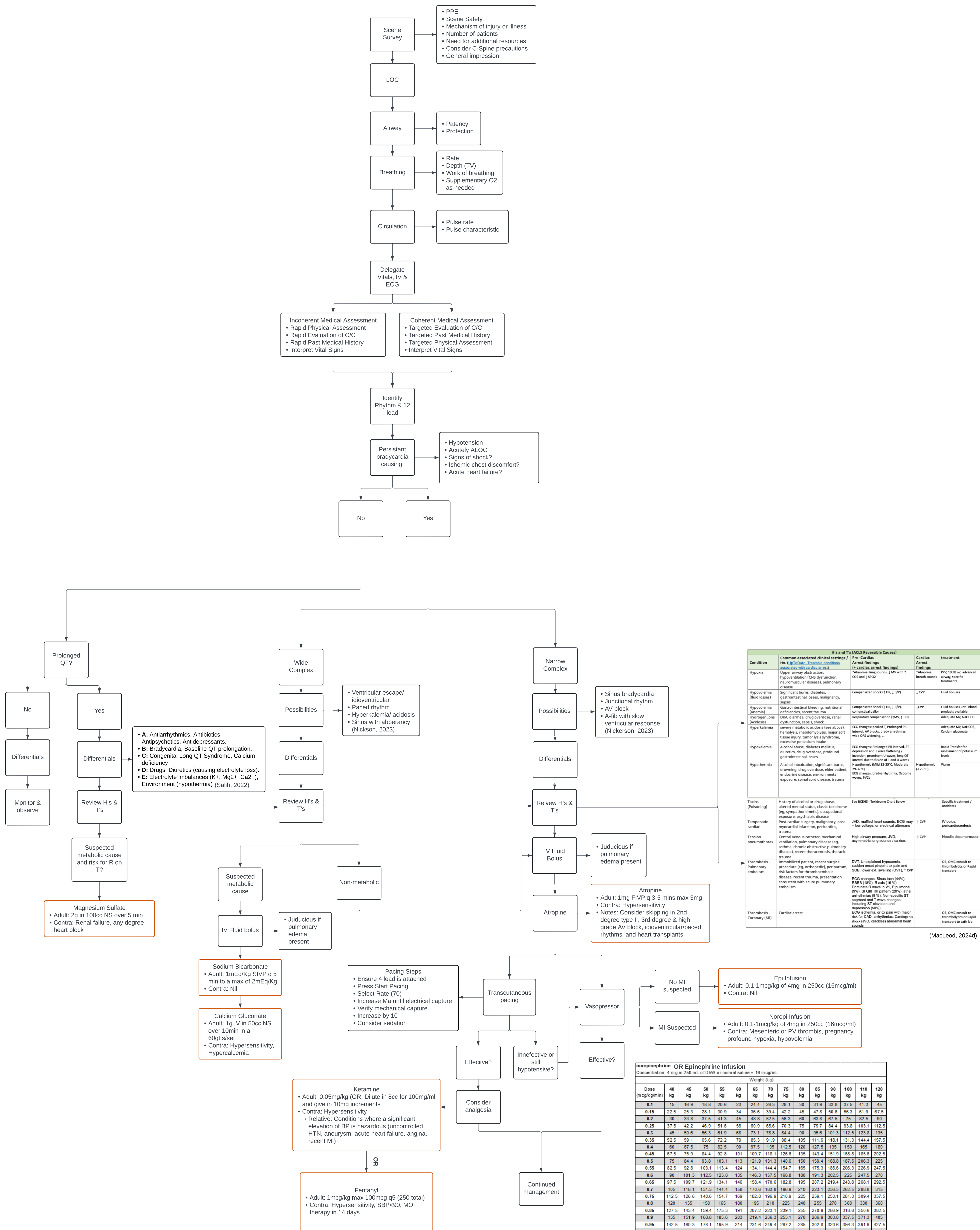


Symptomatic Bradycardia



H's and T's (ACLS Reversible Causes)					
Condition	Common associated clinical settings / Hx. (UpToDate -Treatable conditions associated with cardiac arrest)	Pre -Cardiac Arrest findings (+ cardiac arrest findings)	Cardiac findings	treatment	
Hypoxia	Upper airway obstruction, hypoventilation (CNS dysfunction, neuromuscular disease), pulmonary disease	*Abnormal lung sounds, ↓ MV with ↑ CO2 and ↓ SpO2	*Abnormal breath sounds	PPV, 100% o2, advanced airway, specific treatments	
Hypovolemia (fluid losses)	Significant burns, diabetes, gastrointestinal losses, malignancy, sepsis	Compensated shock (↑ HR, ↓ BP)	↓ CVP	Fluid boluses	
Hypovolemia (Anemia)	Gastrointestinal bleeding, nutritional deficiencies, recent trauma	Compensated shock (↑ HR, ↓ BP), conjunctival pallor	↓CVP	Fluid boluses until Blood products available	
Hydrogen Ions (Acidosis)	DKA, diarrhea, drug overdose, renal dysfunction, sepsis, shock	Respiratory compensation (TMV, ↑ HR)		Adequate Mu, NaHCO3	
Hyperkalemia	severe metabolic acidosis (see above), hemolysis, rhabdomyolysis, major soft tissue injury, tumor lysis syndrome, excessive potassium intake	ECG changes: peaked T, Prolonged PR interval, AV blocks, brady arrhythmias, wide QRS widening, ...		Adequate Mu, NaHCO3, Calcium gluconate	
Hypokalemia	Alcohol abuse, diabetes mellitus, diuretics, drug overdose, profound gastrointestinal losses	ECG changes: Prolonged PR interval, ST depression and T wave flattening / inversion, prominent U waves, long QT interval due to fusion of T and U waves		Rapid Transfer for assessment of potassium levels	
Hypothermia	Alcohol intoxication, significant burns, drowning, drug overdose, elder patient, endocrine disease, environmental exposure, spinal cord disease, trauma	Hypothermic (Mild 32-35°C, Moderate 29-32°C) ECG changes: bradyarrhythmia, Osborne waves, P/QCS	Hypothermic (< 29 °C)	Warm	
Toxins (Poisoning)	History of alcohol or drug abuse, altered mental status, classic toxidrome (eg. sympathomimetic), occupational exposure, psychiatric disease	See BCCHS - Toxidrome Chart Below		Specific treatment / antidotes	
Tamponade - cardiac	Post-cardiac surgery, malignancy, post-myocardial infarction, pericarditis, trauma	JVD, muffled heart sounds, ECG may = low voltage, or electrical alternans	↑ CVP	IV bolus, pericardiocentesis	
Tension pneumothorax	Central venous catheter, mechanical ventilation, pulmonary disease (eg. asthma, chronic obstructive pulmonary disease), recent thoracostomy, thoracic trauma	High airway pressure, JVD, asymmetric lung sounds / cx rise.	↑ CVP	Needle decompression	
Thrombosis - Pulmonary embolism	Immoblized patient, recent surgical procedure (eg. orthopedic), peripartum, risk factors for thromboembolic disease, recent trauma, presentation consistent with acute pulmonary embolism	DVT, Unexplained hypoxemia, sudden onset pleuritic cx pain and SOB, lower ext. swelling (DVT), ↑ CVP		O2, OMC consult re thrombolytics or Rapid transport	
Thrombosis - Coronary (MI)	Cardiac arrest	ECG changes: Sinus tach (44%), RBBB (16%), R axis (16 %), Dominant R wave in V1, P pulmonal (9%), S1 QII TIII pattern (26%), atrial arrhythmias (8 %), Non-specific ST segment and T wave changes, including ST elevation and depression (50%) ECG ischemia, or cx pain with major risk for CAD, arrhythmias, Cardiac shock (JVD, crackles) abnormal heart sounds		O2, OMC consult re thrombolytics or Rapid transport to cath lab	

(MacLeod, 2024d)