ADULT ACUTE CORONARY SYNDROME

Suspected or known ACS

Prehospital Assessment and Care

- Monitor and support airway, breathing, circulation
- Be ready to provide CPR and defibrillation as needed
- Administer aspirin; consider oxygen, nitroglycerin and morphine if needed
- Obtain IV access; do not delay transport for IV
- Obtain 12-lead ECG –
  - Transmit ECG or share findings with receiving hospital!
  - Receiving hospital activates STEMI team per protocol as appropriate
- If considering fibrinolysis, complete fibrinolytic checklist
- Transport to emergency department or catheterization suite per protocol

Immediate Assessment and General Treatment

Within 10 minutes:

- IF STEMI, activate STEMI team per protocol
- Assess and support airway, breathing, circulation
- Obtain vital signs, oxygen saturation
  - If SpO_2 <90%, provide supplemental oxygen to maintain SpO_2 >90% and ≤ 99%; titrate as needed but avoid hyperoxia
- Obtain 12-lead ECG
- Order cardiac markers, complete blood count, electrolytes and coagulation studies
- Obtain brief medical history
- Conduct focused physical examination
- Review/complete fibrinolytic checklist
- Obtain chest radiograph (<30 min; do not delay cardiac interventions)

Immediate General Treatment

- Aspirin
- Nitroglycerin
- Morphine (if discomfort not relieved by nitroglycerin)
- Consider administration of $P2Y_{12}$ platelet receptor inhibators

Evaluate ECG

STEMI
Or new / presumably new LBBB

- Activate STEMI team if not already done
- Provide adjuvant therapies

≤ 12 hours since symptom onset?

YES

Start reperfusion therapy

- PCI (goal: ≤ 90 min of first medical contact)
- Fibrinolysis (goal: s 30 min of arrival)

NO

NSTE-ACS

Complete risk score using validated tool

High risk ECG finding highly suspicious of ischemic and/ or high risk score

Elevated troponin or high risk

- Consider early invasive strategy for:
  - ➢ Refractory ischemic chest discomfort
  - ➢ Recurrent or persistent ST-segment deviation
  - ➢ Ventricular tachycardia
  - ➢ Hemodynamic instability
- Signs/symptoms of heart failure
- Consider dual antiplatelet therapy and anticoagulant therapy (aspirin,
- P2Y12, inhibitor, anticoagulant)
- Provide adjuvant therapies)
- Cardiology consultation

Low or intermediate risk Normal ECG, nondiagnostic ECG or low risk score

Consider:

- Admission for monitoring, further testing and/or intervention
- Outpatient follow-up/ testing

MEDICATION

Aspirin

- 162 to 325 mg. Chewed (if not previously taken or contraindicated)

Nitroglycerin

- 0.4 or 0.8 mg SL every 5 min up to 3 times

Morphine

- 1 to 5 mg IV only if discomfort not relieved by nitroglycerin

See Adjuvant Drug Therapies table, on reverse side.

ADULT ACUTE STROKE

Suspected or known Acute stroke

Prehospital Assessment and Care

- Monitor and support airway, breathing, circulation
  - Provide supplemental oxygen if needed to maintain SpO_2, of 94% to 99%; provide ventilatory support (BVM, noninvasive or invasive) as needed
- Perform prehospital stroke screen and severity assessment and record time of symptom onset/last known normal
- Measure blood glucose; treat hypoglycemia as indicated
- Follow local protocols for destination decision
- Alert receiving hospital and follow protocols for stroke arrival

Activate stroke team per protocol

Immediate General Assessment

Within 10 minutes:

- Ensure airway
- Support oxygenation (maintain SpO_2, of 94% to 99%; unless clinical condition warrants a different level) and ventilation (BVM, noninvasive or invasive) as needed
- Monitor and support circulation as needed
- Order noncontrast CT or MRI
- Perform neurologic screening assessment
- Obtain vascular access and order laboratory studies:
- Measure blood glucose and provide treatment as needed
- Obtain 12-lead ECG
- Place on NPO status

Within 20 minutes:

- Obtain focused history
- Conduct neurologic assessment (NIHSS or similar stroke severity tool)
- Determine time of symptom onset/last known normal
- Complete CT/MRI of head

Within 45 minutes:
Interpret imaging results

Ischemic

Eligible for fibrinolytic and/or endovascular therapy?

YES

Start fibrinolytic therapy, endovascular therapy or both

- **Fibrinolytic therapy** (≤60 min of arrival)
  - ≤ 3 hours of symptom onset (< 4.5 hours for select patients)
- **Endovascular therapy** (if transfer needed, goal is <60 min from arrival to departure)
  - ≤ 6 hours of symptom onset (6 to 24 hours for select patients)

Admit or prepare for transfer to stroke unit

- Begin post-therapy protocols
- Monitor for neurologic deterioration, complications of stroke/stroke therapy
- Manage blood pressure
- Manage glucose per protocol

NO

Consider adjuvant therapies

Seek neurology / expert consult

Admit or prepare for transfer to stroke unit

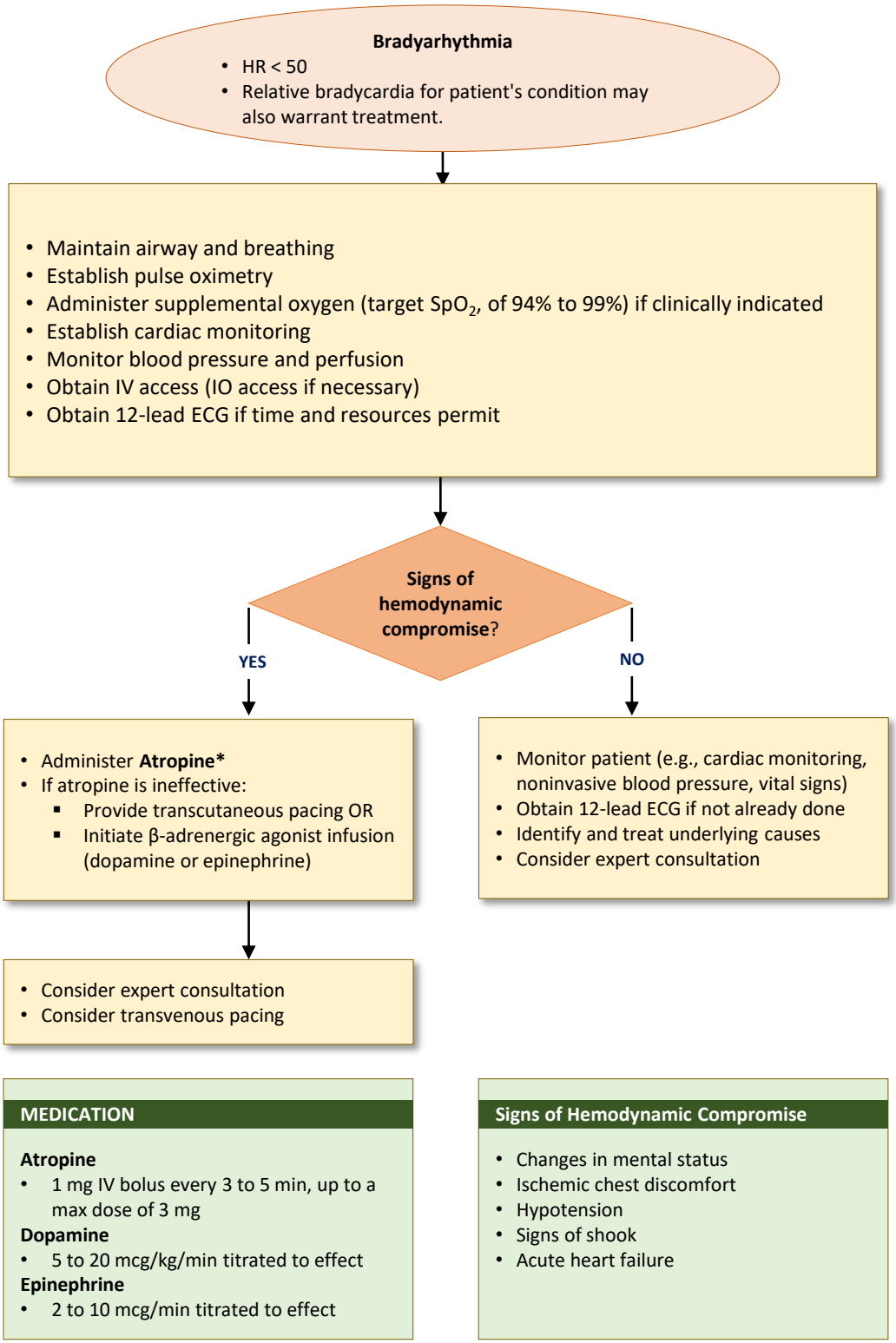
Hemorrhagic

- Consider reversal and/or treatment if patient is on anticoagulants
- Consider treatment of hypertensive crisis
- Manage raised intracranial pressure
- Treat seizures
- Seek expert consult (neurologist / neurosurgeon)

Prepare patient for admission/ transfer to comprehensive stroke or neurosurgical unit/center

Can be done in emergency department or imaging location; best practice is to bring the patient directly from arrival to imaging.
↑CTA with CP or MRA with diffusion-weighted MRI with or without MR perfusion may be used for selected patients.
↕Serum electrolyte panel with renal function tests, complete blood count, cardiac markers, prothrombin time international normalized ratio, activated partial thromboplastin time
§Discontinue therapy with anticoagulant or antiplatelet agents for 24 hours after rtPA administration

ADULT BRADYARRHYTHMIA



*Consider implementing transcutaneous pacing or -adrenergic agonist therapy immediately for patients with second-degree AV block type I or third-degree AV/ block.
Consider implementing transcutaneous pacing immediately if vascular access is difficult to achieve.

ADULT TACHYARRHYTHMIA

Tachycardia
- HR ≥ 100
- Relative bradycardia for patient's condition may also warrant treatment.

- Maintain airway and breathing
- Establish pulse oximetry
- Administer supplemental oxygen (target SpO_2, of 94% to 99%) if clinically indicated
- Establish cardiac monitoring, monitor blood pressure and perfusion
- Obtain 12-lead ECG if time and resources permit
- Obtain IV access (IO access if necessary)

Evaluate Rhythm

Probable Sinus Tachycardia
- **HR usually < 150**

- Monitor patient (e.g., cardiac monitoring, noninvasive blood pressure, vital signs)
- Obtain 12-lead ECG if not already done
- Identify and treat underlying causes (e.g. dehydration, blood loss, fever, infection, anxiety)

Signs of hemodynamic compromise?

YES

- Immediate **synchronized cardioversion** (pre-sedate if possible)
- Consider **adenosine** (do not delay cardioversion) for narrow-complex and regular rhythm
- If refractory, consider:
  - Need to increase energy level for next cardioversion
  - Antiarrhythmic medication (**procainamide, amiodarone** OR sotalol)
  - Underlying cause
  - Expert consultation

NO

Wide QRS (≥ 0.12sec)?

YES

- Obtain IV access and 12-lead ECG if not already done and time and resources permit
- Consider **adenosine** if regular and monomorphic
- Consider antiarrhythmic medication (**procainamide, amiodarone** OR sotalol)
- If refractory, consider:
  - Underlying cause
  - Cardioversion
  - Adjustment of dose or change/addition of another antiarrhythmic medication (**procainamide, amiodarone** OR sotalol)
  - Expert consultation

NO

- Obtain IV access and 12- lead ECG if not already done and time and resources permit
- Attempt **vagal maneuver** if rhythm is regular
- Consider **adenosine** if rhythm is regular
- Consider calcium channel blocker
- OR **β-blocker** if rhythm is not regular, adenosine is ineffective or tachyarrhythmia recurs
- Consider expert consultation

MEDICATION

Adenosine
- First dose: 6 mg via rapid V push
- Second dose: 12 mg if needed
- NOTE: Follow each dose with a rapid 10- to 20-ml NS

Amiodarone
- 150 mg 1/ over 10 min; repeat as needed if arrhythmia recurs
- Maintenance infusion: 1 mg/min for first 6 hours

Procainamide (avoid if prolonged QT or congestive heart failure)
- 20 to 50 mg/min until arrhythmia is suppressed, hypotension develops, ORS duration increases by more than 50% or man close of 17 mg/g is given
- Maintenance infusion: 1 to 4 mg/min

Sotalol (avoid if prolonged QT)
- 100 mg (15 mg/kg) over 5 min

Synchronized Cardioversion Energy Doses

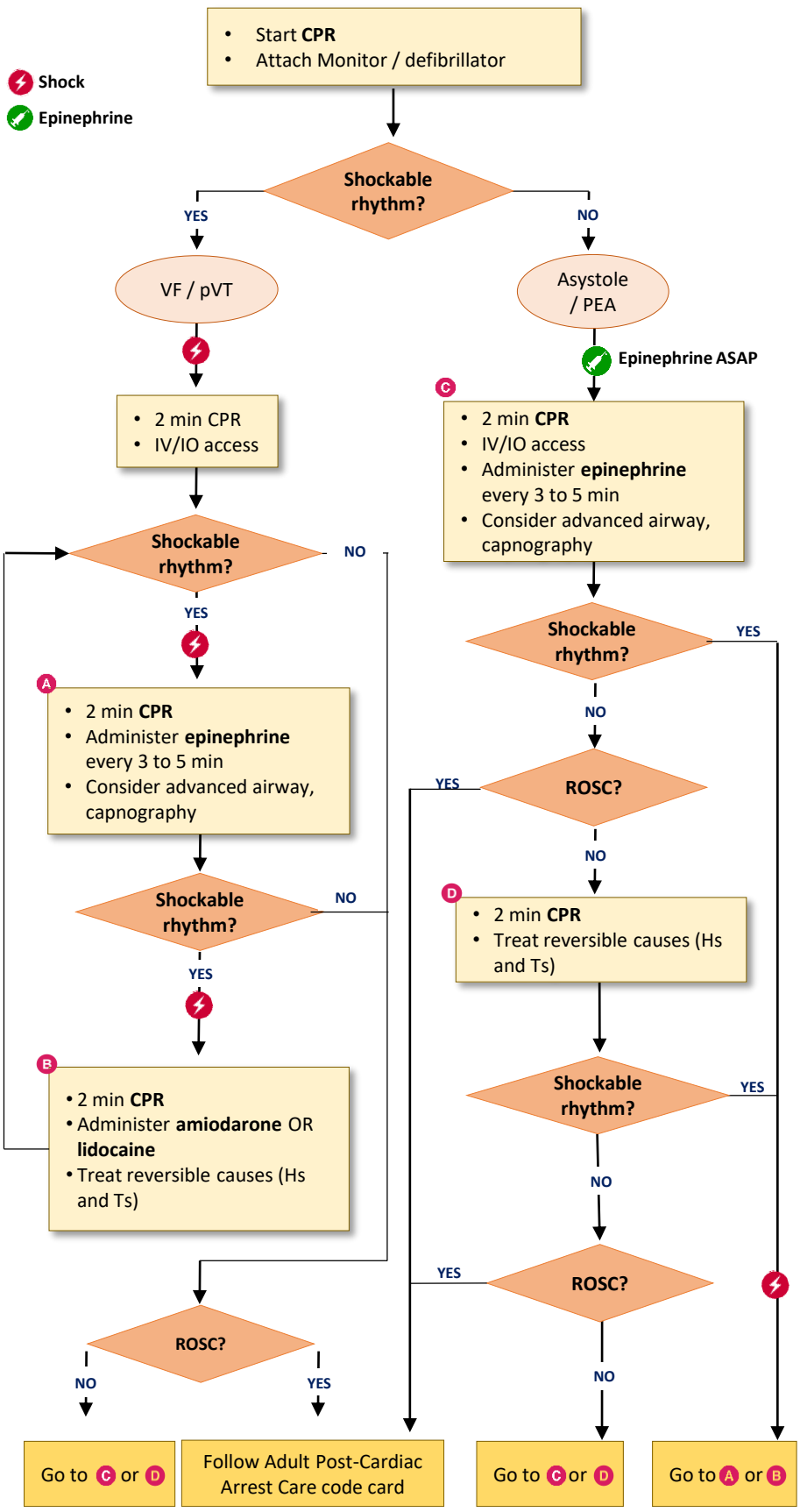
Follow device manufacturer's recommendations for energy doses

Vagal Maneuvers
- Valsalva maneuver
- Cold stimulus
- Gagging
- Carotid massage (use with caution in those with vascular disease, older adults)

Signs of Hemodynamic Compromise

- Changes in mental status
- Ischemic chest discomfort
- Hypotension
- Signs of shook
- Acute heart failure

ADULT CARDIAC ARREST CARE



Defibrillation Energy Doses

Biphasic: Per manufacturer's recommendations (e.g., 120 to 200 J) or if unknown, max available; subsequent doses equal to or greater than first dose Monophasic: 360 J for all doses

Medications

Epinephrine
1 mg IVAO bolus every 3 to 5 min
Amiodarone
First dose: 300 mg IVAO bolus
Second dose: 150 mg after 3 to5 min
Lidocaine
First dose: 1 to 1.5 mg/kg IVIO
Subsequent doses: 0.5 to 0.75 mg/kg IV/IO every 5 to 10 min, up to a max dose of 3 mg/kg

High-Quality CPR

Compress at a rate of 100 to 120 compressions per min and a depth of at least 2 inches (5 cm); allow for full chest recoil
Minimize interruptions to chest compressions to less than 10 sec
Avoid excessive ventilations. Each ventilation should last about 1 sec and make the chest begin to rise
Without advanced airway: 30 compressions: 2 ventilations
With advanced airway: continuous compressions; deliver 1 ventilation every 6 sec without pausing compressions
Rotate compressor every 2 min
Monitor CPR quality with ETCO, arterial blood pressure (if available)

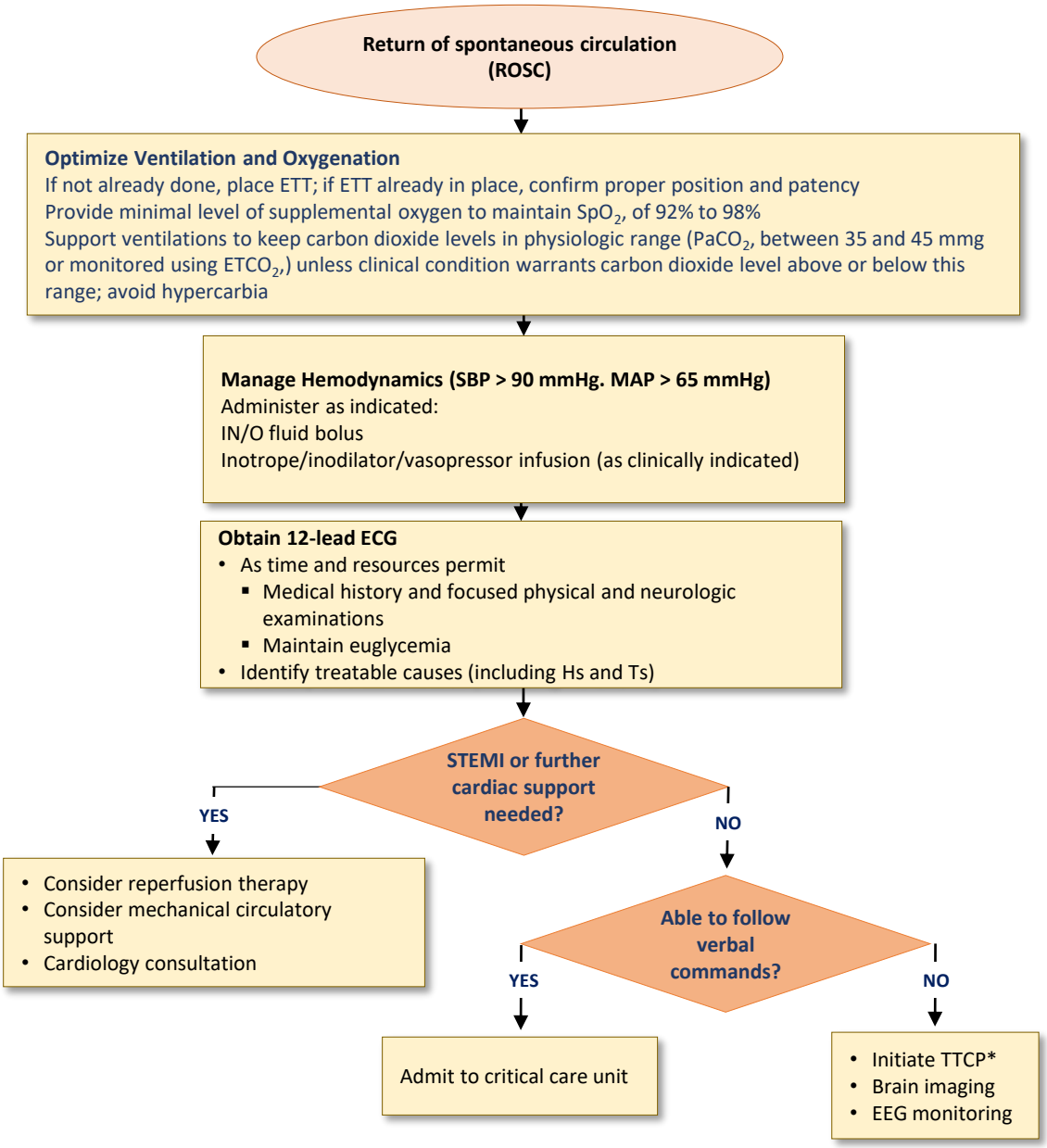
What Is ROSC?

- Sudden and sustained increase in $ETCO_2$.
- Arterial pulse waveform on an A-line when no compressions are being delivered
- Additional signs, including patient movement, normal breathing or coughing, may be present

H's and T's

- Hypovolemia
- Hypoxemia
- Hydrogen ion excess (acidosis)
- Hyperkalemia/hypokalemia
- Hypothermia
- Hyperglycemia/hypoglycemia
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (pulmonary embolism)
- Thrombosis (myocardial infarction)
- Toxins

ADULT CARE FOLLOWING RESUSCITATION



Medications	Ventilation and Oxygenation Goals	Hs and Ts	Targeted Temperature Control Protocol (TTCP)*
• **IV/IO fluid bolus** 1 to 2 L NS or LR solution • **Dopamine** 5 to 20 mcg/kg/min IN/O • **Epinephanine** 2-10 mcg/min IVAO • **Norepinephrine** 0.1 to 05 mcg/kg/min IV/O	**Ventilation** • Start at ↑0 breaths/min; adjust as needed • $PaCO_2$: 35 to 45 mmHg **Oxygenation** • Provide minimal level needed to maintain SpO_2 of 94% to 99%	• Hypovolemia • Hypoxemia • Hydrogen ion excess (acidosis) • Hyperkalemia/hypokalemia • Hypothermia • Hyperglycemia/hypoglycemia • Tamponade (cardiac) • Tension pneumothorax • Thrombosis (pulmonary embolism) • Thrombosis (myocardial infarction) • Toxins	Maintain core body temperature 32° C to 37.3° C for at least 24 hours **Methods include:** Ice-cold IV fluid bolus (30 mL/kg) Endovascular catheters Surface-cooling strategies (e.g., cooling blankets, ice packs) Continuously monitor core temperature via esophageal, rectal or bladder catheter Monitor for negative consequences of hypothermic temperature

Providers should not initiate TUM in the prehospital setting. The evidence for TIM is constantly evolving. Defer to institutional protocols and clinician judgment based on the latest evidence.