Cardiovascular

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Hypertensive Emergencies

Hypertensive Urgency
Definition:
Diastolic **BP 120 mmHg without signs or symptoms or organ compromise.**
If no signs of respiratory distress, pain, or decreased level of consciousness, attempt to contact patient's physician or arrange to see physician.

Hypertensive Emergencies and Gestational Hypertension
Definitions
Hypertensive Emergency: diastolic BP 120 mmHg with signs of end organ damage; altered consciousness, CHF, intracranial hemorrhage (sudden, severe headache and/or unconsciousness), aortic dissection (sudden, severe tearing pain often radiating between the shoulder blades **– BP may show right to left upper arm discrepancy).**
Gestational Hypertension: (greater than 20 weeks gestation) systolic BP 140 mmHg or diastolic BP 90 mmHg Obtain Baseline physical assessment as per protocol. Repeat Vs. frequently.
If diastolic BP 130 mmHg and signs of organ compromise present (altered consciousness, severe headache, CHF, dyspnea, or chest pain) or if pregnant and diastolic BP 110 with any preceding symptoms as well as epigastric or liver tenderness, or visual disturbance:

Adult Routine Transport Orders

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Adult IV/IO

↓

If not pregnant, administer one **Nitroglycerin** 0.4 mg sublingual.

↓

ALWAYS reassess blood pressure prior to and after giving medications.
If pregnant, transport immediately to an appropriate obstetrical facility
Transport with head elevated and patient placed on her left side.

↓

NOTE: Hypertension may be a symptom rather than the primary disease (e.g. hypertension due to a seizure rather than a seizure due to hypertension). Always consider other causes of symptoms, especially in cases of altered consciousness, but do not delay transport.
Especially in suspected Stroke patients with lowering BP.

Chest Pain

◄Angina Pectoris-Suspected►

Chest pain may be described in many ways. Some common descriptions are: discomfort, squeezing, heaviness, tightness, and crushing.

Adult Routine Transport Orders

Cardiac Monitor / 12 Lead ECG

Transmit 12-Lead ECG

EMT: 12-lead EKG set up and application for electronic transmission

If patient has his/her own **Nitroglycerin** (NTG), check BP and if greater than 90 mmHg systolic, they may self-administer their own NTG according to their prescription (Monitor BP). An EMT may assist patient with the administration of their NTG.

Aspirin 324 mg PO (4 baby aspirin, 81 mg each)

Nitroglycerin should not be used in the patient who has consumed a Phosphodiesterase Type 5 Inhibitor within the past 24 hrs these products include **Viagra, Revatio, Cialis, Levitra** they are not gender specific. This may lead to an unsafe drop in blood pressure.

If systolic BP is greater than 90 mmHg systolic:

Nitroglycerin 0.4 mg SL

May be repeated every 3 – 5 minutes X 2

Check BP between doses.

Must have IV lifeline established prior to the administration of NTG.

Caution for Acute Inferior MI

If no relief of chest pain and associated signs/symptoms and systolic BP is greater than 90 mmHg:

Morphine 1 – 2 mg Slowly IVP, IO

Titrate to pain relief if blood pressure greater than 90 mmHg

Maximum 10 – 15 mg

The assessment of chest pain is important. Using the OPQRST method can be helpful.
O: Onset / Origin
P: Provokes
Q: Quality
R: Region/Radiation
S: Severity:
T: Time
Other symptoms like; Difficulty breathing, Dizziness, Nausea/ Vomiting, Syncope, Sweating, Pale/Ashen Color, and Past History are important factors.

General

EMT

AEMT

Paramedic

STEMI

Cardiovascular

Develop an organized system of emergency cardiac care for patients who are having a severe heart attack, or STEMI.

Priorities include:

- 12 lead ECG (before O^2 & NTG)
- Oxygen
- ASA
- Nitroglycerin
- Transmit ECG as soon as possible
- Notify Hospital of ETA

General

EMT

AEMT

Paramedic

Assessment

Obtain **12 Lead** / If **STEMI** / Transmit **ASAP**

History

Allergies

Medications

Routine **Chest Pain** Transport Protocol

Begin STEMI Checklist

See: **12 Lead ECG Charts**

STEMI Protocol Confirmation

NO - STEMI

Routine **Chest Pain** Protocol

Yes

Antiplatlets

Aspirin 324 mg PO

(4 baby aspirin, 81 mg each)

Brilinta (Ticagrelor) 90 mg x 2 PO

180 mg Total

Antiplatlets

Heparin 60 Units/kg

Over 60 seconds

Maximum 4,000 Units

See: **Heparin Bolus**

Administer

Metoprolol (Lopressor) 5 mg IVP over 1 – 2 minutes

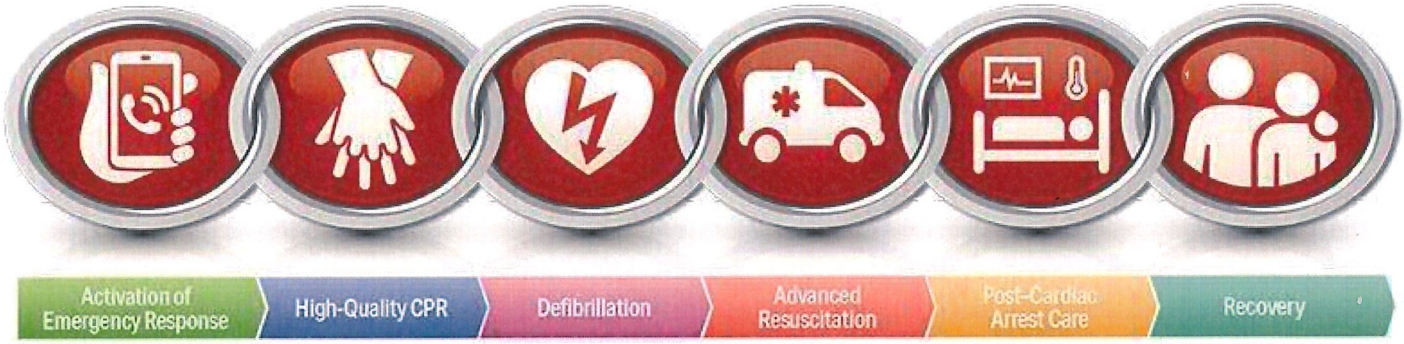
Repeat every 5 minutes

15 mg Total

Administer only if pulse > 60 bpm and

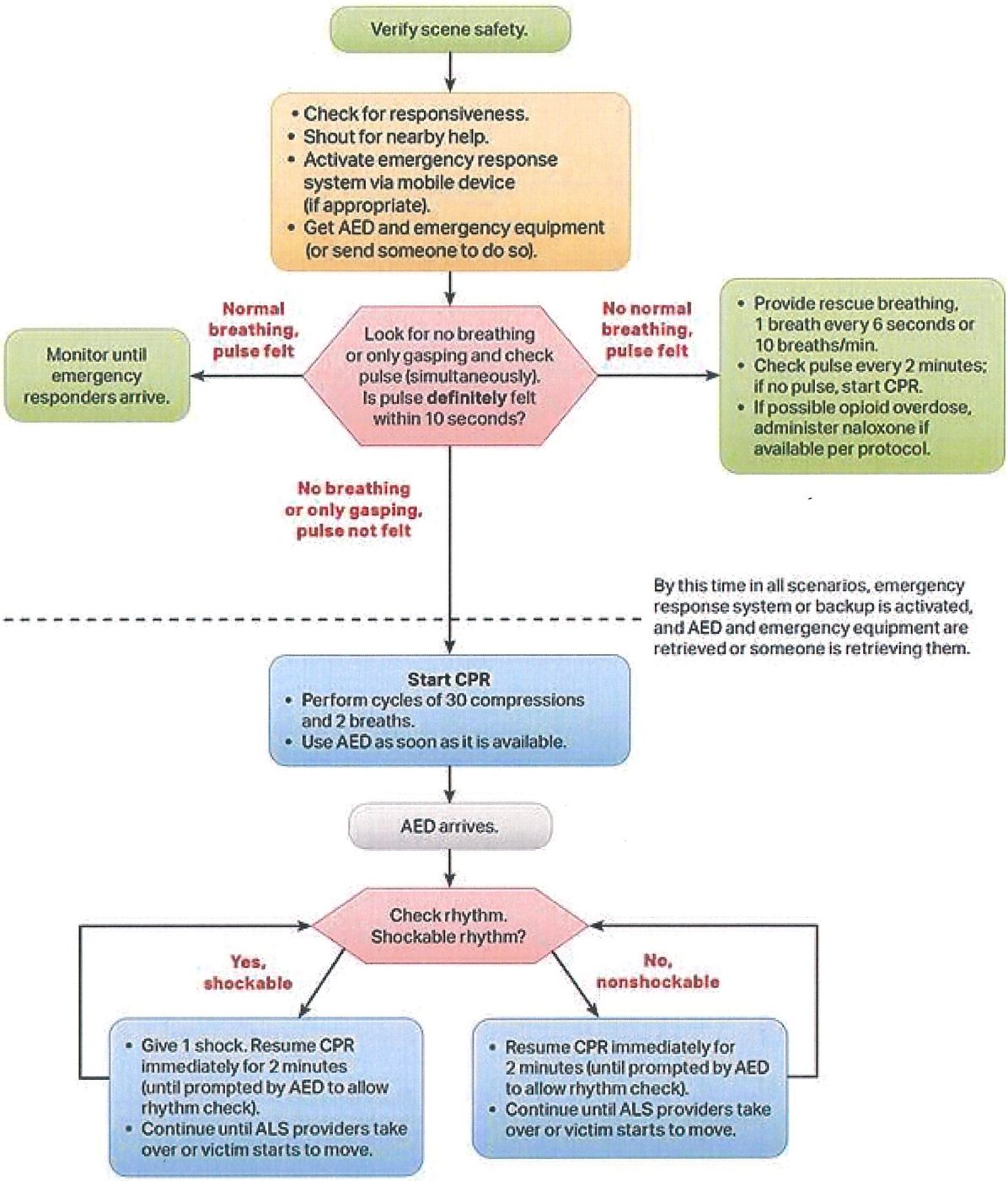
BP > 100 mmhg systolic

Adult IHCA Chain of Survival

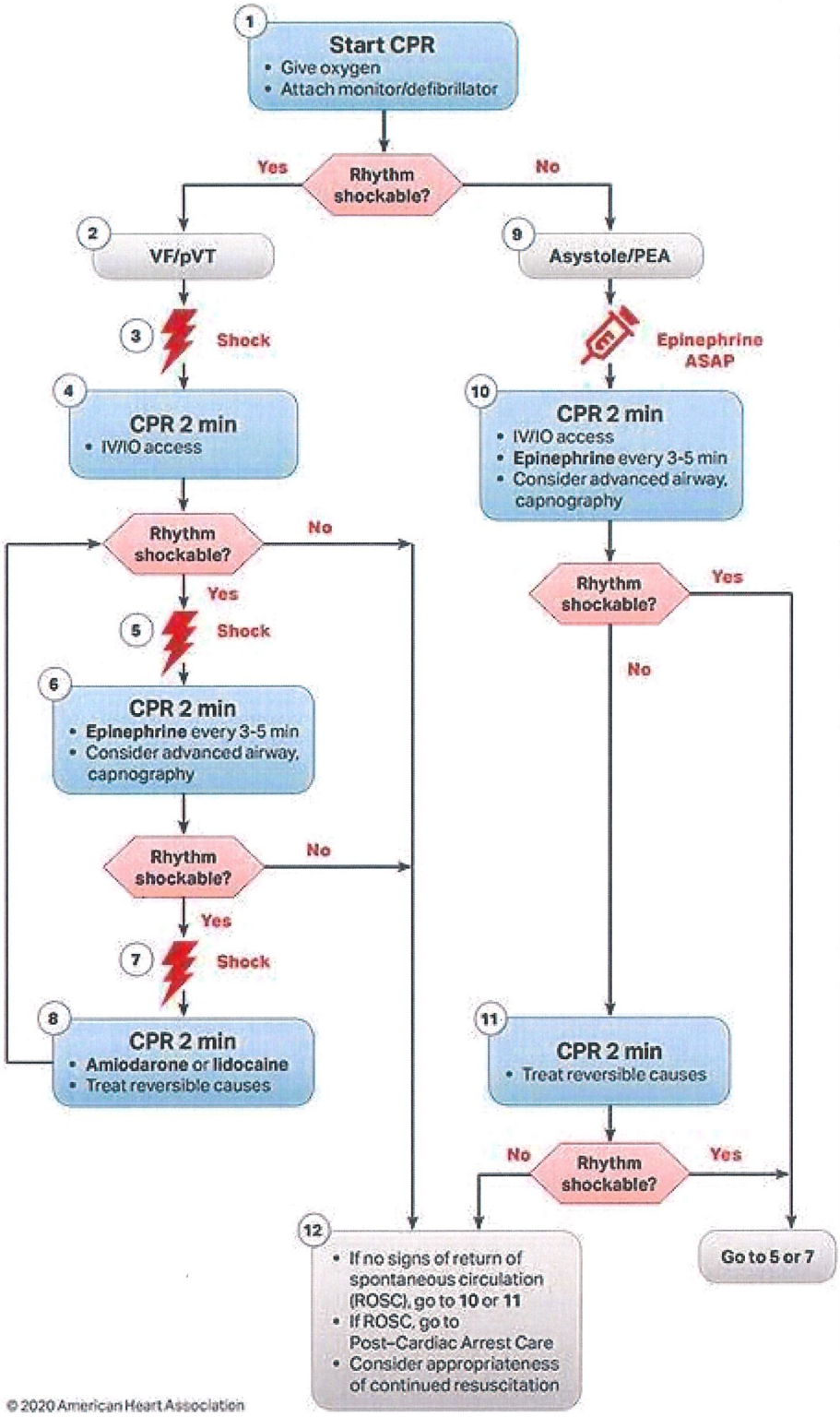


Adult OHCA Chain of Survival

Adult Basic Life Support Algorithm for Healthcare Providers



Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If P_{ETCO_2} is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic**: Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic**: 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
  or
  Lidocaine IV/IO dose: First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

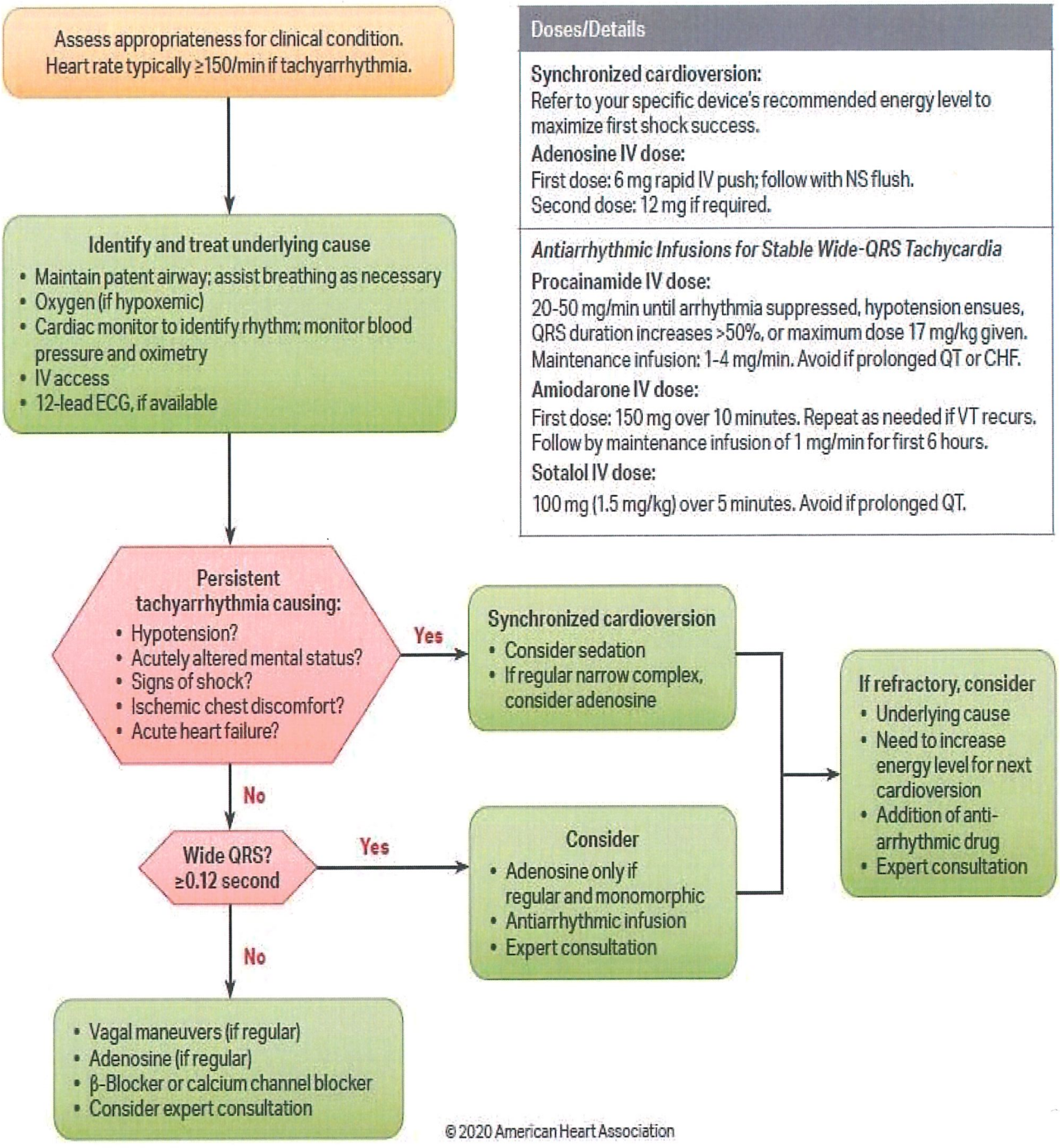
Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

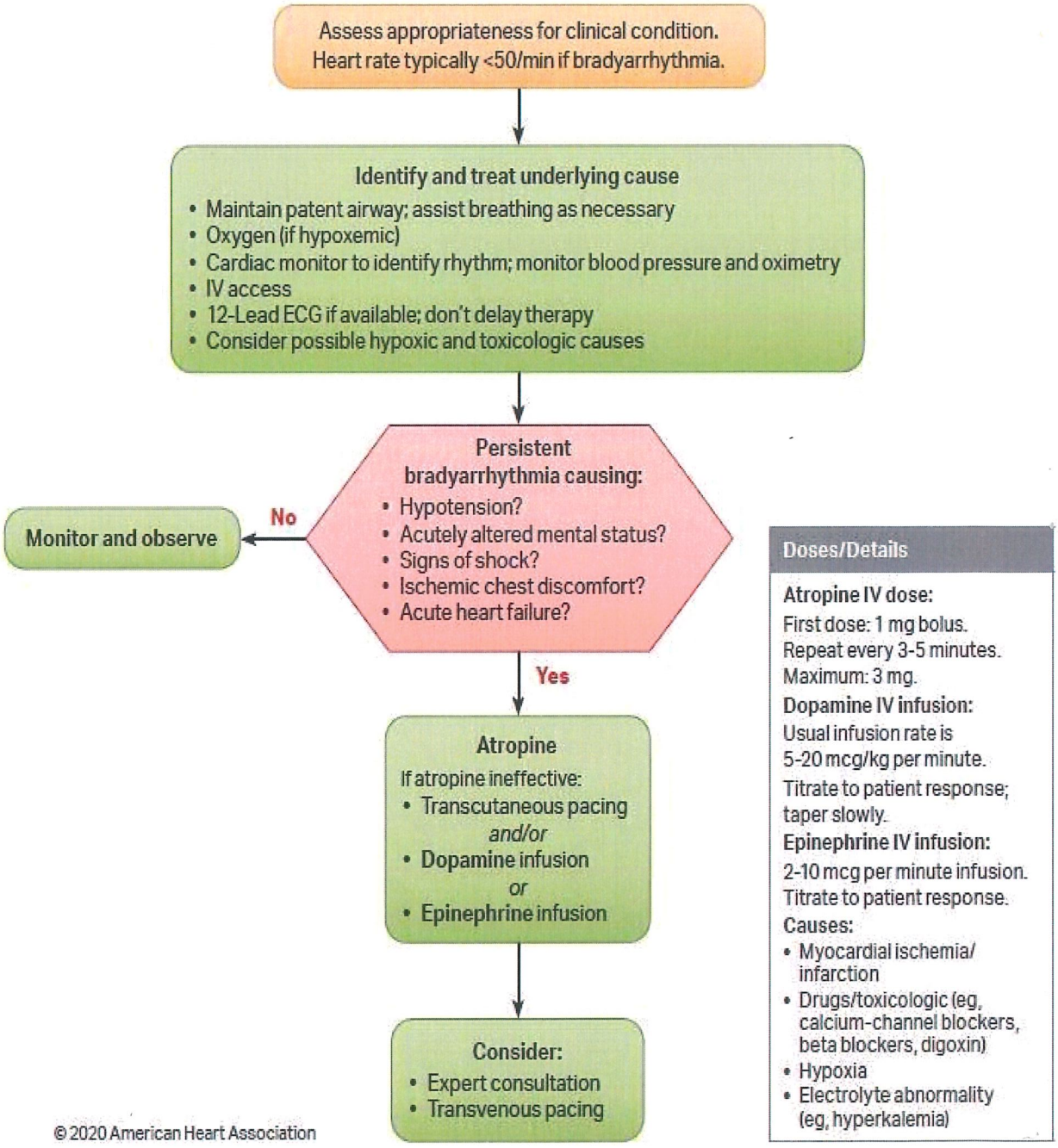
Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

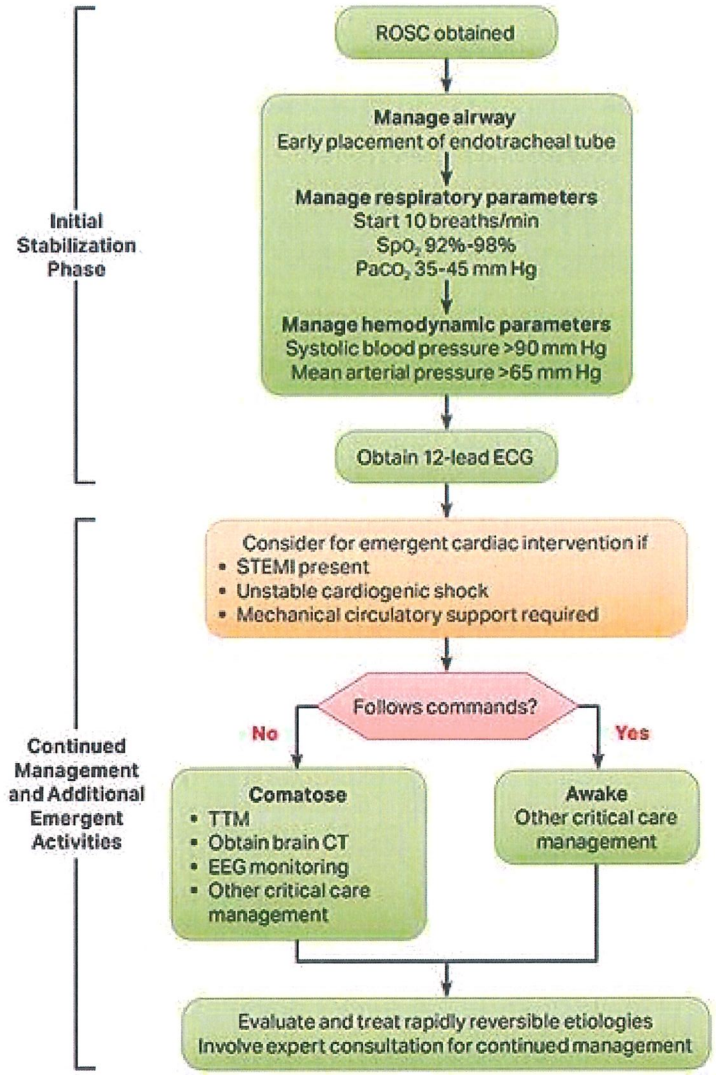
Adult Tachycardia With a Pulse Algorithm



Adult Bradycardia Algorithm



Adult Post–Cardiac Arrest Care Algorithm



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FIO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35-45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/hyperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary