Preventing Cardiac Arrest in the Intensive Care Unit

Clinical Trigger and Response System

* Hypotension	• New hypotension • Addition of a new vasopressor • Significant increase in vasopressor dose
Respiratory insufficiency	• Increase in respiratory rate • Change in mental status • Escalating oxygen requirements
Agitation/Anxiety	• Patient combative • Patient pulling at/off support therapies • Antipsychotic/anxiolytic ineffective
Marked Clinical Concern	• Nursing/Physician concern • New and unexpected clinical change • Other provider concern

***Abnormal vital signs and changes in mental status are common in the ICU. The listed 'Trigger' criteria are prompts only. A 'Trigger' should be invoked if the clinical change is new, unexpected, and/or concerning.**

HYPOTENSION

- new SBP <90
- addition of a new vasopressor
- significant increase in vasopressor dose

STOP

Rapid Deterioration or Cardiac Arrest imminent

YES → **Activate UNIT RESPONSE or call CODE BLUE x21212**

NO

Take care of the patient

- Ensure or obtain adequate IV access
- Start IVF/Vasopressors
- Consider intubation

Communicate

- Huddle with multidisciplinary team at bedside
- Alert attending physician if not present
- Alert any additional personnel needed

Review

- Review Clinical Trigger and Response decision aid
- Review ‘Common Pitfalls’ list
- See REVERSE side of card →

HYPOTENSION

- new SBP <90
- addition of a new vasopressor
- significant increase in vasopressor dose

Clinical Trigger and Response Decision Aid

Shock Type	Etiologies	Diagnostic and Management Considerations

Obstructive	Tension Pneumothorax
	Cardiac Tamponade
	Pulmonary Embolism
	Impaired venous return
		• Exam for cold, mottled extremities
		• Exam for decreased breath sounds or muffled heart sounds
		• Bedside ultrasound and chest Xray
		  ○ Assess for pneumothorax
		  ○ Assess for pericardial effusion
		• Assess for auto-peep
		• Measure lactate, cvO2

Hypovolemic	Intravascular Volume Loss Hemorrhage	• Exam for bleeding (e.g. flank bruising, inspect wounds, assess for GI bleeding) • Consider fluid resuscitation • Measure hemoglobin, lactate, and coagulation parameters • Consider massive transfusion protocol
Cardiogenic	Arrhythmia Valve Failure Cardiomyopathy Myocardial infarction	• Exam for cold, mottled extremities • Cardiac exam with attention to new murmurs • Assess telemetry and consider 12-lead ECG • Send troponin, BNP, lactate, and measure cvO2 • Urgent cardiology consult and consider mechanical support
Distributive	Sepsis Anaphylaxis Drug/Toxin Adrenal Insufficiency	• Examine for rash or other signs of allergy • Consider infectious source and obtain cultures, lactate • Low threshold for broad spectrum empiric antibiotics • Examine medications (esp. sedating medications) • Consider empiric steroid therapy

Review

Common Pitfalls

- Delayed intubation in the setting of clinical deterioration
- Communication when patients are boarders or during off-hours
- Patient code status discordant with perceived GOC

****Document hypotension event in the clinical chart****

Respiratory Insufficiency

- increase in respiratory rate
- change in mental status
- escalating oxygen requirements

STOP

Rapid Deterioration or Cardiac Arrest imminent

YES → **Activate UNIT RESPONSE or call CODE BLUE x21212**

NO

Take care of the patient

Patient NOT intubated

- Maximize respiratory support therapies already in place
- Consider and prepare for intubation

Patient intubated

- Check all ventilator connections
- Increase FiO2 to 100%
- Listen for cuff-leak as sign of ET tube above the vocal cords

Communicate

- Huddle with multidisciplinary team at bedside
- Alert attending physician if not present
- Alert any additional personnel needed

Review

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Respiratory Insufficiency

- increase in respiratory rate
- change in mental status
- escalating oxygen requirements

Clinical Trigger and Response Decision Aid

Area of Defect	Etiologies	Diagnostic and Management Considerations
Controller	Hypercapnia Stroke/CVA Encephalopathy	• Assess ability to protect airway • Assess pCO2
Gas exchanger	Interstitial edema/ARDS Pneumonia Pulmonary embolism Non-infectious interstitial lung disease	• Exam for new crackles, rhonchi, wheezing or absent breath sounds • Obtain bedside US and CXR to assess for PTx and other pathologies • Consider CT-angiogram to assess for PE • Assess for auto-peep and ventilator dyssynchrony
Pump	Mucous plug Equipment failure Diaphragm dysfunction	• Exam for decreased breath sounds • Exam for signs of cuff leak • Deep suction through ETT • Assess all connections and equipment • Consider diaphragm evaluation

Peri-Intubation

- Review **PRE-EMPT** checklist
- Obtain CXR to assess ETT placement
- Ensure set minute volume matches or exceeds pre-intubation minute volume
- Re-assess blood gas within 1 hour of intubation

Post Intubation

Review

Common Pitfalls

- Delayed intubation in the setting of increasing high-flow nasal cannula requirements
- Communication when patients are boarders or during off-hours
- Patient code status discordant with perceived GOC

****Document respiratory event in the clinical chart****

Agitation/Anxiety

- patient combative
- patient pulling at/off support therapies
- family concern regarding mental status

STOP

Rapid Deterioration or Cardiac Arrest imminent

YES → **Activate UNIT RESPONSE or call CODE BLUE x21212**

NO

Take care of the patient

- Assess for and correct hypoxemia
- Ensure staff and patient safety
- Provide patient reassurance

Communicate

- Huddle with multidisciplinary team at bedside
- Alert attending physician if not present
- Obtain additional information from family if present

Review

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Agitation/Anxiety

- patient combative
- patient pulling at/off support therapies
- family concern regarding mental status

Clinical Trigger and Response Decision Aid

Review

Assess patient at bedside with multidisciplinary team

Could this be?

Unrecognized shock

- Assess for occult hypoperfusion and organ dysfunction
  - Exam for cool extremities or mottling
  - Laboratory testing for lactate, hemoglobin, and markers of organ function

Impending respiratory failure

- Assess for hypoxemia, hypercarbia, or airway obstruction
  - Exam for stridor, accessory muscle use
  - Determine If any change in respiratory support or supplemental O2 delivery

Pain

- Assess for any new pain
  - Exam for tenderness (esp abdominal tenderness)
  - Evaluate pain with imaging modalities as needed
  - Treat pain

No → Consider treatment for agitation with antipsychotic or anxiolytic

Common Pitfalls

- Anxiolytics/antipsychotics given despite impending clinical deterioration
- Communication when patients are boarders or during off-hours
- Patient code status discordant with perceived GOC

→ ****Document anxiety/agitation event in the clinical chart****

Marked Clinical Concern

- Nursing concern
- MD/NP/PA concern
- Family concern

Rapid Deterioration or Cardiac Arrest imminent

YES → **Activate UNIT RESPONSE or call CODE BLUE x21212**

NO

- Assess for hypoxemia, hypotension, and agitation
- Huddle with multidisciplinary team at bedside
- Alert attending physician if not present
- Obtain additional information from family if present