

Why I Do What I Do

Induction of Anaesthesia

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Starting Out

Preop Assessment

- Patient history
 - pre existing diseases or conditions
 - chronic or acute
 - lab values
- Physical assessment
 - special concerns - cardiac, pulmonary are a good starting point
 - ABCs

Starting out

Room Setup

- Basic -SADMITT
- Suction - always needs to be available
- Airway - what's my plan, extras available, some very handy
- Drugs - out, paralyzed, comfortable, extras
- Machine - checked
- IV - functioning, will they need another, arterial line, central line
- Table - positioning
- Tapes - eyes, airway
- Extras for case - e.g tourniquet, warmer, pump medications

Preinduction

Patient mentality

- Want patient at ease and have confidence in anaesthesia
- How's their mentality, what works for them what do they need; TLC, humour, quiet confidence
- If there's a student or a learner I let patient know there will be shop talk
- Relatively quiet, I prefer most of the talking from the anesthetist
- If I'm assisting I'm pretty quiet. Tell patient what I'm doing to them
- Decide about arms restrained.
- If you spot something missing casually do or ask. E.g. turn on Oxygen

Positioning

- Do they need a ramp, mini ramp, reverse trendelenburg why?
airway access, preoxygenation
- Is patient comfortable before they go to sleep

PreOxygenation

- SO IMPORTANT! also called denitrogenation
- Who likes math? And anatomy and physiology
- Room air versus supplemental oxygen
- Lung volumes; residual volume, expiratory reserve volume, tidal volume, inspiratory reserve volume
- How much reservoir can we build up
- Mask seal, don't give up the seal, work on your mask technique
mask size, position, lube trick

PreOxygenation

- Patient reservoir; residual volume (RV), expiratory reserve volume (ERV) (about 2000-2500mls) = Functional Reserve Capacity (FRC)
- Room air 21% O₂, exhaled is ~16% so we'll use 20%
- $2,500 \text{ ml} \times 0.2 = 500 \text{ ml O}_2$ reservoir on room air
- O₂ need is $2\text{-}3 \text{ ml/kg/min} \times 70 \text{ kg} \times 3\text{ml/kg/min} = 210 \text{ ml/min}$ (say 200)
- $500\text{ml} / 200 \text{ ml/min} = 2 \frac{1}{2} \text{ min}$ (why we hear 3 min before severe damage)

PreOxygenation

- O₂ with a perfect seal approaches 100% (FiO₂ 1.0)
- 4-8 maximal breaths with 100% O₂ can approach 80% of functional residual capacity (FRC) being oxygen (FRC=RV+ERV)
- 80% of 2000ml = 1600ml O₂ - 8 minute supply
- 5 min of 100% O₂ > 90% = 1800ml or 9 minute supply
- this of course is in a perfect textbook world
- apnea absorption can deliver ~ 200ml/min if done properly

PreOxygenation

Impediment to the textbook

- Obesity - lung volumes are decreased d/t pressure on diaphragm and chest
- Suboptimal positioning
- Lung disease - do they have a restrictive disease or obstructive disease
- Poor seal - technique, claustrophobia, beard, improper mask size, face shape, talking

PreOxygenation

Impediment to the textbook

- Patient's O₂ requirement
- Our numbers are based on the healthy 70kg college student
- We have the morbidly obese 60 year old with a 40 pack year smoking history
- So... 150kg x 3ml/kg of O₂ need = 450ml/min not 200 ml/min our 8 min is now $8/2.25 = 3.55$ - 3 1/2 mins

PreOxygenation

Impediment to textbook

- Plus they probably have smaller lung volumes d/t restrictive disease and ineffective lungs d/t obstructive disease, and good chance for a beard
- As a guess lets cut that 3 1/2 minutes in half = 1 min 45 seconds
- Any other reasons for poor technique costs reservoir time and increased intrathoracic pressure from weight - ? increased or continuous exhalation
- Who hasn't seen someone start to desaturate in under a minute?

PreOxygenation



- We all have if we've done this for any length of time.
- So we need to mask - minimal stress if we're able to
- Or airway - ETT or LMA most likely - in and ventilate - minimal stress
- Can't ventilate, can't intubate. Not minimal stress.

PreOxygenation

Assessment

- Are you getting a good seal - fogging of mask, bag deflating and inflating with respiration (pop off valve - this can be one of those assist moments)
- If you have a good seal are you getting a decent ETCO₂ waveform
- Good tidal volume waveform and what are the volumes
- SpO₂ (saturation peripheral O₂ vs SaO₂ - arterial, SvO₂ - venous) ideally we're at a 100% but that doesn't tell us about our reservoir
- FiO₂ vs FeO₂ - are we washing away the nitrogen and building the O₂ reservoir - really like to see a FeO₂ of 0.8 or greater

Induction

- We've done a good a job as we can preOxygenating and we're ready for induction
- Meds have been chosen.
- Routine; lidocaine to decrease sting of propofol (alkylphenol - phenols irritate - vein endothelium)
- IV anaesthetic - usually propofol - maybe etomidate, ketamine
- Paralytic if appropriate - depolarizer (succinylcholine) or nondepolarizer (rocuronium)

Induction

- Once anaesthetic is in patient (drug in line is not in patient) patience and observation. Very poor cardiac function - low ejection fraction (EF) may take an extra minute to take effect. Easy to get impatient, give more drug and 60 seconds later wish you hadn't.
- Various technique on paralytic before checking if you can ventilate or not. Give before checking - you're going to intubate anyways. I like to check more for an idea how they will be to ventilate on wakeup. Will I be more comfortable or not doing a deep extubation vs need to be quite awake.

Induction

- Unconscious - check blink reflex to ensure and then tape eyes, possibly lube eyes
- Ventilate vs not ventilate (e.g. rapid sequence induction)
- Ventilation - if not easy change something such as positioning, add an oral airway - whatever makes it easier for me is better for the patient
- Another chance at preOxygenation
- Anything out of the norm - such as an n/g
- Let paralytic work if in play

Intubation

- LMA vs ETT
- If LMA I give a little time after initial unconsciousness to allow for a deeper state of unconsciousness - 3 sec to a minute
- Place LMA, check leak pressure

Intubation

easy

- ETT - sometimes easy, sometimes hard
- Easy - get a good view, hand the tube, can pull the corner of the mouth for more space, don't occlude view of glottis when handing the tube
- Pull stylet if in use - pull towards the toes
- Inflate balloon, pilot balloon doesn't need to be hard (<20mm Hg)
- If Lidocaine laryngojet used, mention if the whole thing doesn't come out
- Connect circuit (now it's more important to hang on to the tube). verify bilateral breath sounds

Intubation

- Tape tube in place in preferred position
- Comes in from centre or right, you may want to move to left side
e.g. right shoulder surgery
- If moving to left I ensure i get tongue out of way before moving the tube,
people have gotten ulcerations
- Tube not taped tight against corner of mouth
- I place tape and press, not stretch
- If moved, recheck breath sounds is a good idea

Intubation

- Variation with different tubes for different cases, e.g. nasal intubations, one lung ventilation with a double lumen tube (vs bronchial blocker, vs regular ETT driven deep), electromyography endotracheal tube (EMG) for thyroid surgery - recurrent laryngeal nerve monitor

Intubation

hard

- Be ready to assist, starting with masking, may need a two hand mask by one person and bag by the other
- If you can get a seal with two hands I prefer to be on the bag - gives me more feedback
- Intubating - may be simple help needed e.g. cricoid pressure (Sellick's maneuver) avoid with active vomiting, c-spine, laryngeal fracture
10 newton/1kg/2.2 pounds awake to 30 newton/3kg/6.6 pounds asleep
- More likely to want a BURP to help (backwards, upwards, rightward, pressure), brings the glottis more into view

Intubation

Hard

- be ready and thinking ahead to move along the difficult airway pathway
- positioning
- different airway - e.g. LMA, intubating LMA, smaller ETT
- different blade - miller vs mac blades, video laryngoscope
- fiberoptic bronchoscope
- bougie
- cricothyrotomy kit

Post intubation

- Positioning - help is appreciated and attention to detail
- Try to make as anatomic as possible
- Warming blanket, or blankets in place
- Is there anything else you can help with

Time for a ride on the



DIPRIVAN!