



① IV access

② Monitor → Basic non-invasive monitor

3 Cardiac:

1. Heart rate

2. BP

3. ECG

3 Respiratory:

1.

2. Res. Rate

3. n-tidal CO_2 (expiratory CO_2) → 35-45

③ Pre-Oxygenation / denitrogenation:

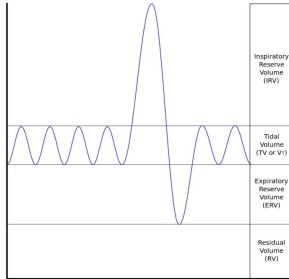
apply 100% pure O_2 3-5 min

why → atmosphere: 21% O_2 , 78% N_2

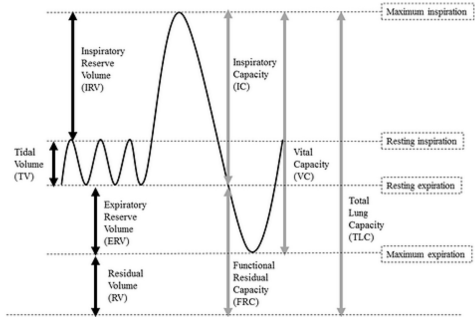
60, to replace the oxygen with nitrogen

Lung volumes

- **Tidal volume (TV) = 500 ml**
Vol. of air inspired or expired per each cycle of normal quiet breathing (eupnea)
 - **Inspiratory reserve volume (IRV) = 3000 ml**
Vol. of air which can be inspired by **maximum forced inspiration AFTER** normal inspiration.
 - **Expiratory reserve volume (ERV) = 1100 ml**
Vol. of air which can be expired by **maximum expiration AFTER** normal expiration.
 - **Residual volume (RV) = 1200 ml**
Vol. of air remaining in the lung after maximal expiration.
- Can't be tested by spirometry.



Lung capacities



1- Inspiratory capacity (IC):

- It is the volume of air that can be inspired by maximal inspiratory effort **After** the end of normal resting expiration

- $IC = TV + IRV = 500 + 3000 = 3500$ ml.

2- Expiratory capacity (EC):

- It is the volume of air that can be expired by maximal expiratory effort **After** the end of normal resting inspiration

- $EC = TV + ERV = 500 + 1100 = 1600$ ml.

3- Functional residual capacity (FRC):

- It is volume of air remaining in lungs after normal expiration.

- $FRC = ERV + RV = 1100 + 1200 = 2300$ ml.

Can't be tested by spirometry.

4- Vital capacity (VC):

- Volume of air expired maximally after maximal inspiration.

- $VC = IRV + TV + ERV = 3000 + 500 + 1100 = 4600$ ml.

5- Total lung capacity (TLC):

- Volume of air present in the lung at end of maximal inspiration.

- $TLC = VC + RV = 4600 + 1200 = 5800$ ml

Can't be tested by spirometry.

* Functional Residual Capacity → Volume remaining in the lung after normal expiration

Residual ← maximal

$$FRC = RV + ERV$$

$$= 1100 + 1200 = 2300 \text{ ml} \times 21\% = 480 \text{ ml}$$

Brain Death بعد 2-3 min بعد ما بيلت يغير

* 2.3L of pure O₂ كلهم O₂ بيل 500ml بيسير (480)

وهدول نرفلان LOC / apnea 5-7 min بكتوني

④ Medication

1. Induction of GA

* Maximum 4 types of medication :

- ① Benzodiazepine (analgesic) Short acting → Fast onset / Fast offset عشان المريض يتنام بسرعة ويجهي بسرعة
 - Midazolam - Short acting / sedative dose + General anesthetic dose
 - ↓ relaxed / drowsy ↓ long sedative effect
 - anterograde amnesia → منلا انقيه لمداد بعد صلا حاج يتذكر

② Phentamine (opioid)

- Strong opioid → surgical incision لعنى المريض بيقبل ال
- 100 time stronger than morphine

hypnotic agent ال dose بلكو ① + ② *

③ Propofol onset of action within 30 sec / Duration : 2-8 min

(Arm - Brain circulation)
once injected in the cannula → It reaches the Brain → LOC

Side effect: Res. depression, Res. arrest

↓ small dose ↓ general anesthetic dose

↓ RR, ↓ HR, ↓ BP المريض بطل يتنفس

بهاي لجانة بطل يتنفس ms. relaxant بطل يتنفس

فعل عملها :

- amnesia
- analgesia
- LOC

± muscle relaxation

* Endoscopic surgeries → ms. relaxant مطلوب
السلامة والسائلة

④ Muscle Relaxant

Onset 2-3 min

Duration 30-45 min typical Intermediate

تقل ما اعطيت ، اذا كنت بعضي Propofol وعمل Res. arrest ← لا يتم العمل Test ventilation
 ↓
 Jaw thrust , head tilt , manual ventilation [if easy to ventilate → بعضي ms. relaxant)
 difficult to ventilate → عملي لفترة عملت Ple oxygenation .

● Maintenance

mixture of gases صون بليس اعطي

Pure O₂ 100% ما يخلو

Maintenance of Hypnosis → ① propofol by infusion ;
 ② Inhalational agent

* العناية طولان الحزم من 45 min - سويدي اعطي maintenance of ms relaxant

بعضي dose اتق من اول dose

□ الان ندي اصحي المريض :

شو اعطيتيه ؟ ضاير من عطني ؟ شو من اثري بي اعطيه reverse ؟

• اعطيتيه Benzodiazepines اول ندي ، مش ضاير من اعطي لانه Small sedative dose

• بعديها اعطيت Opioids in adequate dose ... Opioids يعطي المريض مش ف Pain ← stable vital signs

+ Pupils dilated

antidot → naloxone انقاذ ، و اعطيتي نالوكس

• Propofol ← 2-3 min يعطي

ACh esterase inhibitor - neostigmine \leftarrow Ms. relaxant •

إذا برى الهمية خلال 45 m. إذا لم يفتح

و يعطى atropine لأنه يثبته من ال Heart Rec.

سبب ال عتال اول. عتال اول فاعله

ال reverse يغير ال تاعله tachycardia

بعدين يرجع ال base

مع ال extubation فاعله ال ms. power

Regular RR , good tidal volume ال
12-20 400-500