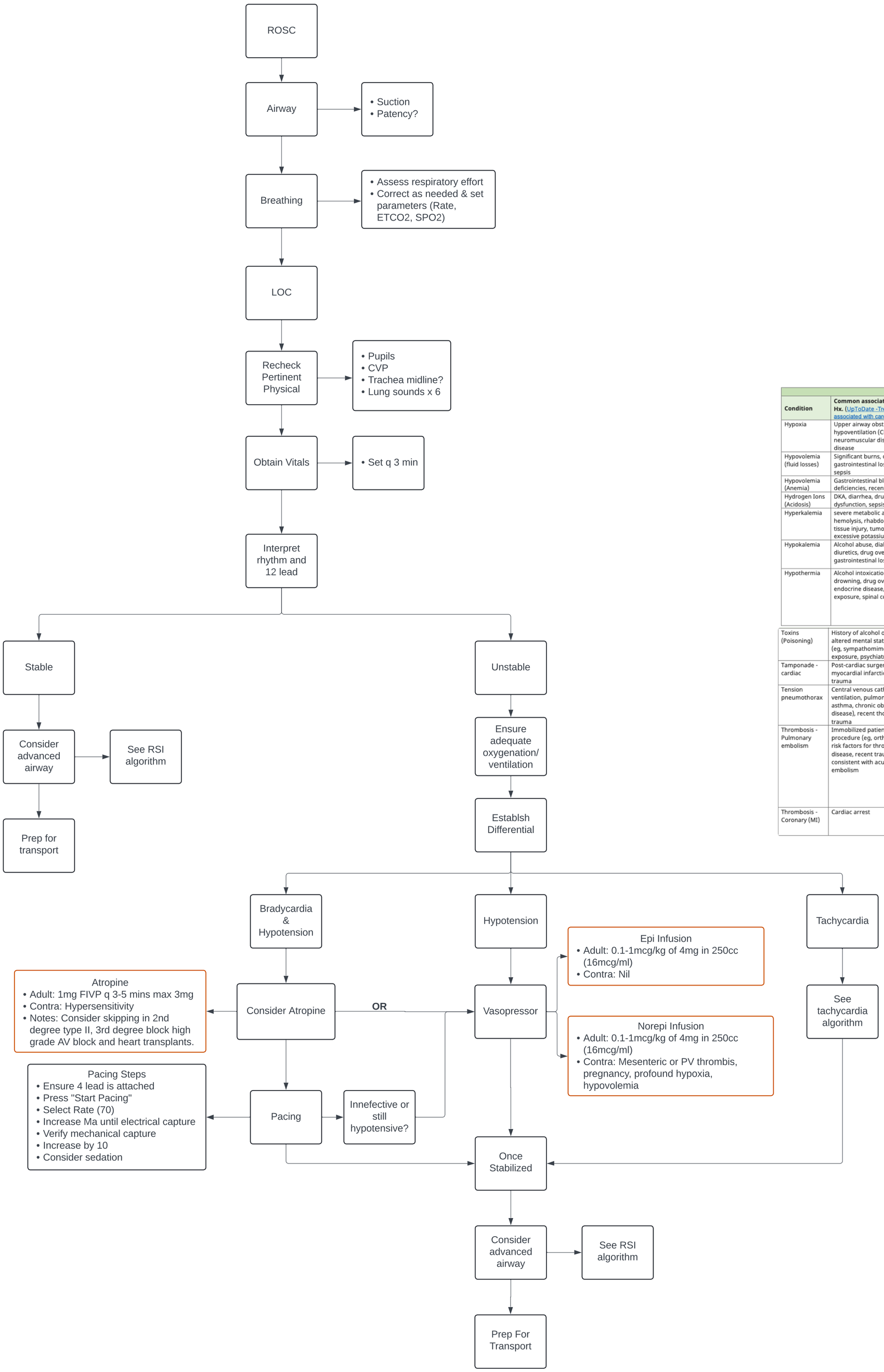
Post Adult Cardiac Arrest



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 Arrest 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, ↓ B/P)	↓ CVP	Fluid boluses
Hypovolemia (Anemia)	Gastrointestinal bleeding, nutritional deficiencies, recent trauma	Compensated shock (↑ HR, ↓ B/P), conjunctival pallor	↓CVP	Fluid boluses until Blood products available
Hydrogen Ions (Acidosis)	DKA, diarrhea, drug overdose, renal dysfunction, sepsis, shock	Respiratory compensation (↑MV, ↑ HR)		Adequate Mv, 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 arrythmias, wide QRS widening, ...		Adequate Mv, 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, PVCs	Hypothermic (< 29 °C)	Warm
Toxins (Poisoning)	History of alcohol or drug abuse, altered mental status, classic toxidrome (eg, sympathomimetic), occupational exposure, psychiatric disease	See BCEHS - 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 thoracentesis, thoracic trauma	High airway pressure, JVD, asymmetric lung sounds / cx rise.	↑ CVP	Needle decompression
Thrombosis - Pulmonary embolism	Immobilized 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 pinpoint cx pain and SOB, lower ext. swelling (DVT), ↑ CVP ECG changes: Sinus tach (44%), RBBB (18%), R axis (16 %), Dominate R wave in V1, P pulmonal (9%), SI QIII TIII pattern (20%), atrial arrhythmias (8 %), Non-specific ST segment and T wave changes, including ST elevation and depression (50%)		O2, OMC consult re thrombolytics or Rapid transport
Thrombosis - Coronary (MI)	Cardiac arrest	ECG ischemia, or cx pain with major risk for CAD, arrhythmias, Cardiogenic shock (JVD, crackles) abnormal heart sounds		O2, OMC consult re thrombolytics or Rapid transport to cath lab

(MacLeod, 2024d)

norepinephrine OR Epinephrine Infusion

Concentration: 4 mg in 250 mL of D5W or normal saline = 16 mcg/mL

	Weight (kg)													
Dose (mcg/kg/min)	40 kg	45 kg	50 kg	55 kg	60 kg	65 kg	70 kg	75 kg	80 kg	85 kg	90 kg	100 kg	110 kg	120 kg
0.1	15	16.9	18.8	20.6	23	24.4	26.3	28.1	30	31.9	33.8	37.5	41.3	45
0.15	22.5	25.3	28.1	30.9	34	36.6	39.4	42.2	45	47.8	50.6	56.3	61.9	67.5
0.2	30	33.8	37.5	41.3	45	48.8	52.5	56.3	60	63.8	67.5	75	82.5	90
0.25	37.5	42.2	46.9	51.6	56	60.9	65.6	70.3	75	79.7	84.4	93.8	103.1	112.5
0.3	45	50.6	56.3	61.9	68	73.1	78.8	84.4	90	95.6	101.3	112.5	123.8	135
0.35	52.5	59.1	65.6	72.2	79	85.3	91.9	98.4	105	111.6	118.1	131.3	144.4	157.5
0.4	60	67.5	75	82.5	90	97.5	105	112.5	120	127.5	135	150	165	180
0.45	67.5	75.9	84.4	92.8	101	109.7	118.1	126.6	135	143.4	151.9	168.8	185.6	202.5
0.5	75	84.4	93.8	103.1	113	121.9	131.3	140.6	150	159.4	168.8	187.5	206.3	225
0.55	82.5	92.8	103.1	113.4	124	134.1	144.4	154.7	165	175.3	185.6	206.3	226.9	247.5
0.6	90	101.3	112.5	123.8	135	146.3	157.5	168.8	180	191.3	202.5	225	247.5	270
0.65	97.5	109.7	121.9	134.1	146	158.4	170.6	182.8	195	207.2	219.4	243.8	268.1	292.5
0.7	105	118.1	131.3	144.4	158	170.6	183.8	196.9	210	223.1	236.3	262.5	288.8	315
0.75	112.5	126.6	140.6	154.7	169	182.8	196.9	210.9	225	239.1	253.1	281.3	309.4	337.5
0.8	120	135	150	165	180	195	210	225	240	255	270	300	330	360
0.85	127.5	143.4	159.4	175.3	191	207.2	223.1	239.1	255	270.9	286.9	318.8	350.6	382.5
0.9	135	151.9	168.8	185.6	203	219.4	236.3	253.1	270	286.9	303.8	337.5	371.3	405
0.95	142.5	160.3	178.1	195.9	214	231.6	249.4	267.2	285	302.8	320.6	356.3	391.9	427.5
1	150	168.8	187.5	206.3	225	243.8	262.5	281.3	300	300	337.5	375	412.5	450

Rate (mL/hr)

(AHS protocols, 2024)

References

1) AHS protocols. (2024, August 8). https://www.ahsems.com/public/protocols/templates/desktop/#home

2) MacLeod, M. H. (2024d). ACLS Reversible Causes – Hs & Ts.