**Postoperative Deterioration in Cardiac Surgical Patients – ICU Physician Adjudicator Structured Questionnaire**

**Deterioration Event Patient Cohort**

| Outcome Title | Definition | Notes | ICU Physician Adjudicator Questions to Complete via Chart Review |
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| Low Cardiac Index | *New* decrease in cardiac index below 2.0 L/min/m2 with either:   1. No prior cardiac index measurement within 48 hours 2. Prior cardiac index measurement within 48 hours ≥2.0 L/min/m2 | Outcome requires PA catheter | 1. Did this patient have a low cardiac index <2.0 L/min/m2    1. Yes    2. No, explain why: \_\_\_<free text> 🡪 skip remaining questions 2. Was this low cardiac index due to hemodynamic instability requiring treatment (e.g. fluid bolus, transfusion, inotrope, surgical intervention, cardioversion, intubation)    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No, explain why: \_\_\_ < free text> **🡪** skip remaining questions 3. If 2 = Yes **🡪** Was the hemodynamic instability primarily iatrogenically induced by a medical/procedural intervention following the ICU admission?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 4. If 3 = Yes **🡪** what was the cause?    1. <free text> 5. If 2 = Yes **🡪** What were the treatments *performed within 8 hours* (select all that apply):    1. Intravascular volume expansion    2. Blood transfusion    3. Vasopressor support (ongoing and/or newly initiated/escalated)    4. Inotrope support (ongoing and/or newly initiated/escalated)    5. Surgical/procedural intervention    6. Cardioversion    7. Intubation    8. Adjustment to ventilator settings    9. Other: \_\_\_ <free text> |
| Sustained Hypotension | Decrease in mean arterial pressure (MAP) below 55 mmHg for >=120 minutes with either:   1. No prior MAP measurement within 48 hours 2. Prior MAP measurement within 48 hours ≥55 mmHg | If multiple sources of mean arterial pressure are being monitored, algorithm should follow the *highest* mean arterial pressure measurement | 1. Did this patient have a sustained MAP < 55 mmHg?    1. Yes    2. No, explain why: \_\_\_<free text> 🡪 skip remaining questions 2. Was this low MAP due to hemodynamic instability requiring treatment (e.g. fluid bolus, transfusion, vasopressor, surgical intervention, cardioversion, intubation)    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No, explain why: \_\_\_ < free text> **🡪** skip remaining questions 3. If 2 = Yes **🡪** Was the hemodynamic instability primarily iatrogenically induced by a medical/procedural intervention following the ICU admission?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 4. If 3 = Yes **🡪** what was the cause?    1. <free text> 5. If 2 = Yes **🡪** What were the treatments *performed within 8 hours* (select all that apply):    1. Intravascular volume expansion    2. Blood transfusion    3. Vasopressor support (ongoing and/or newly initiated/escalated)    4. Inotrope support (ongoing and/or newly initiated/escalated)    5. Surgical/procedural intervention    6. Cardioversion    7. Intubation    8. Adjustment to ventilator settings    9. Other: \_\_\_ <free text> |
| Epinephrine Bolus | Epinephrine IV bolus administered >10 mcg |  | 1. Did this patient receive an epinephrine IV bolus?    1. Yes    2. No, explain: \_\_\_<free text> 🡪 skip remaining questions 2. What was the cause (select all that apply)?    1. Hypovolemia (subacute, >1 hour)    2. Hypovolemia (acute blood loss within 1 hour)    3. Hypoxia (subacute, >1 hour)    4. Hypoxia (acute within 1 hour)    5. Acidosis    6. Electrolytes    7. Tamponade    8. Pneumothorax    9. Myocardial infarction    10. Pulmonary embolism    11. Device malfunction or discontinuation    12. Other: \_\_\_\_ <free text> |
| New inotrope infusion | New inotrope infusion started, not previously being used within 48 hours |  | 1. Was this patient initiated on a new inotrope infusion?    1. Yes    2. No, explain: <free text> **🡪** skip remaining questions 2. Was this inotrope infusion started due to hemodynamic deterioration?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 3. If 2 = Yes **🡪** Was the hemodynamic deterioration primarily induced by a medical/procedural intervention following the ICU admission?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 4. If 3 = Yes **🡪** what was the cause?    1. <free text> 5. If 2 = No, what was the likely cause of this outcome?    1. Discretionary change in management (e.g. physician preference)    2. Unable to determine    3. Other: \_\_\_\_<free text> |
| Inotrope infusion rate escalation | Two conditions met:   1. Inotrope infusion started at a rate/or reaching a rate at or above *threshold infusion rate* (defines start time for monitoring of infusion) 2. Inotrope infusion rate then increases to ≥100% of value at start time for monitoring of infusion, at any point during ICU stay | *Threshold infusion rates*:  Milrinone – 0.250 mcg/kg/min  Dobutamine – 2.0 mcg/kg/min  Epinephrine – 0.02 mcg/kg/min  Dopamine – 2.5 mcg/kg/min  Isoproterenol – 2.0 mcg/min  If patient remains initially at an infusion rate above threshold, and then falls below threshold, a subsequent increase in the infusion rate needs only be >=100% the threshold value to qualify. | 1. Was this inotrope infusion dose escalated?    1. Yes    2. No, explain: <free text> **🡪** skip remaining questions 2. Was this inotrope infusion increased due to hemodynamic deterioration?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 3. If 2 = Yes **🡪** Was the hemodynamic deterioration primarily induced by a medical/procedural intervention following the ICU admission?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 4. If 3 = Yes **🡪** what was the cause?    1. <free text> 5. If 2 = No, what was the likely cause of this outcome?    1. Discretionary change in management (e.g. physician preference)    2. Unable to determine    3. Other: \_\_\_\_<free text> |
| New vasopressor infusion | New centrally-administered vasopressor infusion started (norepinephrine, vasopressin), not previously being used within 48 hours |  | 1. Was this patient initiated on a new vasopressor infusion?    1. Yes    2. No: explain <free text> **🡪** skip remaining questions 2. Was this vasopressor infusion started due to hemodynamic deterioration?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 3. If 2 = Yes 🡪 Was the hemodynamic deterioration primarily induced by a medical/procedural intervention following the ICU admission?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 4. If 3 = Yes 🡪 what was the cause?    1. <free text> 5. If 2 = No, what was the likely cause of this outcome?    1. Discretionary change in management (e.g. physician preference)    2. Unable to determine    3. Other: \_\_\_\_<free text> |
| Vasopressor infusion rate escalation | Two conditions met:   1. Vasopressor infusion started at a rate/or reaching a rate at or above *threshold infusion rate* (defines start time for monitoring of infusion) 2. Vasopressor infusion rate then increases to ≥100% of value at start time for monitoring of infusion, at any point during ICU stay | *Threshold infusion rates*:  Norepinephrine – 0.10 mcg/kg/min  Vasopressin – 2 units/hour  If patient remains initially at an infusion rate above threshold, and then falls below threshold, a subsequent increase in the infusion rate needs only be >=100% the threshold value to qualify. | 1. Was this vasopressor infusion dose escalated?    1. Yes    2. No: explain <free text> **🡪** skip remaining questions 2. Was this vasopressor infusion increased due to hemodynamic deterioration?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 3. If 2 = Yes 🡪 Was the hemodynamic deterioration primarily induced by a medical/procedural intervention following the ICU admission?    1. Yes – definitely (>95%)    2. Yes – probably (80-95%)    3. Yes – possibly (50-80%)    4. No 4. If 3 = Yes 🡪 what was the cause?    1. <free text> 5. If 2 = No, what was the likely cause of this outcome?    1. Discretionary change in management (e.g. physician preference)    2. Unable to determine    3. Other: \_\_\_\_<free text> |
| Mortality | Patient Mortality | Need to right-censor data if determination of ‘comfort care’ or ‘end-of-life care’ measures employed. | 1. Was there a period prior to the patient’s death in which the patient was made comfort and/or end-of-life care?    1. Yes – estimated date/time of comfort/end-of-life care measures implemented <provide date/time>    2. No (skip 2) 2. Immediately prior to comfort/end-of-life care measures, would the continuation of ongoing therapies likely have extended the patient’s life >24 hours?    1. Yes    2. No |

**Prediction Algorithm *Non-Event* Control Patient Review**

| ICU Physician Adjudicator Questions to Complete via Chart Review |
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| 1. As your clinical intuition drove you to investigate after reviewing the discharge summary, did you note any of the following outcomes (can choose multiple)?    1. Low cardiac index <2.0 L/min/m2, at any point >24 hours after admission to the ICU    2. Sustained low MAP <55 mmHg for >= 120 consecutive minutes, at any point >24 hours after admission to the ICU    3. Death in the ICU    4. New inotrope infusion (not previously used within 48 hours), at any point >24 hours after admission to the ICU    5. New centrally-acting vasopressor infusion (not previously used within 48 hours), at any point >24 hours after admission to the ICU 2. Did this patient receive CPR which involved epinephrine or chest compressions (i.e. not just cardioversion) at any point >24 hours after admission to the ICU? 3. <Free text> Describe any other life-threatening hemodynamic deterioration (excluding hemodynamically stable arrhythmias, e.g. AFib) occurring at any point >24 hours after admission to ICU, not captured by outcomes above. |