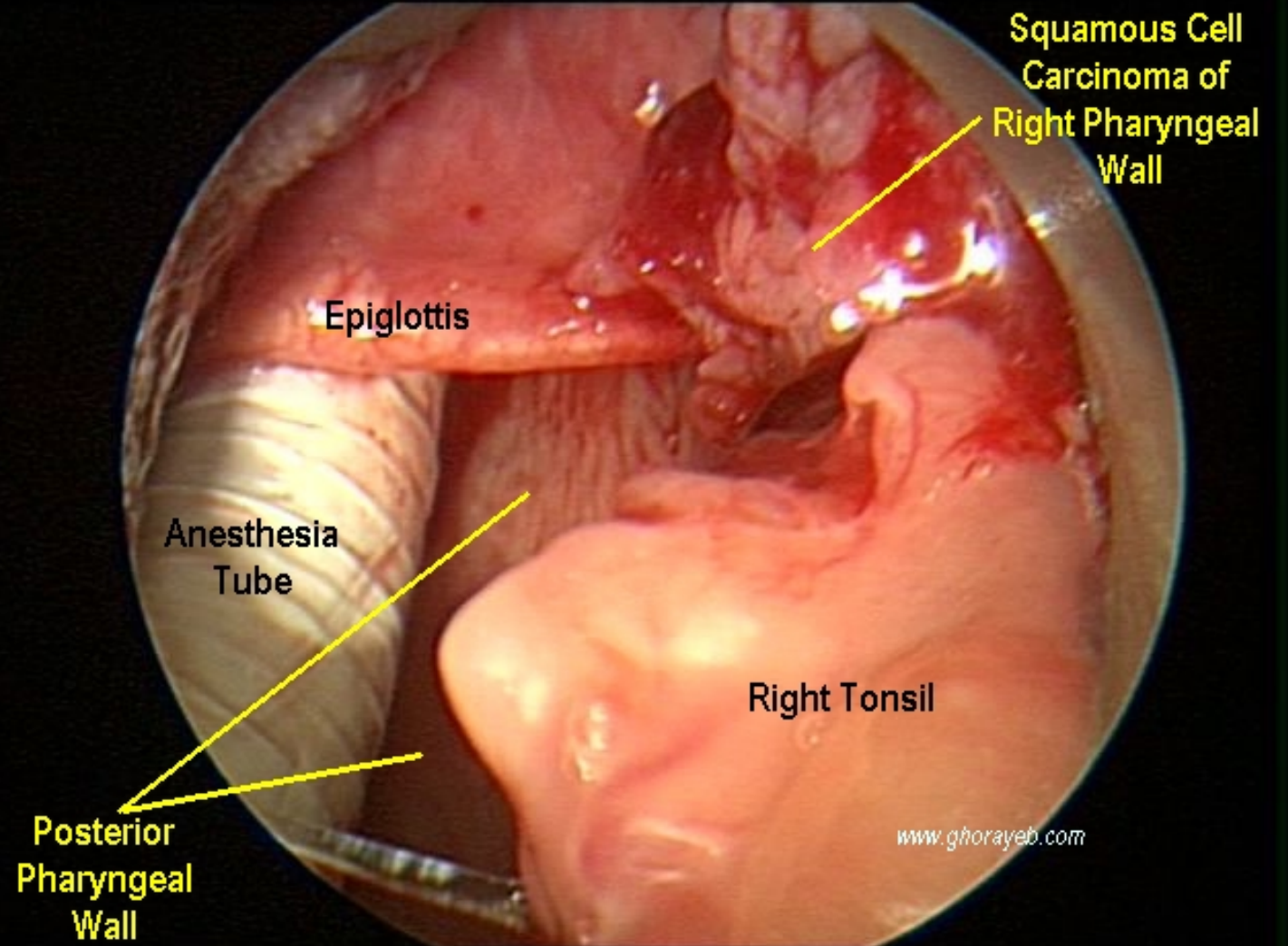
Airway contaminants

Oropharynx



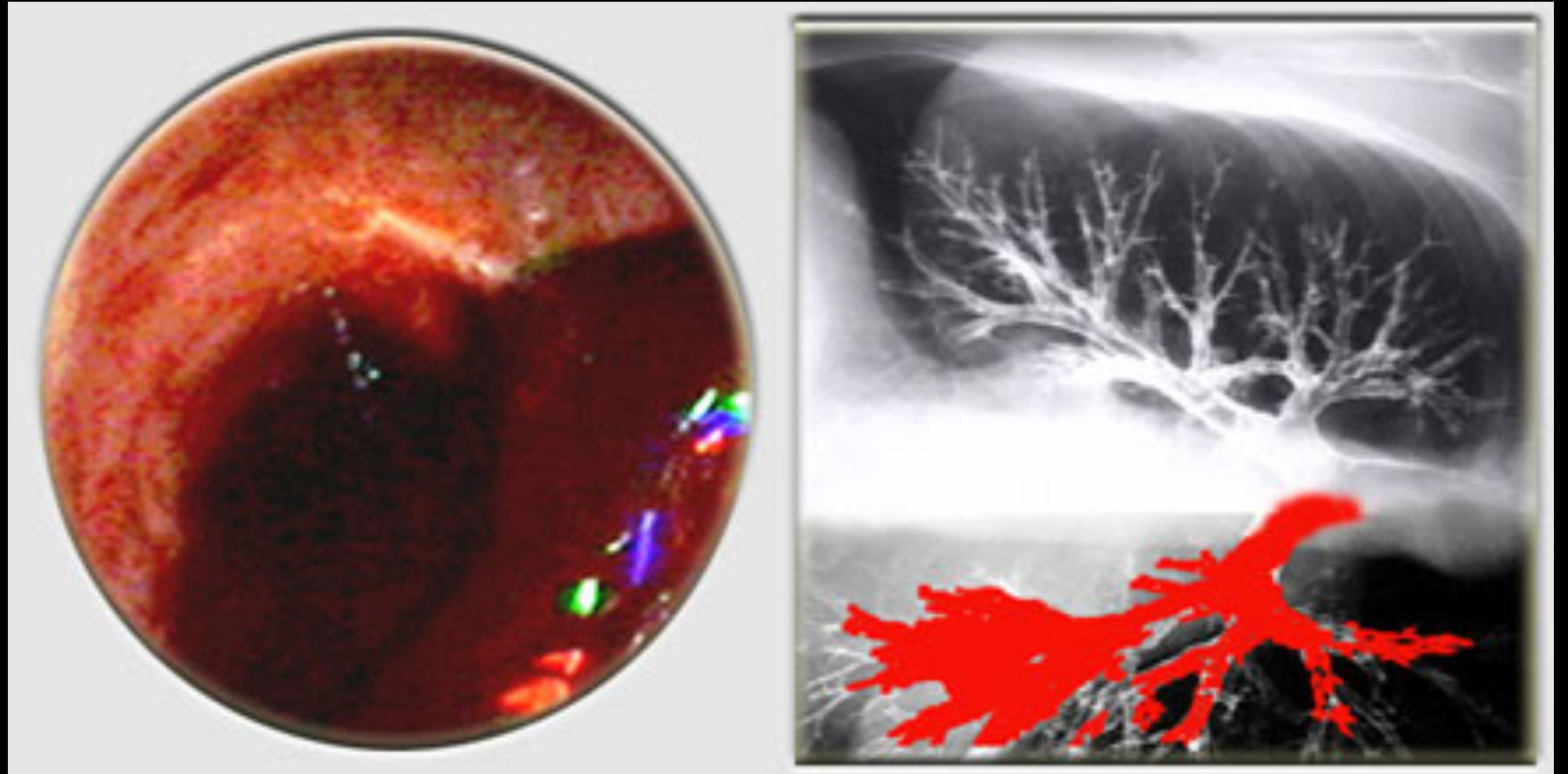
Airway contaminants

Pharyngeal



Airway contaminants

Hemoptysis



Airway contaminants

Gastric/esophageal CRAP





Standy By Me, 1986

Airway contaminants

Gastric/esophageal BLOOD



“Emesis is the Nemesis”

Jim DuCanto

How to Manage Fluids in Emergency Airway Procedures

By Richard M. Levitan, MD, FACEP; Yen Chow, MD; & Jim DuCanto, MD | on May 14, 2017 | 1 Comment

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It has long been assumed in emergency airway management that the fundamental priorities are oxygenation and ventilation. Apart from instances of severe acidosis with compensatory respiratory alkalosis, ventilation is rarely as time critical as oxygenation. Desaturation and severe hypoxemia kills in seconds to



What to do?

PREPARATION

INCREMENTALIZATION

BE CALM

Prevenire?



CONTAMINATED AIRWAY

Patients requiring intubation in the Emergency Department are never "NPO after midnight." This means that emergent airways are often massively "c...

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FOAM Content on This Topic



By Jonathan St. George MD

47
FOLLOWERS

PHOTO: EMBERPROJECT.ORG

Understand that **Airway Contamination** is one of the major causes of failure in first-pass tracheal intubation attempts in Emergency and Critical Care airway management, as well as failure of face mask ventilation and extraglottic airway ventilation

Understand the tools and **techniques** for efficient airway decontamination

Understand the use of a **simulation** system to model airway decontamination during airway management

Practice smart

PLAY
PRACTICE
PERFECT





Use a Knife – Save a Life HT @airwaycam





Prevention of Airway Contaminants

PATIENT POSITIONING—HEAD ABOVE STOMACH

AVOIDANCE OF GASTRIC INSUFFLATION DURING MASK VENTILATION

ADEQUATE SEDATIVES DURING AIRWAY MANAGEMENT

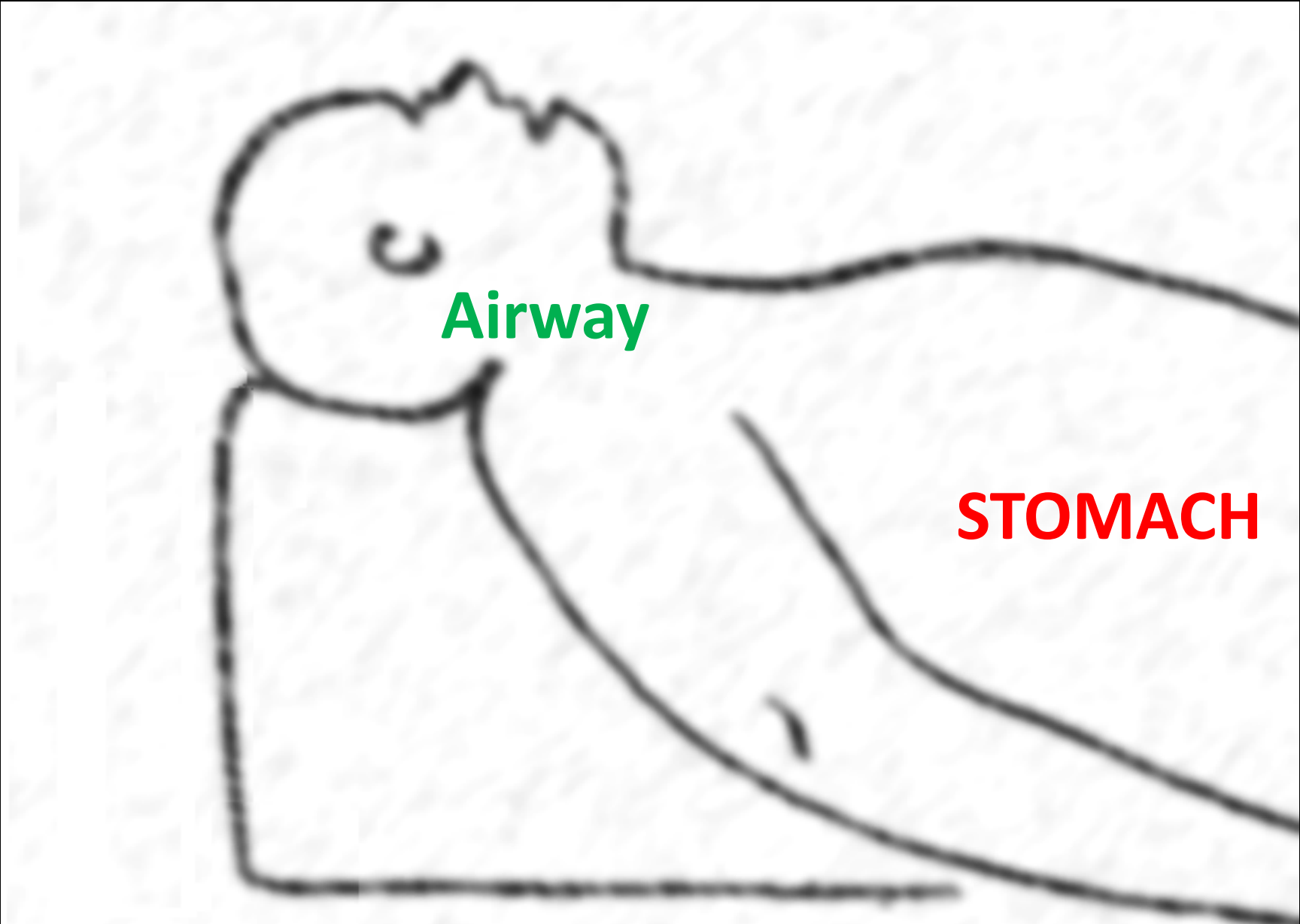
NEUROMUSCULAR RELAXANTS DURING TRACHEAL INTUBATION

Position

Head elevated

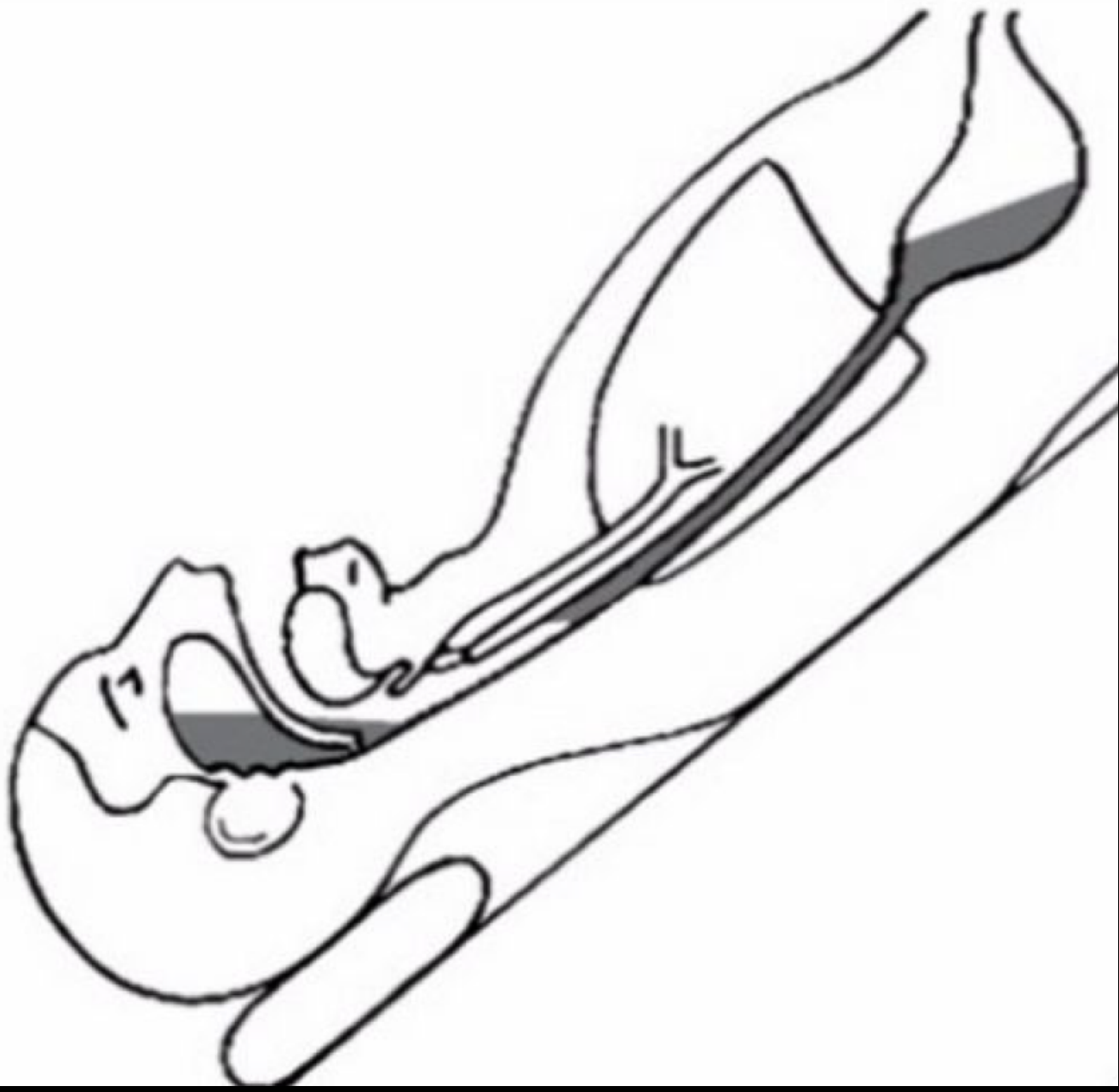
Head of bed up

Head lateral



Airway

STOMACH





CLINICNAME
2015-03-10 03:37:17

Have suction ready
Overwhelming fluids run down into lungs

@jducanto



A volte
NON BASTA

SUCTION WARS
SALAD WARS

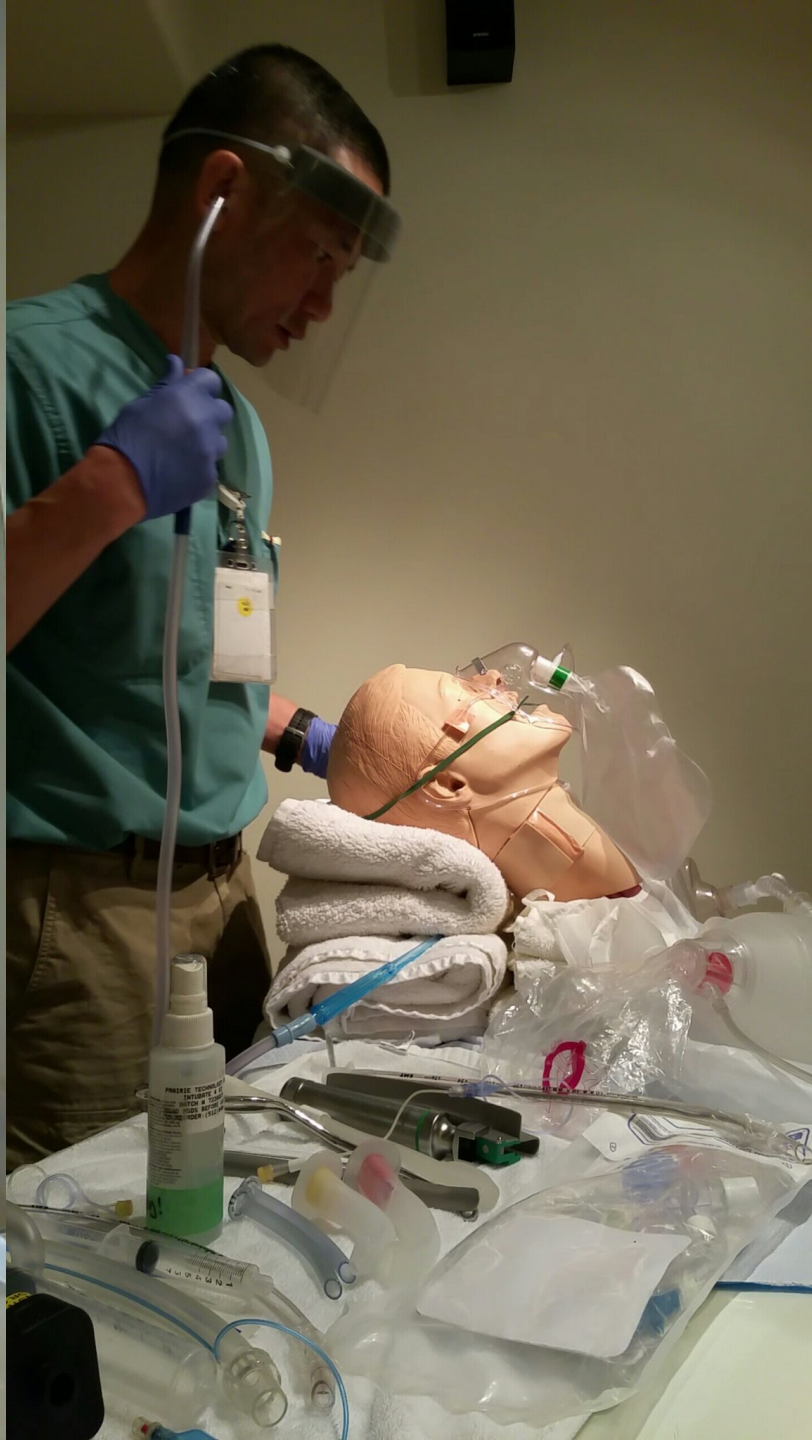


THE PROTAGONIST

Rhunyc '09

Suction Prep











The Inadequacies of Contemporary Oropharyngeal Suction

JAMES TOBY VANDENBERG, MD, FAAEM
DAVID R. VINSON, MD, FAAFP

er used 80 years ago

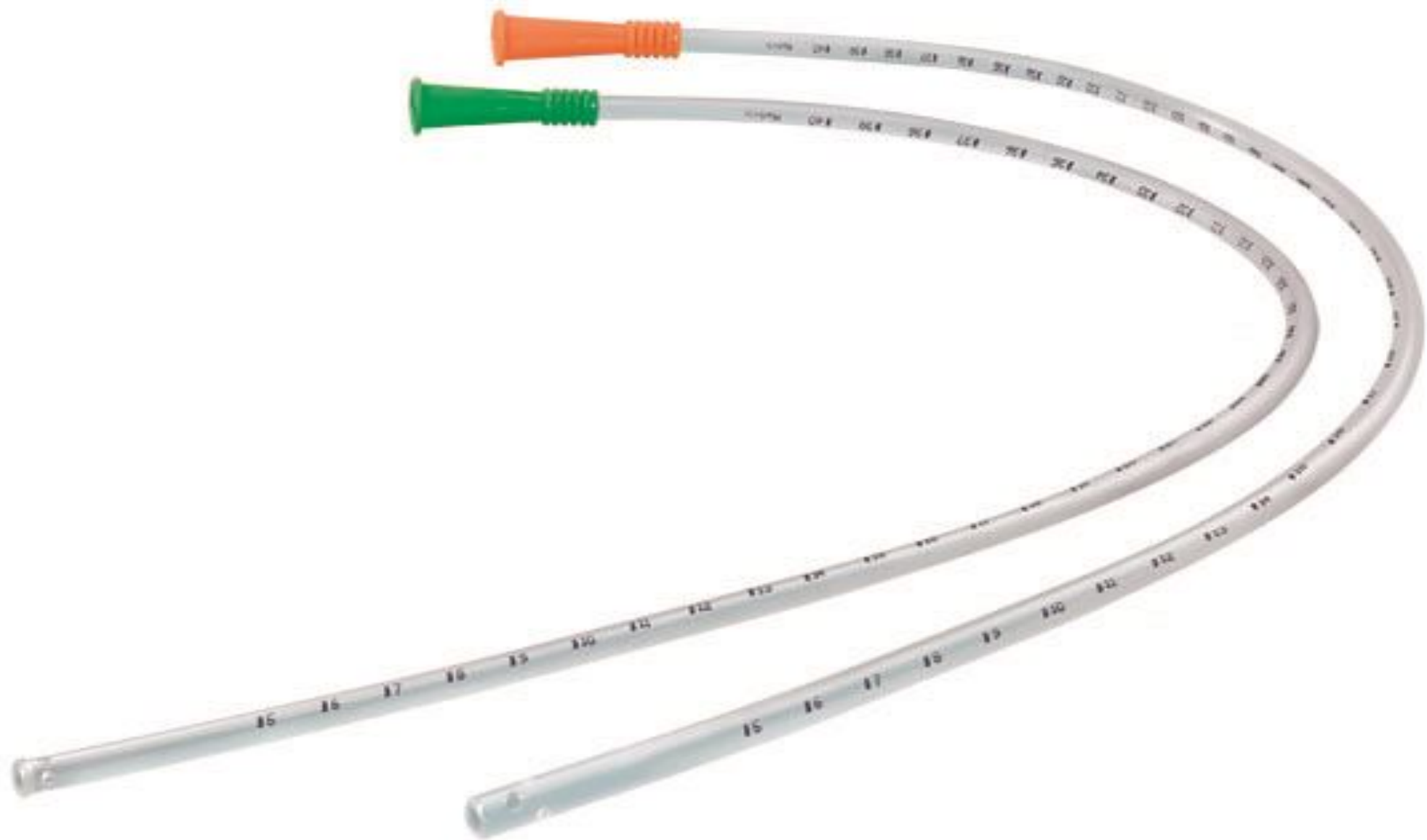
coefficient; L, the length of the tube.

Airway management is the highest priority in any resuscitation. Suction equipment capable of rapidly clearing the oropharynx is mandatory for airway management. Inadequate oropharyngeal suction with standard equipment may be associated with major complications in emergency airway management.

The “Standard Equipment”: Rigid Suction Catheters

Equipment

Yankauer (Created 110 years ago this year 2017!)
Innovation of Sidney Yankauer, M.D.,
Otolaryngologist Mount Sinai Hospital, New York City, circa 1907
Intended for intraoral surgery
Many design variations



Intended to remove blood (liquid phase) without removing the growing clot to speed surgical hemostasis

Small holes in tip prevent entraining tissue into catheter

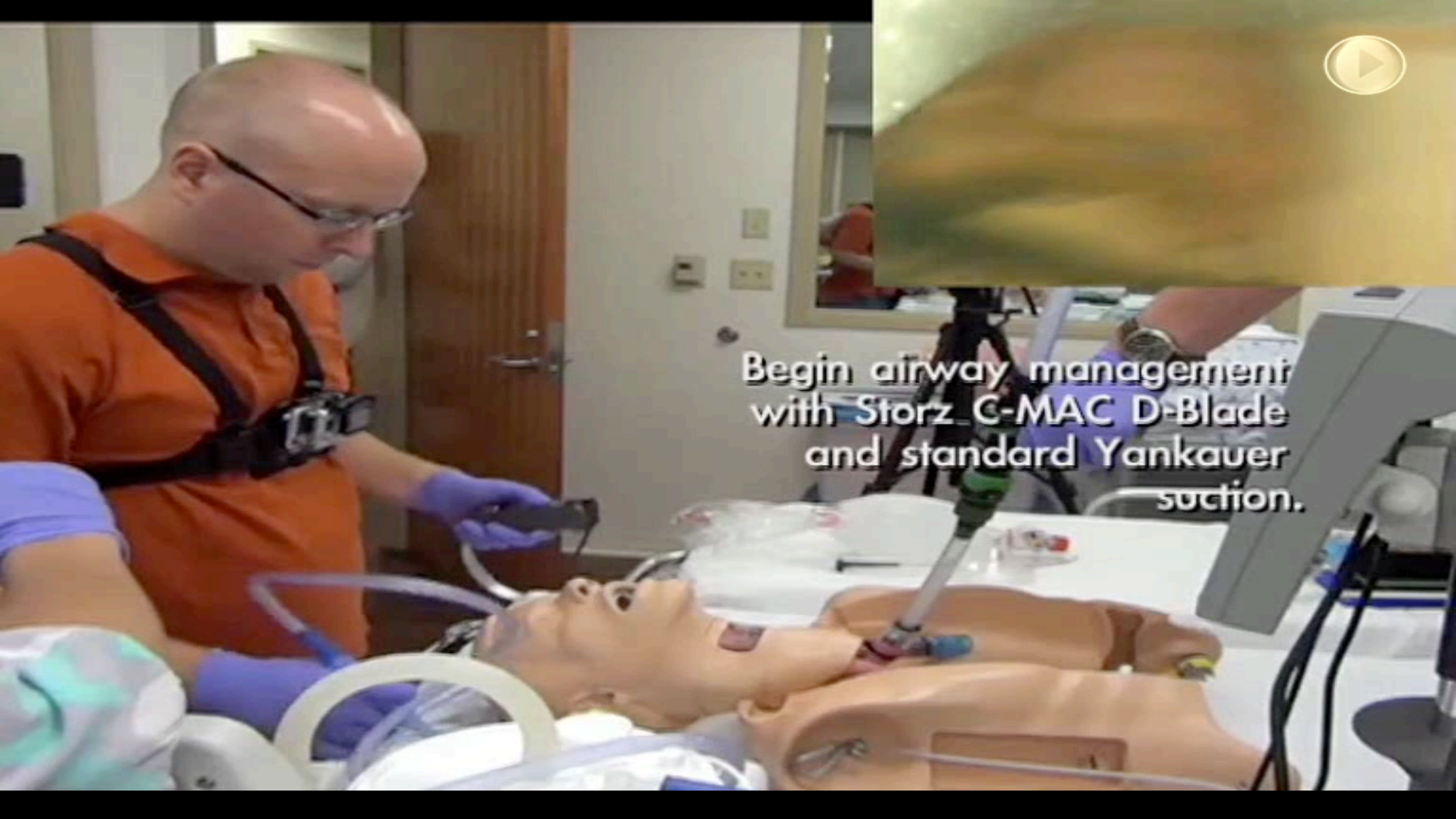
Size of holes in tip vary substantially between models and manufacturers







Begin airway management
with Storz C-MAC D-Blade
and standard Yankauer
suction.

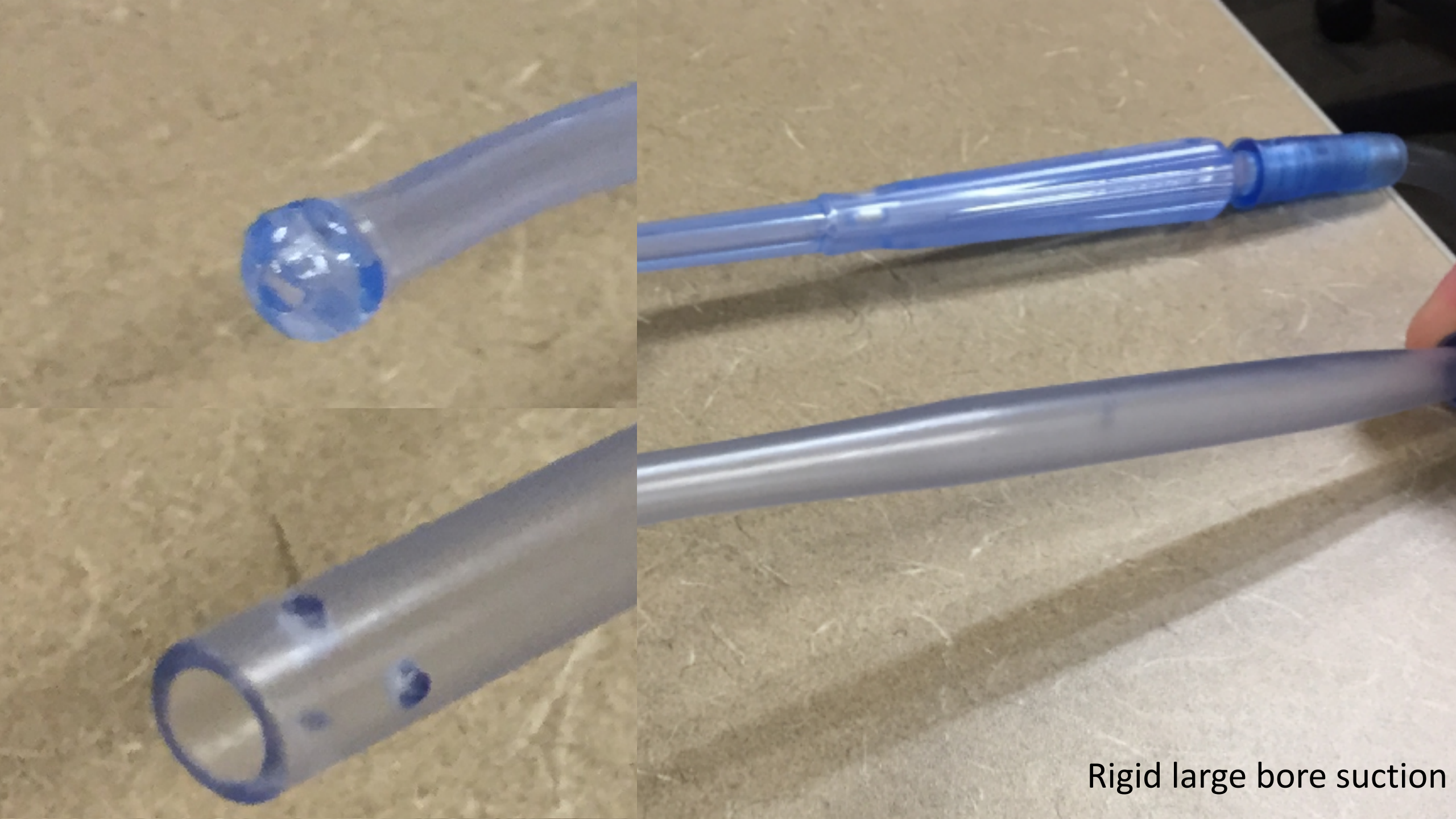




Evolution of Rigid Suction Catheters







Rigid large bore suction

.26" I.D.

CHOOSING A SUCTION CATHETER

BY THE RESUSCITATIONIST (@LA_REANIMATEUR)



Standard Yankauer

Best for:

Catching that little drip of spittle on the patient's cheek since you've already opened up your suction package and are bored.

Not for:

Solids larger than the subatomic level and liquids thicker than purified glacier water.

Best used by:

You, while getting your teeth cleaned.

The DuCanto Catheter

Best for:

Suctioning clotted blood, detritus, fecal material, tissue and most importantly, cream corn from the airway during intubation.

Not for:

Spittle.

Best used by:

Resuscitators and masters of the airway.

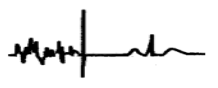
**Yankauer vs SSCOR DuCanto:
Chunky Tomato Soup Challenge 250(ml)**

Device	Time	Rate
Yankauer	27 sec	555 ml/min
DuCanto	8 sec	1,875 ml/min







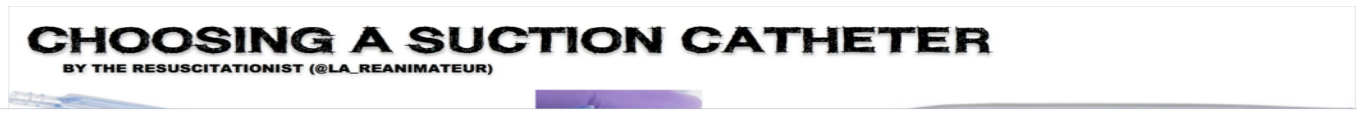


The Resuscitator
@La_Reanimateur

Choosing Wisely: Suction Catheter Edition. When to choose the Yankauer vs the DuCanto Suction Catheter
[@jducanto](#) [@bmiesemer](#) #FOAMed #FOAMems

Lingua originale: inglese; tradotto da bing

Scegliere saggiamente: Edizione del catetere di aspirazione. Quando scegliere il vs Yankauer il catetere di aspirazione DuCanto
[@jducanto](#) [@bmiesemer](#) #FOAMed #FOAMems



Rispondi a The Resuscitator, James D...

Dean Speerbrecher ha ritwittato

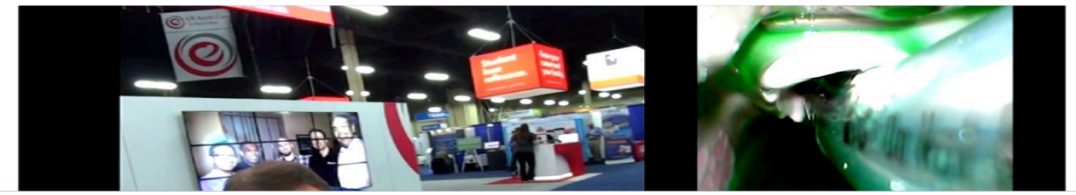


Tyler Christifulli
@christifulli88

Oh you use the Yankauer?? That's cute. You must be a dentist... because true resuscitator use the Ducanto suction catheter. [@FOAMEMS](#)

Lingua originale: inglese; tradotto da bing

Oh si utilizza il Yankauer?? È carino. È necessario essere un dentista... perché vero resuscitator utilizzare il catetere di aspirazione Ducanto. [@FOAMEMS](#)



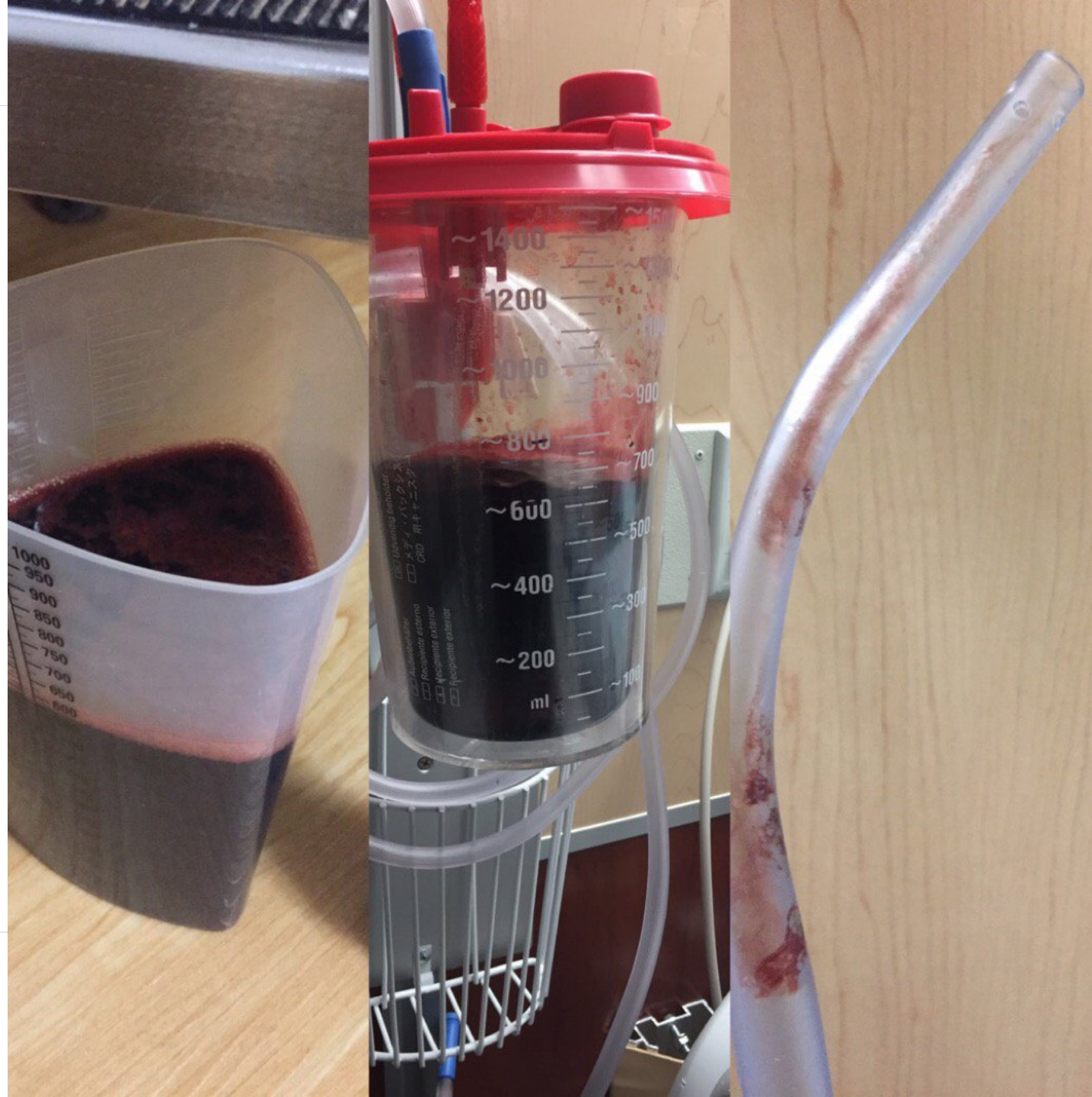
Rispondi a Tyler Christifulli



MZ, MD
@GoodishIntent

Used my @jducanto catheter for midnight intubation shenanigans and ongoing hemoptysis. Thumbs up. 👍
#SMACC #FOAMed

🌐 Lingua originale: inglese; traduci



Rispondi a MZ, MD, James DuCanto, M.D.



Mike Abernethy @FLTDOC1

.@phccinfo @DrHowieMell @Tippet1 @UCAirCareDoc @momedic9019 @iredellcoems

Hmm A bougie fits nicely in a Ducanto catheter

Lingua originale: inglese; traduci



Rispondi a Mike Abernethy, Jamie @ PHC...





SSCOR

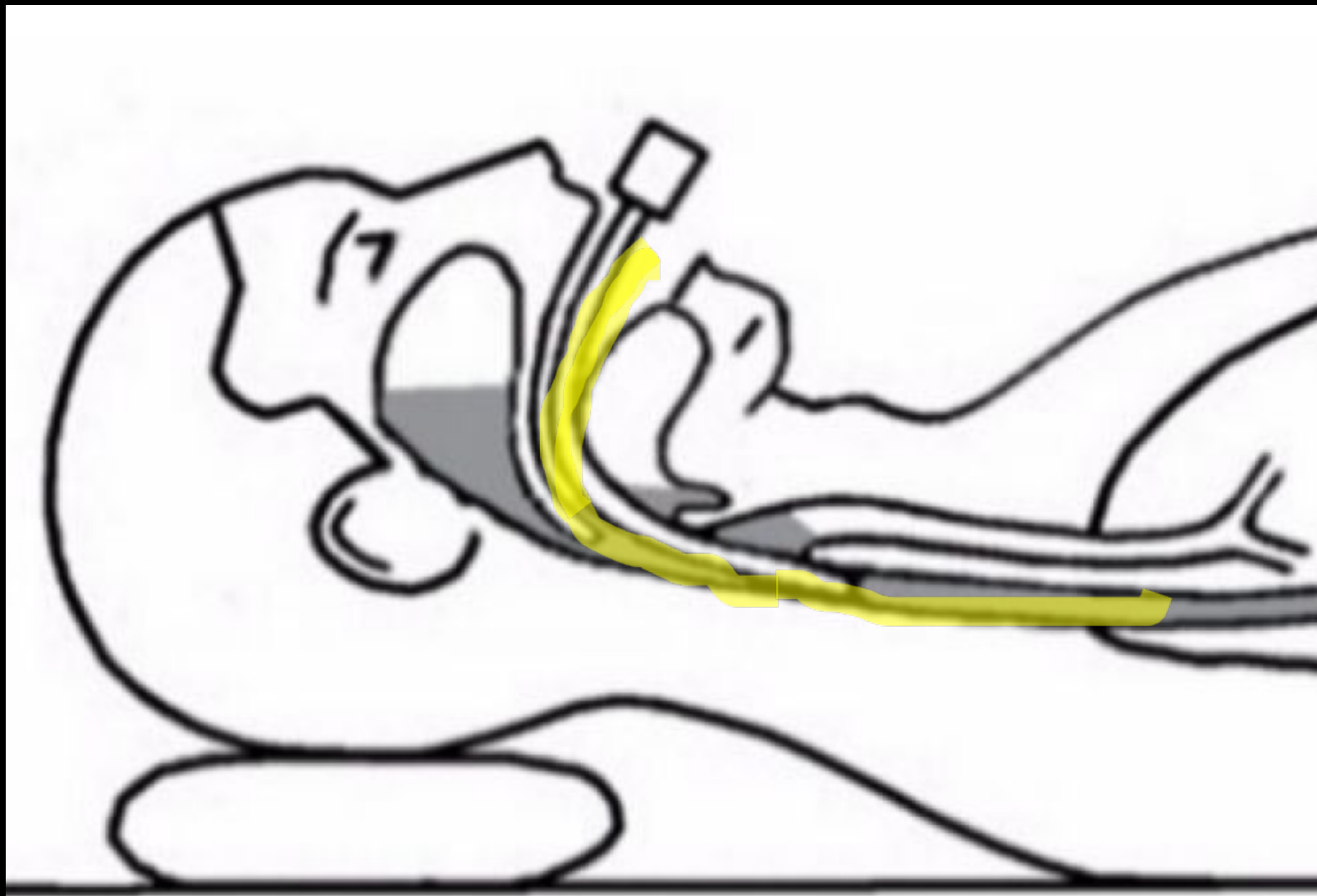
#STELLAR SUCTION

@AirwayGladiator

CLEARING THE AIRWAY IS OUR #1 PRIORITY

Le tecniche

Esophageal diversion

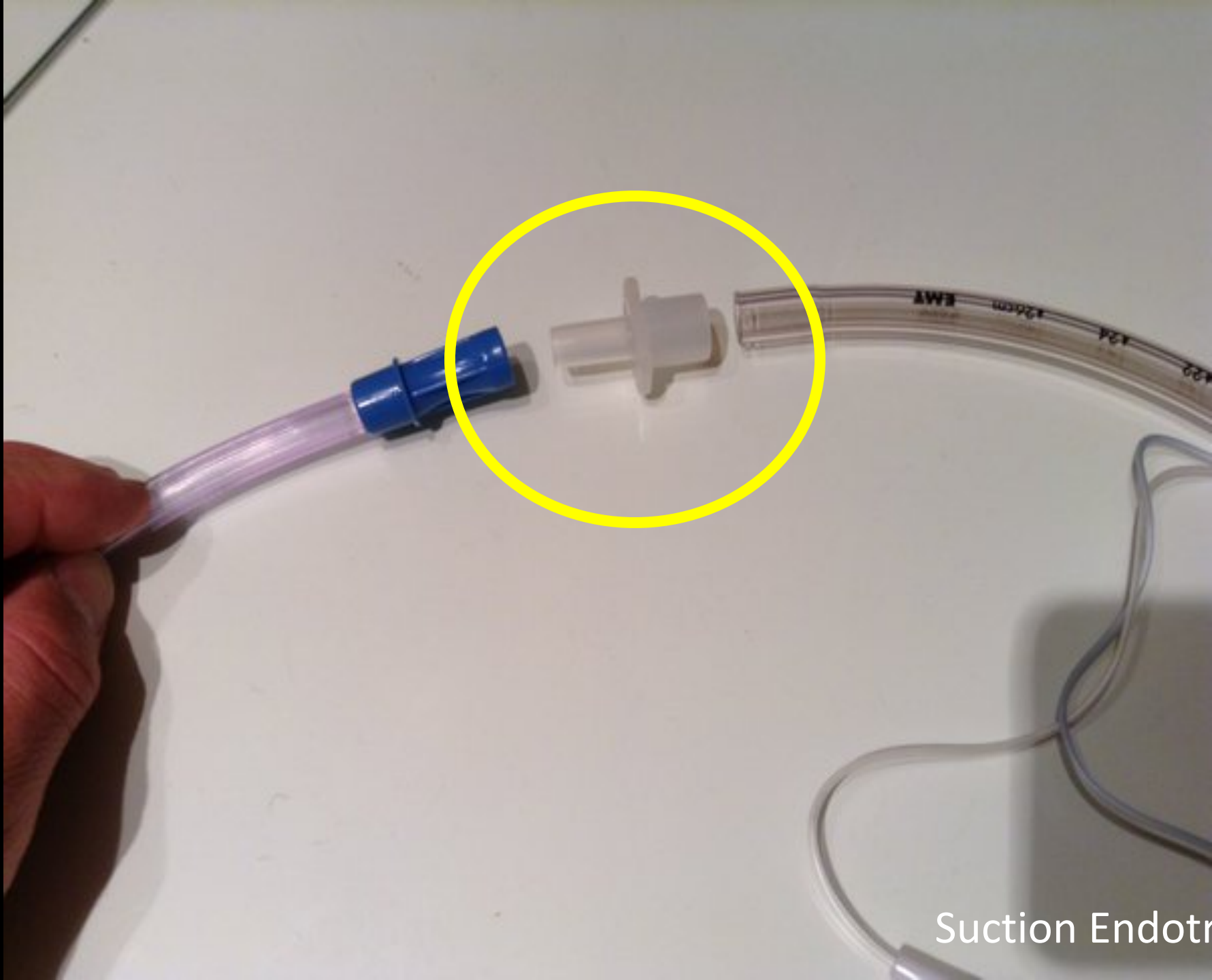




Suction Endotracheal Tubes



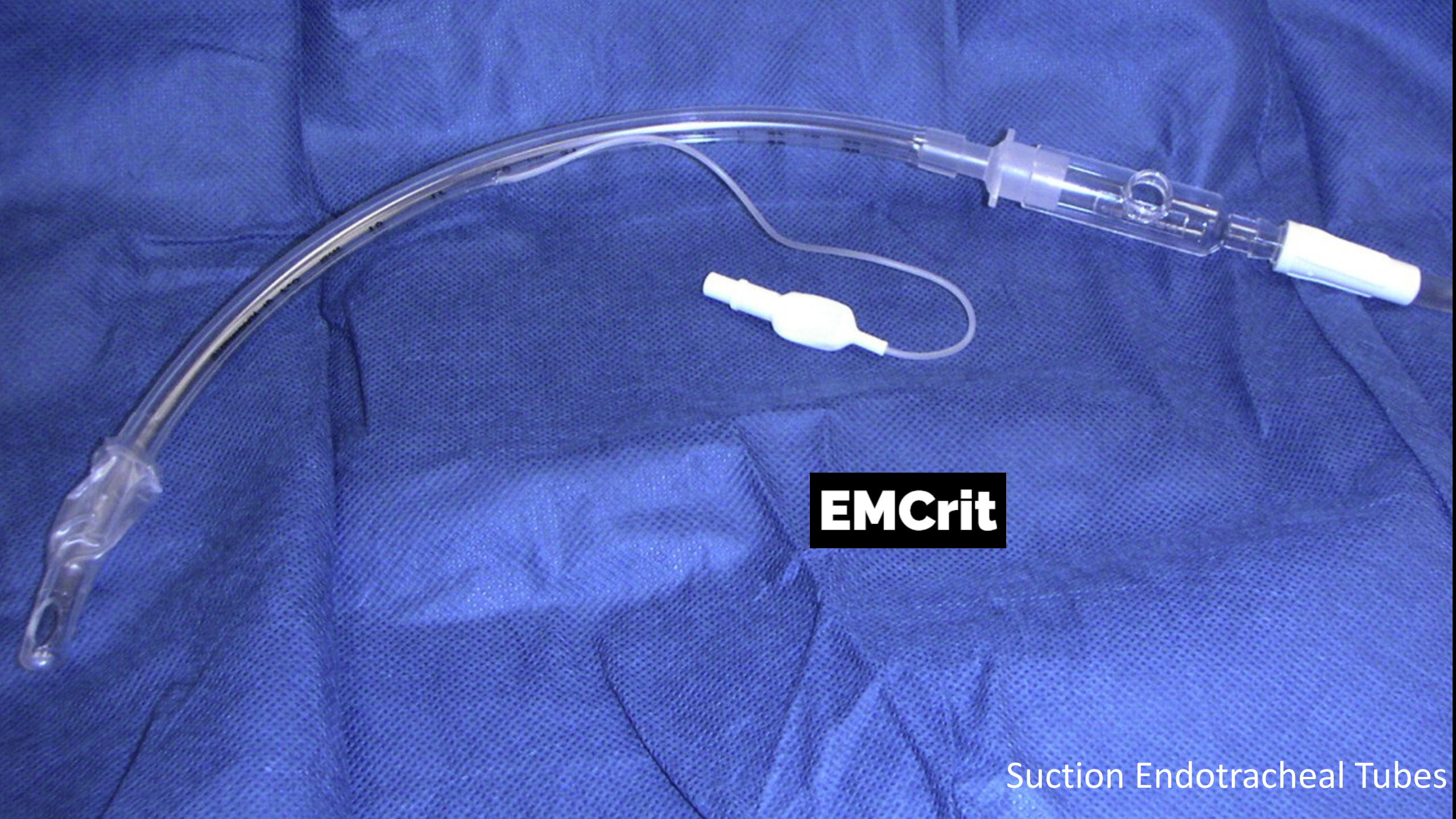
Suction Endotracheal Tubes



Suction Endotracheal Tubes



Suction Endotracheal Tubes



EMCrit

Suction Endotracheal Tubes



Weingart, Bhagwan
J Clin Anesth 2011

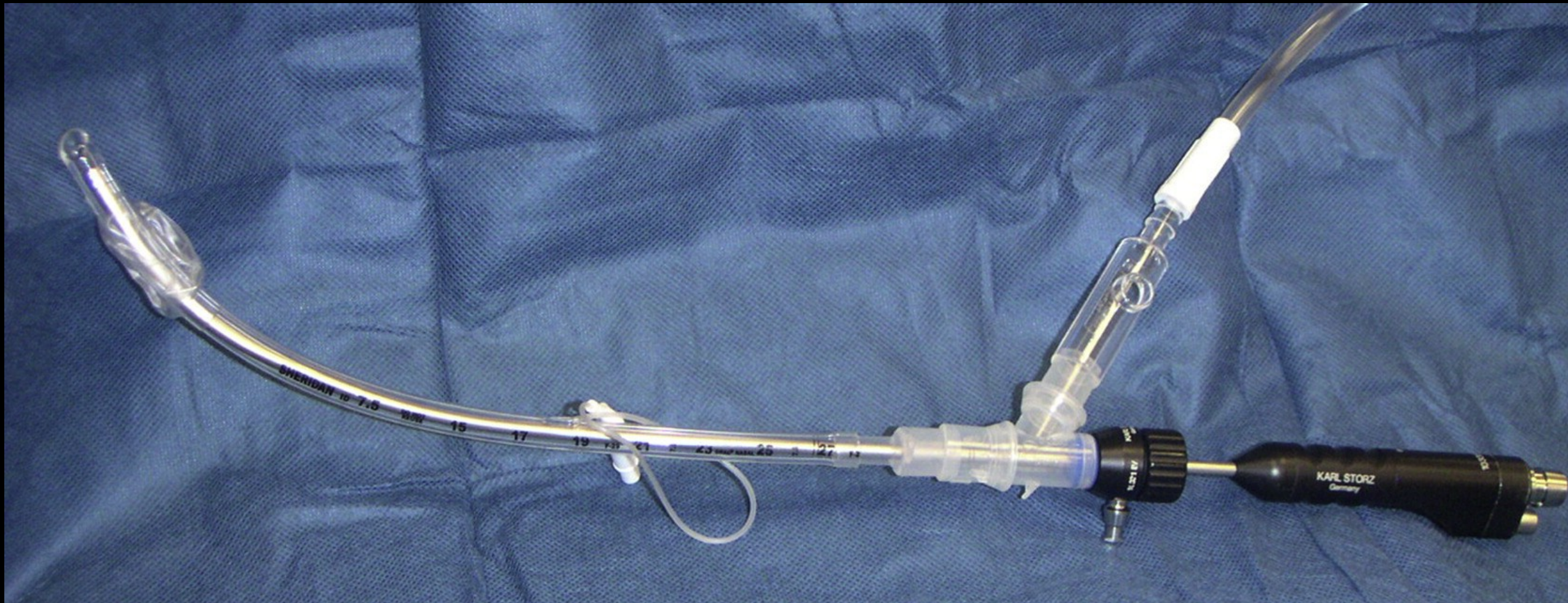
Suction Endotracheal Tubes



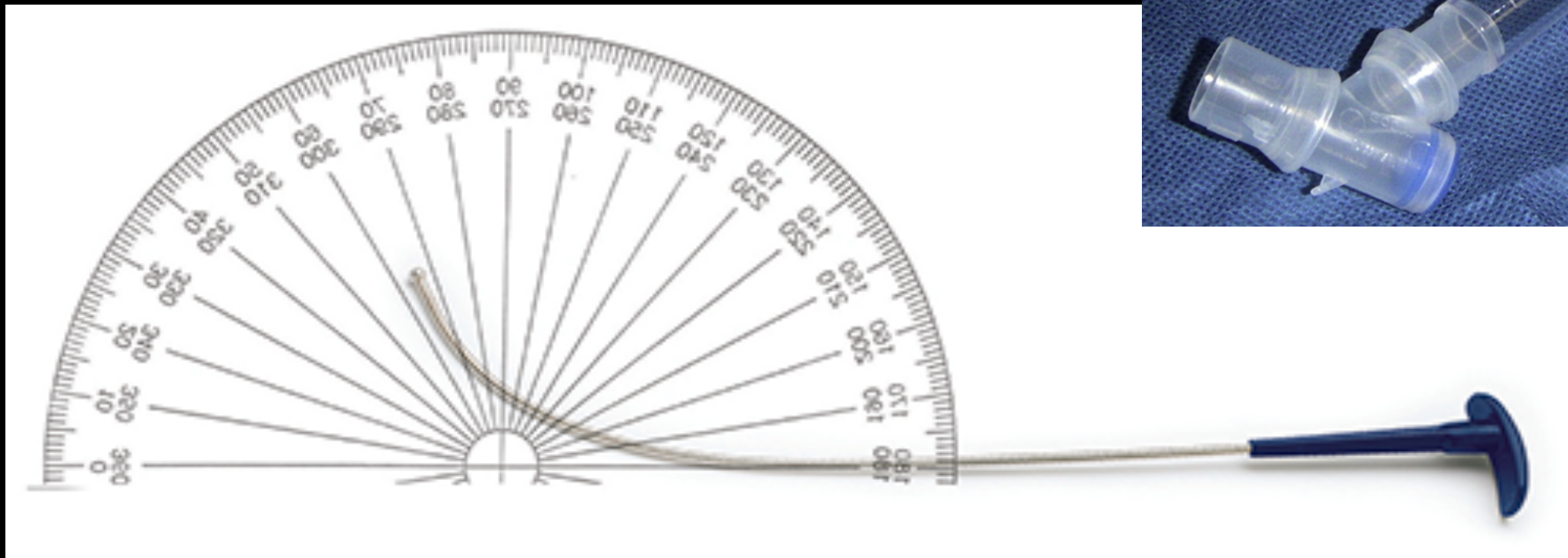
Suction Endotracheal Tubes



Suction Endotracheal Tubes



Suction Endotracheal Tubes



Suction Endotracheal Tubes

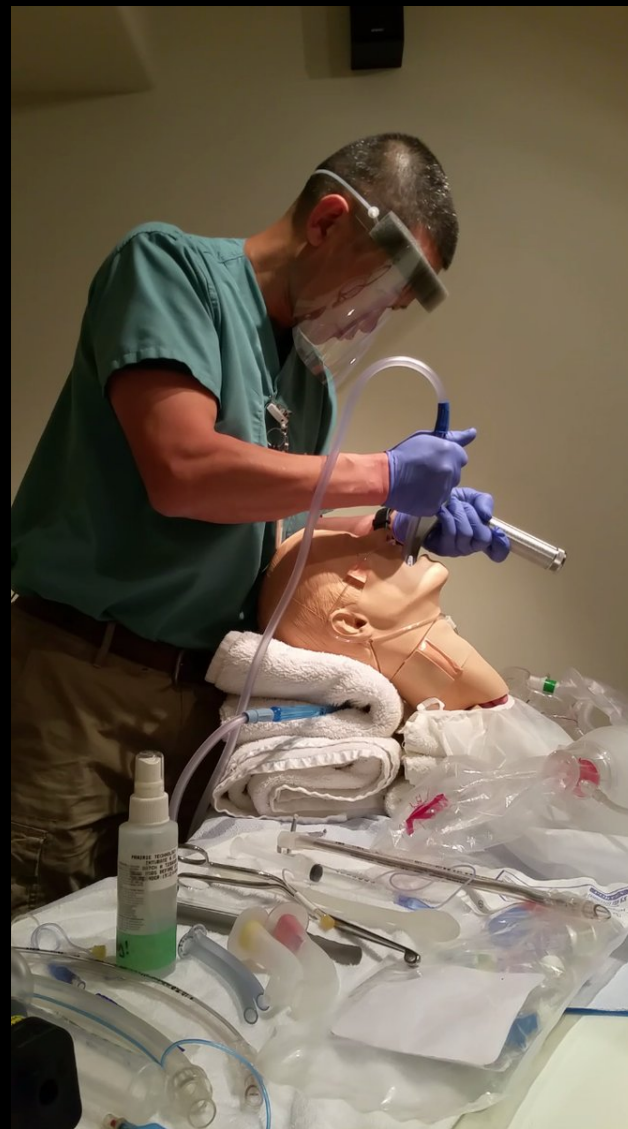
SALAD

AIRWAY MANAGEMENT



Suction
Assisted
Laryngoscopy
Airway
Decontamination

Suction Assisted Mouth Opening



Suction epiglottoscopy

@TBayEDGuy

airwayNautics



WARNING

VL only is at a high risk of failure in a Bloody Airway

Challenges of this "crash" airway

Hematemesis, arrest, CPR, limited mouth opening,
previous failed DL/VL attempts

STRATEGY

VL hyperangulated blade

Stay High

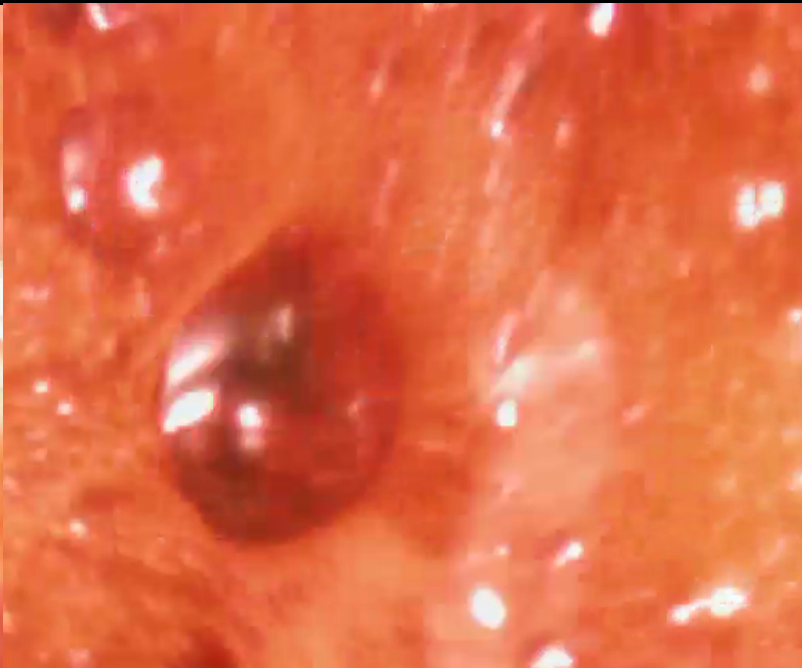
Stay Back

Stay Dry

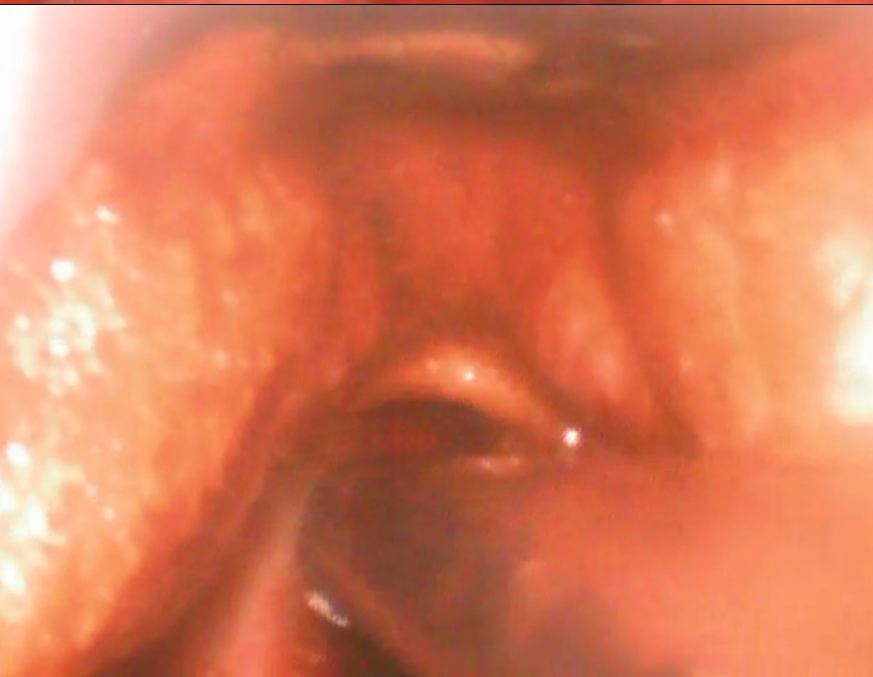
Suction Assisted Laryngoscopy Airway Decontamination:

Lead with Suction

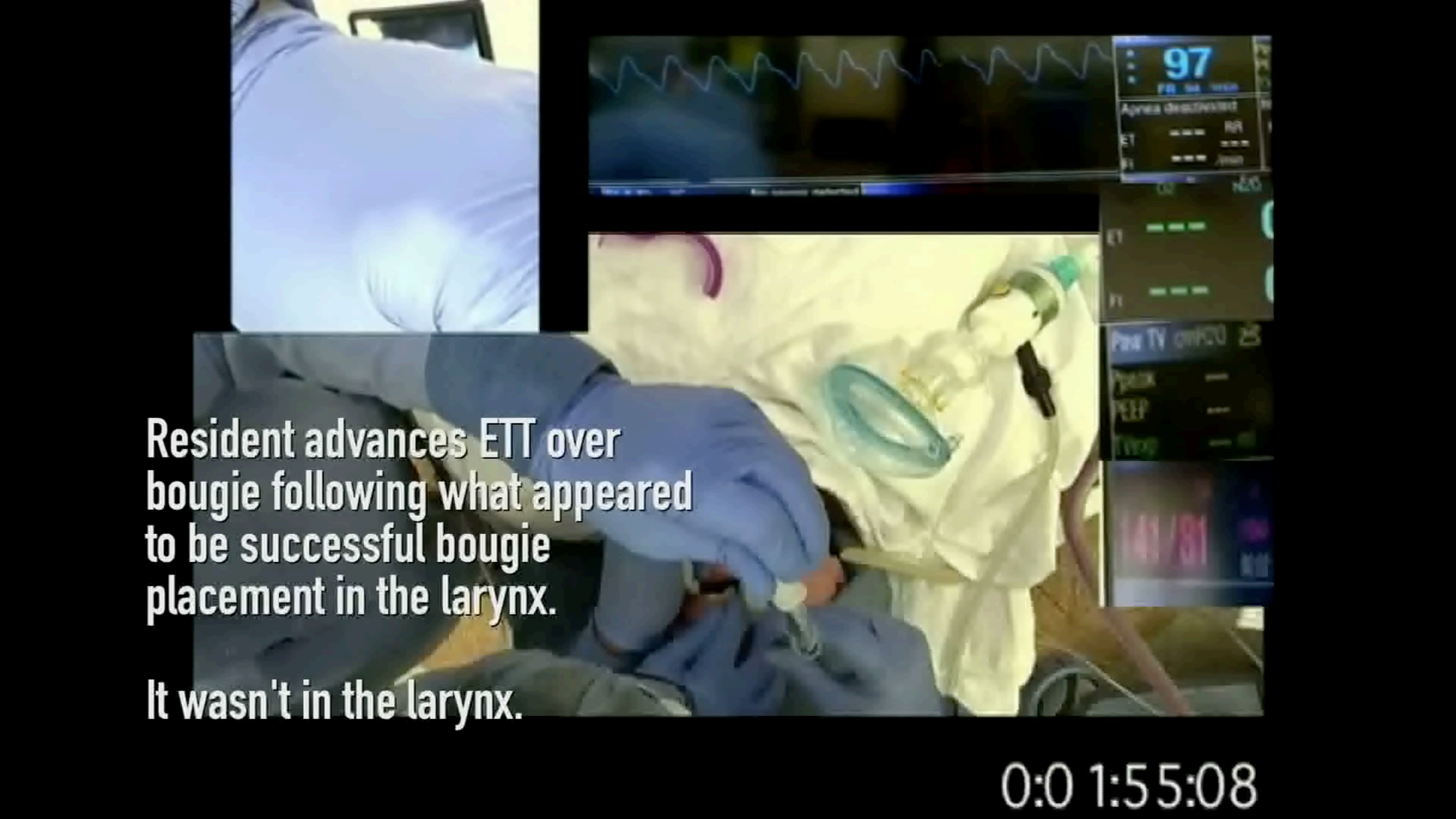
Left Park Suction in Hypopharynx



Too close
Too low
Late suction



Stay BACK
Stay HIGH
Stay DRY



Resident advances ETT over bougie following what appeared to be successful bougie placement in the larynx.

It wasn't in the larynx.

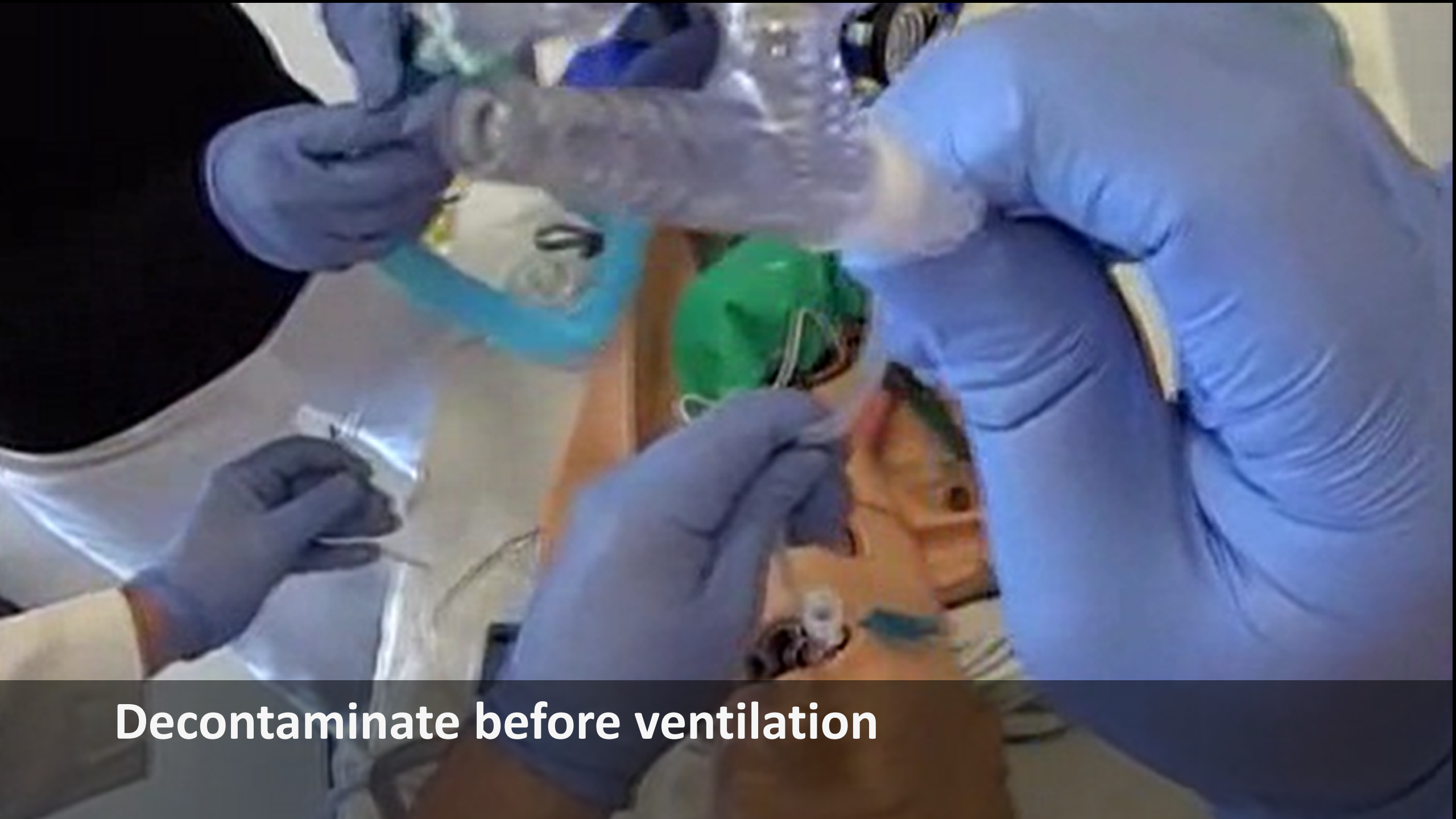
0:0 1:55:08



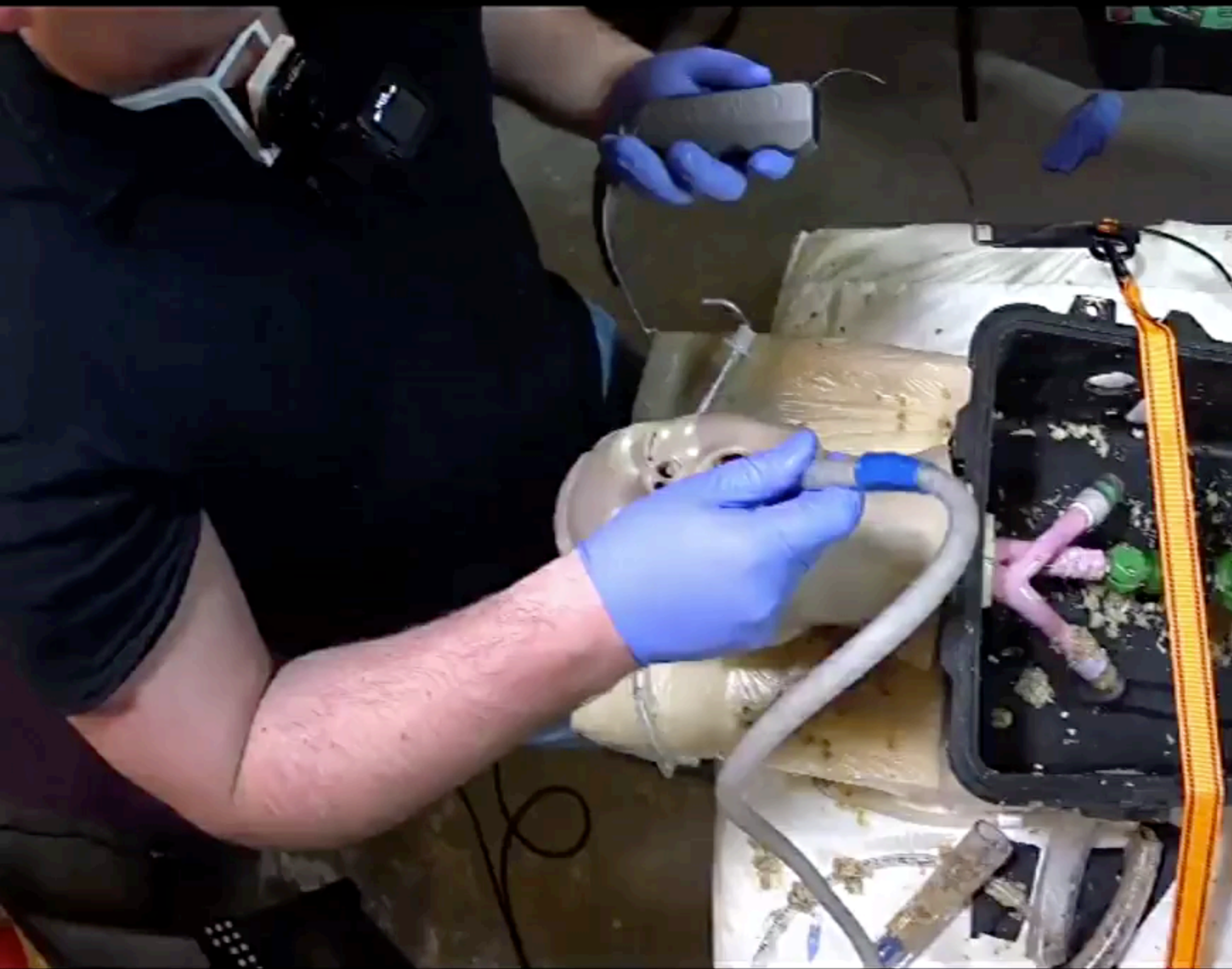
Suction-assisted iGel Insertion







Decontaminate before ventilation



II

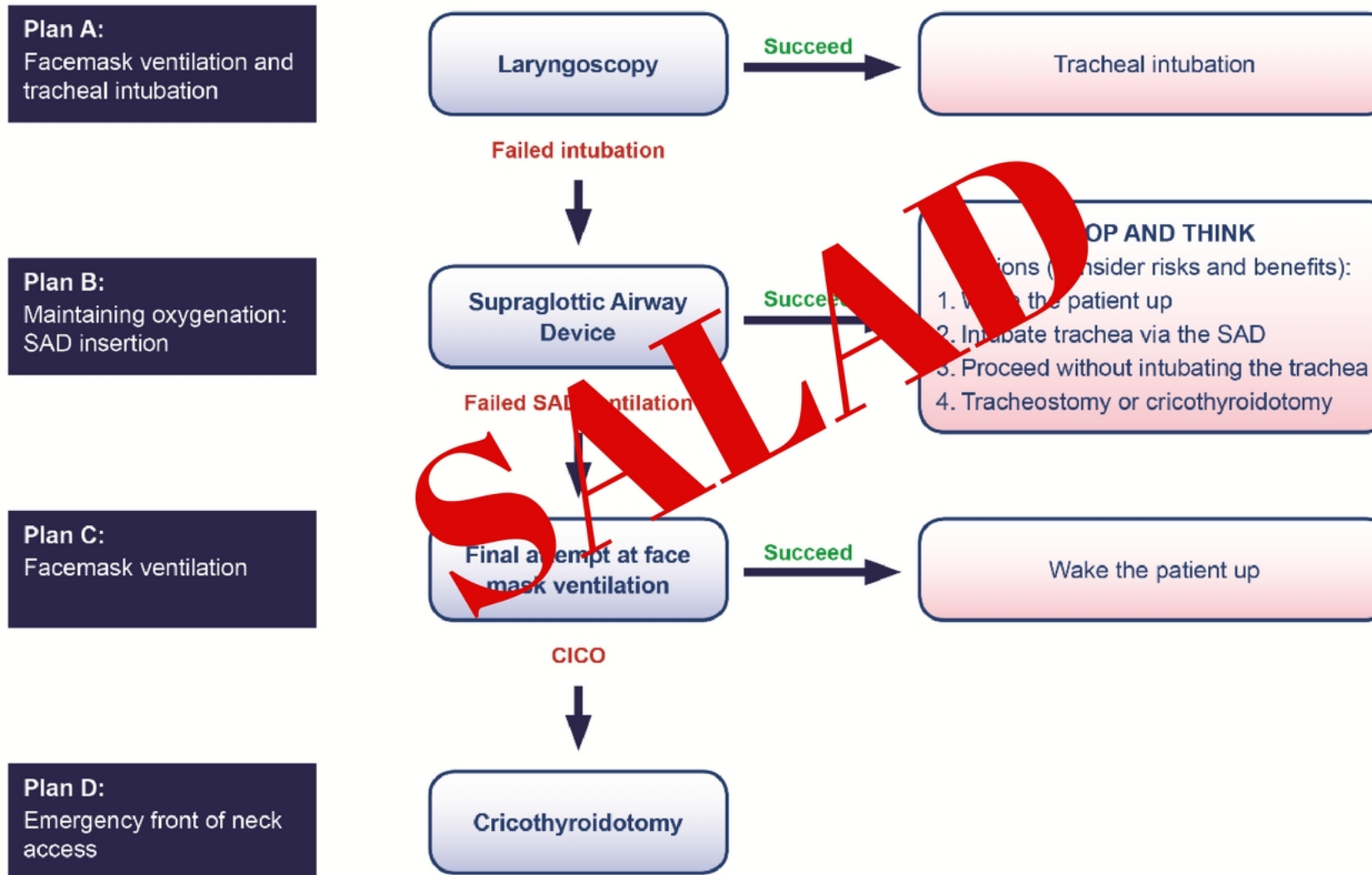
ROVESCIO

DELLA

MEDAGLIA

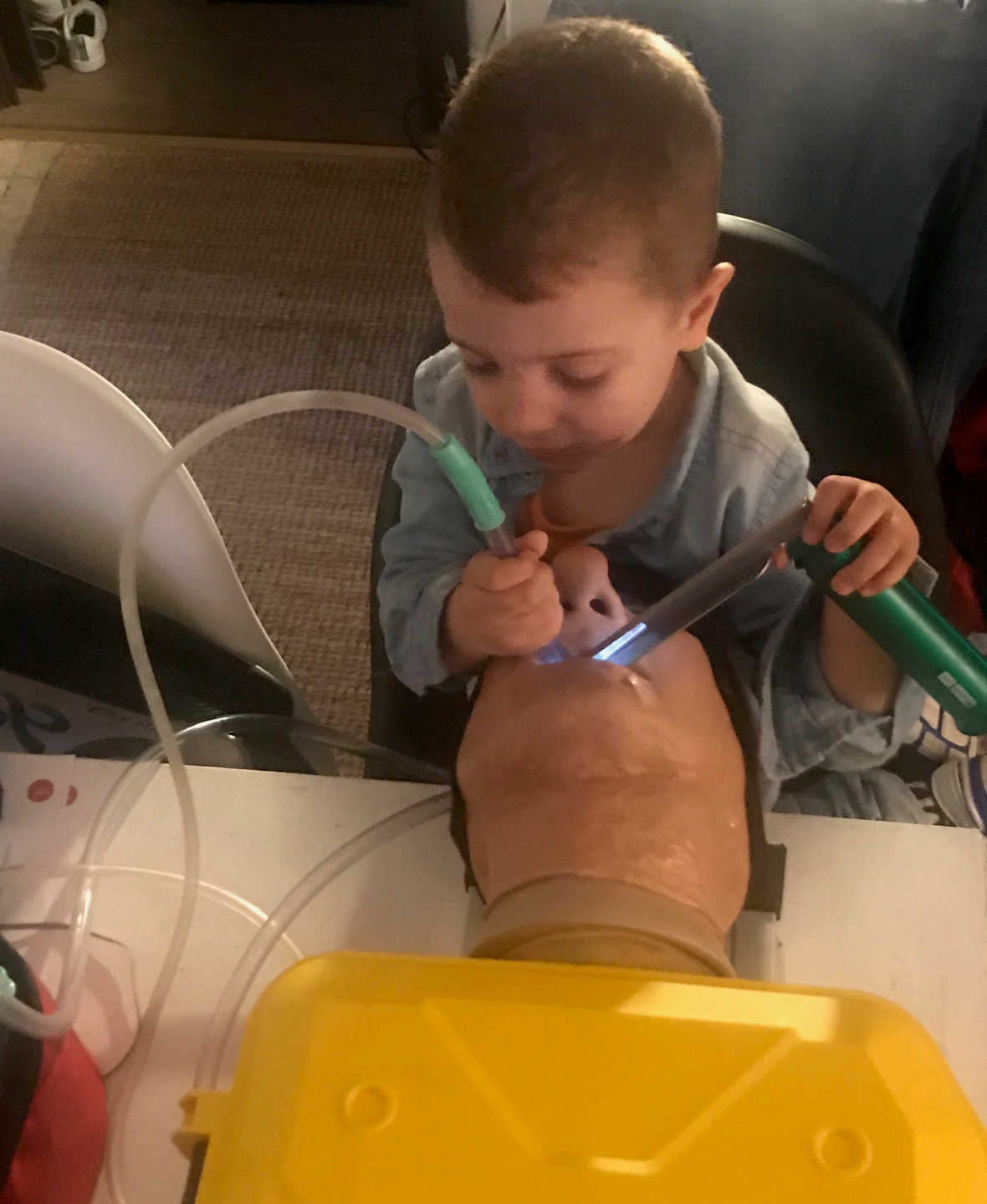
MTD 2008

DAS Difficult intubation guidelines – overview



Preparation

**PLAY
PRACTICE
PERFECT**



Incrementalize

**Small Simple Sound
Sequential Steps**



**KEEP
CALM
AND
SUCTION
ON**



smacc

social media and critical care

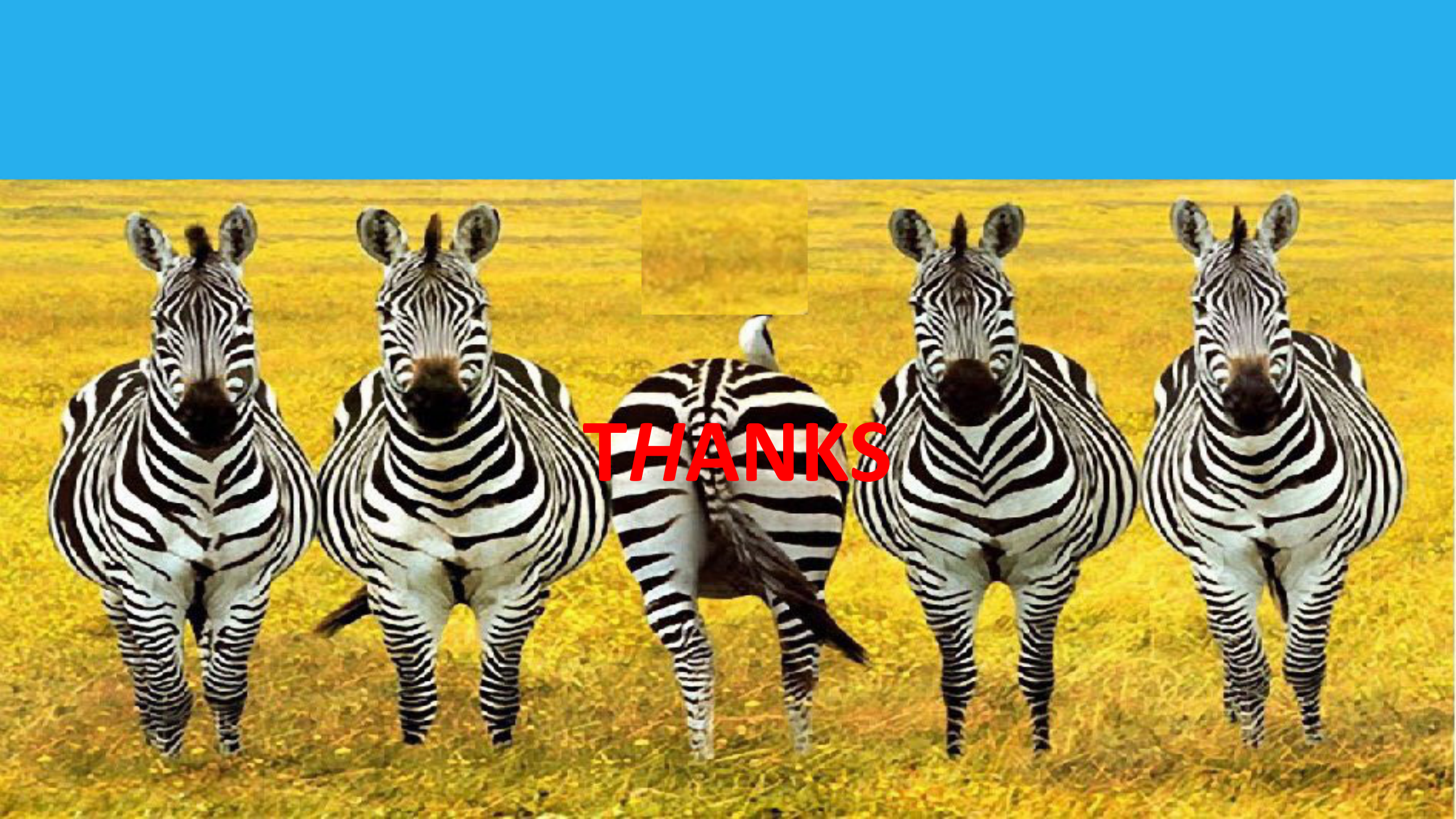


#FOAMED



intubatiEM





THANKS