Postoperative Care

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Target: 4th Year Medical Students
Duration: 50–60 minutes

Approach to caring for patients in the perioperative period

Common postoperative problems seen in the immediate postoperative period

Predict, recognize, prevent, and treat common postoperative complications

The principles of enhanced recovery

Learning Objectives

The surgeon finishes the last stitch and leaves the OR.
Is the operation really over?
When does postoperative care actually begin?

At the end of surgery, The theatre team should then formally hand over the care of the patient to the patient recovery staff.
Or PACU
The information provided should include :

Name and age,

The surgical procedure,

The anesthetic and analgesics

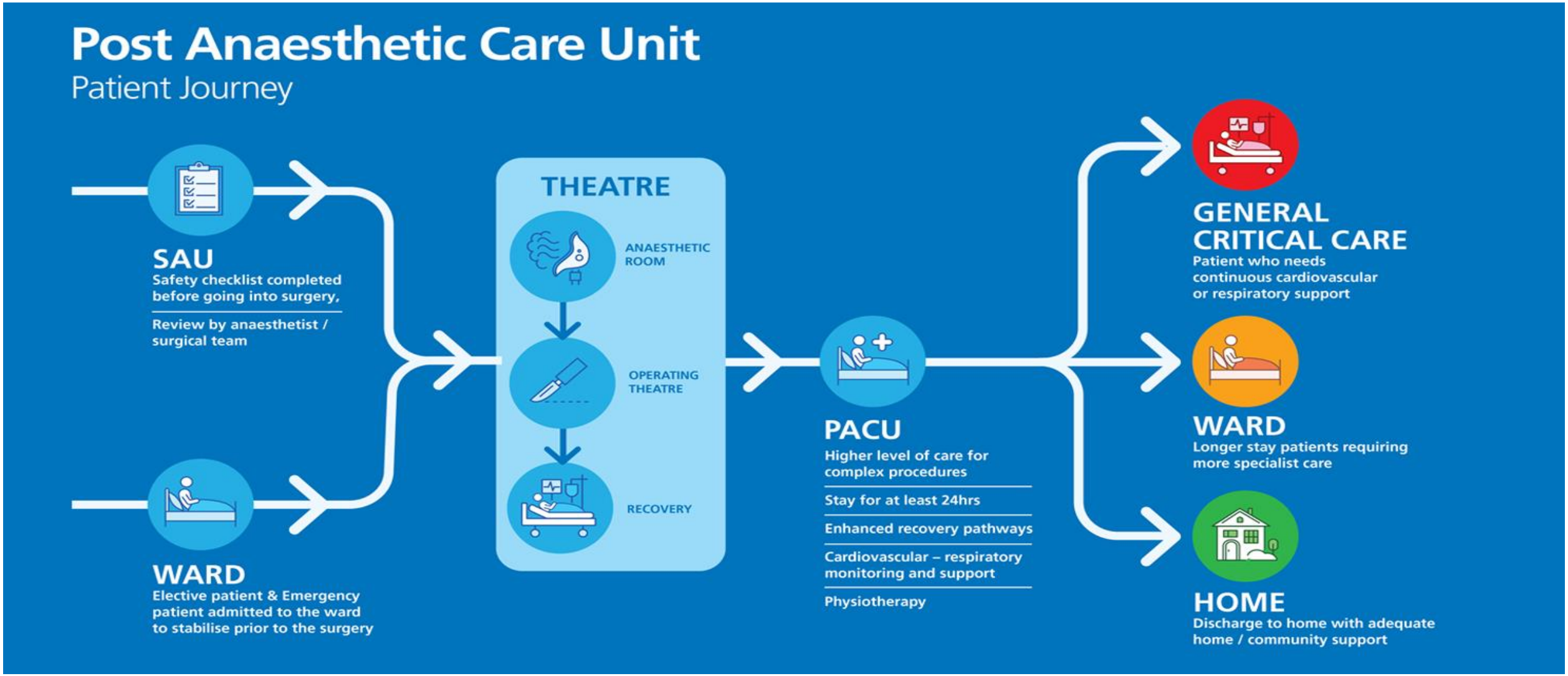
Fluid replacement, blood loss, urine output,

Any surgical/anesthetic problems encountered or expected,

Existing medical problems and allergies.

A plan for the management of pain and nausea or vomiting should also be conveyed.

PACU is the recovery area where patients wake up from anesthesia while nurses and doctors closely watch vital functions such as : Breathing and oxygen level Heart rate and blood pressure Level of consciousness Pain and nausea Surgical site and bleeding



The patient can be discharged from PACU when they fulfl the following criteria

1. They are fully conscious
2. Respiration and oxygenation are satisfactory;
3. They are normothermic, not in pain and not nauseous;
4. Cardiovascular parameters are stable
5. Oxygen, fluids and analgesics have been prescribed
6. There are no concerns relating to the surgical procedure.

Phases of Post-Operative Care

1. Immediate Phase (0–24 hours)

- PACU / ICU
- Airway protection
- Hemodynamic stability

2. Early Phase (24–72 hours)

- Mobilization
- Pulmonary hygiene
- Fever evaluation

3. Late Phase (>72 hours to weeks)

- Wound healing
- Infection
- Anastomotic leak
- Nutritional rehabilitation

Systematic Assessment: The ABCDE Approach

A – Airway

- Patency
- Secretions
- GCS
- Need for oxygen or airway adjunct

B – Breathing

- Respiratory rate
- Oxygen saturation
- Chest expansion
- Auscultation

C – Circulation

- Pulse and blood pressure
- Capillary refill
- Drain output
- Evidence of bleeding
- Urine output (>0.5 mL/kg/hr)

D – Disability

- Level of consciousness
- Pupillary response
- Pain score
- Delirium screening

E – Exposure

- Temperature
- Surgical wound
- Lines, catheters, drains
- Limb examination

Monitoring in the Immediate Post-Operative Phase

Routine Parameters

- Heart rate
- Blood pressure
- Respiratory rate
- Oxygen saturation
- Temperature
- Urine output
- Drain volumes

Frequency

- Every 15 minutes initially
- Hourly when stable
- Then 4-hourly on the ward

POSTOPERATIVE OBSERVATIONS

The recording of observations as an ‘early warning system’ begins in recovery and is continued on the ward until the patient is discharged from the hospital

The following six simple physiological parameters, which are routinely measured, are used to calculate the score:

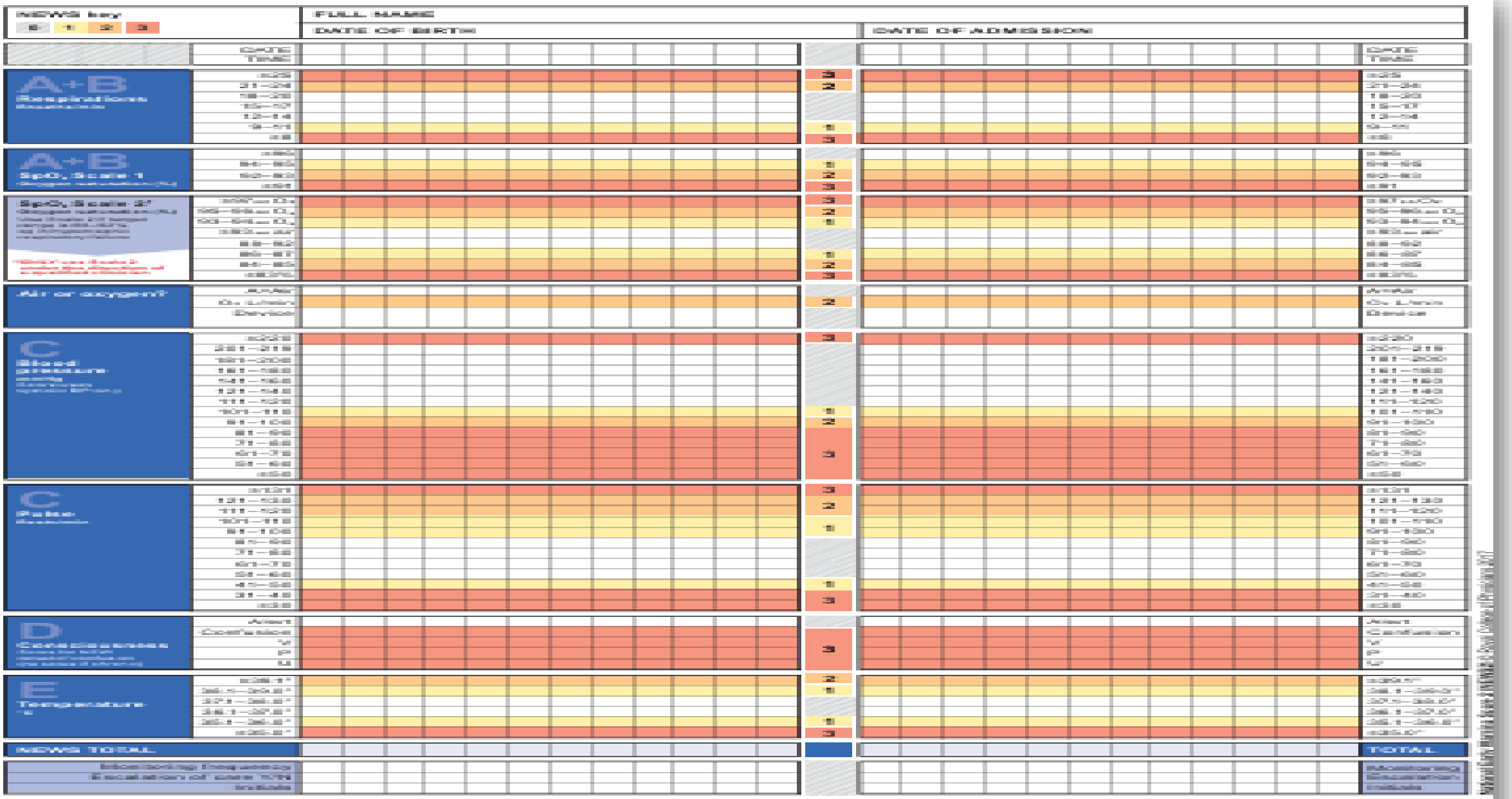
1. respiration rate
2. oxygen saturation
3. systolic blood pressure
4. pulse rate
5. level of consciousness or new-onset confusion, disorientation and/or agitation
6. temperature.
7. Two points are added if the patient needs supplemental oxygen.

Early Warning System (EWS)

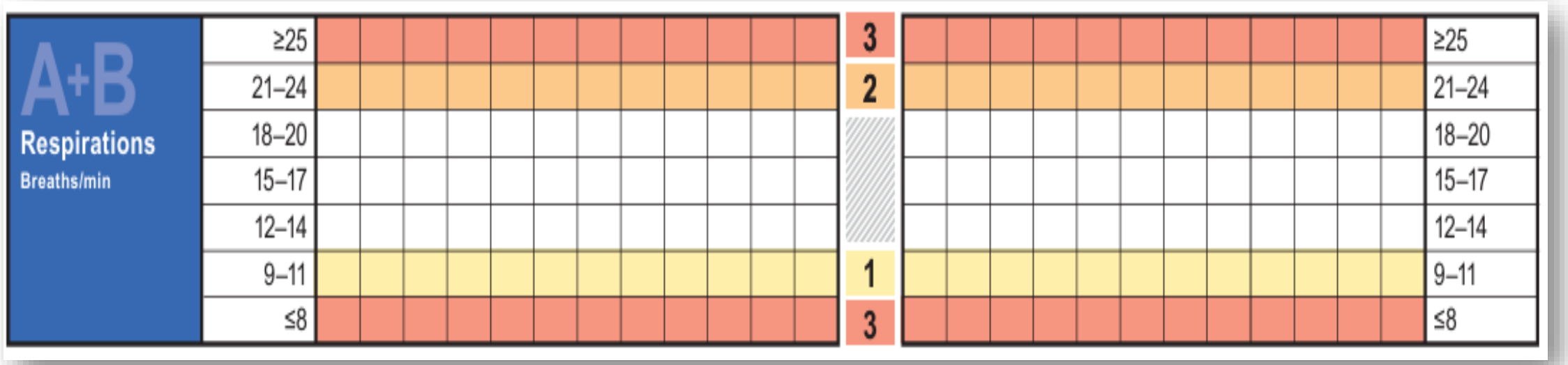
is a structured bedside tool used to detect early signs of patient deterioration by scoring abnormal vital signs and clinical observations. It helps staff recognize risk early, escalate care quickly, and prevent cardiac arrest, ICU admission, or death.

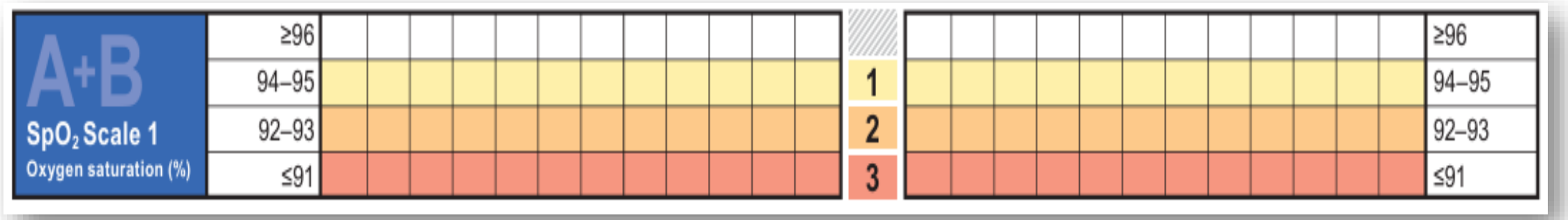
Typical parameters include:

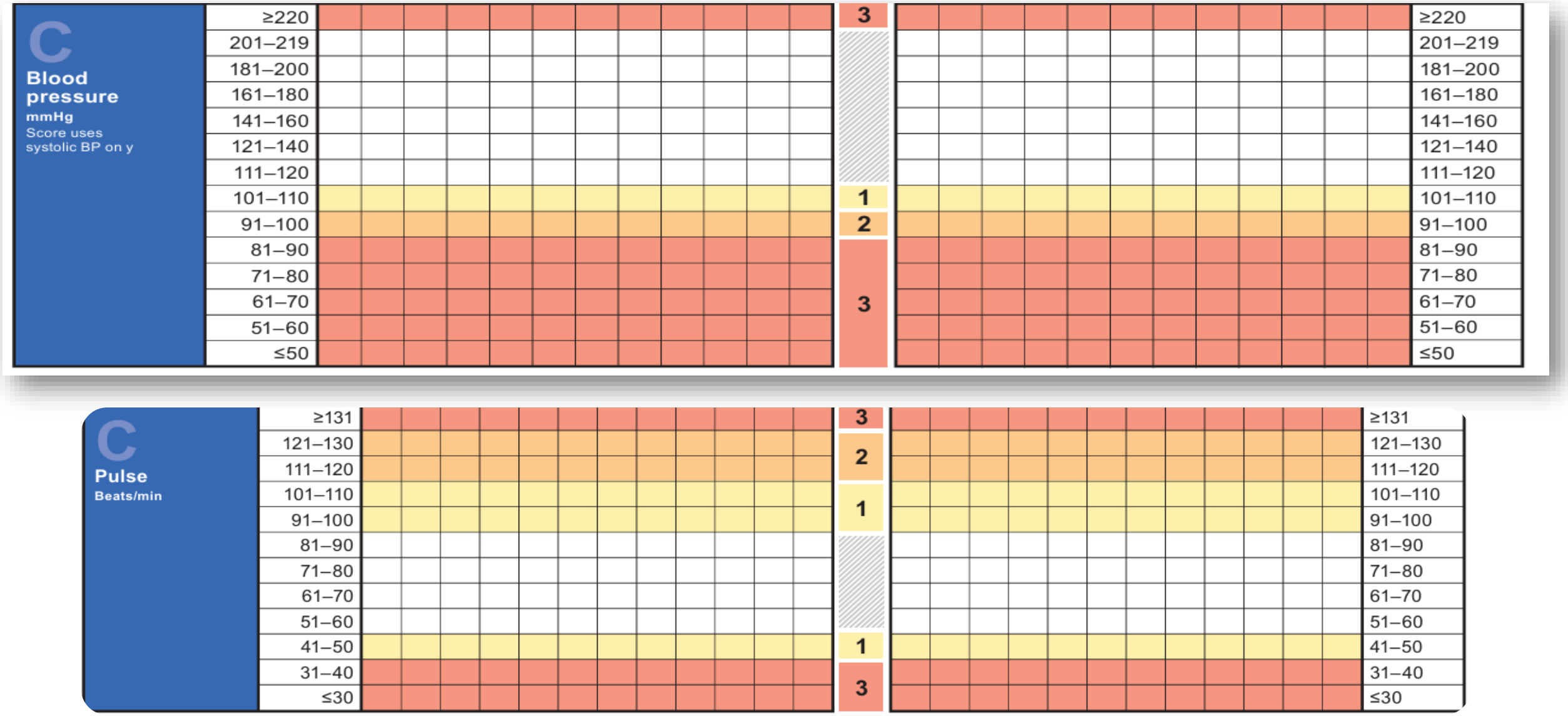
- Respiratory rate
- Oxygen saturation
- Supplemental oxygen use
- Heart rate
- Blood pressure
- Temperature
- Level of consciousness (e.g., AVPU or GCS)
- Urine output (sometimes)

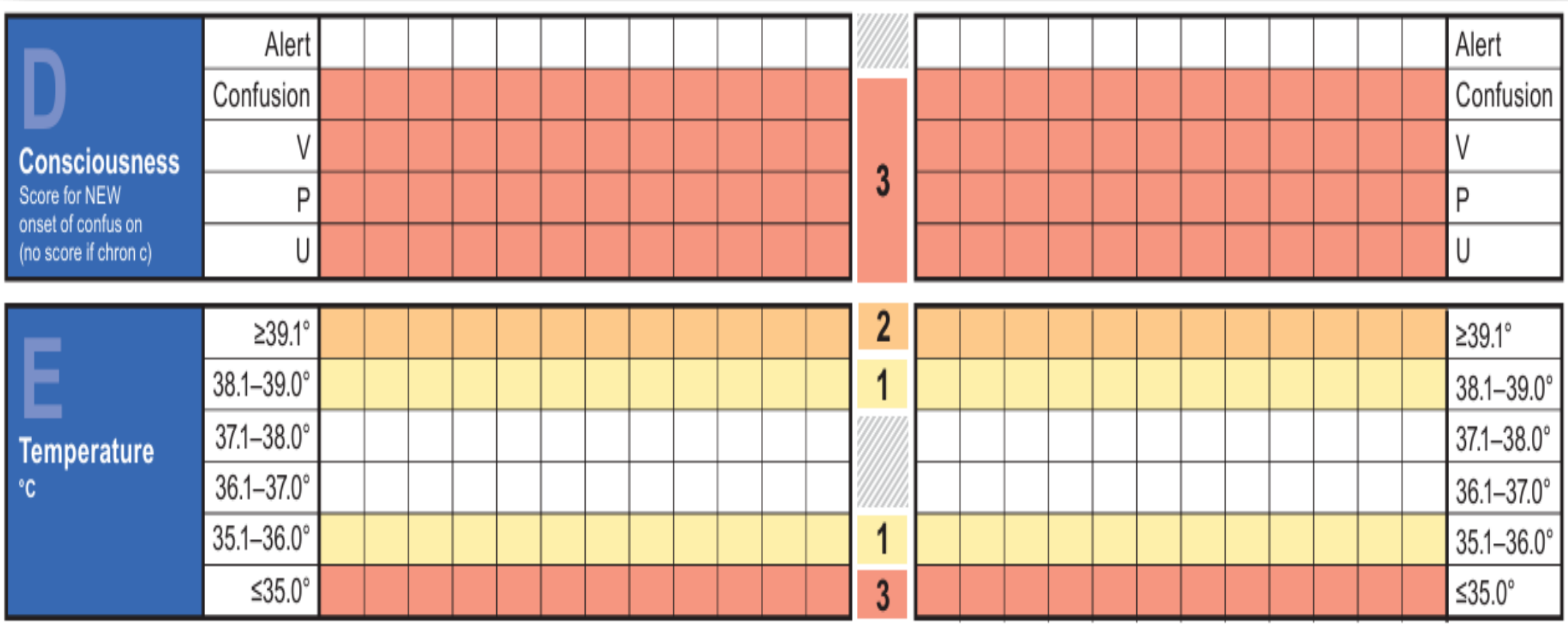


1 An example of an early warning system using patient observations: the National Early Warning System (NEWS) fro Physicians. (Reproduced from Royal College of Physicians. National Early Warning Score (NEWS) 2: Standardising the ness severity in the NHS. Updated report of a working party. London: RCP, 2017.)


A+B
Respirations
Breaths/min
≥25
21–24
18–20
15–17
12–14
9–11
≤8
3
2
1
3
≥25
21–24
18–20
15–17
12–14
9–11
≤8


A+B
SpO2 Scale 1
Oxygen saturation (%)
≥96
94–95
92–93
≤91
1
2
3
≥96
94–95
92–93
≤91


C
Blood pressure
mmHg
Score uses systolic BP on y
≥220
201–219
181–200
161–180
141–160
121–140
111–120
101–110
91–100
81–90
71–80
61–70
51–60
≤50
3
1
2
3
C
Pulse
Beats/min
≥131
121–130
111–120
101–110
91–100
81–90
71–80
61–70
51–60
41–50
31–40
≤30
3
2
1
1
3


D
Consciousness
Score for NEW onset of confus on (no score if chron c)
Alert
Confusion
V
P
U
3
Alert
Confusion
V
P
U
E
Temperature
°C
≥39.1°
38.1–39.0°
37.1–38.0°
36.1–37.0°
35.1–36.0°
≤35.0°
2
1
1
3
≥39.1°
38.1–39.0°
37.1–38.0°
36.1–37.0°
35.1–36.0°
≤35.0°

National Early Warning (NEW)Score

An aggregate score places patients in different

- risk categories (low to high risk) that trigger an appropriate clinical response,
- who are in the high-risk category of clinical deterioration will need urgent assessment by staff with critical care experience and airway skills.

NEW score	Clinical risk	Response
Aggregate score 0–4	Low	Ward-based response
Red score Score of 3 in any individual parameter	Low–medium	Urgent ward-based response*
Aggregate score 5–6	Medium	Key threshold for urgent response*
Aggregate score 7 or more	High	Urgent or emergency response**

* Response by a clinician or team with competence in the assessment and treatment of acutely ill patients and in recognising when the escalation of care to a critical care team is appropriate.

**The response team must also include staff with critical care skills, including airway management.

Figure 24.2 Risk category from the National Early Warning (NEW) score and response. *Response by a clinician or team with competence in the assessment and treatment of acutely ill patients and in recognising when the escalation of care to a critical care team is appropriate. **The response team must also include staff with critical care skills, including airway management. (Reproduced from Royal College of Physicians. *National Early Warning Score (NEWS) 2: Standardising the assessment of acute-illness severity in the NHS*. Updated report of a working party. London: RCP, 2017.)

Post-Operative Analgesia

Effective analgesia aims to:

- Reduce physiological stress responses (tachycardia, hypertension, hypoventilation)
- Facilitate deep breathing and coughing
- Enable early mobilization
- Improve sleep and overall recovery
- Prevent chronic post-surgical pain

Standard pain Assessment Methods:

- **Numeric Rating Scale (NRS):**

Patient rates pain from **0 (no pain)** to **10 (worst imaginable pain)**.

- **Visual Analogue Scale (VAS):**

A continuous line (usually 10 cm) representing pain intensity from none to severe.

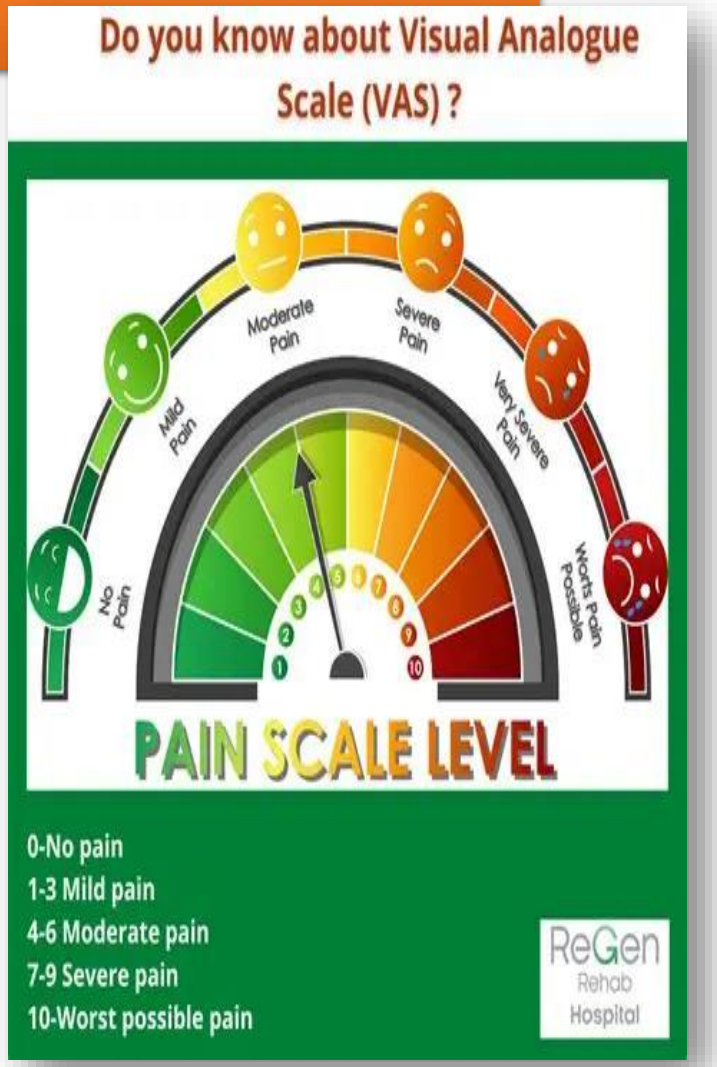
- **Functional Indicators:**

Assessment of whether pain limits:

- Deep breathing
- Effective coughing
- Mobilization
- Participation in physiotherapy

- **Sedation Score (in patients receiving opioids):**

Used to detect excessive central nervous system depression and reduce the risk of respiratory compromise.



Multimodal Analgesia

to optimize post-operative pain control while minimizing opioid-related adverse effects.

it matters to :

- Improves analgesic efficacy
- Reduces opioid dose requirements
- Lowers nausea, sedation, and respiratory depression
- Facilitates early mobilization and respiratory function

Types

- **Non-opioids:** Paracetamol ± NSAIDs
- **Opioids:** For moderate–severe pain, lowest effective dose
- **Regional/local techniques:** Epidural, nerve blocks, wound infiltration
- **Adjuvants:** Ketamine (low dose), gabapentinoids (selected cases)
- **Non-pharmacological:** Positioning, splinting, physiotherapy

Surgical Site

Post-op wound and drain management aims to:

- Prevent surgical site infection SSI)
- Detect hemorrhage early
- Identify leaks or fistula
- Promote optimal healing
- Minimize foreign-body dwell time
- Reduce re-operation rates

Systematic Wound Assessment

👀 LOOK

- Erythema (spreading vs localized)
- Swelling or tension
- Discharge: serous / purulent / bloody
- Skin necrosis or blistering
- Wound edge separation (dehiscence)
- Ecchymosis or expanding hematom

✋ FEEL

- Warmth
- Fluctuance (abscess)
- Crepitus (gas-forming infection—**emergency**)
- Excessive tenderness

👃 SMELL

- Foul odor → anaerobic infection

📏 MEASURE

- Size of erythema
- Length of separation
- Drainage volume

Drain Management

🚨 Red Flags for Post-Operative Drains

- 150–200 mL/hr for 2–3 hours (mediastinal/cardiac drains)
- Fresh bright blood after an initial decline
- Sudden drop in blood pressure with rising drain output
- Falling hemoglobin
- Bilious drainage (yellow–green)
- Feculent or foul-smelling fluid
- Milky/white fluid (suspect chyle)
- Purulent discharge
- Sudden dark blood after being clear
- New or worsening air leak in chest drain
- Loss of swing with respiratory distress
- Secondary rise in output after previous fall
- Persistently high output beyond expected timeframe
- Sudden stop in output with patient deterioration (possible blockage/tamponade)
- Fever with turbid drainage
- Increasing pain or swelling near drain site
- Expanding wound hematoma or tension
- Drain dislodgement with instability

Purpose

- Evacuate fluid/air
- Detect bleeding/leaks
- Prevent collections
- Guide re-intervention

📊 Monitor

- **Volume:** trend, sudden ↑ =bleeding/leak
- **Character:**
  – Serous = normal
  – Fresh blood = hemorrhage
  – Milky = chyle
  – Bilious = bile leak
  – Feculent = bowel injury
  – Purulent = infection
  – Air bubbling = lung/bronchial leak

  Odor: foul → infection

Post-Op Fluid Therapy

Goal of fluid therapy

- Maintain tissue perfusion
- Support blood pressure & cardiac output
- Preserve renal function
- Replace real losses
- Avoid salt/water overload
- Promote gut recovery & mobilization

Monitor

Clinical

- HR, BP, MAP
- Capillary refill, skin temperature
- Lung auscultation, edema
- Daily weight

Renal

- Urine output ≥ 0.5 mL/kg/hr
- Creatinine trend

Laboratory

- Lactate
- Hb/hematocrit
- Electrolytes

Dynamic Tests

- Passive leg raise
- Stroke volume change
- IVC ultrasound

🧪 Maintenance vs Replacement

Maintenance Fluids

- 👉 Cover *normal daily physiologic needs* when the patient is stable and not eating/drinking.
- **Typical Goals**
- Water: **25–30 mL/kg/day**
- Sodium: ~1 mmol/kg/day
- Potassium: ~1 mmol/kg/day (if kidneys functioning)
- Glucose: small amount to prevent ketosis (optional)
- **Preferred Fluids**
- Balanced crystalloids (e.g., Hartmann's / Plasma-Lyte)
- Add K^+ only after urine output confirmed
- **Used When**
  ✓ Hemodynamically stable
  ✓ Minimal losses
  ✓ No active bleeding
  ✓ Adequate urine output

Replacement Fluids

- Replacement fluids are given to **replace actual fluid losses** that have already occurred or are continuing.

Purpose

- Replace blood loss
- Replace gastrointestinal losses
- Replace drain output
- Correct third-space losses

When to use

- Hypotension
- Tachycardia
- Low urine output
- high drain or NG tube output
- Falling hemoglobin or electrolyte imbalance

Thank you