

AIRWAY ROTATION BINDER

FELIPE URDANETA M.D.





Welcome to the Airway Rotation at the NFSGVHS

I am delighted you are taking part of this rotation. The goal is for you to acquire tools for life-long learning. We have two primary and equally important missions: 1-Patient care with regards to airway management and, 2-Education. Advanced Airway management training is a relatively new concept directed at acquisition, refinement and maintaining skills and knowledge regarding airway management topics. The curriculum of this rotation is designed for either a two or four week rotation. We will only be paired in the O.R a limited number of days (this unfortunately is totally out of my hands). We therefore need to optimize your rotation to the maximum. My goal is to make you better, and for you to approach and think differently about airway management. In this short period of time you will be allowed to achieve graded responsibility and will increase your knowledge and skills in advanced adult airway management techniques and topics. By the end of the rotation, if you follow the instructions, follow the lecture podcasts, answer the questions of the binder and read the recommended material, you will gain greater knowledge and increase your comfort and competency. The task will require in-house and home duties. The first task is for you to download the binder @ (<http://felipeairway.sites.medinfo.ufl.edu/files/2014/05/Airway-Rotation-3.1.pdf>). Here you will find a set of instructions and an overview of the material we will cover. You will see that each day has its own duties and a checkmark for each of the topics you will discuss with your attending; as well there is a final checklist of all the airway techniques and activities you have performed. The Airway blog (<http://felipeairway.sites.medinfo.ufl.edu>), will be a good start to find the references you need to read and you will also find the podcast lectures that you have to do on your own (you can also find them on iTunes in the Podcast section just search for Airway Educational Project). If the rotation gets cut short for any reason, unfortunately there will be topics and techniques we will not have the possibility to perform or discuss. The more effort you put into this the more you will benefit from it.

FELIPE URDANETA

Day #0 (Home)

1- Follow Podcast #1 in the Blog and go over your Pre-test questionnaire with your Staff Attending.

PRE-TEST

1-The most sensitive criteria to predict a difficult intubation is:

- a) Large neck circumference
- b) Mallampati > 2
- c) Thyromental distance < 3cm
- d) All of the above
- e) None of the above since they all have poor sensitivity and it depends on the individual patient and circumstance.

2-A patient on a heparin drip in the ICU needs ventilatory support. All of these devices are recommended to help ventilation, except:

- a) BiPAP
- b) One or two handed BMV
- d) Oropharyngeal airway
- e) Nasopharyngeal Airway

3-During an emergency intubation the use of a Videolaryngoscope is always indicated:

a)True

b)false

4-For an emergency airway scenario all these maneuvers are accepted and recommended except:

a)Call for help/assistance

b)Use of LMA

c)Use of rigid bronchoscopy

d)Use of tracheal tube stylets

5-The most sensitive method to detect correct ETT placement in the trachea is:

a)fogging and humidification of the tube

b)Hemodynamic response at intubation (tachycardia and hypertension)

c)Outward movement of the chest upon inspiration

d)Presence of exhaled CO₂

e)Auscultation of chest

6-After preoxygenation RSI fails. You obtain a grade III/IV view. What is the next best step?:

- a)Use a gum elastic bougie
- b)Change blades
- c)Place an LMA
- d)Attempt BMV
- e) Cricothyrotomy

7-A patient with prior history of radiation to the head and neck presents to the ED in severe respiratory distress. Which of the following is the most appropriate technique to secure the airway?:

- a)Sleep FOB intubation
- b)Retrograde intubation
- c)Intubation via ILMA under local anesthesia
- d)Awake tracheostomy under local anesthesia
- e)Awake FOB under local anesthesia

8-Each of the following is a recommended maneuver in the Non-emergent ASA DA algorithm branch except:

- a) Classic LMA
- b) Fastrach LMA
- c) Fiberoptic Intubation
- d) Transtracheal Jet-ventilation
- e) Light Wand



Day #1

1- Start using the Airway Checklist

2-Discuss with your staff ways the OOORAM (Out of the OR Airway Management) checklist could be improved.

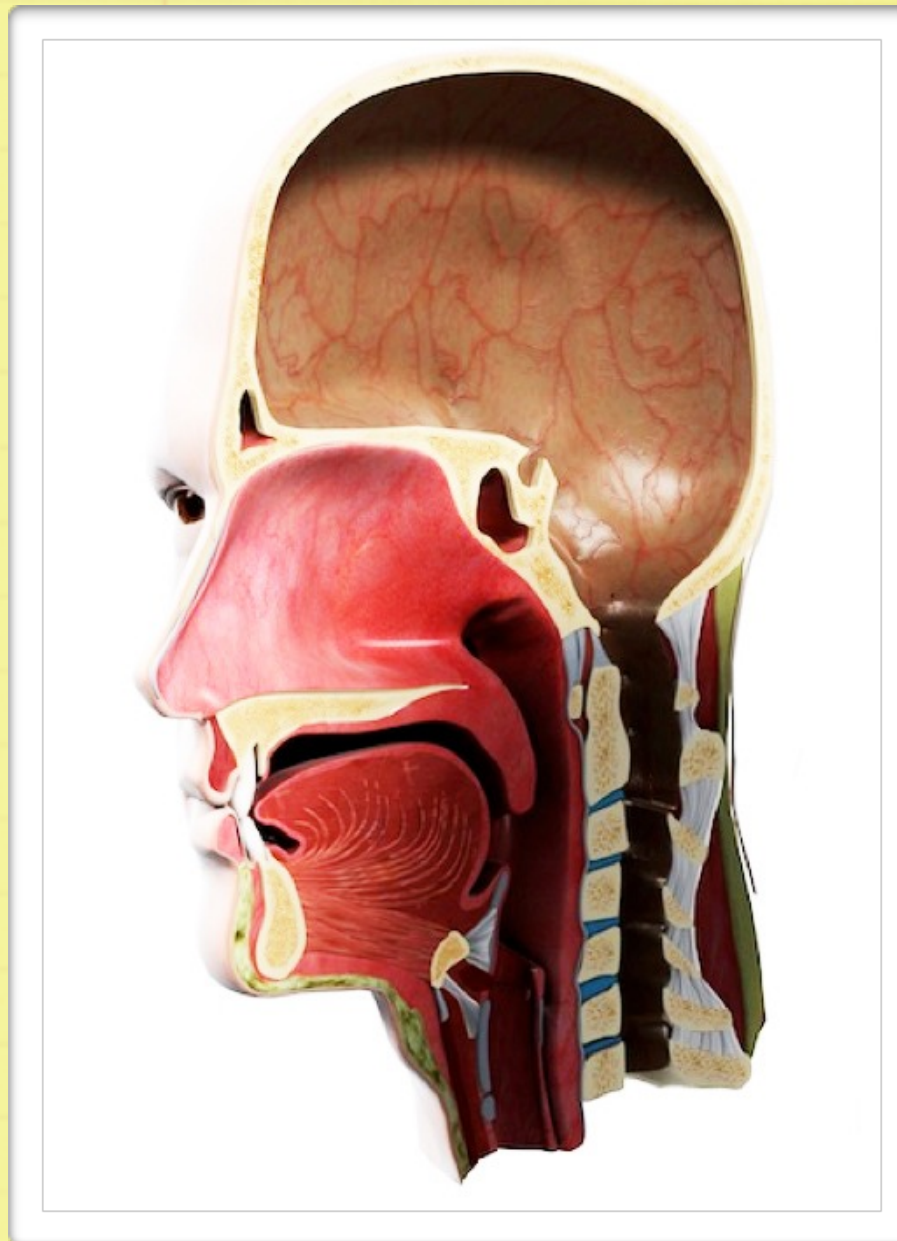
1-Discuss with your staff member some advantages of the use of the Anesthesia Checklist available @ (<http://felipeairway.sites.medinfo.ufl.edu/files/2009/12/2012-Urdaneta-3.pdf>)

2-Discuss with your staff member this OOORAM Checklist available @ (<http://felipeairway.sites.medinfo.ufl.edu/files/2013/11/OOORAM-Checklist-2.pdf>)

Day #2

1- Objective to understand basic anatomy of the airway and sensory innervation, relevant of course for awake intubation.

Anatomy of the Airway



1-I need you to define the boundaries of the nasopharynx, oropharynx and laryngopharynx and correlate them with respect of the cervical vertebrae?



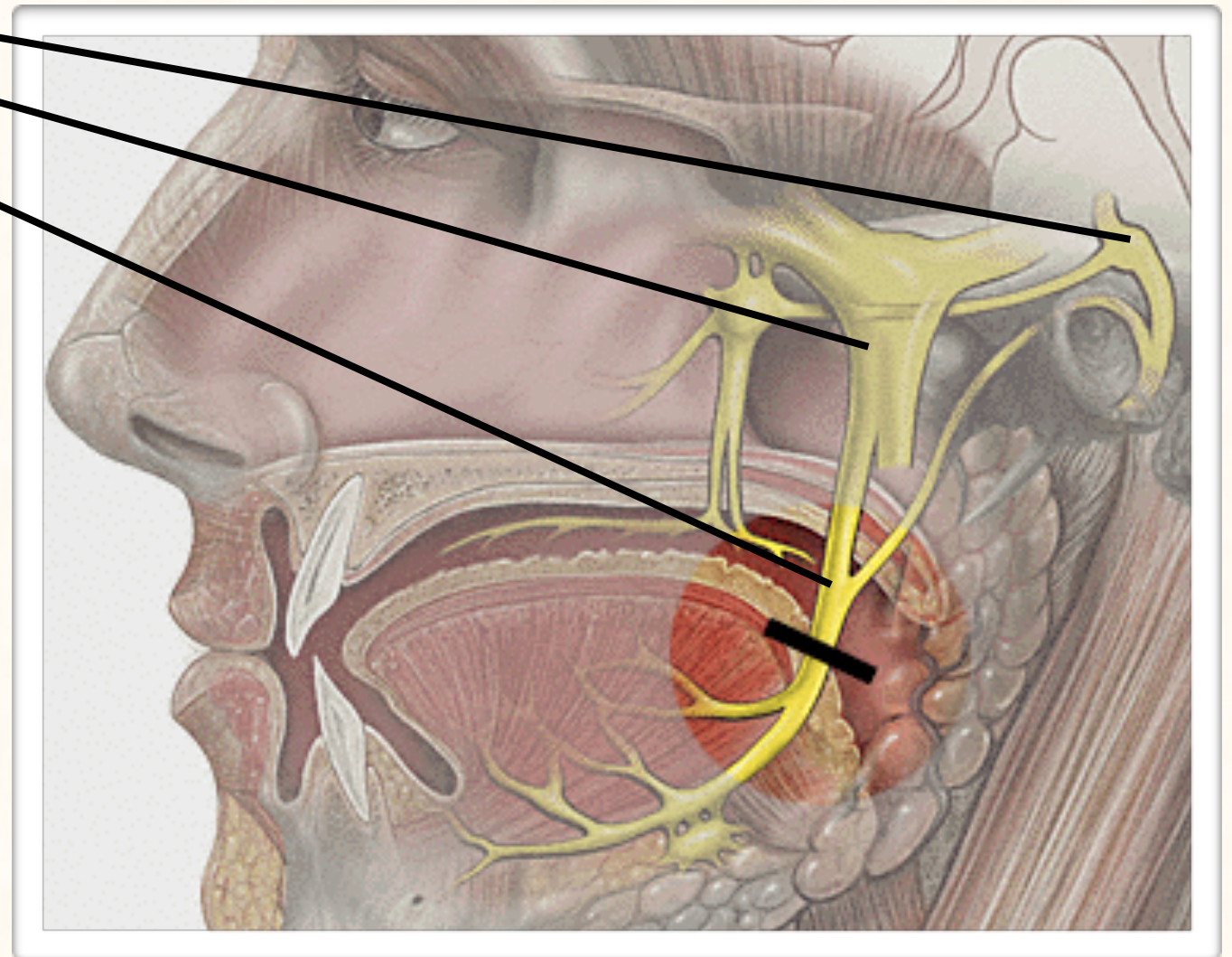
3-Identify the structures

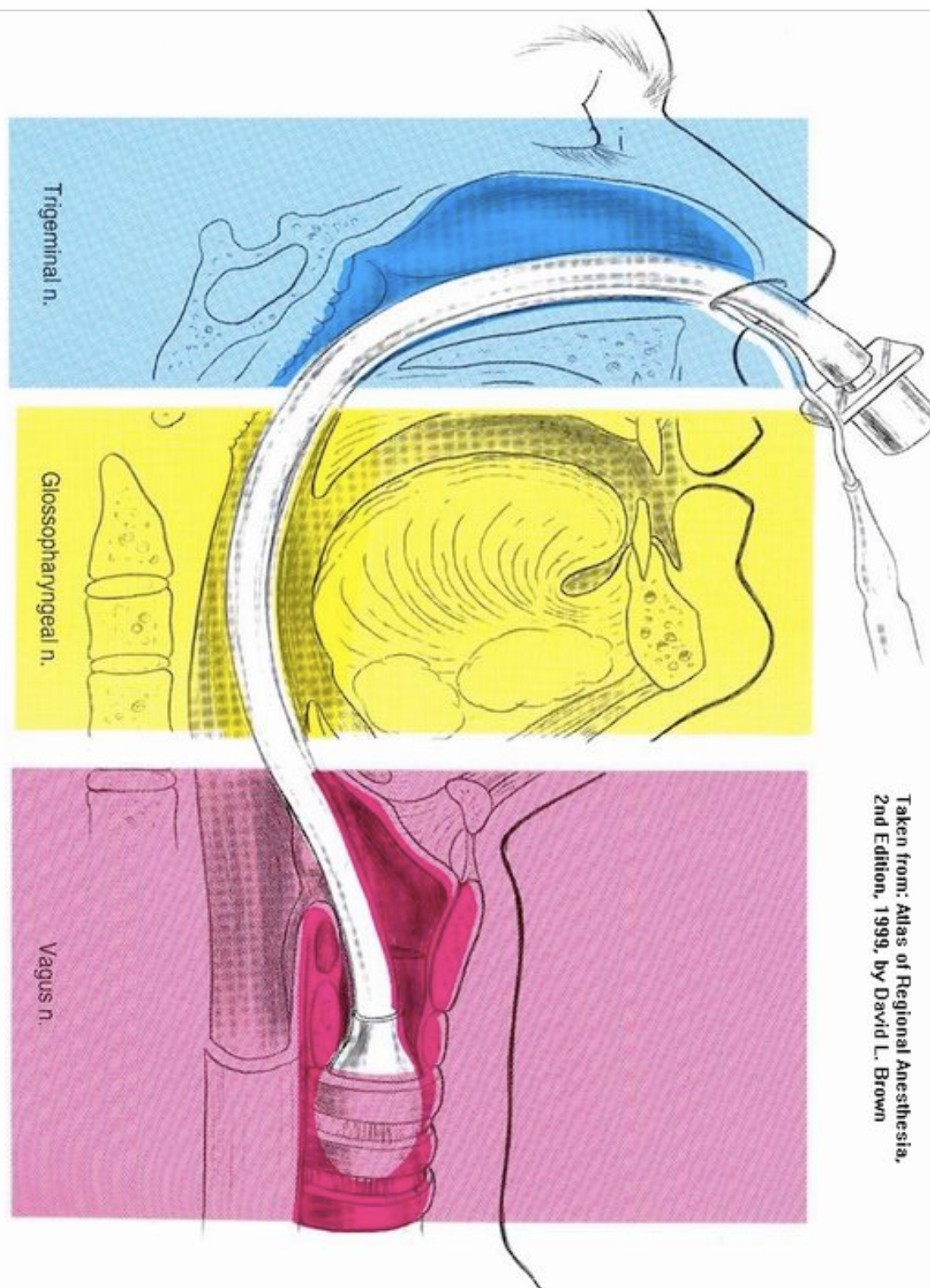
- 3.a Lingual nerve
- 3.b Trigeminal Ganglia
- 3.c Facial Nerve

3-Which of these two nerves supply sensory innervation to the nasal mucosa?

- a)Anterior ethmoidal nerve
- b)Maxillary nerve
- c)Both
- d)None of the above

4-Can you describe the Kratschmer reflex and why it could be important for nasal surgery?





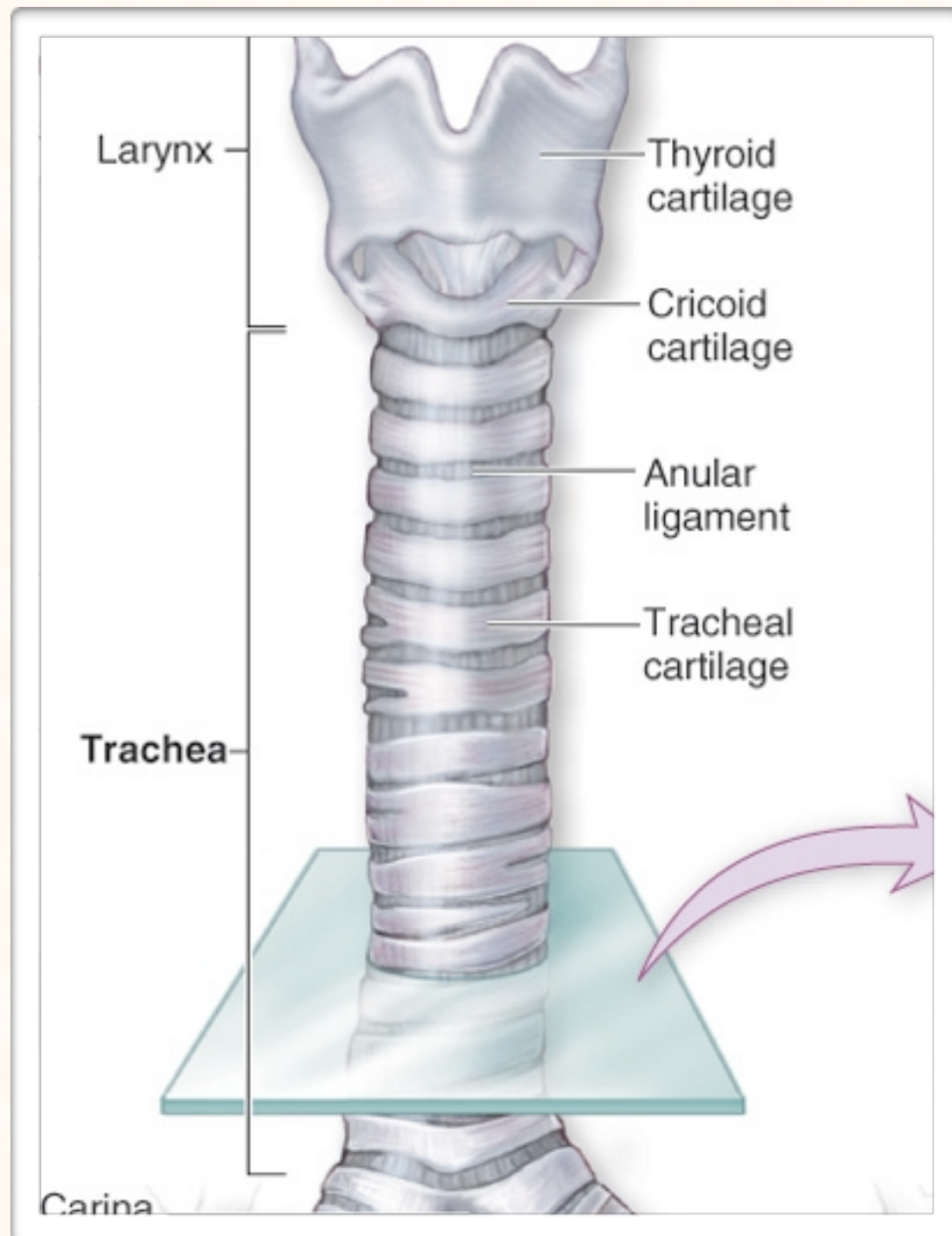
5-Can you provide at least two options to anesthetize the nasopharynx, oropharynx and laryngo-pharynx?

6-Name two structures supplied by the Superior Laryngeal nerve (SLN)

7-Do you anesthetize the External or Internal branch of the SLN to instrument the airway?

8-If you were to block sensory innervation from the posterior tongue base to as far down as the vocal cords which nerve would you block?

9-If you were to block sensory innervation to the larynx below the vocal cords which nerve would you block?



Stimulation of the superior laryngeal nerve endings in the supraglottic region can induce protective closure of the glottis. This phenomenon is a reflex a polysynaptic involuntary reflex.

10-Can you provide its name

11-Which population is mostly at risk

12- Which side of the recurrent laryngeal nerve is more likely to be involved with diseases of the chest and damaged during surgery due to its proximity to many intrathoracic structures?

13-In adults how many average rings does the trachea have?

14-At which ring does the trachea become intra-thoracic?

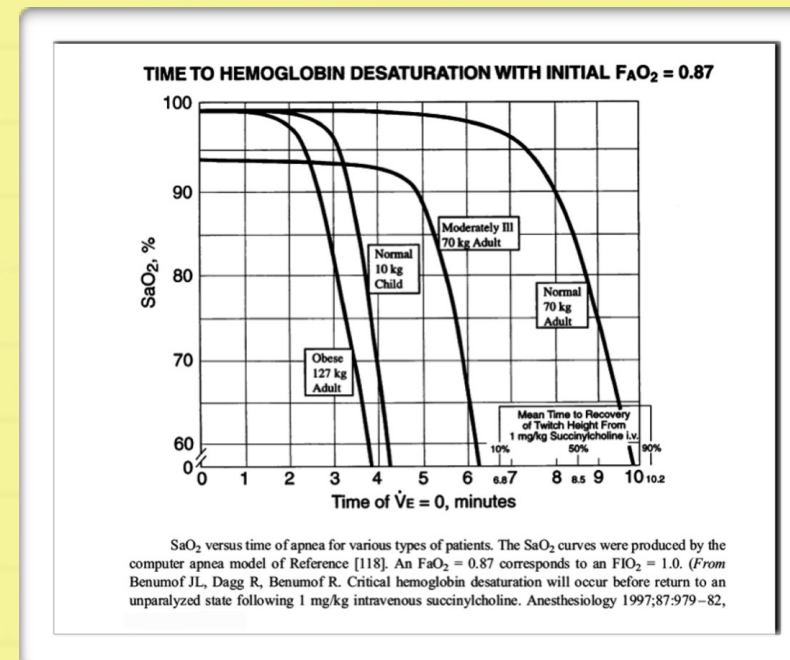
Day #3

1- Objective to complete Podcast #2 of the Airway Blog

2-Please be prepare to discuss with me the relevance of Pre-oxygenation.

3-Please think about the se issues with regards of emergency airway management.

1-Can you discuss with your staff member the meaning of this famous Benumof graph:



2-On what year was the original ASA D.A Algorithm published?

3-Can you discuss with your staff member the pharmacokinetics of Succinylcholine.

4-Discuss with your staff member whether to use full dose or 0.6 mg/Kg of Sux. for intubation. Is there any difference in effectiveness, can you analyze any study on the subject?



Day #4

1- Objective to complete Podcast #3 of the Airway Blog about preoperative evaluation.

2-Be prepare to discuss and be ready to defend your arguments with regards to relevance of airway Preop. evaluation.

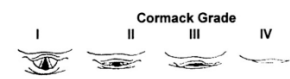
3-What is for you the top #3 goals of your evaluation process.

1-What is the IDS? Discuss it with your Staff member

IDS Score	Degree of Difficulty
0	Easy
0 < IDS ≤ 5	Slight Difficulty
5 < IDS	Moderate to Major Difficulty
IDS = ∞	Impossible intubation

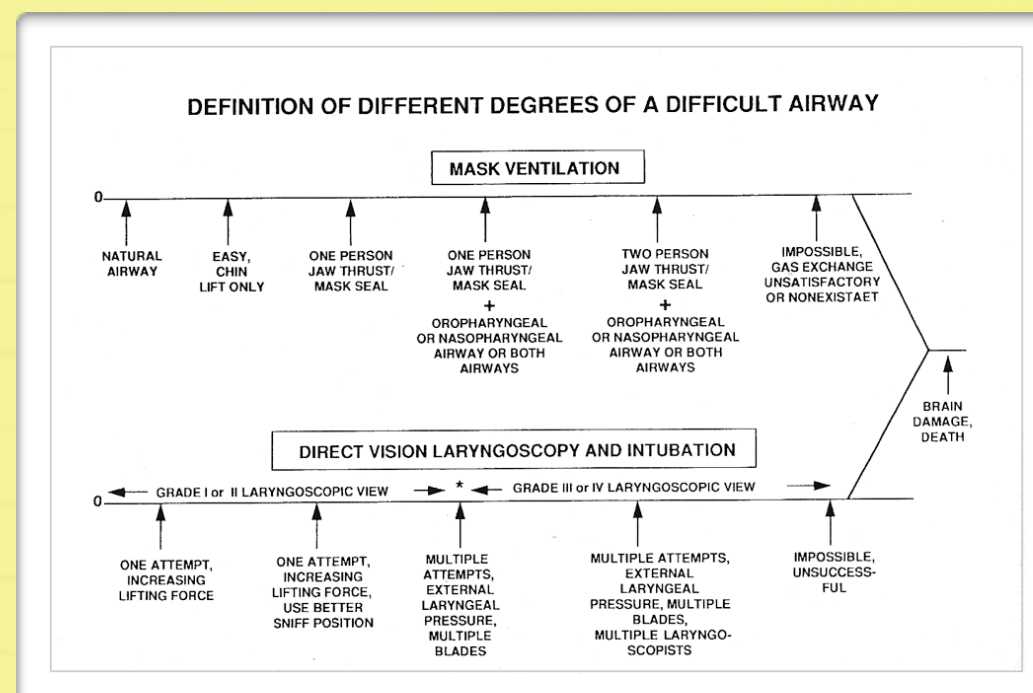
Rules for Calculating IDS Score:

N₁	Every additional attempt adds 1 pt.
N₂	Each additional operator adds 1 pt.
N₃	Each alternative technique adds 1 point: Repositioning of the patient, change of materials (blade, ET tube, addition of a stylette), change in approach (nasotracheal/orotracheal) or use of another technique (fibroscopy, intubation through a laryngeal mask).
N₄	Apply Cormack grade for 1st oral attempt. For successful blind intubation N ₄ = 0.
N₅	Selick's maneuver adds no points.
Impossible intubation:	IDS takes the value attained before abandonment of intubation attempts.



Cormack RS, Lehane J. Difficult tracheal intubation in obstetrics. Anaesthesia 1984;39:1105-1111.

3-Take a look at this graph. Can you discuss with your staff attending its significance



4-Can you discuss with your staff member these two classification systems:

Table 2. Simplified Score Model Described by Arné et al. (20) for Prediction of Difficult Intubation

Risk factor	Score
Previous knowledge of difficult intubation	
No	0
Yes	10
Diseases associated with difficult intubation	
No	0
Yes	5
Clinical symptoms of airway pathology	
No	0
Yes	3
IG and mandible subluxation	
IG ≥ 5 cm or SLux > 0	0
IG < 5.0 – 3.5 cm and SLux = 0	3
IG < 3.5 cm and SLux < 0	13
Thyromental distance	
≥ 6.5 cm	0
< 6.5 cm	4
Maximum range of head and neck movement	
More than 100°	0
About 90° ($\pm 10^\circ$)	2
Less than 80°	5
Mallampati score	
Class 1	0
Class 2	2
Class 3	6
Class 4	8
Total possible	48

IG = interincisor gap; SLux = subluxation (maximal forward protrusion of the lower incisors beyond the upper incisors).

Table 1. Wilson Risk Sum Score (1)

Risk factor	Level	Variable
Weight	0	< 90 kg
	1	90–110 kg
	2	> 110 kg
Head and neck movement	0	$> 90^\circ$
	1	About 90° (i.e., $\pm 10^\circ$)
	2	$< 90^\circ$
Jaw movement	0	IG ≥ 5 cm or SLux > 0
	1	IG < 5 cm and SLux = 0
	2	IG < 5 cm and SLux < 0
Receding mandible	0	Normal
	1	Moderate
	2	Severe
Buck teeth	0	Normal
	1	Moderate
	2	Severe

IG = Interincisor gap; SLux = Subluxation (maximal forward protrusion of the lower incisors beyond the upper incisors).

5- According to Lundstrom et.al (British Journal of Anaesthesia 107 (5): 659–67 2011) What was the sensitivity of the Modified Mallampati score in their study?



Day #5

1- Objective to complete Podcast #4 About D.A Algorithms.

2-Name #3 major differences between the DAS and the ASA algorithms.

3-Name #3 points of weakness with the latest algorithmic plan.

4-What is the Vortex method?

1-Discuss with your staff the major differences between the 1993 D.A Algorithms and the 2003 version.

2-Discuss with your staff some of the major differences in the British and ASA D.A Algorithm.

3-Discuss with your staff member some of the modifications you would like to see in the next version of the ASA D.A Algorithm.

4-Discuss with your staff member about the evolution of the concept and definition of D.A.

5-Discuss with your staff member the incidence of Failed Intubation in the General population.

6-Discuss with your staff member the incidence of Failed intubation in the OB population.



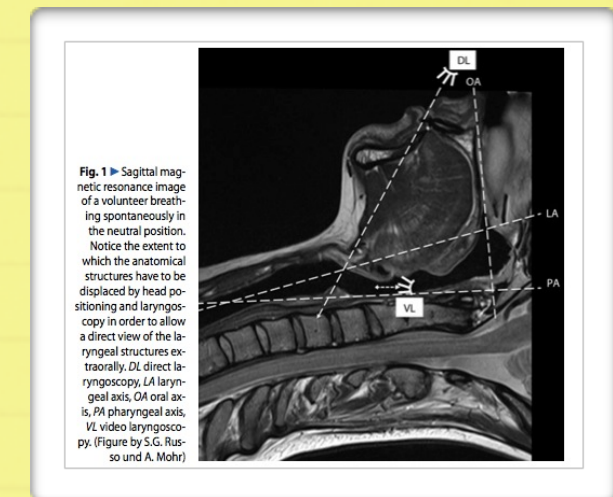
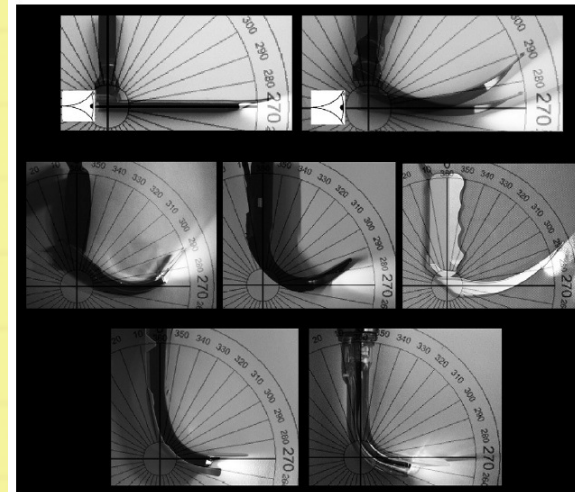
Day #6

1- Objective to complete Podcast #5 About Indirect Laryngoscopy.

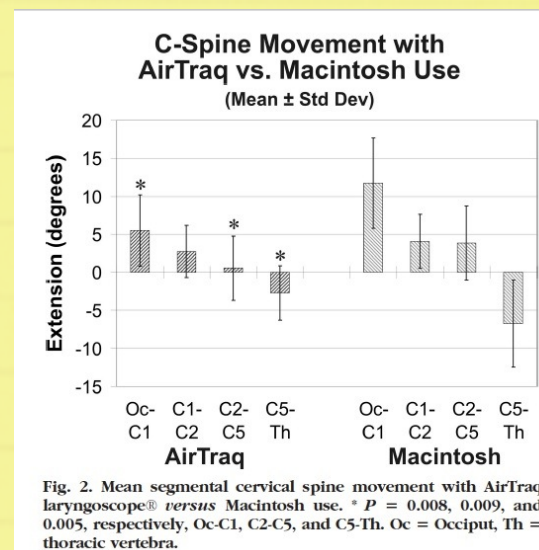
2-Give me #3 points of argument as to why we should use V.L more often.

3-What is your preferred device and why?

1-Discuss with your staff the following image obtained from [Ann Emerg Med. 2011;57:240-247 and Anaesthesist 2012 · 61:1017–1026
What are the implications?



2-Take a look at this graph. Can you discuss with your staff attending its significance? Taken from (Anesthesiology 2009; 111:97–101)



Day #7

1- Objective to complete Podcast #6 About the use of N.M Agents for Intubation.

2-Defend the argument that “you should never administer N.M agents for out of the O.R airway”

3-Give me #3 samples of cases in you should not use N.M agents.

1-Discuss with your staff 3 major advantages of the use of N.M agents for routine airway management.

2-Discuss with your staff 3 major disadvantages of the use of N.M agents for routine airway management.

3-Discuss with your staff member whether you are or not a BMV “checker” before administering N.M Agents.

4-Discuss with your staff member whether N.M agents should be used for out of the OR intubations. Always? Never? Sometimes? Why?



Day #8

1- Objective to complete Podcast #11 About Extubation Issues.

2-Think about your personal and Institutional attitudes towards extubation.

3-Give me #3 reasons why a plan must always be established before every extubation.

1-Discuss with your staff the 2012 DAS approach for extubation.

2-Discuss with your staff member the incidence and implications of Airway Complications on Extubation.

3-Discuss with your staff advantages, disadvantages and principles behind these three advanced extubation methods: **Deep extubation, Bailey Maneuver and Remifentanil use.**



Day #9

1- Objective to discuss the modern use of SGA's

2-Be prepare to defend your argument with me regarding your choice of of SGA use.

3-Defend your plan of action regarding the use of intubating SGA's.

1-Discuss with your staff the Chandy and the up and down maneuvers with the Fastrach LMA.

2-Discuss with your staff three controversial uses of SGA's in modern anesthetic management.

3-Discuss with your staff member the difference in the incidence of sore throat between SGA's and ETT's.

4- Discuss with your staff member the incidence of aspiration and compare between the use of SGA's and ETT's.

5- Discuss with your staff member the use of SGA's and PPV



Day #10

1- Objective to discuss the principles of Awake FOI.

2-Where do you think it is best to stand when you perform an AFOI?

3-Be prepare to defend your argument regarding your approach method, Nasal vs. Oral (advantages and disadvantages)

1-Discuss with your staff member about the 3 major steps recommended prior AFOI: Preparation, Psychological preparation, Desiccation. Any advantages to the use of Glycopyrrolate vs Atropine? Dose?

2-Discuss with your staff the controversial issues with regards to pharmacological support.

3-Discuss with your staff member the differences and effectiveness of airway anesthetizing methods.

4- Discuss with your staff member indications and contraindications of the oral vs nasal approach.

5- Discuss with your staff member the use of SGA's and as conduits for FOI.



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

1-In a recent Meta-analysis regarding the prognostic value of the modified Mallampati score, what were their reported findings? (BJA

107 (5);659:2011)

- a)90% specificity
- b)50% sensitivity
- c)35% sensitivity
- d)35% specificity
- e)None of the above

2-All Intrinsic laryngeal muscles are supplied by the RLN, except:

- a)Posterior cricoarytenoid muscle
- b)Lateral cricoarytenoid muscle
- d)Transeverse arytenoid
- e)Cricothyroid



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

3-A patient just underwent a total Thyroidectomy with bilateral lymph node dissection. Upon extubation are you more concerned with damage to which nerve fibers?

- a) Abductor Fibers
- b) Adductor Fibers
- c) Equally concerned
- d) Not concerned at all

4- Would you rather deal with a patient with complete bilateral RLN damage or a patient with incomplete RLN damage after a neck procedure:

- a) Complete
- b) Incomplete
- d) Equally concerned
- e) Not concerned at all



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

5-Sugammadex is a new selective muscle relaxant reversal agent that acts independently from cholinesterase inhibition. Which agents does it specifically reverse?

- a) Rocuronium
- b) Vecuronium
- c) Both
- d) Neither

6- Recommended Sugammadex dose to reverse a profound block is:

- a) 1-2 mg/Kg
- b) 2-4 mg/Kg
- d) >4 mg/Kg
- e) Not recommended for profound block



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

7-A recent study from the Netherlands points out a specific weakness of relying on Sugammadex for rescue of a CICV scenario
(Anaesthesia, 2010, 65: 936-941)

- a) Time of administration
- b) Time of mixture (preparation) of the drug
- c) Incorrect reversal dose
- d) All of the above
- e) None of the above

8- Based on your experience and preference which Algorithmic approach to D.A you rely upon the most:

- a) DAS (Anaesthesia 2004, 59:675-694)
- b) ASA (Anesthesiology 2013, 18 (2))
- d) Canadian Airway Focus Group (Can J Anesth 2013 60:1089-1118)
- e) Vortex Approach



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

9-Regarding the standard adult bougie that you used this month, what is the length, width and Coude tip angle

- a) 80 cm, 12 fr, 20 degrees
- b) 90 cm, 10 fr, 30 degrees
- c) 70 cm, 15 fr, 30 degrees
- d) None of the above
- e) All of the above

10- Based on your above answer, which is the smallest Adult ETT you can use a bougie with:

- a) 7.5 ETT
- b) 7.0 ETT
- c) 6.5 ETT
- d) 6.0 ETT
- e) 5.5 ETT



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

11-Regarding the 5.0 iGel SGA the following statement is true:

- a)It accepts up to a 7.5 regular ETT
- b)It accepts up to a 7.5 Hi-Lo Evac. ETT
- d)It accepts up to an 8.0 regular ETT

12- Regarding the 3.5 Air-Q SGA SGA the following statement is false:

- a)It should be used in patients between 50-70 Kg
- b)When the cuff is inflated the pressure should be no greater than 60 cm H₂O
- c)The Maximum size ETT one can use with this is an 8.0 ETT
- d)The Maximum size ETT one can use with this is an 7.5 Regular ETT
- e)The Maximum size ETT one can use with this is an 7.0 Hi-lo Evac. ETT



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

13-Regarding the 4.5 Air-Q SGA SGA the following statement is false:

- a)It should be used in patients between 70-100 Kg
- b)When the cuff is inflated the pressure should be no greater than 60 cm H₂O
- c)The Maximum size ETT one can use with this is an 9.0 ETT
- d)The Maximum size ETT one can use with this is an 7.5 Hi-lo Evac. ETT
- e)The Maximum size ETT one can use with this is an 8.0 Hi-lo Evac. ETT

14- Regarding the Cook Airway Exchange Catheter the following are its true dimensions:

- a)100 cm, 12 Fr
- b) 90 cm, 13 Fr
- c) 80 cm, 14 Fr
- d) 83 cm, 15 Fr
- e) 83 cm, 14 Fr



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

15-Regarding the Cook Extra Firm Exchange Catheter for double lumen ETT's, the following are its true dimensions:

- a) 100 cm, 12 Fr
- b) 110 cm, 11 Fr
- c) 100 cm, 11 Fr
- d) 100 cm, 13 Fr
- e) 110 cm, 12 Fr

16-Regarding the Cook Aintree Exchange Catheter, the following are its true dimensions:

- a) 60 cm, 20 Fr
- b) 56 cm, 19 Fr
- c) 65 cm, 20 Fr
- d) 60cm, 19 Fr
- e) 66 cm, 19 Fr



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

17-Regarding the Cook Arndt Airway Exchange Catheter with guide wire, the following are its true dimensions:

- a) 100 cm, 13 Fr
- b) 80cm, 14 Fr
- c) 70 cm, 14 Fr
- d) 90 cm, 13 Fr
- e) 110 cm, 12 Fr

18-Regarding the Cook Cuffed Cricothyrotomy set available at the GVA, the following are its true dimensions:

- a) 6 mm ID, 18 G/5.7 cm set
- b) 5.0 mm ID, 18 G/5.7 cm set
- c) 5.5 mm ID, 20G/ 5.7 cm set
- d) 6.5 mm ID, 118G/5.7 cm set



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

19-You get called to ED because a patient arrived with a Laryngeal Tube in place; the patient is adequately ventilated and oxygenated, but they want to exchange for an ETT; Your best approach is:

- a) Pull the LT out and intubate
- b) Extraluminal approach using VL of your choice
- c) Endoluminal approach with FOS + Aintree catheter
- d) Endoluminal approach with FOS + Arndt exchange catheter

20-You get called to ED because a patient arrived and is suspected to have Angioedema; the patient is adequately ventilated and oxygenated but struggling a bit. Your best approach is:

- a) RSI and small ETT
- b) VL small ETT
- c) ENT consult + Surgical approach in the ED
- d) Transport to OR, AfOI nasal approach, prep. the neck
- e) Transport to OR, AfOI oral approach, prep the neck



Day #11

1- Objective to evaluate whether your reading was adequate and you have a broader depth of knowledge.

POST-TEST

21-You are in charge of a patient scheduled for Panendoscopy with prior history of partial glossectomy + radiation + chemotherapy, due to cancer. He got lost in the follow up and now is back and it appears his cancer has recurred. He is a very difficult patient and ENT could not perform indirect exam in their office. What is the next best approach:

- a) RSI w/ VL or DL (your choice)
- b) AfOI via nasal route
- c) AfOI via oral route
- d) Inhalation Induction
- e) Pre anesthetic endoscopic assessment (PEAE)

Bonus question- You are scheduled to do a Lap. Chole. on a 290 lb, 5'7" man, who was a difficult intubation in 1990 and had to be admitted to the ICU afterwards. He remembers few details, but he states he lost two front teeth in the process. No other record is available. Your best approach is:

- a) RSI and small ETT
- b) VL small ETT
- c) AfOI and either nasal or oral approach
- d) Intubation via LMA
- e) DL or VL + Bougie



AIRWAY TECHNIQUES and DEVICES

- ☐ Glidescope Direct
- ☐ Glidescope Direct w/Bougie
- ☐ Glidescope
- ☐ C-Mac
- ☐ Airtraq
- ☐ Airtraq w/Bougie
- ☐ Pentax AWS
- ☐ Awake FOI
- ☐ Intubating LMA
- ☐ Supreme LMA
- ☐ iGel LMA
- ☐ Air-Q LMA
- ☐ Aintree Device
- ☐ ETT Exchanger
- ☐ Bailey Maneuver
- ☐ Laryngeal Tube
- ☐ Nasal Intubation
- ☐ Double Lumen ETT
- ☐ Invasive Options Didactic Session
- ☐ Jet ventilation Drill
- ☐ Anesthesia Check-List
- ☐ Extubation Plan
- ☐ DA/DI Letter
- ☐ Out of the OR Intubation
- ☐ Simulation Session

