

INTUBASI ENDOTRAKEAL

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Definisi

Tindakan memasukkan pipa endotrakeal ke dalam trakea

Indikasi

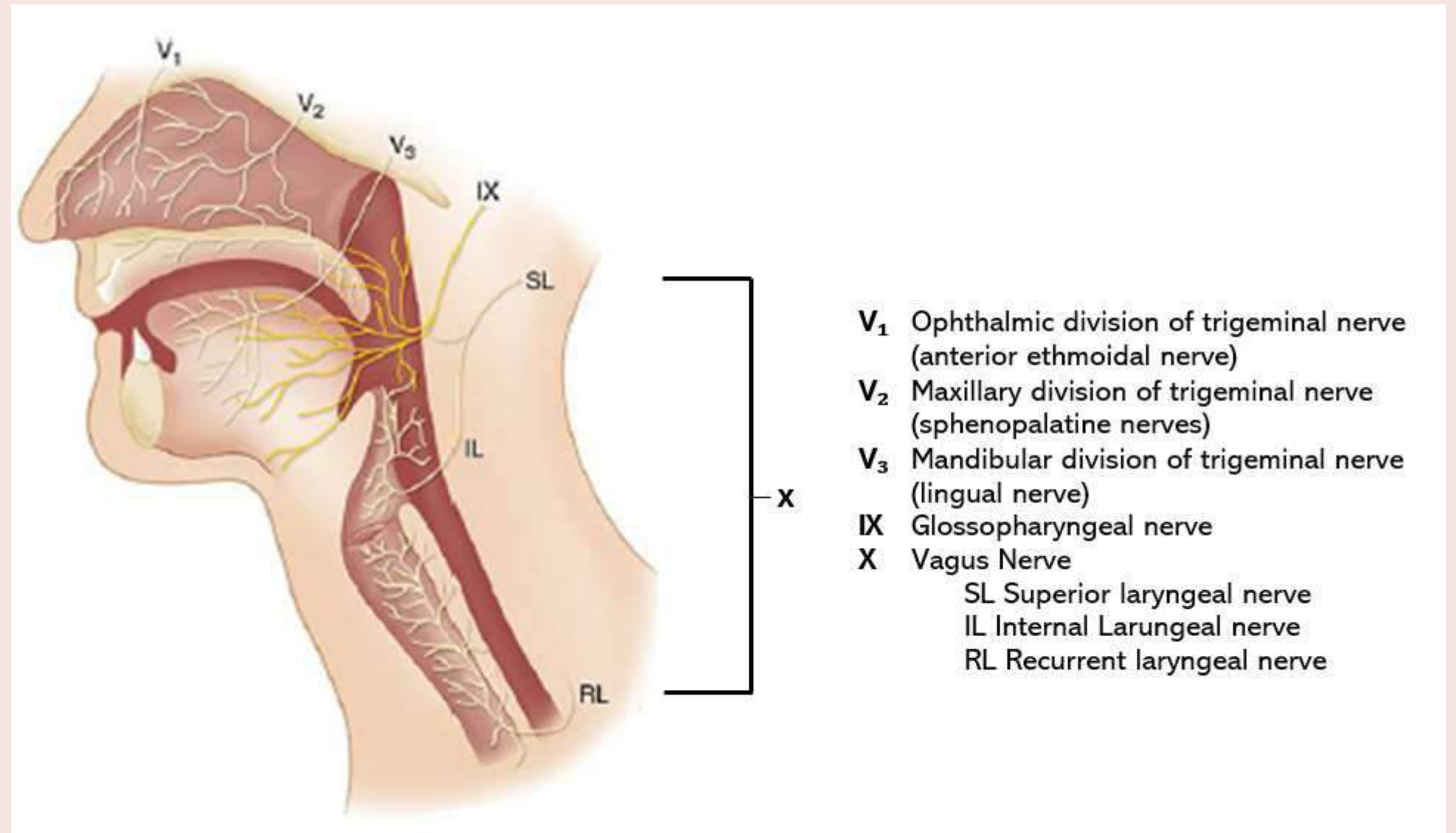
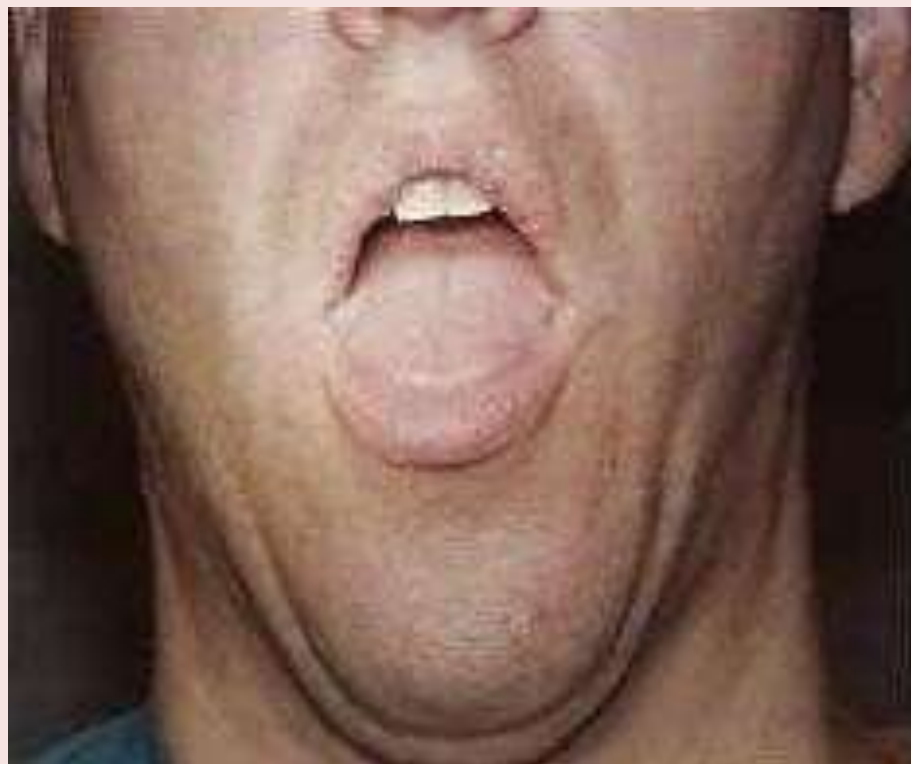
- Akses/patensi jalan nafas untuk ventilasi
- Henti nafas
- Obstruksi
- Terapi gagal nafas
- Suctioning
- Akses obat tertentu
- Mencegah aspirasi
- Pemberian obat anestesi inhalasi

Kontra Indikasi

- Penolakan
- Obstruksi hebat (traumatic/non traumatic)



Siap Intubasi?



Persiapan Pasien

Ventilasi :

- **M**ask seal difficulty : anatomi abnormal, luka, atau rambut (kumis, jenggot)
- **O**besity / **O**bstruction
- **A**ge > 55 tahun
- **N**o teeth
- **S**tiff lungs , **S**norning

Anticipating a difficult airway :

Look externally : trauma/burn/CA/blood/abnormality

Evaluate **3-3-2**

Mallampati

Obstruction : visible tumor/Xray

Neck mobility : susp. cervical trauma?

Mallampati



Persiapan Peralatan dan Obat

STATICS:

- S**cope : Laryngoscope, Stethoscope
- T**ube : Siapkan 3 nomor ukuran
- A**irway : Bagging, Face mask, OPT/NPT
- T**ape : Plester
- I**ntroducer : Stylet, Magill forceps
- C**onnecter : Alat penghubung
- S**uction, **S**yringe: Peralatan suction yang berfungsi baik.

Oral Endotracheal Tube Size Guidelines

Age	Internal Diameter (mm)	Cut Length (cm)
Full-term Infant	3.5	12
Child	$4 + \frac{\text{Age}}{4}$	$4 + \frac{\text{Age}}{2}$
Adult		
Female	7.0 – 7.5	24
Male	7.5 – 9.0	24

Persiapan Obat

Analgesia

- Topical LA – lidocaine
- Opioid Fentanyl 0.5-2mcg/kgbb IV – titrasi
- Ketamin?

Sedation

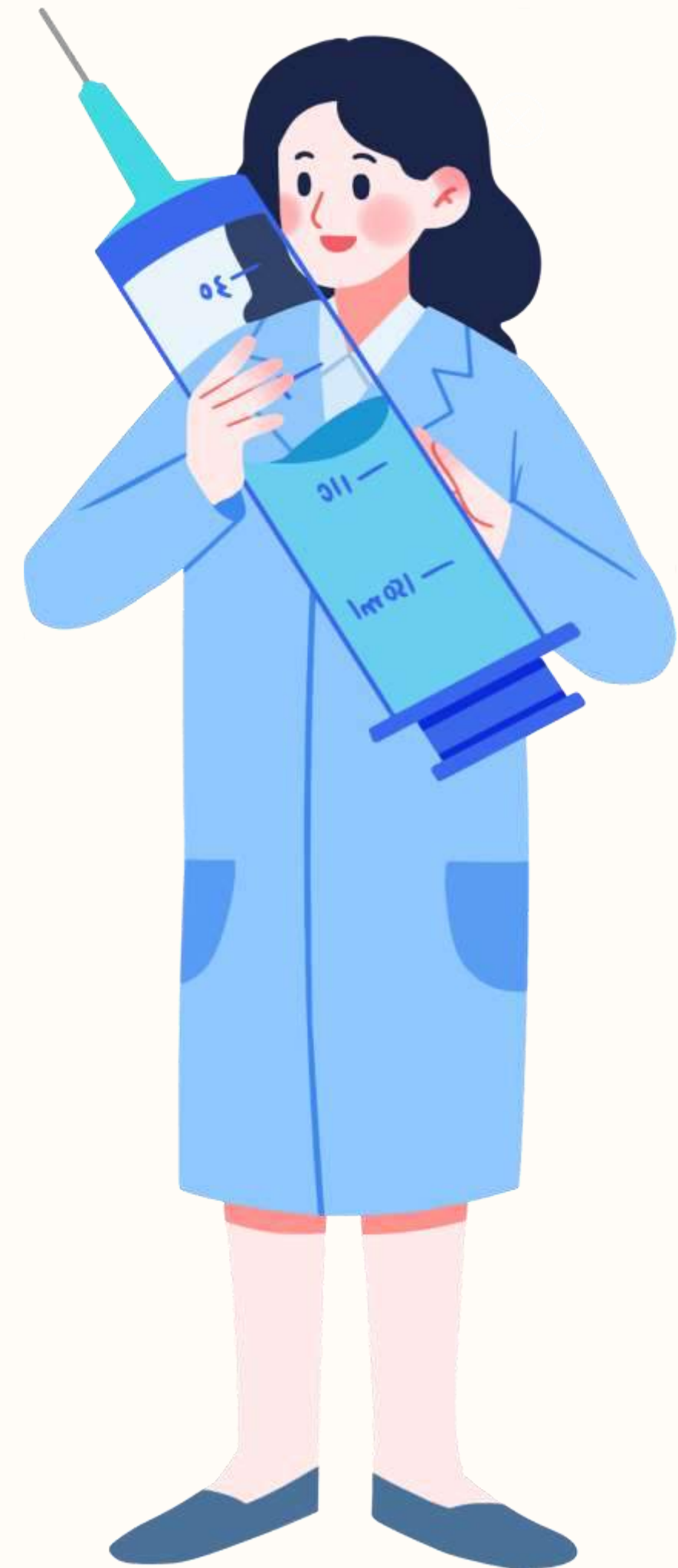
- Midazolam 0.1-0.3mg/kgbb IV - titrasi

OR

- Propofol 0.25mg/kgbb IV - titrasi

Neuromuscular blocker

- Rocuronium 0.6-1mg/kgbb IV or atracurium



Persiapan Tim



- Inform consent
- Pastikan tidak bekerja sendiri/*call for help*
- Pastikan akses IV lancer, obat dan alat berfungsi baik
- monitoring TD , SpO2, HR/ECG, capnograph
- Posisikan anggota TIM sesuai tugas
- Posisikan diri

Head and neck position and the axes of the head and neck upper airway

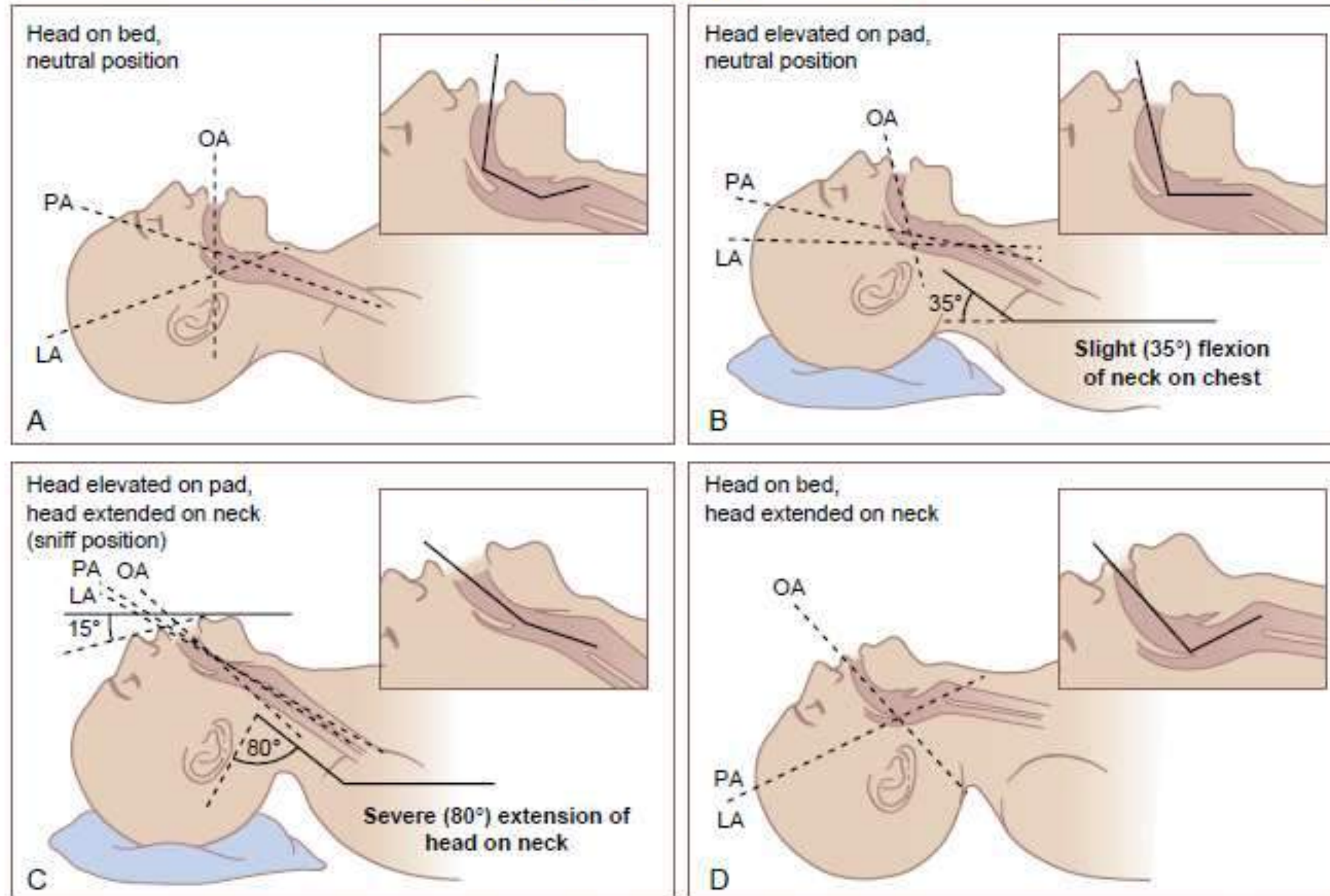
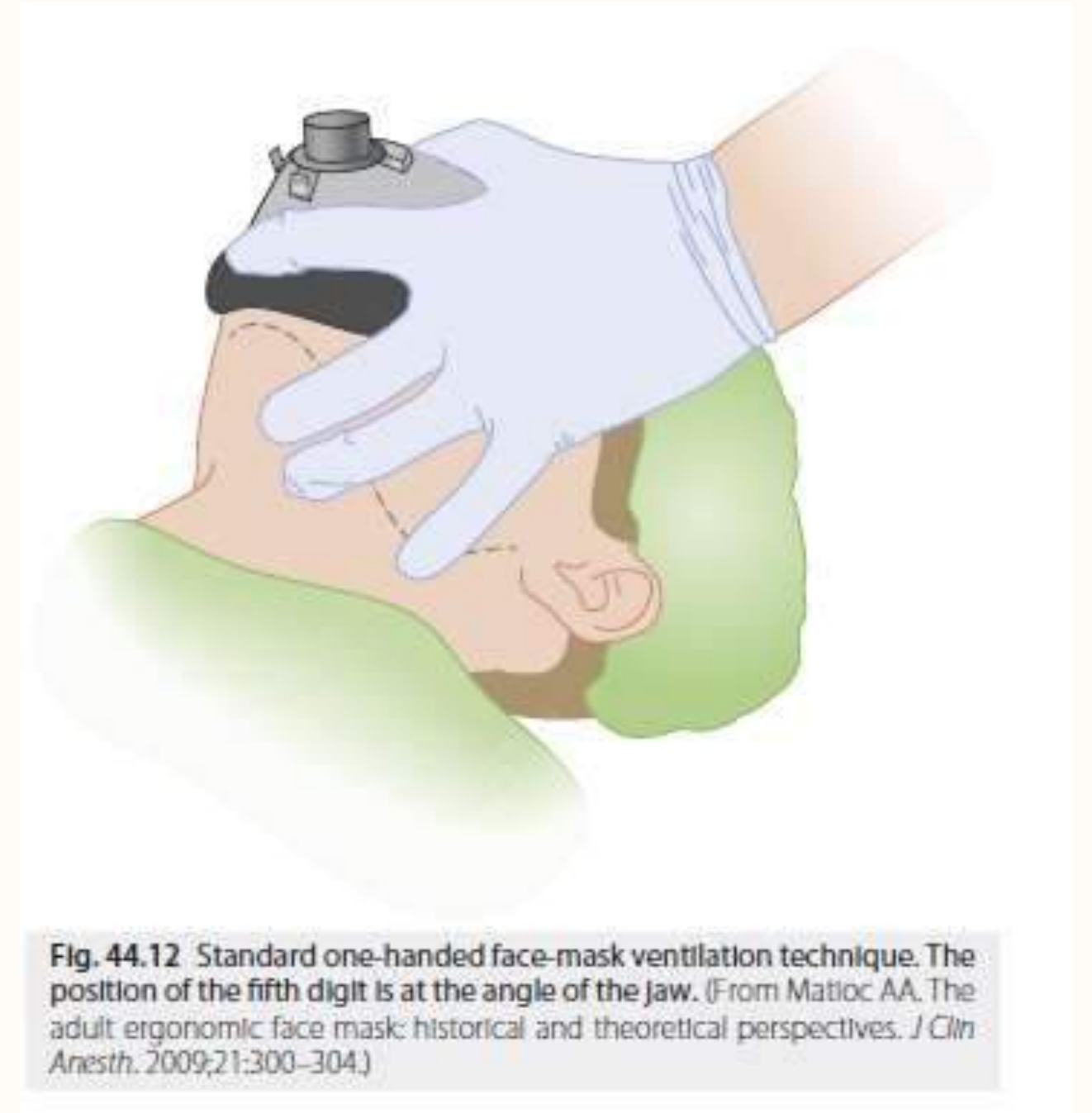


Fig. 44.18 Schematic diagrams show the alignment of the oral axis (OA), pharyngeal axis (PA), and laryngeal axis (LA) in four different head positions. Each head position is accompanied by an inset that magnifies the upper airway (oral cavity, pharynx, and larynx) and superimposes (*bold line*) the continuity of these three axes within the upper airway. (A) The head is in the neutral position with a marked degree of nonalignment of the LA, PA, and OA. (B) The head is resting on a large pad that flexes the neck on the chest and aligns the LA with the PA. (C) The head is resting on a pad (which flexes the neck on the chest). Concomitant extension of the head on the neck brings all three axes into alignment (sniffing position). (D) Extension of the head on the neck without concomitant elevation of the head on a pad, which results in nonalignment of the PA and LA with the OA. (From Baker PA, Timmermann A. Laryngoscopic tracheal intubation. In: Hagberg CA, Artime CA, Aziz M, eds. *Hagberg and Benumof's Airway Management*. 4th ed. Philadelphia: Elsevier; 2018.)

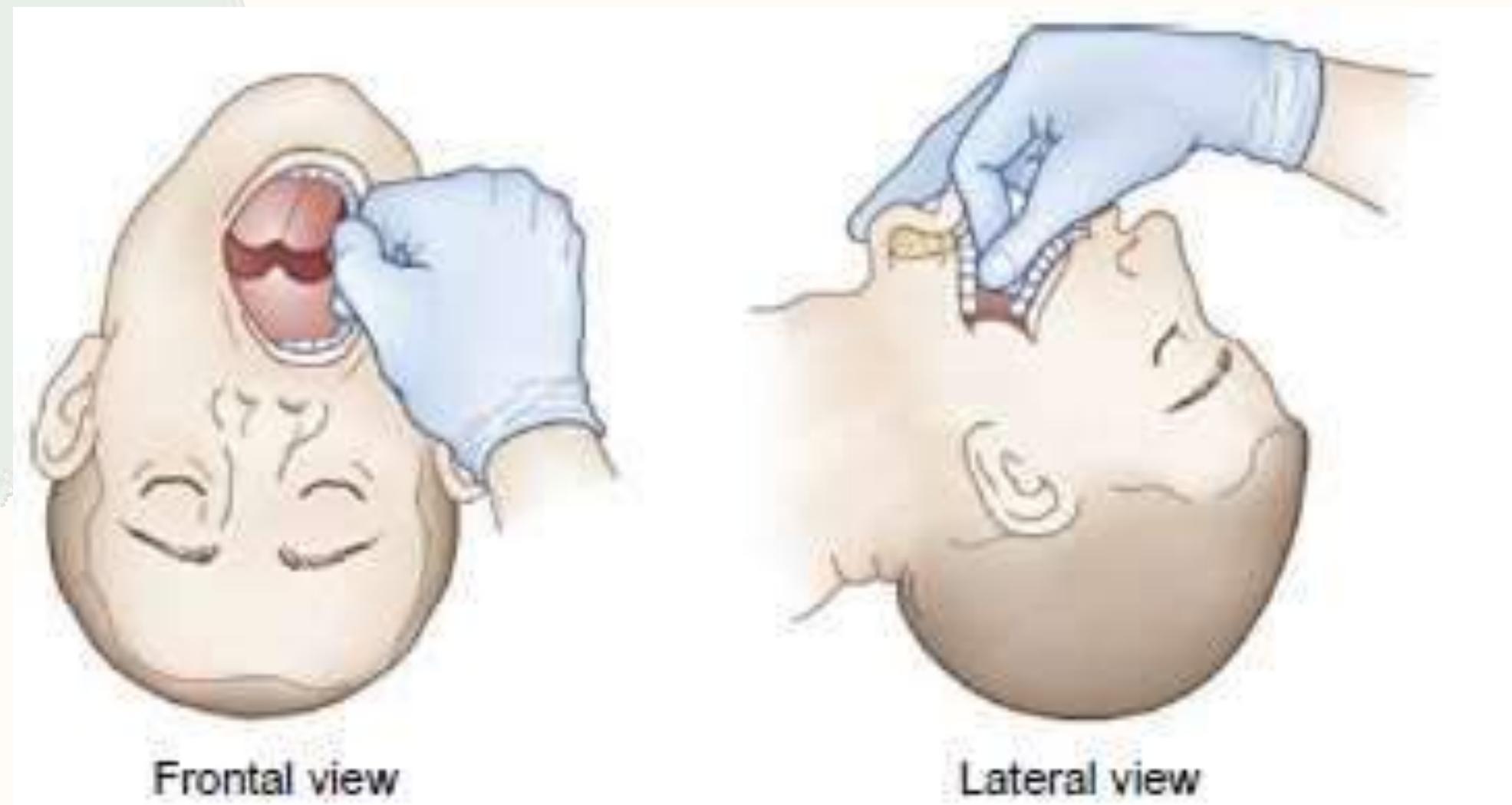
Prosedur

- Preoxigenasi : pilih ukuran masker yang sesuai, pastikan masker tidak ada kebocoran. Triple airway manuver, OPT/NPT. Oksigen 100% selama 3 menit. Pastikan dada terangkat



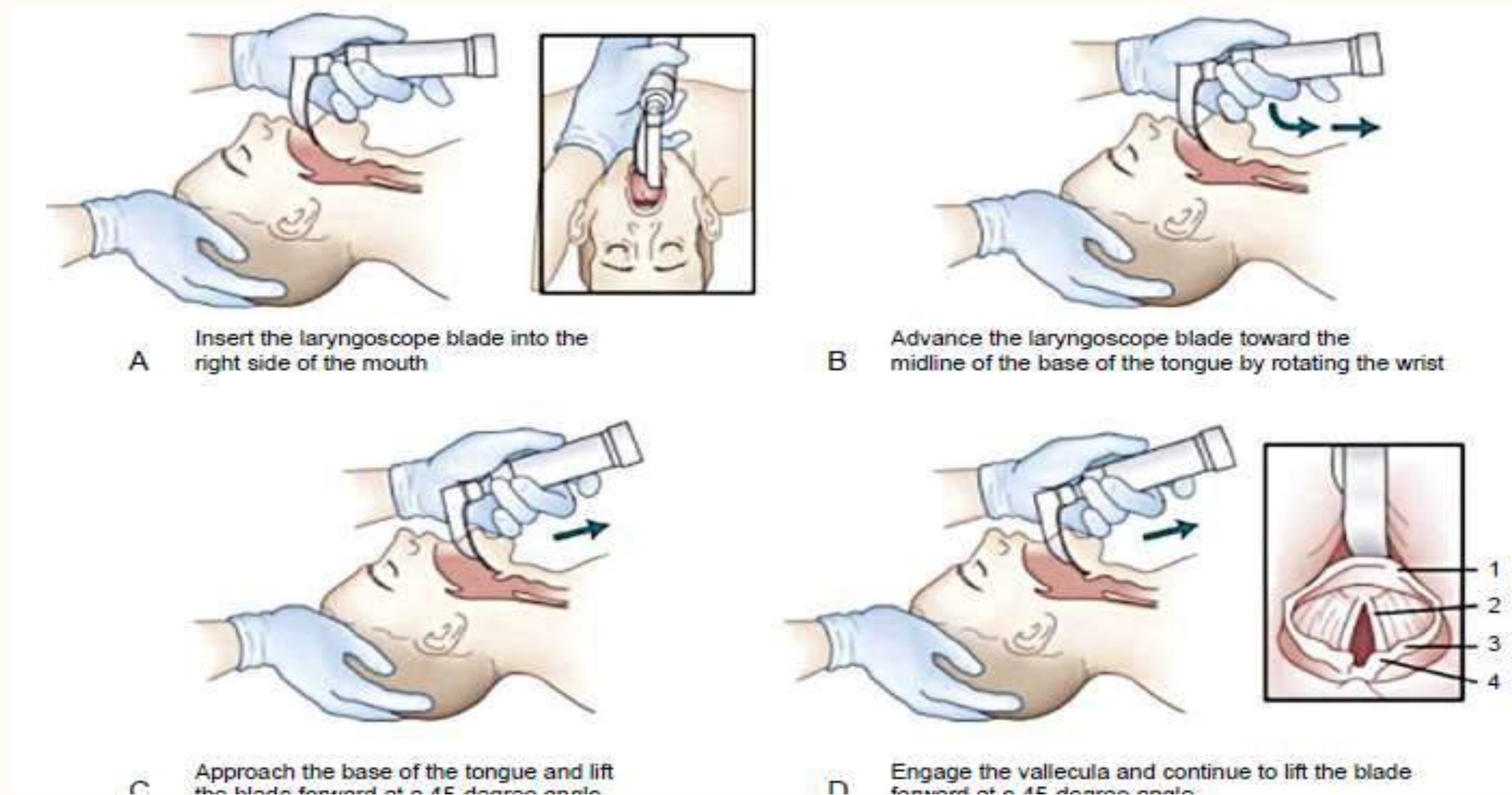
Prosedur

- Laringoskop dinyalakan di tangan kiri
- Buka mulut dengan tangan kanan, *cross finger* (ibu jari menekan mandibula ke bawah, jari telunjuk menekan maksila ke atas)



Prosedur

- Masukkan mulai dari sisi kanan kemudian menyingkirkan lidah ke kiri
- Cari epiglotis. Tempatkan ujung bilah laringoskop di valekula (pertemuan epiglotis dan pangkal lidah)
- Angkat epiglotis dengan elevasi laringoskop ke atas (jangan menggunakan gigi seri atas sebagai tumpuan) untuk melihat plica vocalis

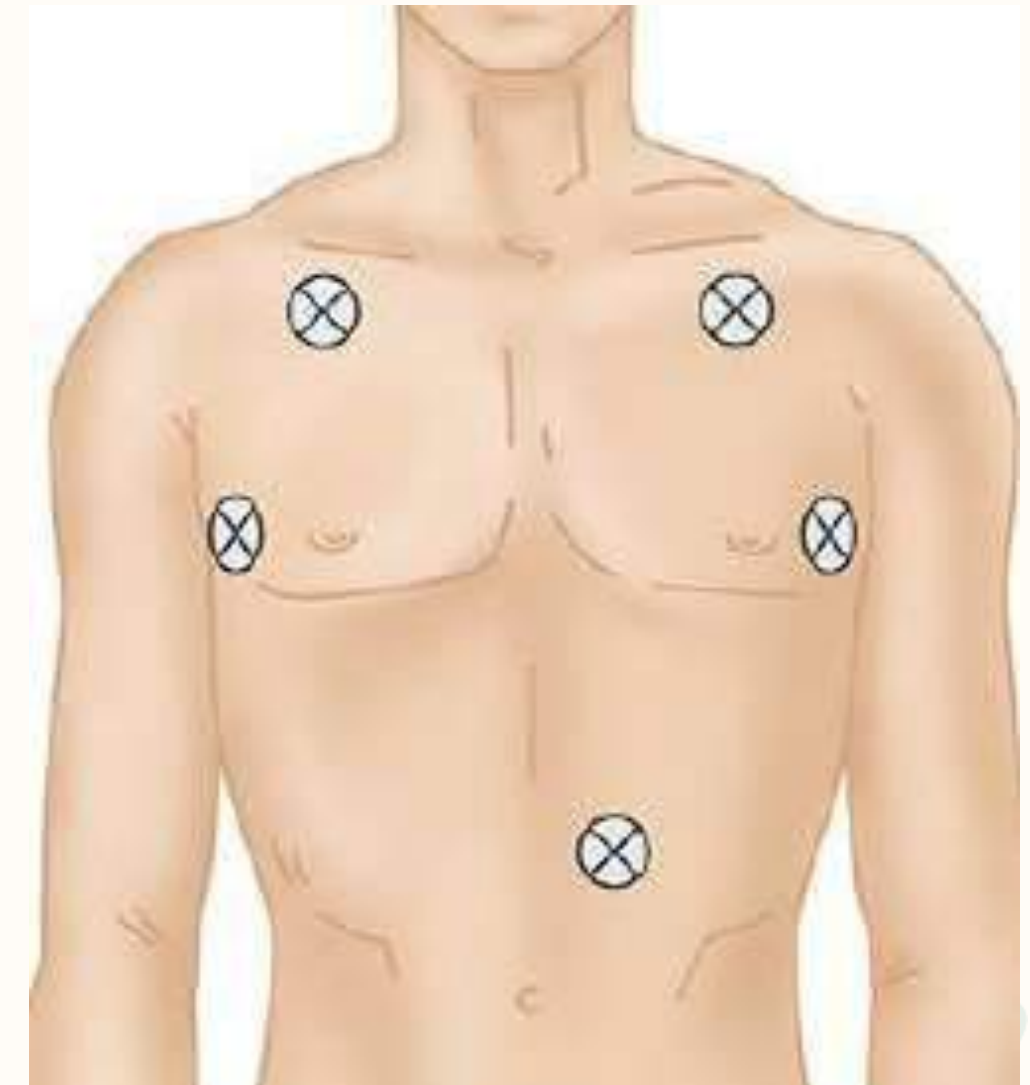


Cormack-Lehane grading scale



Prosedur

- Bila tidak terlihat, minta bantuan asisten untuk melakukan Backward Upward Rightward Pressure
- Masukkan ET sampai ujung proksimal *cuff ET* melewati plica vocalis
- Kembangkan *cuff ET* secukupnya (sampai tidak ada kebocoran udara, <25cmH₂O)
- Cek dengan cara memberikan VTP, lalu lakukan auskultasi di 5 titik.



Persiapan

- Setelah pasti diletakkan di trakea, pasang OPA supaya tidak tergigit oleh pasien
- Fiksasi



Komplikasi Intubasi

Selama
Intubasi

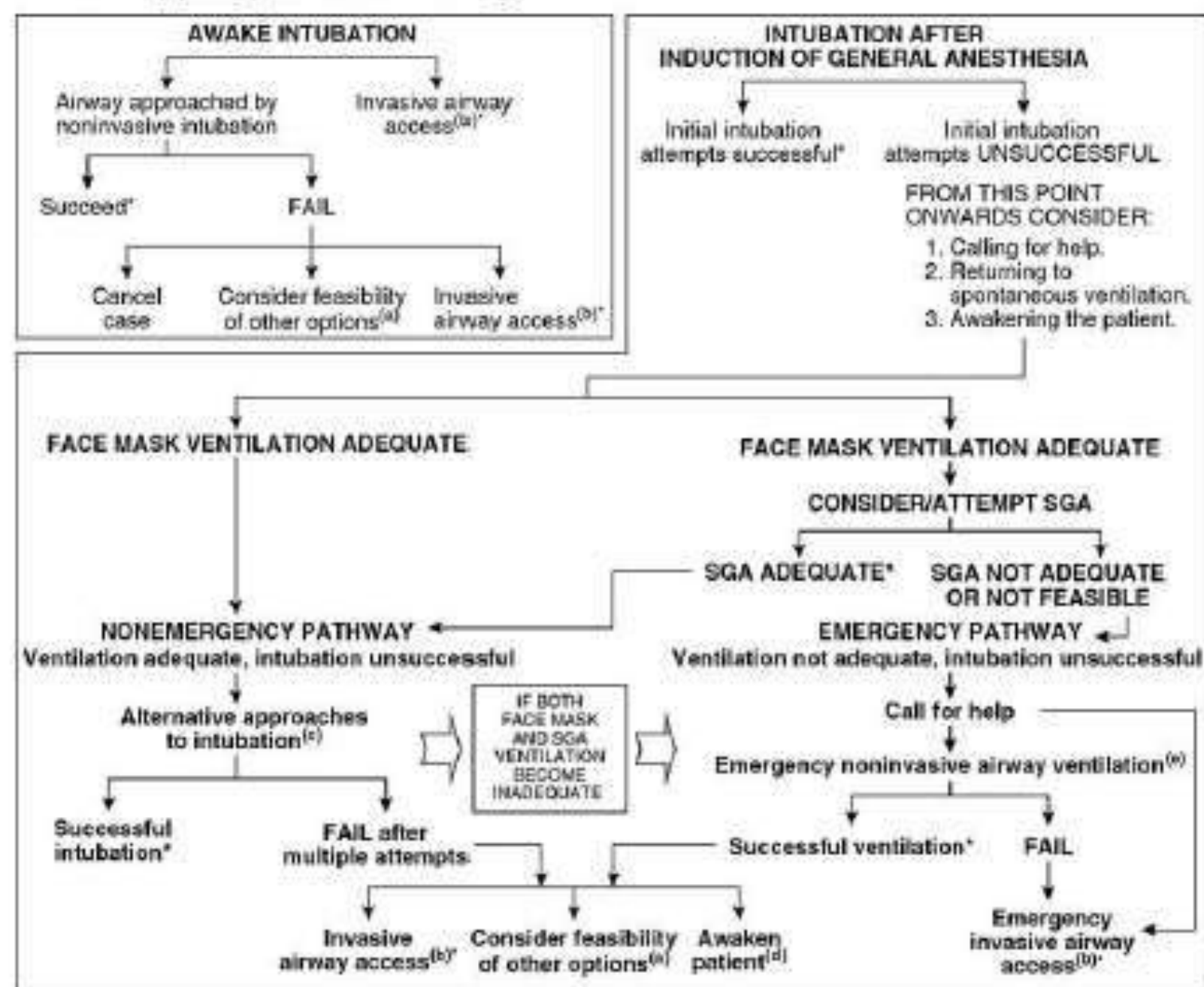
- Trauma
- Merangsang saraf simpatis
- Malposisi bronkus/esofagus
- Spasme bronkus
- Aspirasi

Komplikasi Intubasi Endotrakheal

Setelah
Ekstubasi

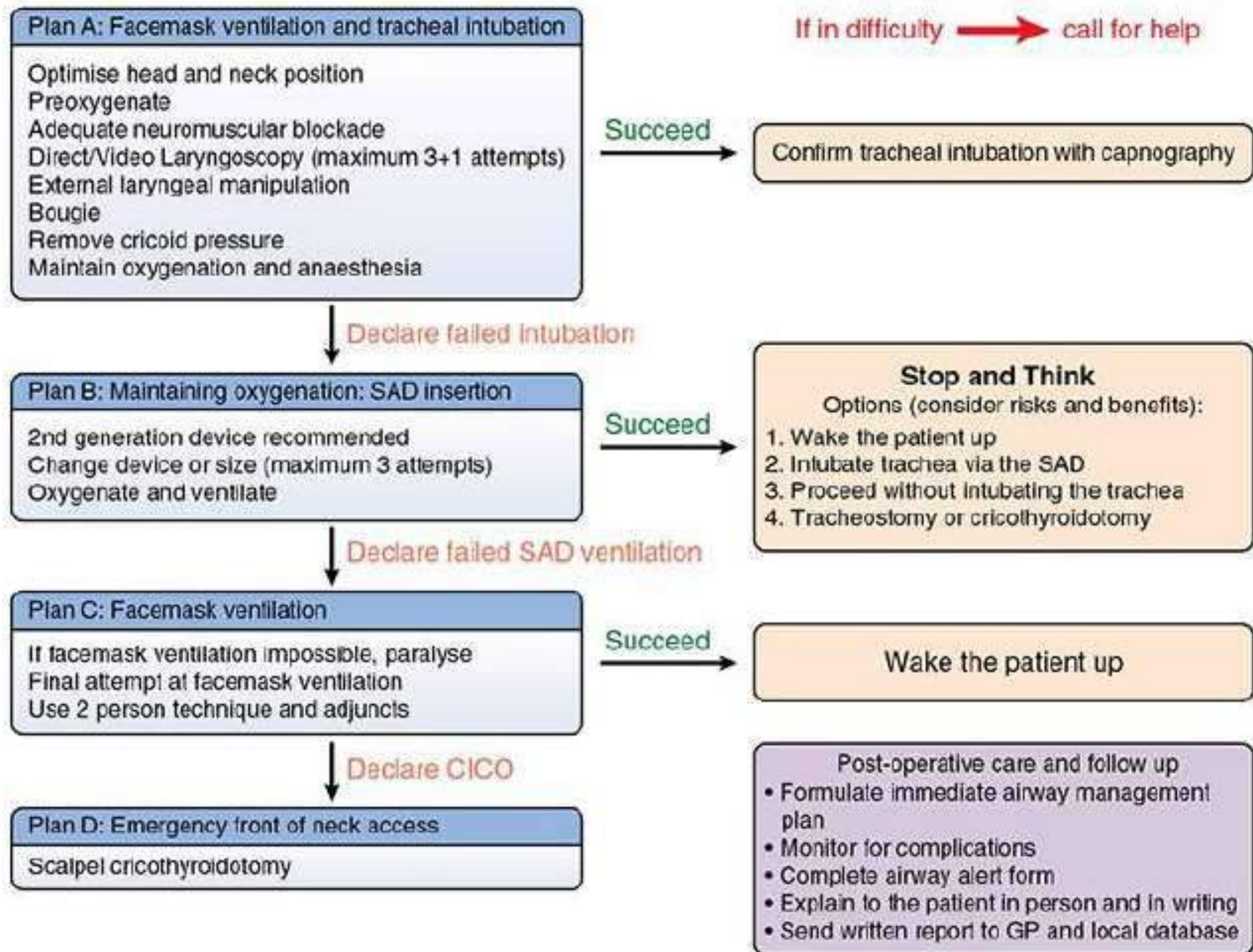
- Spasme
- Malposisi
- Gangguan fonasi
- Edema dan stenosis Infeksi

1. Assess the likelihood and clinical impact of basic management problems:
 - Difficulty with patient cooperation or consent
 - Difficult mask ventilation
 - Difficult supraglottic airway placement
 - Difficult laryngoscopy
 - Difficult intubation
 - Difficult surgical airway access
2. Actively pursue opportunities to deliver supplemental oxygen throughout the process of difficult airway management.
3. Consider the relative merits and feasibility of basic management choices:
 - Awake intubation vs. intubation after induction of general anesthesia
 - Non-invasive technique vs. invasive techniques for the initial approach to intubation
 - Video-assisted laryngoscopy as an initial approach to intubation
 - Preservation vs. ablation of spontaneous ventilation
4. Develop primary and alternative strategies:



*Confirm ventilation, tracheal intubation, or SGA placement with exhaled CO₂.

Management of unanticipated difficult tracheal intubation in adults



Thank you!



**OBAT-OBAT
EMERGENCY**

OBAT EMERGENCY

Menilik KEPUTUSAN MENTERI KESEHATAN REPUBLIK INDONESIA NOMOR
HK.01.07/MENKES/4799/2021 : TENTANG DAFTAR OBAT KEADAAN DARURAT MEDIS

DAFTAR OBAT KEADAAN DARURAT MEDIS

Nama Generik	
1	Adrenalin (epinefrin) - inj 1mg/mL
2	Lidokain - inj 2%
3	Atropin - inj 0,25mg/mL
4	Isosorbid dinitrat - tab 5 mg - tab 10 mg
5	NaCl 0,9% - Inf
6	Deksametason - Inj 5mg/mL

Nama Generik	
7	Salbutamol - Cairan ih 1 mg/ml
8	Ringer Lactat - Inf
9	Glukosa 40%
10	Diazepam - Inj 5 mg/mL - Enema 5 mg/2,5 mL - Enema 10 mg/2,5 mL
11	Klorpromazin (inj) - Inf 5 mg/mL (i.m.)
12	Ketoprofen - Supp 100mg
13	NaCl 0,9% - Inf

Nama Generik	
13	Parasetamol - Supp 80 mg - Supp 125 mg - Drops 100 mg/mL
14	Propranolol - Tablet 10mg - Inj 1mg/mL
15	Fitomenadion (Vitamin K1) - Inj 2 mg/mL - Inj 10 mg/mL
16	Magnesium sulfat - Inj 5 mg/mL - Inj 40% (i.v.)
17	Nifedipin - Tab 10 mg
18	Gliseril Trinitrat - Tab sublingual 500 mcg

JENIS-JENIS OBAT EMERGENCY LAIN



Adrenalin

Noradrenalin/Norepineprin

Dobutamin

Atrophine

Lidocain

Furosemid

Morphin

Classification and Comparative Pharmacology Sympathomimetics

		Reception Stimulated			Mechanism of Action	Cardiac Effects			Peripheral Vascular Resistance	Renal Blood Flow	Mean Arterial Pressure	Airway Resistance	Central Nervous System Stimulation	Single Intravenous Dose (70 kg Adult)	continuous Infusion Dose (70 kg Adult)
		α	β1	β2		Cardiac Output	Heart Rate	Dysrhythmia							
Natural catecholamines															
Epinephrine	+	++	++	Direct	+++	++	+++	±	--	+	--	Yes	2-8 µg	1-20 µg/min	
Norepinephrine	+++	+	+	Direct	-	-	+	+++	---	+++	NC	No	Not used	4-16 µg/min	
Dopamine	++	++	+	Direct	+++	+	+	+	+++	NC	NC	No	Not used	2-20 µg/kg/min	
Synthetic catecholamines															
Isoproterenol	0	+++	+++	Direct	+++	+++	+++	---	---	±	---	Yes	1-4 µg	1-5 µg/min	
Dobutamine	0	+++	+	Direct	+++	+	±	NC	++	+	NC	No	Not used	2-10 µg/kg/min	
Synthetic noncatecholamines															
Ephedrine	++	+	+	Direct and indirect	++	++	++	+	---	++	--	Yes	10-25 µg	Not used	
Phenylephrine	+++	0	+	Direct	-	-	NC	+++	---	+++	NC	No	50-100 µg	20-50 µg/min	

+ = minimal increase ++ = moderate increase +++ = marked increase - = minimal decrease -- = moderate decrease --- = marked decrease NC = no change

ADRENALIN / EPINEPRIN

❑ Fungsi

- ❖ Sebagai stimulus reseptor adrenergic

❑ Indikasi - Dosis

- ❖ Meningkatkan aliran darah myocard dan susunan saraf pusat saat kompresi dan ventilasi (RJP) Asistole, PEA, VF/VT Pulseless : 1 mg via IV diulang @ 2 mnt atau 5 siklus
- ❖ Shock Anaphylaksis : 0,3 – 0,5 mg SC/IM
- ❖ Shock sepsis : 0,05 µg/kgbb/menit IV Titiasi sampai maksimal 10 mcg/ mnt

RUMUS : $\frac{\text{Dosis} \times \text{BB} \times 60}{\text{konsentrasi obat}}$

Cth: BB 50kg, dosis 0,1 mcg, 4 mg (4ampul) dilarutkan dlm 50 ml Nacl sehingga menjadi pengenceran 80 µg/ml

Penghitungan : $\frac{0,1 \times 50 \times 60}{80} = 3,75 \text{ ml/jam}$

- ❖ Bronkospasme? 0,3 mg ?

❑ Sediaan : 1 Ampul = 1 mg = 1ml

❑ Efek Samping : Tacchycardi dan VT/Arhytmia, Hipertensi, Iskemik perifer (pada dosis yang tinggi

NOREPINEFRIN

Indikasi

Syok Septic / kardiogenik hipotensi akibat resistensi perifer yang rendah rendah

Sediaan

1 vial = 4mg (4000 µg) = 4ml

Dosis dan cara pemberian

a.Dosis : 0,05–0,10 µg/kg/min.

b.Start : 0,05 µg/kg/min.

diencerkan misal 1 amp hingga 50 cc, Maka 80 mcg/ml

$$\frac{\text{Dosis} \times 60 \times \text{BB}}{\text{Konsentrasi}}$$

Contoh:

Pasien dengan BB 50 kg. Dosis norepinefrin dimulai dari 0.05 µg/kgBB/menit.

$$\frac{0.05 \times 60 \times 50}{80} = 1,875 \text{ ml/jam}$$

DOBUTAMIN HCL

Indikasi : Inotropic, meningkatkan kontraktilitias

Sediaan : Ampul 250 mg dalam 5 ml

Dosis dan Cara Pemberian :

a. Dosis 5 – 20 µg/kg/menit, titrasi

b. Cara pemberian :

- Sediaan dobutamine 1 ampul = 250 mg.

(250.000 µ g)

- Dilarutkan hingga 50 ml, sehingga didapatkan

5.000 µg/ml

- $\frac{\text{Dosis} \times 60 \times \text{BB}}{\text{Konsentrasi}}$

Contoh: BB 50 kg, mulai daru 5

µg/kgBB/menit.

$$\frac{5 \times 60 \times 50}{5.000} = \frac{15.000}{5.000} = 3 \text{ ml/jam}$$

SULFAS ATROPIN / SA

❑ Golongan : Antikolinergik

❑ Ampul 1 ml = 0,25 mg

❑ Indikasi

- a. Bradikardia simtomatis **0,5 - 1 mg IV** tiap 3 – 5 menit; maksimal 3 mg
- b. Menurunkan sekresi kelenjar liur premedikasi intubasi **0,25 mg IV**

Efek Samping

- a. Memperburuk iskemia miokard (takikardi, palpitasi)
- b. Menyebabkan bradikardia paradoksal pada dosis $< 0,5$ mg
- c. Midriasis, penurunan motilitas usus, retensi urin
- d. anaphylaxis

AMIODARONE / CORDARONE

❑ SEDIAAN : 1 ampul = 3ml = 150mg

❑ Blok kanal Ion Na, K, Ca sehingga memperpanjang konduksi

❑ INDIKASI :

1. Henti jantung refrakter thdp RJP, shok, & vasopresor

**300 mg (dalam 20 ml – 30 ml D5%)
IV/ bolus, diikuti satu kali 150 mg IV
bolus dalam 3 sampai 5 menit**

2. Takikardia dengan kompleks QRS

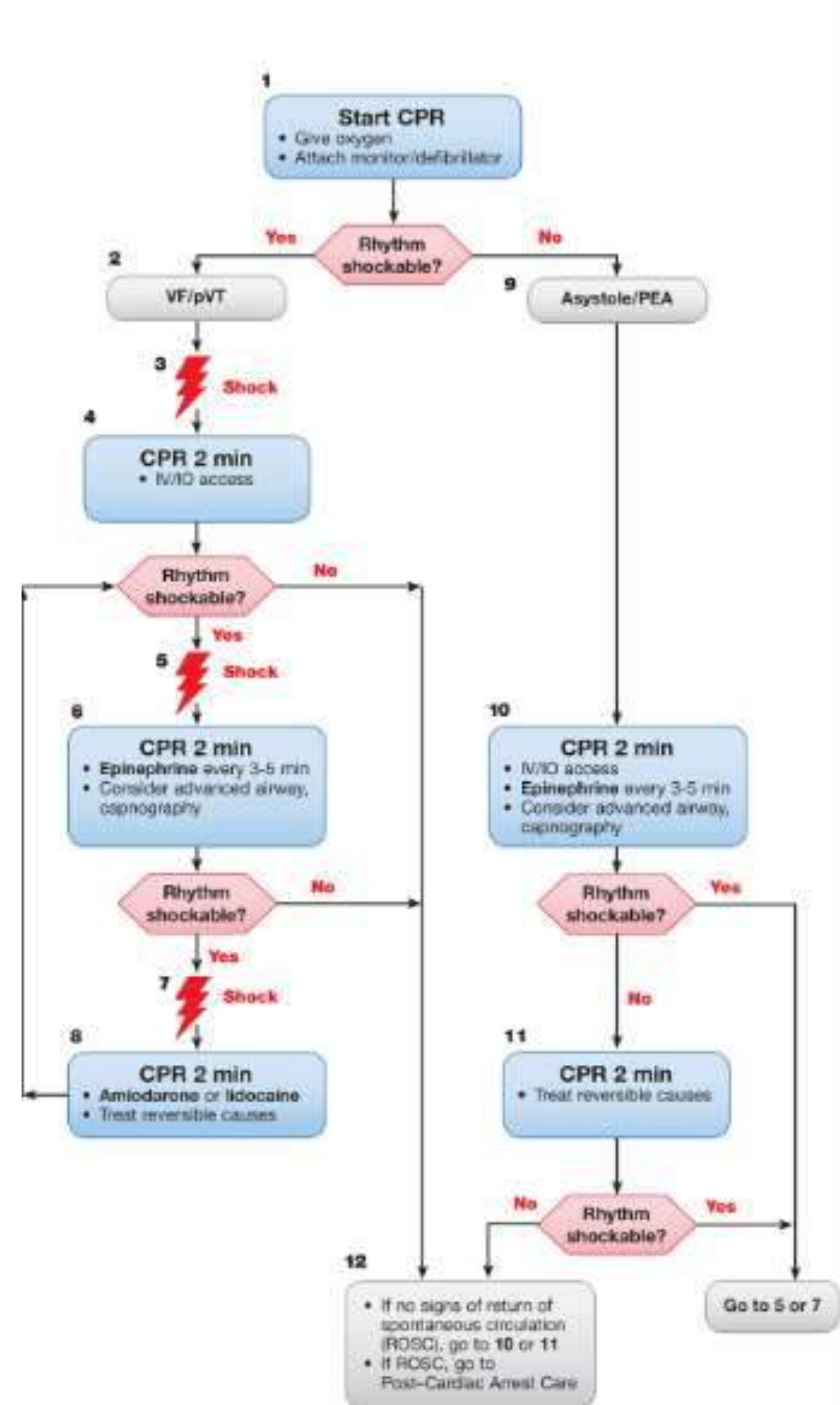
Lebar yang Stabil :

**150mg selama 10 menit, dilanjutkan
1mg/menit selama 6 jam.**

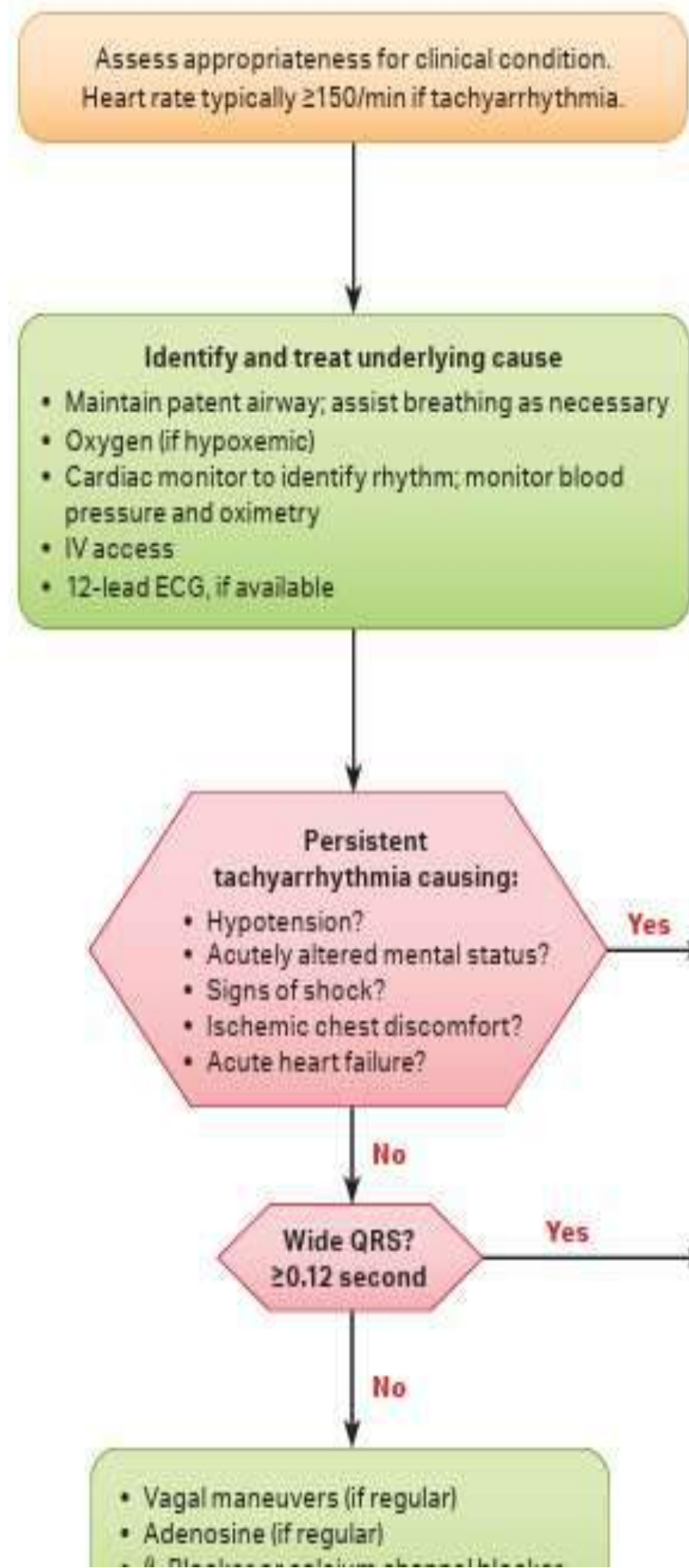
❑ EFEK SAMPING :

1. Hipotensi

2. Dapat memperburuk gagal jantung



- CPR Quality**
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
 - Minimize interruptions in compressions.
 - Avoid excessive ventilation.
 - Change compressor every 2 minutes, or sooner if fatigued.
 - If no advanced airway, 30:2 compression-ventilation ratio.
 - Quantitative waveform capnography
 - If P_{ETCO₂} <10 mm Hg, attempt to improve CPR quality.
 - Intra-arterial pressure
 - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.
- Shock Energy for Defibrillation**
- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
 - **Monophasic:** 360 J
- Drug Therapy**
- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
 - **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
 - OR-
 - **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.
- Advanced Airway**
- Endotracheal intubation or supraglottic advanced airway.
 - Waveform capnography or capnometry to confirm and monitor ET tube placement.
 - Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions.
- Return of Spontaneous Circulation (ROSC)**
- Pulse and blood pressure.
 - Abrupt sustained increase in P_{ETCO₂}, typically >40 mm Hg.
 - Spontaneous arterial pressure waves with intra-arterial monitoring.
- Reversible Causes**
- Hypovolemia
 - Hypoxia
 - Hydrogen ion (acidosis)
 - Hypo-/hyperkalemia
 - Hypothermia
 - Tension pneumothorax
 - Tamponade, cardiac
 - Toxins
 - Thrombosis, pulmonary
 - Thrombosis, coronary



- Doses/Details**
- Synchronized cardioversion:**
Refer to your specific device's recommended energy level to maximize first shock success.
- Adenosine IV dose:**
First dose: 6 mg rapid IV push; follow with NS flush.
Second dose: 12 mg if required.
- Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia**
- Procainamide IV dose:**
20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.
- Amiodarone IV dose:**
First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.
- Sotalol IV dose:**
100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

LIDOKAIN

❖ Sediaan Ampul 2 ml = 40 mg

❖ Indikasi :

❖ Alternatif amiodaron pada henti jantung :

dosis pertama 1-1.5mg/kgBB,
dilanjutkan 0.5-0.75,g/kgBB

❖ Anestesi lokal

Topical sebelum intubasi

Anestesi infiltrasi

❖ TOXIIC /MAX dosis 3mg/kgBB

NICARDIPINE HCL

Sediaan

Ampul 10 ml = 10 mg

Indikasi :

a. Hipertensi emergensi

3 – 5 mg/jam titrasi sesuai target MAP/ klinis

Max 15mg/jam

Perhatian

- Pasien dengan peningkatan tekanan intrakranial saat fase akut stroke serebral
- Pasien dengan riwayat hipersensitif terhadap produk ini
- Pasien dengan gangguan fungsi hati dan ginjal
- Pasien dengan stenosis aorta

a. Efek samping

hipersensitif., trombositopenia, gangguan fungsi hepar dan ginjal,. Palpitasi, hipotensi,, nyeri kepala, nausea, muntah, mual

FUROSEMIDE

Sediaan

Ampul 2 ml = 20 mg

Indikasi :

- a. Terapi ajuvan untuk edema paru akut (ALO : Acute Lung Oedem) : **20-50 mg bolus**, dapat dilanjutkan dengan dosis kontinyu

Perhatian

- a. Dehidrasi
- b. Hipovolemia
- c. Hipotensi
- d. Hipokalemia atau gangguan keseimbangan elektrolit lainnya

FUROSEMIDE

Dosis dan cara pemberian :

0,5 – 1 mg/kg diberikan 1 – 2 menit, jika tidak respon : 2 mg/kg diberikan pelan 1 – 2 menit (pemberian lazim dengan drip/memakai syringe pump)

AMINOFILIN

Sediaan

Ampul = 10 ml = 240mg

Indikasi :

Menghilangkan & mencegah gejala-gejala asma & bronkhospasme yang bersifat reversible :

6 mg/kg bols pelan Anak 1-9 tahun : 1 mg/kg/jam

Perhatian

Hipersesitifitas, dapat membangkitkan kejang, vertigo, palpitasi, aritmia, mual, daire

DIAZEPAM

Sediaan : ampul = 10 mg = 2 ml → 1 ml = 5 mg

Indikasi :

Digunakan untuk mengatasi kejang-kejang, eklamsia, gaduh gelisah dan tetanus

Dosis 10 mg IV dapat diulangi setiap 30-60 menit.

Perhatian

Efek samping dapat menyebabkan depresi pernafasan.

PROPOFOL

Sediaan : Ampul/vial 10 ml =20 mg/ml

Indikasi : Kejang berulang

Loading dose 2mg/kgbb IV bolus, dapat di ulang namun max 10 mg/kgbb.

Dapat diberikan dosis maintenance namun berhubungan erat dengan propofol infusion syndrom

Perhatian

Hipersensitivitas, nyeri daerah injeksi, Apnoe

Ahipotensi

MAGNESIUM SULFAT

Sediaan : MgSO₄ 40% dalam 25 ml fl = 10gram

Indikasi :

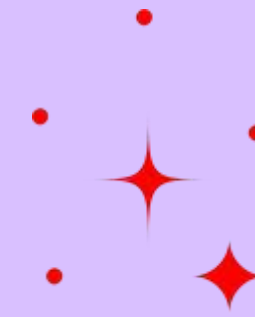
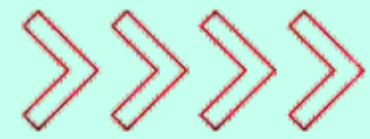
a. Preeklamsia : loading 4gr diencerkan dan diberikan bolus pelan dilanjutkan dengan dosis kontinyu 6 gram selama 6 jam

Perhatian

- Awasi tanda-tanda hipermagnesemia untuk menghindari kelebihan dosis (depresi nafas, hiporefleksi dan retensi urin)
- Gunakan dengan hati-hati pada pasien penderita kerusakan ginjal akut dan pasien *myasthenia gravis*
- Antidote Calcium glukonas

Monitoring yg perlu dilakukan

1. Monitor tanda vital sebelum pemberian terapi/obat emergency
2. Pastikan Kepatenan IV line
3. Lakukan double checking sebelum mengencerkan obat
4. Lakukan penghitungan obat sesuai dosis yang diminta, double checking kembali
5. Bila menggunakan alat syringe pump / alat infus pump, saat setting dilakukan oleh 2 orang
6. Monitor tanda vital 3-5 menit pertama setelah pemberian terapi, 1 jam pertama setelah pemberian, dan selanjutnya setiap 4 jam
7. Monitor intake dan output cairan
8. Kolaborasi dengan perawat bila ada peningkatan/ penurunan TTV untuk penambahan/ pengurangan dosis



Terima Kasih

