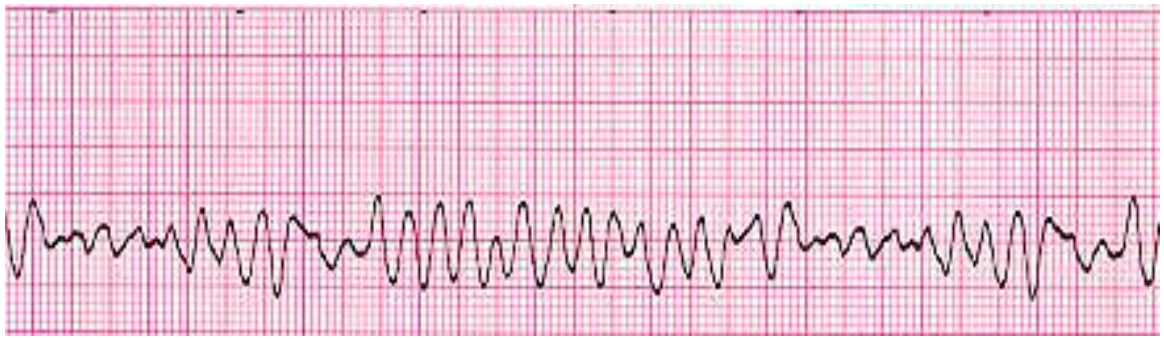
CARDIOPULMONAR RESUSCITATION – AHA 2015

- 70% of **out-of-hospital cardiac arrests (OHCAs)** occur in the home, and approximately 50% are unwitnessed. Outcome from OHCA remains poor: only 10.8% of adult patients with nontraumatic cardiac arrest.
- **In-hospital cardiac arrest (IHCA)** has a better outcome 22.3% - 25.5% of adults surviving to discharge

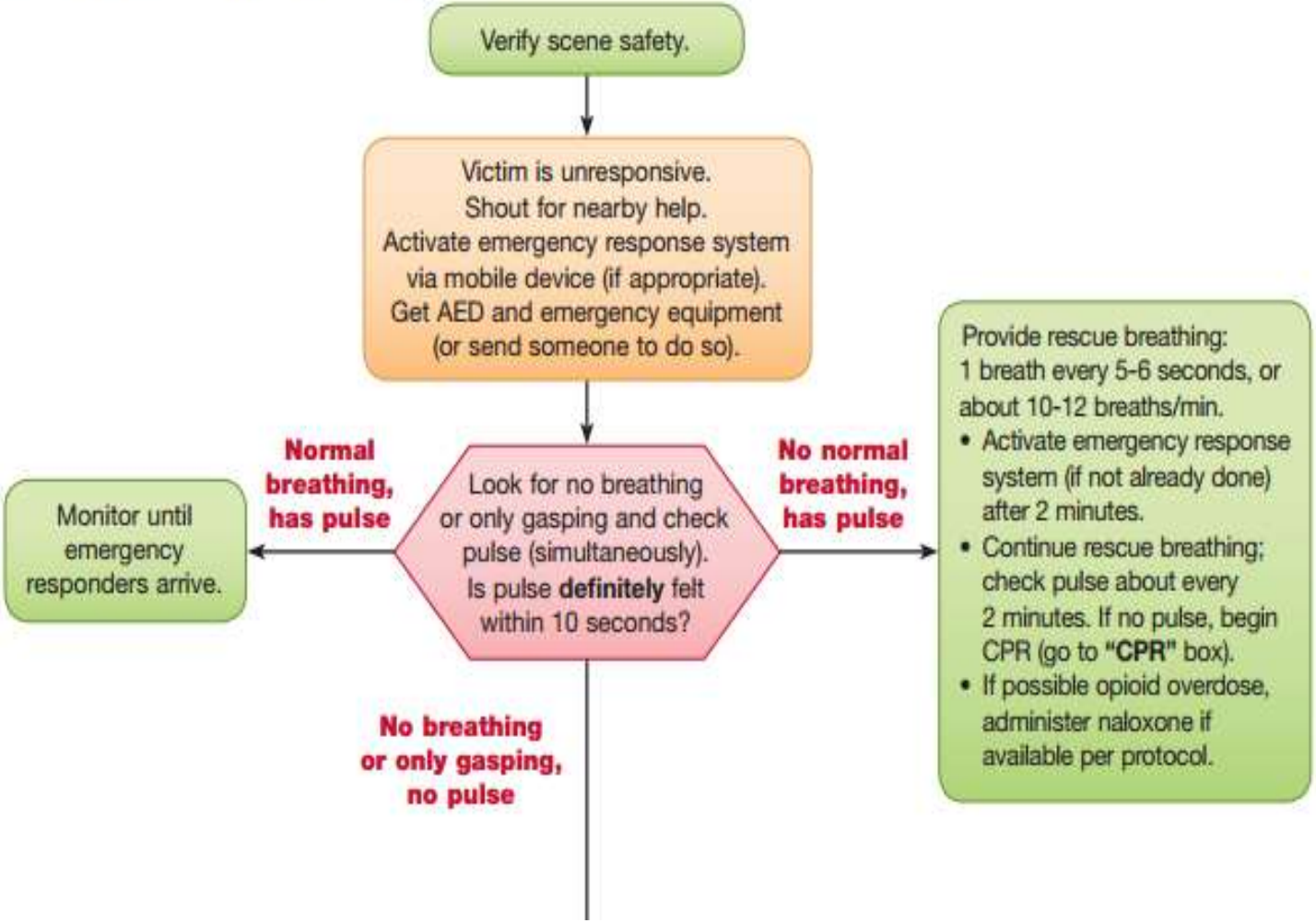


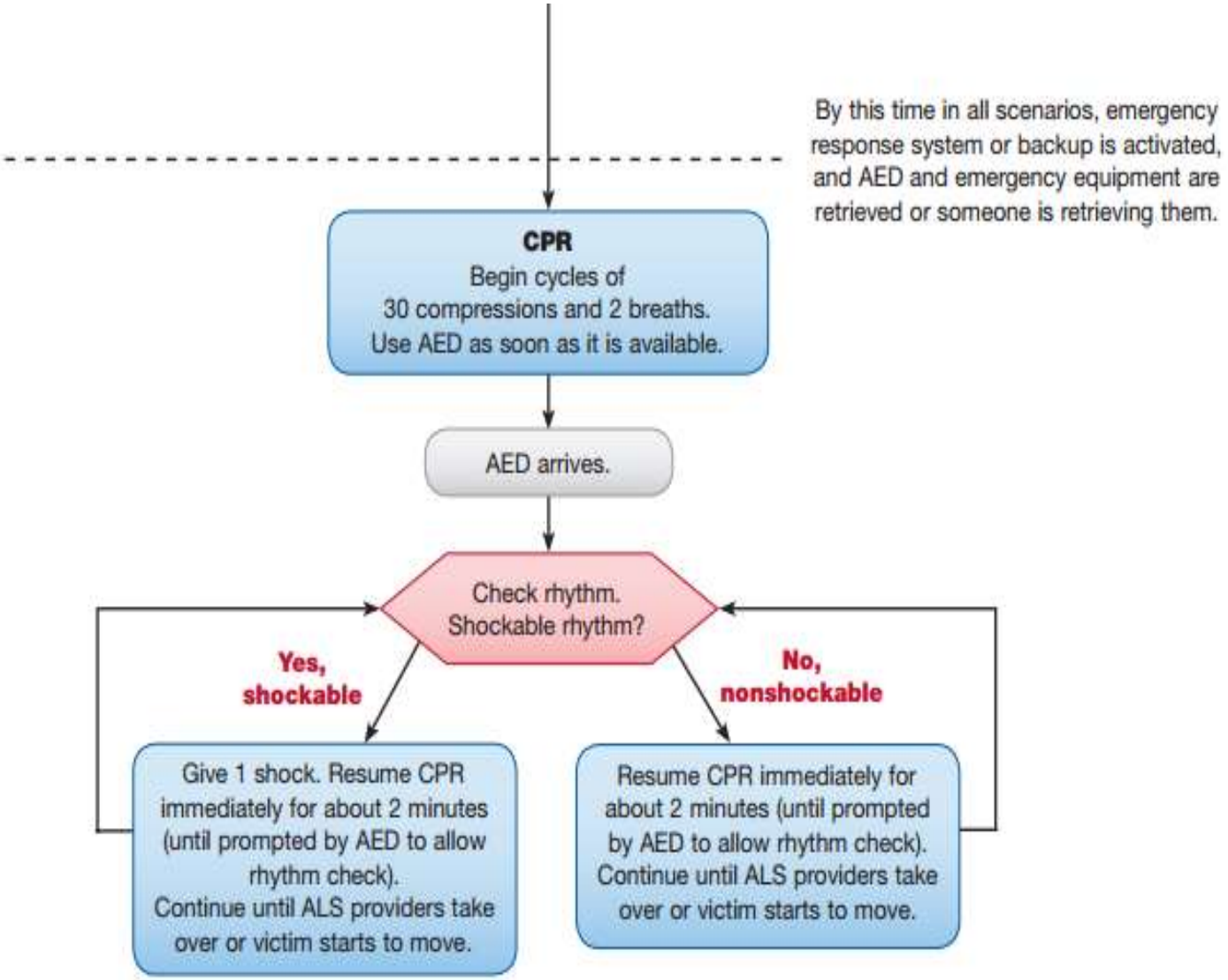
IHCA and OHCA Chains of Survival

- **Immediate Recognition & Activation of the Emergency Response System**

  patient is **unresponsive** with **abnormal or absent breathing** ➔ assume that the patient is in **cardiac arrest** ➔ **Call for HELP**
- **Check for a pulse** ➔ no more than 10 seconds
  - Ideally, the pulse check is performed simultaneously with the check for no breathing or only gasping
- **Early CPR**
  - a compression-to-ventilation ratio of 30:2
  - begin the CPR sequence with chest compressions rather than breaths **(C-A-B vs A-B-C)**
- **Early Defibrillation**
  - The AED or manual defibrillator is used as rapidly as possible

BLS Healthcare Provider
Adult Cardiac Arrest Algorithm—2015 Update





High-quality CPR

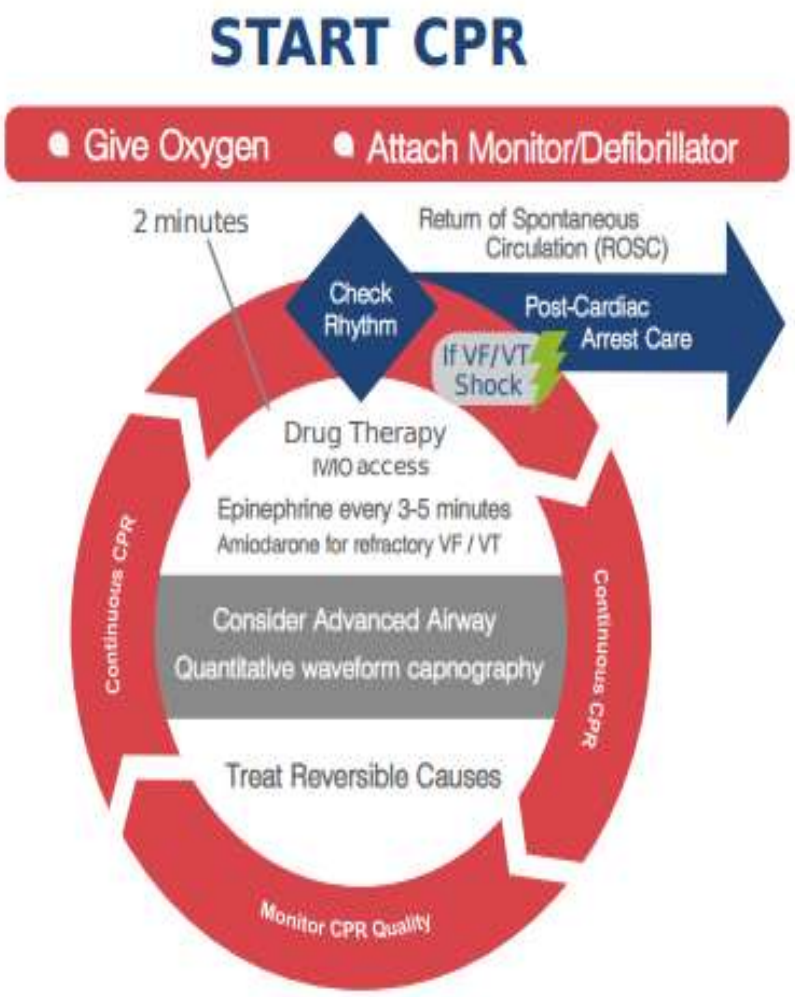
➔ improves survival from cardiac arrest, including

- Ensuring chest compressions of adequate rate
  - 100 x/min – 120 x/min
- Ensuring chest compressions of adequate depth
  - at least 2 inches or 5 cm for an average adult, while avoiding excessive chest compression depths (greater than 2.4 inches or 6 cm)
- Allowing full chest recoil between compressions
- Minimizing interruptions in chest compressions
  - to pause compressions for less than 10 seconds
- Avoiding excessive ventilation

AIRWAY & BREATHING

- During CPR **without** an advanced airway, a **compression-to-ventilation ratio of 30:2** is used.
- Delivers breaths during pauses in compressions and each breath **over approximately 1 second**
  - head tilt–chin lift maneuver → no evidence of head or neck trauma
- When the victim **has** an advanced airway during CPR, **NO longer** deliver cycles of 30:2 → to deliver 1 breath every 6 seconds (10 breaths per minute) while continuous chest compressions are being performed

Shout for Help/Activate Emergency Response



Doses/Details for the Cardiac Arrest Algorithms

CPR Quality

- Push hard (≥ 2 inches [5cm]) and fast (≥ 100/min) and allow complete chest recoil.
- Minimize interruptions in compressions.*
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
- If P_{ETCO_2} <10mm Hg, attempt to improve CPR quality
- Intra-arterial pressure
- If relaxation phase (diastolic) pressure < 20 mm Hg, attempt to improve CPR quality.

Drug Therapy

- Epinephrine IV/IO Dose: 1 mg every 3-5 minutes
- Vasopressin IV/IO Dose: 40 units can replace first or second dose of epinephrine
- Amiodarone IV/IO Dose**: First dose: 300 mg bolus. second dose: 150 mg

Advanced Airway***

- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- 8-10 breaths per minute 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

Shock Energy

- 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

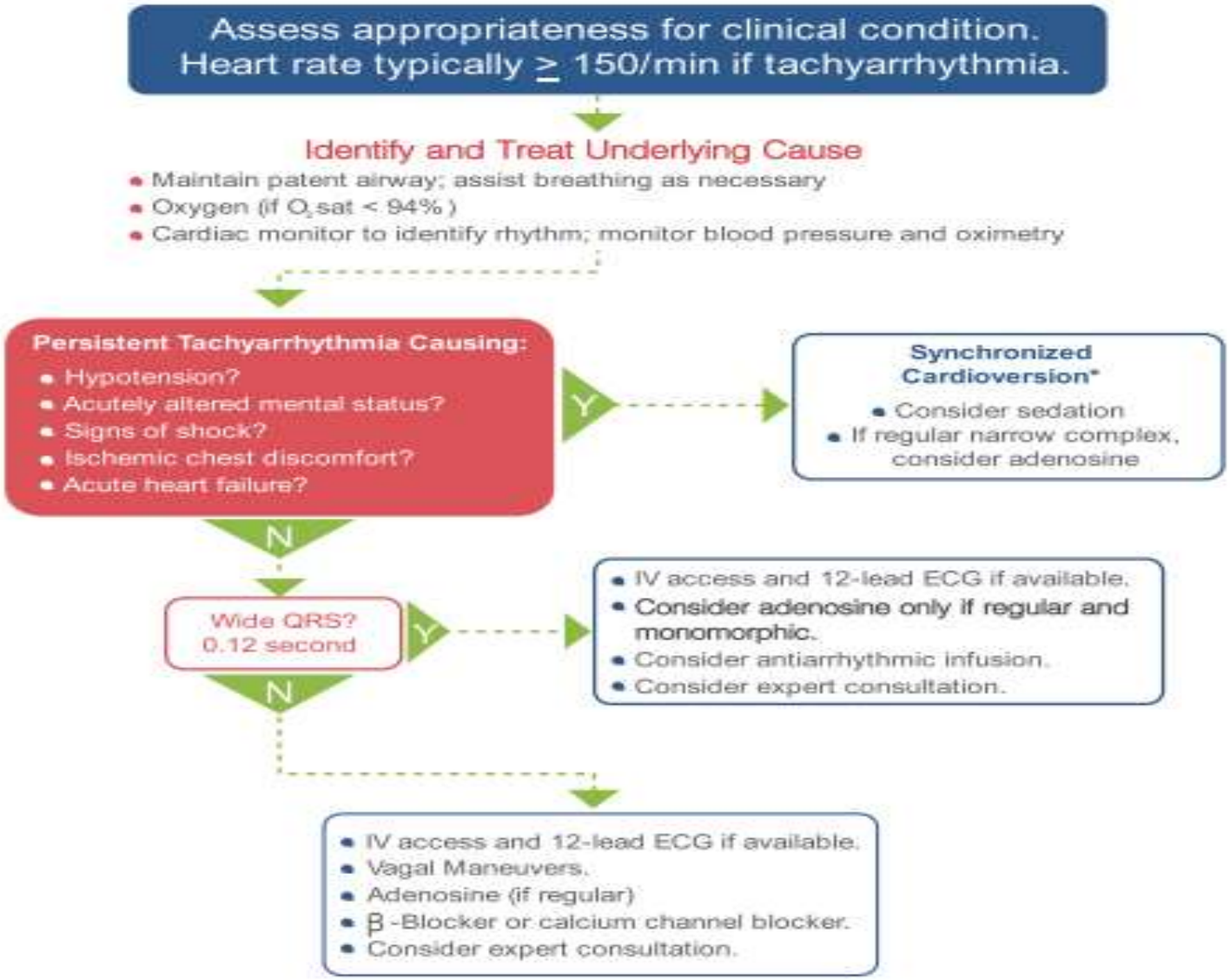
Reversible Causes

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

ANTI ARHTYMIA AGENT

- can be used during cardiac arrest for refractory ventricular dysrhythmias
- Refractory VF/pVT is
  - generally refers to failure to terminate VF/pVT with 3 stacked shocks, or with the first shock
  - "persistent or recurrent VF/pVT after 1 or more shocks
- Refractory VF/pVT to improve rates of ROSC → **Amiodarone** (weak recommendation, moderate-quality evidence)
- Lidocaine or nifekalant as an alternative to amiodarone in adult patients with refractory VF/pVT (weak recommendation, very-low-quality evidence).

TACHYARRHYTMIA



Doses/Details

Synchronized Cardioversion**

Initial recommended doses:

- Narrow regular : 50-100 J
- Narrow irregular : 120-200 J biphasic or 200 J monophasic
- Wide regular : 100 J
- Wide irregular : Defibrillation dose (NOT synchronized)

Adenosine IV Dose:

First dose : 6 mg rapid IV push; follow with NS flush.
Second dose : 12 mg if required

Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia Procainamide IV Dose:

20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases > 50% or maximum dose 17 mg/kg given.
Maintenance infusion : 1-4 mg/min.
Avoid if prolonged QT or CHF.

Amiodarone IV Dose:

First dose : 150 mg over 10 minutes.
Repeat as needed if VT recurs.
Follow by maintenance infusion of 1 mg/min for first 6 hours..

Sotalol IV Dose:

100 mg (1.5 mg/kg) over 5 minutes.
Avoid if prolonged QT.

BRADYARRHYTMIA