OneShot 4.0

Anaesthesia

DBMCI · 2026

DBMCI one

ANAESTHESIA

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“Success
is the sum of
small efforts
done every
day.”

- Dr. Ajay Yadav

ANAESTHESIA DELIVERY SYSTEMS

CYLINDERS

Oxygen Cylinder

- Color- Black body with white shoulders
- Pressure -2000 PSI

Nitrous Oxide

- COLOR - Blue
- PRESSURE - 760 PSI

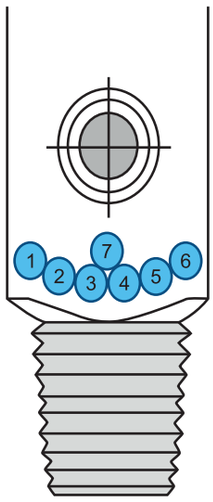
Entonox

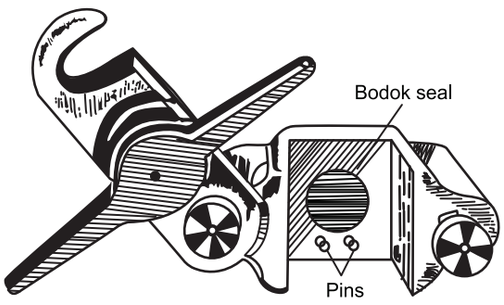
- Blue body with blue and white shoulders
- Pressure- 2000 PSI

CENTRAL SUPPLY OF GASES

- *Pressure : 60 PSI*

PIN INDEX SYTEM



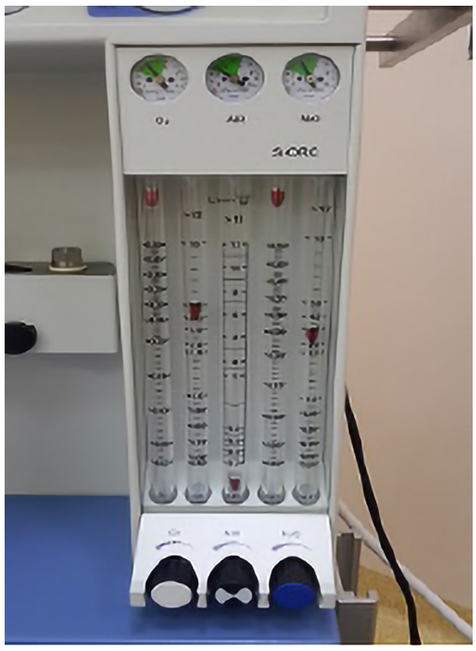


PIN INDEX POSITION

- Oxygen- 2, 5
- Nitrous oxide- 3,5

ANESTHESIA MACHINE

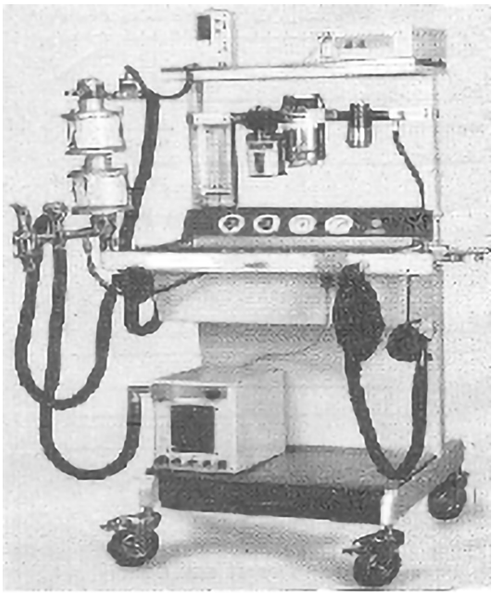
Rotameter



Vaporizer

ANESTHESIA MACHINE

Boyles Machine



ANESTHESIA WORKSTATION

BREATHING CIRCUITS

Magill

Bains

Jackson Rees

Summary of Semiopen Circuits

Circuit	Semiopen circuit of choice	Fresh gas flow
Magill	Spontaneous ventilation	Equal to minute volume
Bains	Controlled ventilation	1.6 times of minute volume
Jackson and Rees	Pediatric patients less than 6 years or less than 20 kg	Same as of Bains

Circle System

Soda Lime Composition

$Ca(OH)_2$ - 80%

NaOH- 3%

KOH- 1%

H_2O- 15%

Color indicator

Toxic Compounds of Inhalational Agents with Sodalime

Trielene- neurotoxic and ARDS

Sevoflurane: Compound A

Desflurane- Carbonmonoxide with desiccated sodalime

Sevoflurane- Burns with desiccated sevoflurane

NOTES

EQUIPMENTS

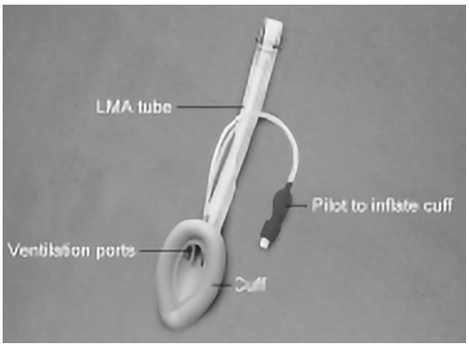
AMBU BAG

Airway

- Gudels

Nasal Airways

Laryngeal mask airway



ADVANTAGE:

- Avoids complications of intubation
- Disadvantage : Aspiration

SECOND GENERATION LMA:

Proseal

IGEL

Face Masks

Disadvantage:
Increased risk of aspiration

LARYNGOSCOPE

Macintosh

Most commonly used
Preferred for adults

Miller

Preferred for children of all ages

Video laryngoscope

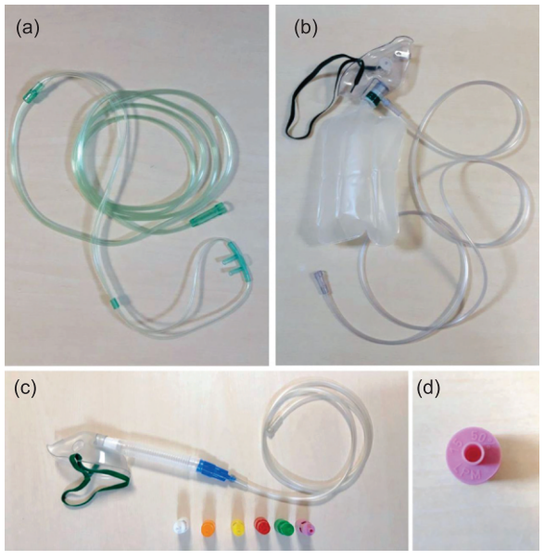
High success rate for failed intubation by direct laryngoscopy

ENDOTRACHEAL TUBES

- *Cuff : Low pressure and high volume*
- *Cuff tubes : Can be used at ages*

	Adult	Children
Size	*Male* *Female*	
Length	*Male* *Female*	

OXYGEN DELIVERY DEVICES



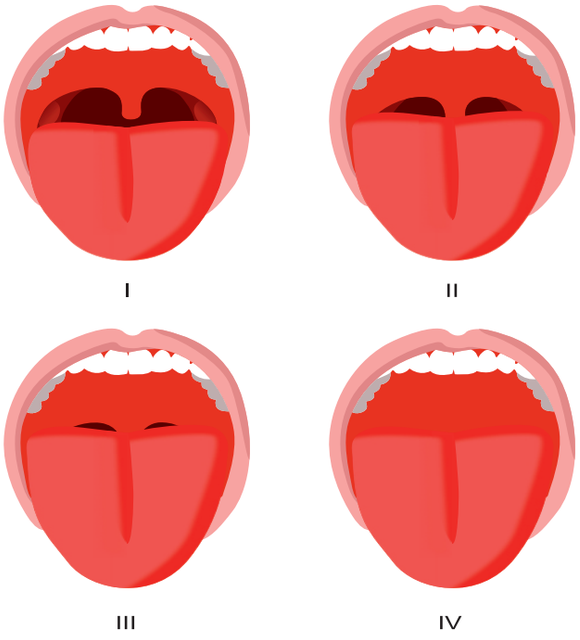
Oxygen delivery devices

Device	Maximum flow (liter/ minute)	Maximum FIO_2
Nasal cannula	6	0.45
Simple oxygen mask	10	0.6
Mask with reservoir	15	0.8
Venturi mask	15	0.6

NOTES

PREOPERATIVE ASSESMENT

MODIFIED MALLAMPATI CLASSIFICATION



Preoperative drugs modifications

Drug	Modification required
Viagra	Stop 24 hours before surgery
ACE inhibitors	Stop 24 hours before surgery
ARB	Stop 24 hours before surgery
High dose estrogen oral contraceptives	Stop 4 weeks before surgery
Herbal medications	Stop 7 days before surgery
Warfarin	Stop 5 days before surgery
Directly acting oral anticoagulants	Stop 48 hours before surgery
Aspirin	Stop 72 hours before surgery
Clopidogrel	Stop 5 days before surgery
Oral hypoglycemics	Omit on the day of surgery
NSAIDS	Omit on the day of surgery
Diuretics	Omit on the day of surgery

Fasting guidelines

Type of food	Fasting hours
Solid	6 hours
Fatty/non-veg	8 hours
Clear fluids	2 hours
Breast milk	4 hours

MONITORING

Bispectral index monitor

- To see the depth of anesthesia

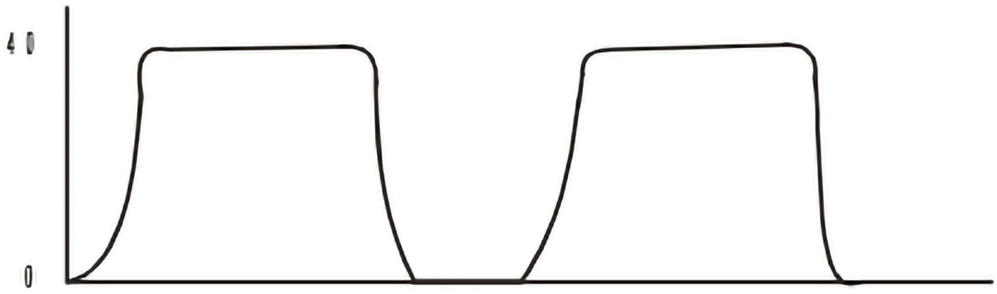
PULSE OXIMETER

Limitation:

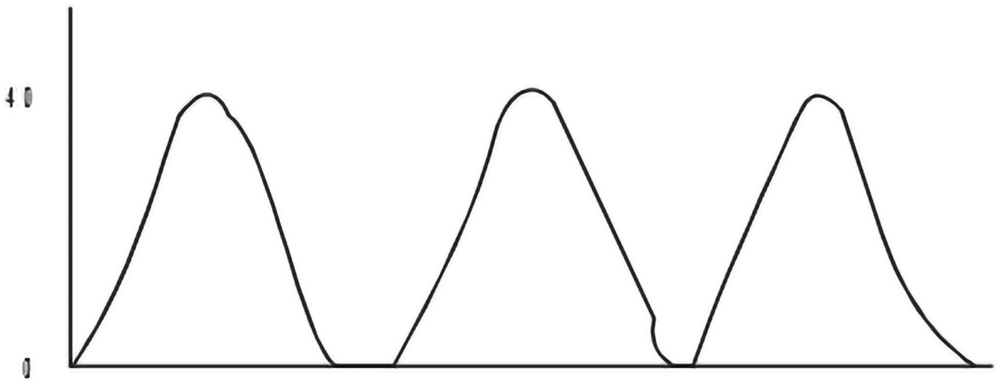
CAPNOMETER

CAPNOGRAPHY GRAPHS

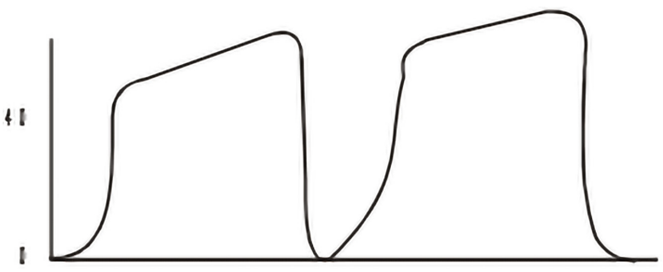
i. Normal graph for mechanical ventilated patient



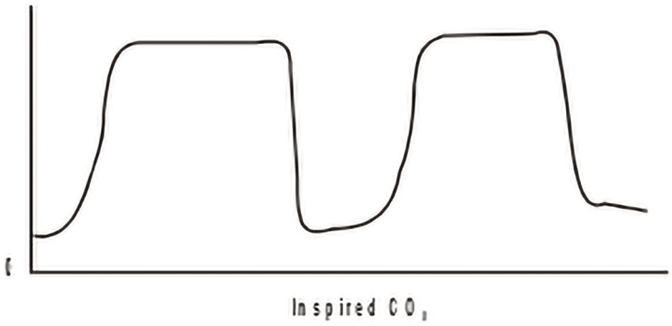
ii. Spontaneous breath



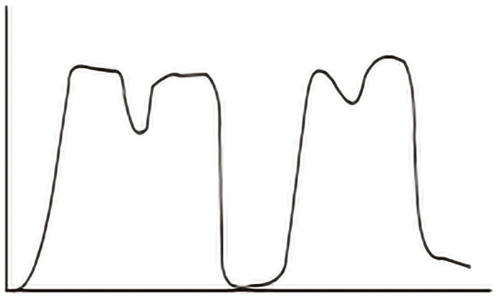
iii. COPD/ASTHMA (SHARK FIN PATTERN)



iv. *Exhausted sodalime*

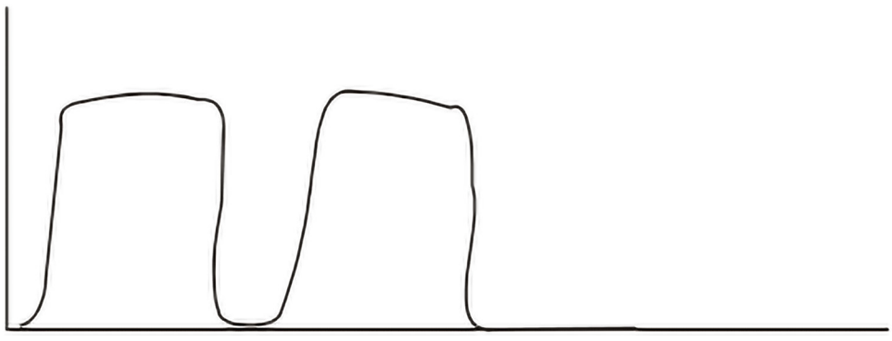


v. *Recovery of spontaneous breath (Curae notch)*



vi. *ETCO2 becoming zero*

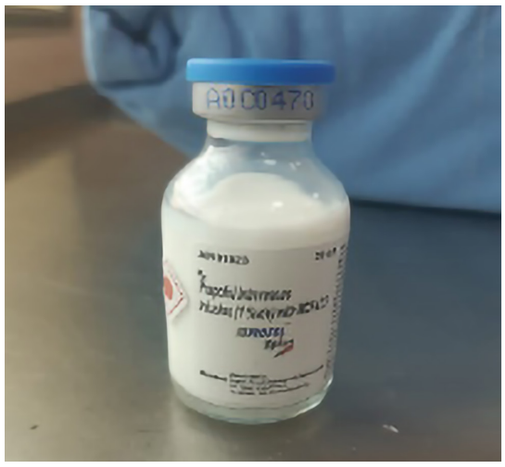
- *Extubation*
- *Apnea*
- *Disconnection*
- *Complete obstruction*



INTRAVENOUS ANESTHETICS

Thiopentone

Propofol



Summary of IV agents

Agent	Comments
Thiopentone	Cerebroprotective Induction agent of choice for neurosurgery Alkaline Ph Intraarterial injection causes vasospasm
Propofol	Painful injection Bacterial contamination due to egg lecithin IV Agent of choice for induction and day care surgery
Etomidate	Most cardiac stable Can cause adrenocortical depression
Ketamine	IV agent of choice for Shock Low cardiac output states Uncontrolled asthma Major side effects- Vivid reactions (Hallucinations)
Opioids	Used for analgesia Can cause respiratory depression Maximum muscle rigidity- alfentanil
Dexmedetomidine	Alpha 2 agonist Used for sedation

INHALATIONAL AGENTS

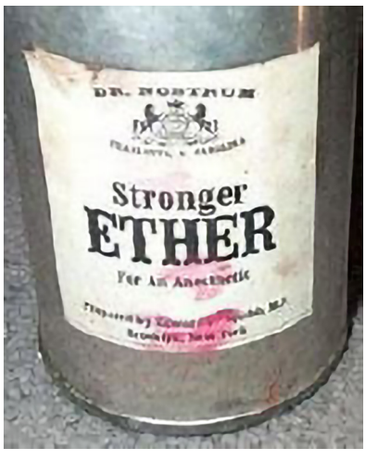
Halothane bottle

Isoflurane

Sevoflurane

Desflurane

Ether

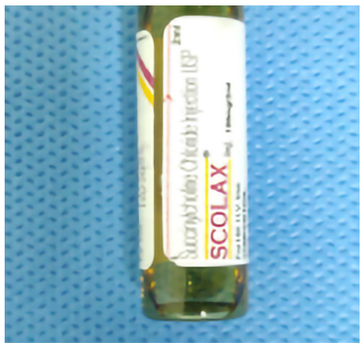


Summary of inhalational agents

Agent	Comments
Halothane	Causes hepatitis Sensitizes myocardium to catecholamines
Isoflurane	Agent of choice cardiac patients Does not cause coronary steal
Sevoflurane	-Inhalational agent of choice for Pediatric induction Neurosurgery Day care surgery
Desflurane	Does not produce fluoride Agent of choice for renal patients
Nitrous oxide	C/I Pneumothorax/pneumopericardium/pneumocephalus Ozone depletion
Xenon	Ideal agent Expensive

MUSCLE RELAXANTS

Suxamethonium



Rocuronium

Neostigmine

Agent	
Suxamethonium	• Ideal muscle relaxant for intubation • Causes Hyperkalemia • C/I for muscular dystrophies • Most commonly implicate for malignant hyperthermia
Vecuronium	• Most cardiac stable
Rocuronium	• Non- depolarizer of choice for intubation
Cis-atracurium /Atracurium	• Metabolized by Hoffman degradation • Muscle relaxant of choice for renal and hepatic failure
Suggamadex	• New reversal agent of steroidal muscle relaxants

REGIONAL ANAESTHESIA

LOCAL ANESTHETICS

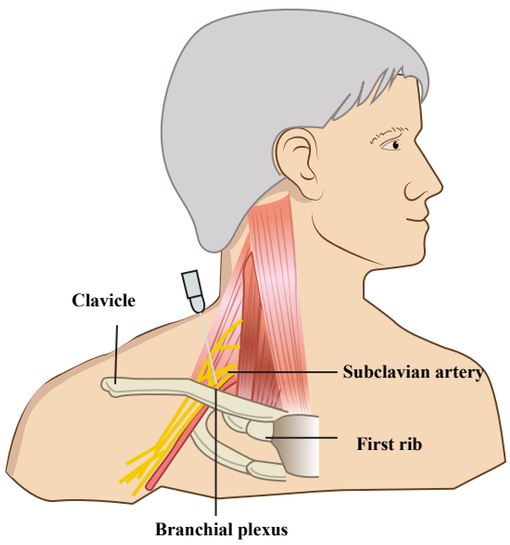
Xylocard

Ropivacaine

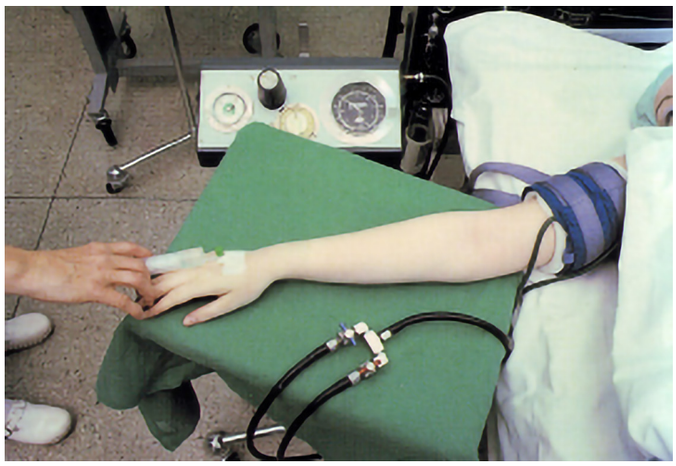
Agent	Comments
Lignocaine	• **Max safe dose** Without adrenaline – 4.5 mg/kg With adrenaline – 7 mg/kg • **Duration** Without adrenaline – 45-60 minutes With adrenaline – 2-3 hours
Bupivacaine	• Preferred for painless labour and post-op analgesia • Highly cardiotoxic • C/I- Bier's block
Ropivacaine /levobupivacaine	Less cardiotoxicity
Prilocaine	Causes methemoglobinemia

REGIONAL BLOCKS

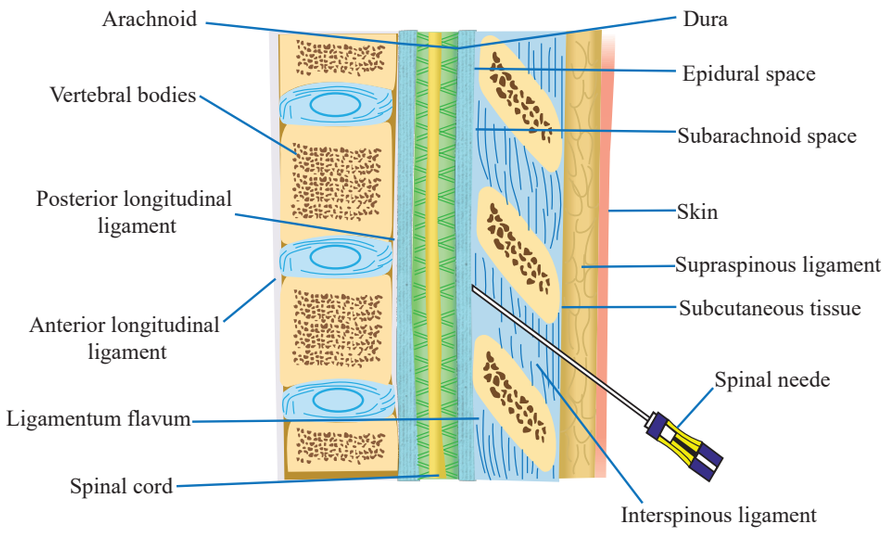
Supraclavicular brachial plexus block



Biers block



Structure encountered during spinal



Block	Comments
Supraclavicular brachial plexus block	Bothersome complication- pneumothorax
Beirs block	Bupivacaine- absolutely C/I
Spinal	**Structures encountered** • Skin • S/C tissue • Supraspinous • Interspinous • Ligamentum flavum • Dura • Arachnoid **Absolute C/I** • Raised ICT • Coagulopathy/ anticoagulants • Patient refusal • Infection at local site • Severe fixed cardiac output lesions
Epidural	Needle used – Tuohy Used for painless labour/post-op analgesia

ANESTHETIC MANAGEMENT OF CO-EXISTING DISEASES

GA agents for systemic diseases

System	IV agent	Maintenance agent	Muscle relaxants
CVS	Etomidate	Isoflurane	Vecuronium
Hypotension	Ketamine	Desflurane >6%	Vecuronium
Respiratory (asthma)	Controlled – Propofol Uncontrolled – ketamine	Sevoflurane	Steroidal
Hepatic	Propofol	Sevoflurane	Cisatracurium > atracurium
Renal	Propofol	Desflurane	Cisatracurium > atracurium

SPECILALITY MANAGEMENT

Day care surgery

IV	Propofol
Inhalational	Sevoflurane
Muscle relaxant	Mivacurium
Opioid	Remifentanil
Benzodiazepine	Midazolam

NOTES

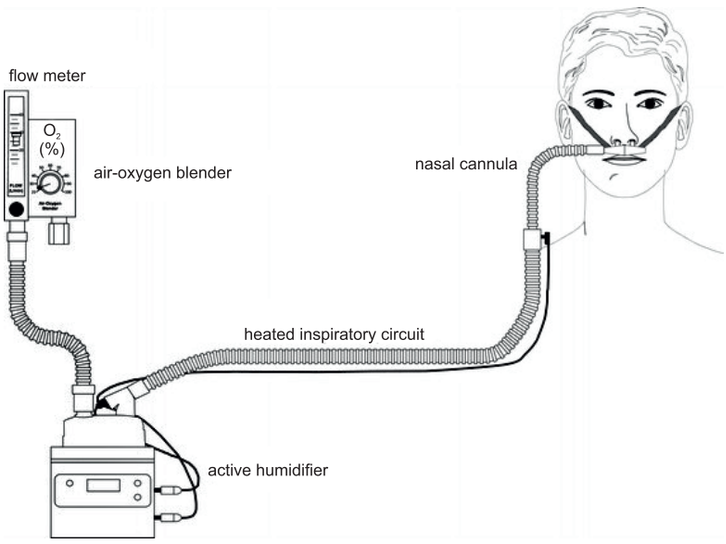
CRITICAL CARE AND CPCR

CRITICAL CARE

Non-invasive ventilation

Type II respiratory failure

High flow nasal cannula



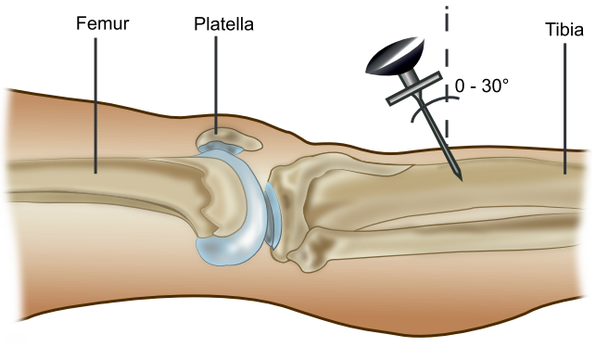
Lung protective strategy

Parameter	
Tidal volume	4-6 ml/kg
Plateau pressure	<30 cmH20
PEEP	Start with 5 cm H20 and titrate
FIO2	<0.6

CARDIOPULMONARY AND CEREBRAL RESUSCITATION

Mechanical CPR device

Intraosseous



Recommended for:
All ages
Anything can be given
Preferred over endotracheal tube

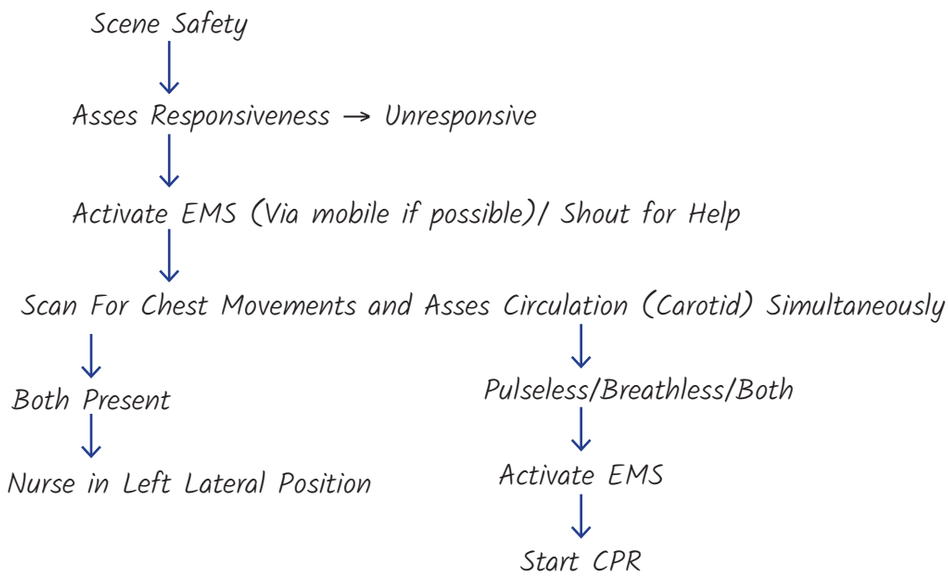
	Basic Life Support	Advanced Cardiac Life Support
Airway	Manually	Equipments
Breathing	Mouth to mouth/ bag and mask	ETT/LMA/Tracheostomy
Circulation	Cardiac massage	Cardiac massage
Defibrillation	Automatic external defibrillators/public assess defibrillators	Manual defibrillators
Drugs	-	+

Cardiac massage

	Infants (0 – 1 Year) Excluding newborns	Children (1- 14)	Adults
Pulse check	Brachial	Carotid	Carotid
Compression area	Mid sternum	Mid Sternum	Lower one third
Compression with	2 – 3 fingers	Heel of one hand	Both hands (one over the other)
Depth	1 ½ inch	2 inch	2 inch (not more than 2.4 inches)
Rate	100 / minute {but not more than 120}	100 / minute {but not more than 120}	100 / minute {but not more than 120}
Ratio			
Without advanced airway	15:2 (Two rescuers) 30:2 (one)	15:2 (Two rescuers) 30:2 (one)	30:2
With advanced airway	100 compressions with 20-30 breaths	100 compressions with 20-30 breaths	100 compressions with 10 breaths

ALGORITHM FOR CPR

For Adults :



For Children :

- 5 Cycles of CPR (15:2) and Then Call for Ems

SHOCKABLE RHYTHM

Ventricular fibrillation
Pulseless ventricular tachycardia
Polymorphic ventricular tachycardia

Shock energy :
Monophasic : 360 J
Biphasic : 160-200 J

SUMMARY OF AHA 2020 CHANGES

1. RECOVERY – 4th chain of survival
2. RESPIRATORY RATE for children: 20-30/minute

NOTES

NOTES