

PRE-OP PREPARATION

Pre-operative preparation refers to the systematic set of assessments, procedures, and instructions performed before surgery to ensure the patient is medically fit, psychologically ready, and physically prepared for a safe surgical procedure and anaesthesia.

Mnemonic for Key Goals - "SAFE OP"

- **S** - Stabilize medical conditions (BP, diabetes, infections)
- **A**-Assess fitness (labs, ECG, chest X-ray)
- **F**-Fasting instructions (to reduce aspiration risk)
- **E**-Educate the patient (about procedure, risks, consent)
- **O**-Organize documentation (consent, checklists)
- **P** - Prepare skin, bowel, bladder, IV line, etc.

Importance:

- Minimizes surgical and anaesthetic complications
- Builds patient confidence
- Improves post-op recovery

A. PRE-ANAESTHETIC / PPREOPERATIVE ASSESSMENT (PAA)-CLINIC AND METHODS

Pre-anaesthetic assessment (PAA) is a systematic evaluation of a patient's

medical, surgical, and anaesthetic history along with clinical examination before undergoing anaesthesia and surgery.

Objectives:

- Ensure patient safety
- Reduce perioperative risks and complications
- Plan the most suitable anaesthetic technique
- Build patient rapport and reduce anxiety
- Obtain informed consent

i. HISTORY TAKING

• Past History:

- Previous **illnesses** (e.g., diabetes, hypertension, asthma)
- Previous **surgeries** or complications during anaesthesia

• Personal History:

- **Smoking:** Risk of bronchospasm, delayed healing
- **Alcohol use:** May alter drug metabolism

General Physical Examination:

- **Vital Signs:** Pulse, BP, temperature, respiratory rate
- **Systemic Examination:**
 - **CVS (Cardiovascular system):** murmurs, heart failure signs

- **RS (Respiratory system):** Wheeze, crackles
- **CNS (Central nervous system):** sensorium, reflexes, neurological deficits

ii. RELEVANT ROUTINE INVESTIGATIONS

Routine preoperative investigations are done to:

- Detect **hidden medical problems**
- Assess **organ function**
- Evaluate **anaesthetic risk**
- Ensure **safe conduct** of anaesthesia and surgery

Table - 8.1 : Relevant Routine Investigations

Test	Purpose
Chest X-ray	Lung pathology, cardiac size
ECG	Detect arrhythmias, myocardial infarction
Echocardiography	Cardiac function, valve status
Angiography (if needed)	Coronary artery status
Complete Blood Count (CBC) & coagulation profile	Anaemia, infection, bleeding risk
Liver Function Test (LFT)	Drug metabolism, coagulation factors
Renal Function Test (RFT)	Urea, creatinine – drug clearance
Others	Blood sugar and electrolytes

Chest X-ray (CXR):

A chest X-ray (CXR) is a simple imaging test used to assess the lungs, heart, and chest structures. It plays a vital role in preoperative evaluation, especially before anaesthesia and surgery.

Why Chest X-Ray is Important Pre-Op:

- **C - Cardiac status:** Detects heart enlargement, cardiomegaly, or signs of heart failure.
- **L - Lung pathology:** Screens for infections (pneumonia, TB), fibrosis, COPD, or masses.

- **A - Airway assessment:** Tracheal deviation or mediastinal shift affecting intubation.
- **P - Previous conditions:** Detects past diseases like TB scars or pleural effusion.
- **S - Surgical planning:** Important for thoracic, cardiac, or upper abdominal surgeries.

ECG

An ECG (Electrocardiogram) is a non-invasive test that records the electrical activity of the heart using electrodes

placed on the skin. It is an essential part of preoperative assessment, especially for patients undergoing anaesthesia or major surgery.

Mnemonic: "HEART" - Importance of ECG in Pre-Op (AT & OT)

- **H - Heart rhythm** (detects arrhythmias like AF, bradycardia)
- **E - Electrolyte imbalance effects** (e.g., hyperkalemia changes)
- **A - Anaesthesia risk assessment** (identifies cardiac issues)
- **R - Rate & rhythm monitoring** (baseline before surgery)
- **T - Tissue damage detection** (old or recent myocardial infarction)

What ECG Detects:

- Arrhythmias (irregular heartbeats)
- Myocardial infarction (heart attack)
- Left ventricular hypertrophy
- Conduction blocks (e.g., bundle branch block)
- Ischemia (poor blood supply)

Why ECG is Important for AT & OT Technicians:

- To help anaesthetist **evaluate cardiac fitness** before anaesthesia
- To ensure **monitoring equipment is ready** for at-risk patients
- To recognize **abnormal rhythms** and report immediately
- To record **baseline ECG** for comparison during and after surgery

Indications for Pre-Op ECG:

- Age > 40 years (in many institutions)
- Known heart disease or hypertension
- Diabetes, smoking history
- Major or emergency surgeries

Echocardiography

Echocardiography (Echo) is a **non-invasive ultrasound test** that uses high-frequency sound waves to **visualize the heart's structure and function**, including chambers, valves, and blood flow.

Mnemonic: "ECHO" - Uses of Echocardiography

- **E - Ejection fraction** (measures pumping strength)
- **C - Chamber size and wall motion**
- **H - Heart valve function** (detects stenosis or regurgitation)
- **O - Observe flow** (detects clots, shunts, or fluid like pericardial effusion)

Why It's Important in Pre-Operative Care (AT & OT Role):

- Detects **left ventricular dysfunction**, which increases anaesthetic risk
- Identifies **valvular heart disease** (like mitral stenosis or aortic stenosis)
- Assesses **pulmonary artery pressure** and diastolic function
- Helps guide anaesthetic plan (regional vs general, fluid management)

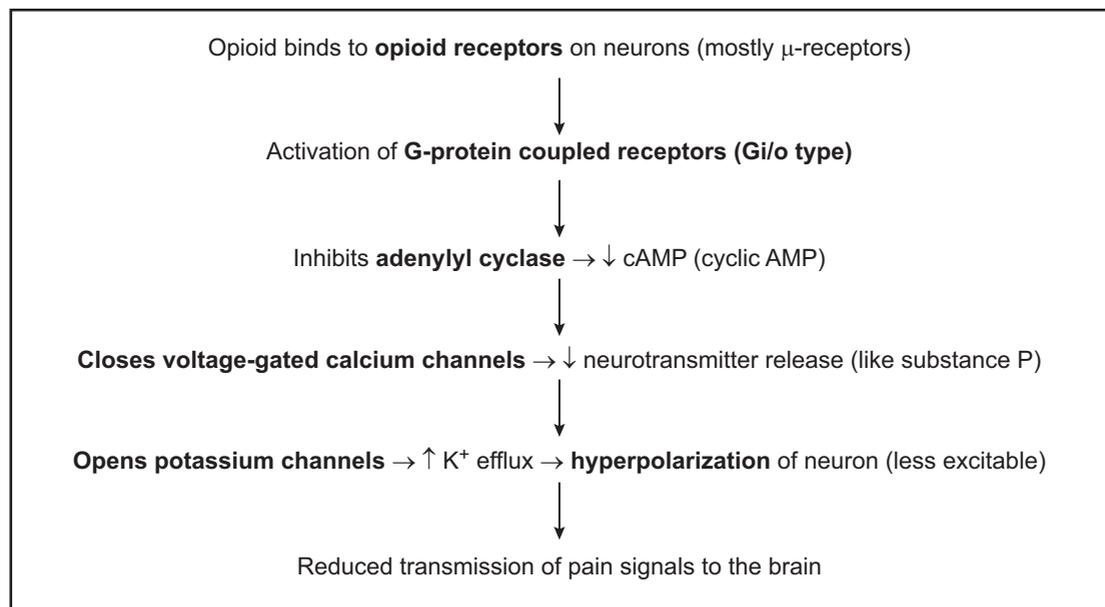
OPIOID ANALGESICS

Opioid analgesics are a class of pain-relieving (analgesic) drugs that act on opioid receptors (μ (μ), κ (κ), and δ (δ)) in the central nervous system (brain and spinal cord) to reduce the perception of pain.

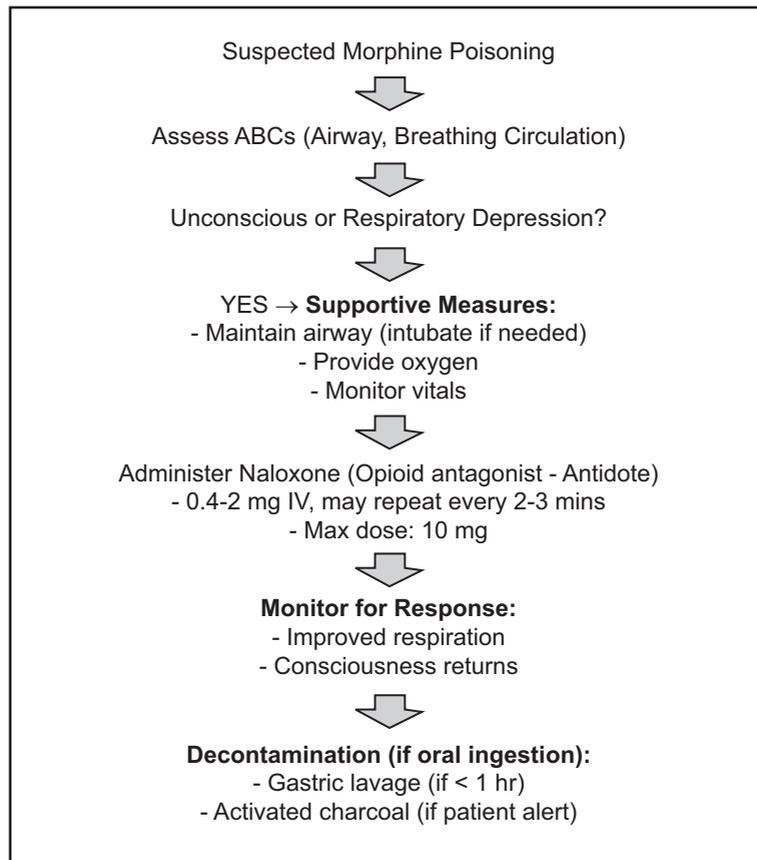
- Classification of opioids is shown in **Table 28.1**.
- Mechanism of opioid (e.g., morphine) is shown in **Flowchart 28.1 & Fig 28.1**.
- Uses, adverse effects and contraindications of morphine is shown in **Table 28.10**.
- Treatment of opioid (e.g. morphine) overdose / poisoning is shown in **Box 28.1**.

Table - 28.1 : Classification of Opioids

Natural	Semisynthetic	Synthetic
<ul style="list-style-type: none"> • Morphine • Codeine • The baine 	<ul style="list-style-type: none"> • Heroin (diacetylmorphine) • Oxycodone • Hydromorphone • Buprenorphine 	<ul style="list-style-type: none"> • Fentanyl • Methadone • Tramadol • Pethidine (Meperidine)



Flow Chart. 28.1 : Mechanism of action of opioid



Flow Chart. 28.2 : Treatment of opioid (e.g.morphine) overdose / poisoning

Expected Questions

Long essays

(10 marks)

1. Classify opioids. Discuss in detail about any three opioids

Short Essays

(5 marks)

1. Morphine
2. Treatment of opioid overdose
3. Contraindications of opioids (Morphine)

Short Answers

(2 or 3 marks)

1. Naloxone

INTRODUCTION TO CPR / RESUSCITATION - BLS

Cardiopulmonary Resuscitation (CPR) is a life-saving emergency technique used in cardiac arrest, polytrauma or sudden collapse, aimed at restoring heart function and breathing. Basic Life Support (BLS) is the foundation of emergency care, which includes CPR, rescue breathing, and use of an AED (Automated External Defibrillator), performed by trained responders or laypersons before advanced medical care arrives.

Goals of BLS: (Mnemonic: "COW")

- **C - Circulation:** Maintain blood flow to brain and organs
- **O - Oxygenation:** Restore breathing or provide artificial breaths
- **W - Warning system:** Early activation of EMS (Emergency Medical Services)

10 Golden Rules Before Starting CPR (Mnemonic: "DRS-ABCD" - adopted from first responder protocols)

- **D - Danger:** Ensure the area is safe for you and the victim
- **R - Response:** Check if the person is responsive (shake and shout)
- **S - Shout for Help:** Call for nearby help
- **A - Airway:** Open the airway (head-tilt, chin-lift)

- **B - Breathing:** Look, listen, and feel for breathing (max 10 seconds)
- **C - Circulation:** Check for pulse (carotid pulse in adults)
- **D - Defibrillation:** Use AED if available

Steps of BLS / CPR in Adults (Mnemonic: C-A-B)

- **C - Circulation (Chest Compressions):**
 - **Rate:** 100–120 compressions/min
 - **Depth:** At least 2 inches (5 cm)
 - **Ratio:** 30 compressions: 2 breaths
 - **Recoil:** Allow full chest recoil after each compression
 - **Hand position:** Centre of chest, lower half of sternum, heel of one hand over the other
- **A - Airway:**
 - Use head-tilt, chin-lift to open airway
 - If trauma suspected, use jaw thrust (without head tilt)
- **B - Breathing:**
 - Give 2 rescue breaths
 - Each breath over 1 second, with visible chest rise
 - Avoid excessive ventilation

Use of AED (Automated External Defibrillator):

- As soon as available, turn on AED
- Follow voice prompts
- Clear the victim before shock is delivered
- Resume CPR immediately after shock

CPR Mnemonic Summary:

"Push Hard, Push Fast, Don't Stop"

- **Hard:** At least 2 inches
- **Fast:** 100–120 compressions/min

- **Don't Stop:** Unless victim recovers or professionals take over

Special Notes:

- Do not check pulse for more than 10 seconds
- If untrained, perform Hands-Only CPR (Chest compressions only)
- **Children/infants:** Compression depth ~1.5 to 2 inches; use 2 fingers for infants
- Use pocket mask or bag-valve mask (BVM) if trained and available (Table - 34.1)

Table - 34.1 : Summary Table		
Step	Action	Key Points
C - Circulation	30 chest compressions	Rate: 100–120/min, Depth: ≥ 5 cm
A - Airway	Open airway	Head-tilt, chin-lift
B - Breathing	2 rescue breaths	1 sec each, visible chest rise
AED	Use as soon as available	Resume CPR after shock

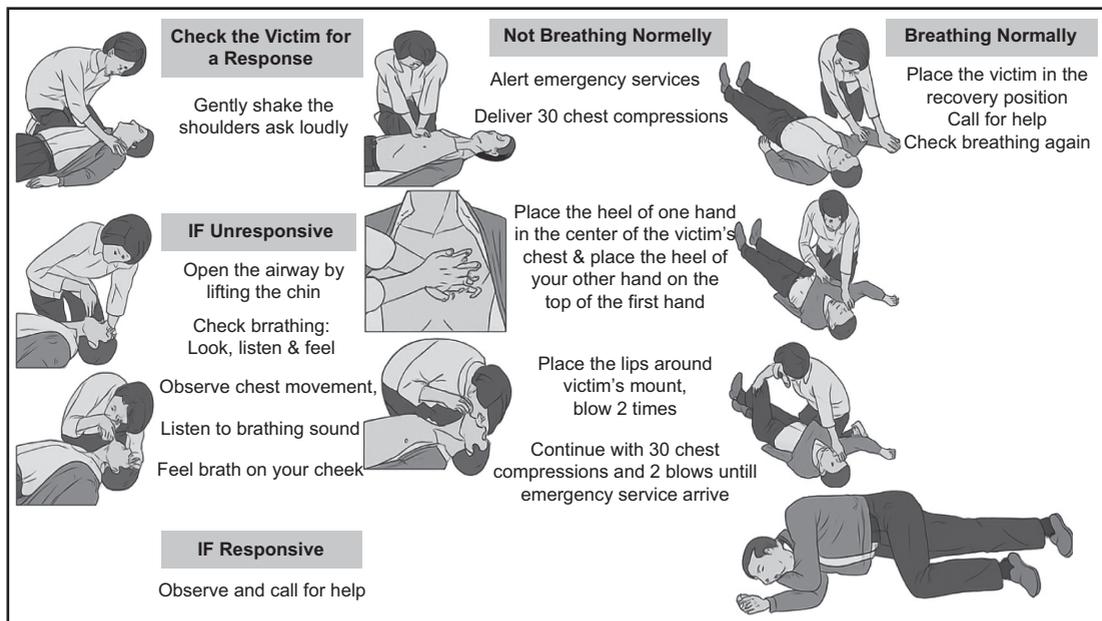


Fig. 34.1 : Basic Life Support (BLS)

Advanced Cardiac Life Support (ACLS) - 5 Marks Summary

ADVANCED CARDIAC LIFE SUPPORT

Definition: ACLS (Advanced Cardiac Life Support) is a set of clinical interventions and algorithms used to manage cardiac arrest, stroke, and other life-threatening cardiovascular emergencies in hospital or pre-hospital settings.

Key Components of ACLS:

a. High-Quality CPR

- **Rate:** 100–120 compressions/min
- **Depth:** 5–6 cm in adults
- Allow full chest recoil
- Minimal interruptions

b. Airway Management

- Use of advanced airways (ET tube, supraglottic airway)
- Confirm placement with capnography
- Provide adequate ventilation

c. Defibrillation

- **For shockable rhythms:** Ventricular Fibrillation (VF) & Pulseless VT
- Use AED or manual defibrillator ASAP

d. Drugs

- Epinephrine 1 mg every 3–5 min
- Amiodarone or Lidocaine for refractory VF/pVT
- Correct underlying causes (H's & Ts)

e. Post-Cardiac Arrest Care

- Targeted temperature management
- Maintain oxygenation and perfusion
- Monitor for organ function and neurological recovery

f. Updated 2020–2024 AHA recent guidelines (Latest)- Basic Life Support (BLS) - Highlights

- **Chest compression rate:** 100–120/min
- **Depth:** At least 2 inches (5 cm) in adults
- **Compression-Ventilation Ratio:** 30:2 (with no advanced airway)
- **Minimize interruptions:** ≤ 10 seconds for pulse checks

Defibrillation

- Use AED as early as possible
- First shock: **200J (biphasic) or 360J (monophasic)**
- Resume CPR **immediately** after shock for 2 minutes (**Table - 34.2**)

Table - 34.2 : Medications in Cardiac Arrest

Drug	Dose	Indication
Epinephrine	1 mg IV/IO every 3–5 min	All pulseless rhythms
Amiodarone	300 mg IV push, then 150 mg	VF/pVT unresponsive to shock
Lidocaine	1–1.5 mg/kg	Alternative to amiodarone
Atropine	1 mg IV every 3–5 min	Bradycardia
Adenosine	6 mg IV push, then 12 mg	SVT (if regular and monomorphic)