



RESUSCITATION

Dr. Hatem Elhussieny

Emergency Medicine Board
Al-Shifa Medical Complex

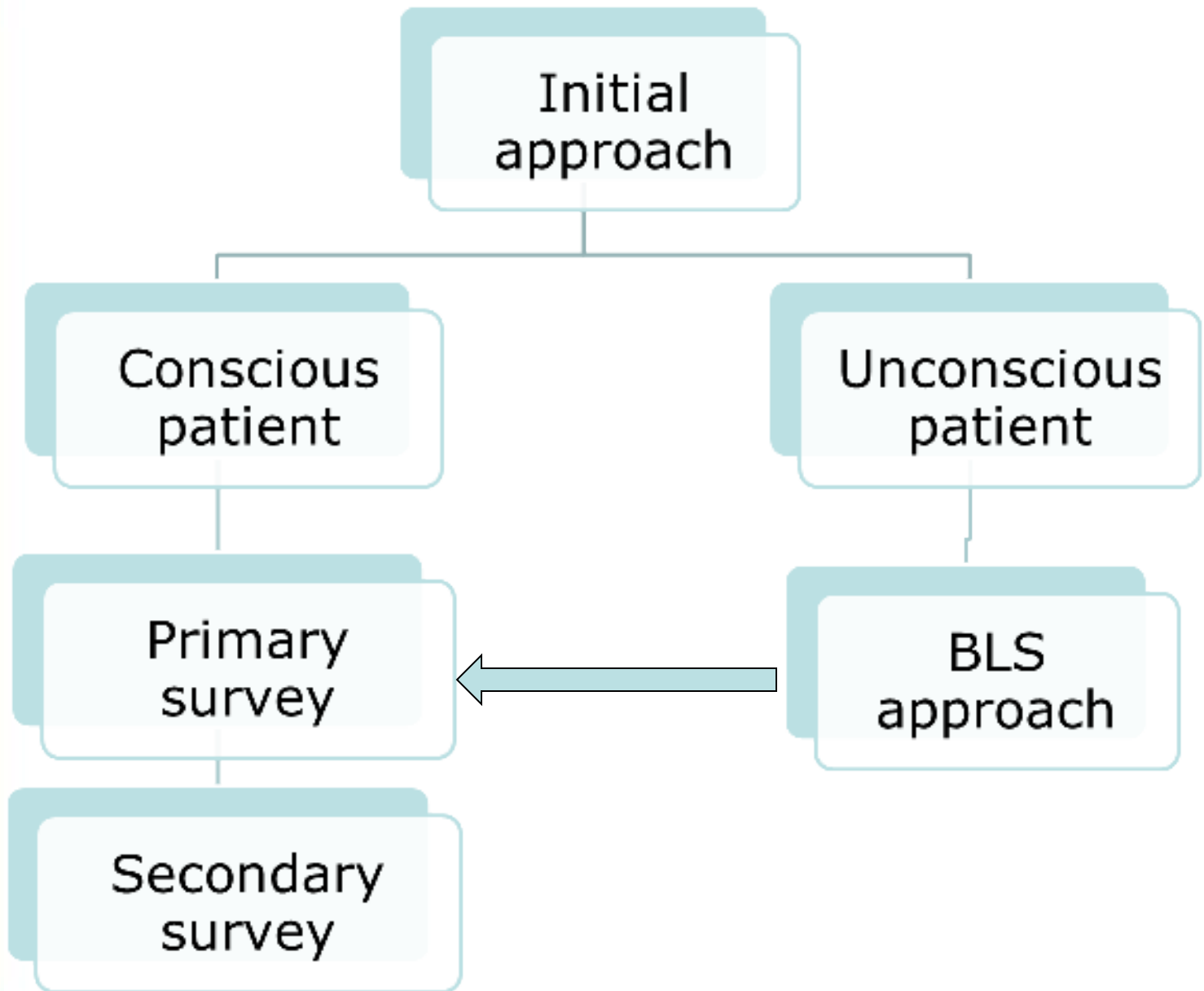
Introduction

Resuscitation is the process of correcting physiological disorders (such as lack of breathing or heartbeat) in an acutely ill patient.

It is an important part of intensive care medicine, trauma surgery and emergency medicine.

Well known examples are cardiopulmonary resuscitation

Systemic Approach



BLS Approach

Safety

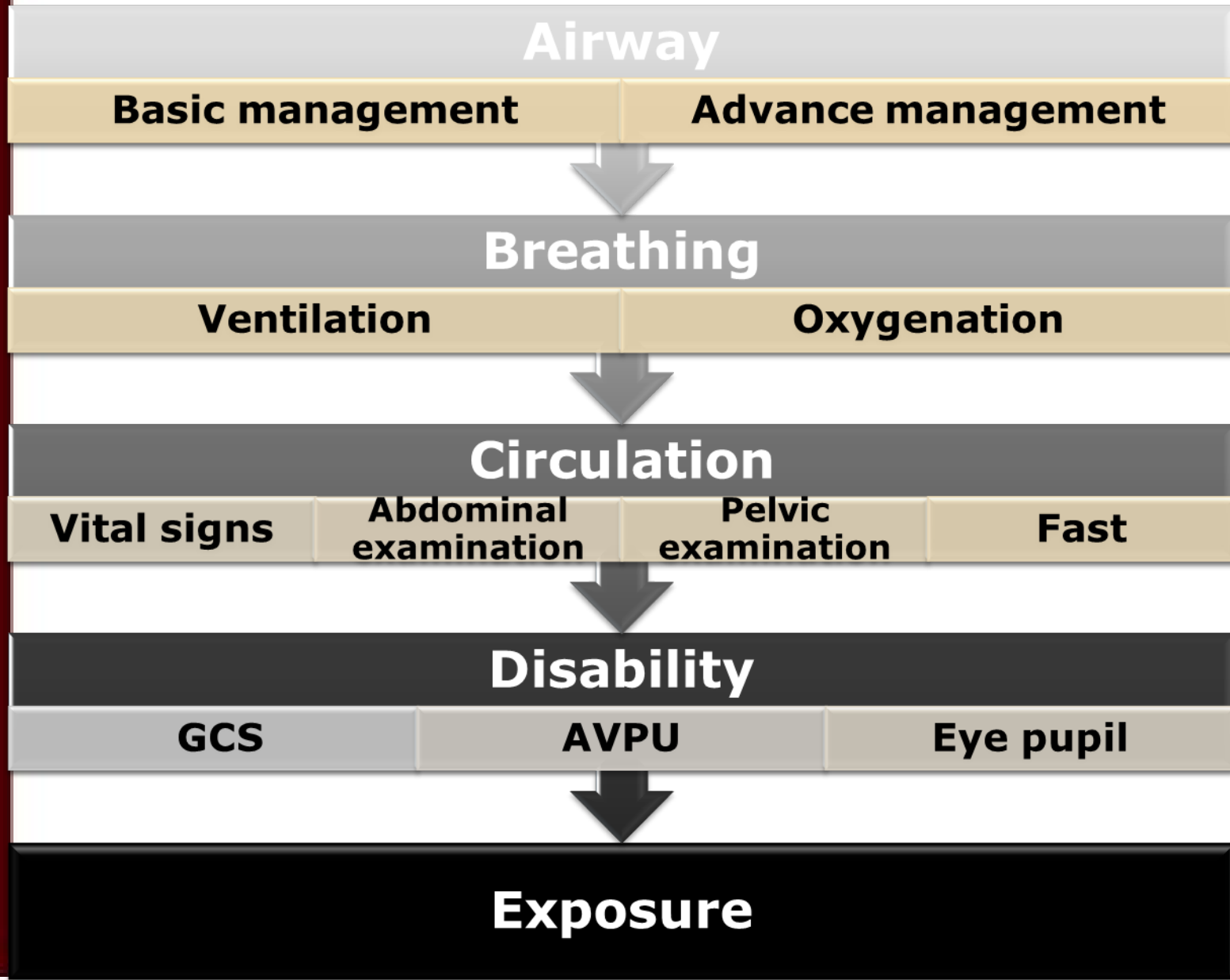
Check responsiveness

Activate emergency response

Check pulse and breath

Start C.P.R

Primary survey



Secondary survey

Sings & Symptoms



Allergy



Medications



Past medical history



Last meal



Event

High Quality CPR

Push hard and fast

Achieving a rate of 100–120
compressions per minute

Compressing the chest to a depth of 2–
2.4 inches (5–6 cm)

Allow chest recoil

Avoid hyperventilation

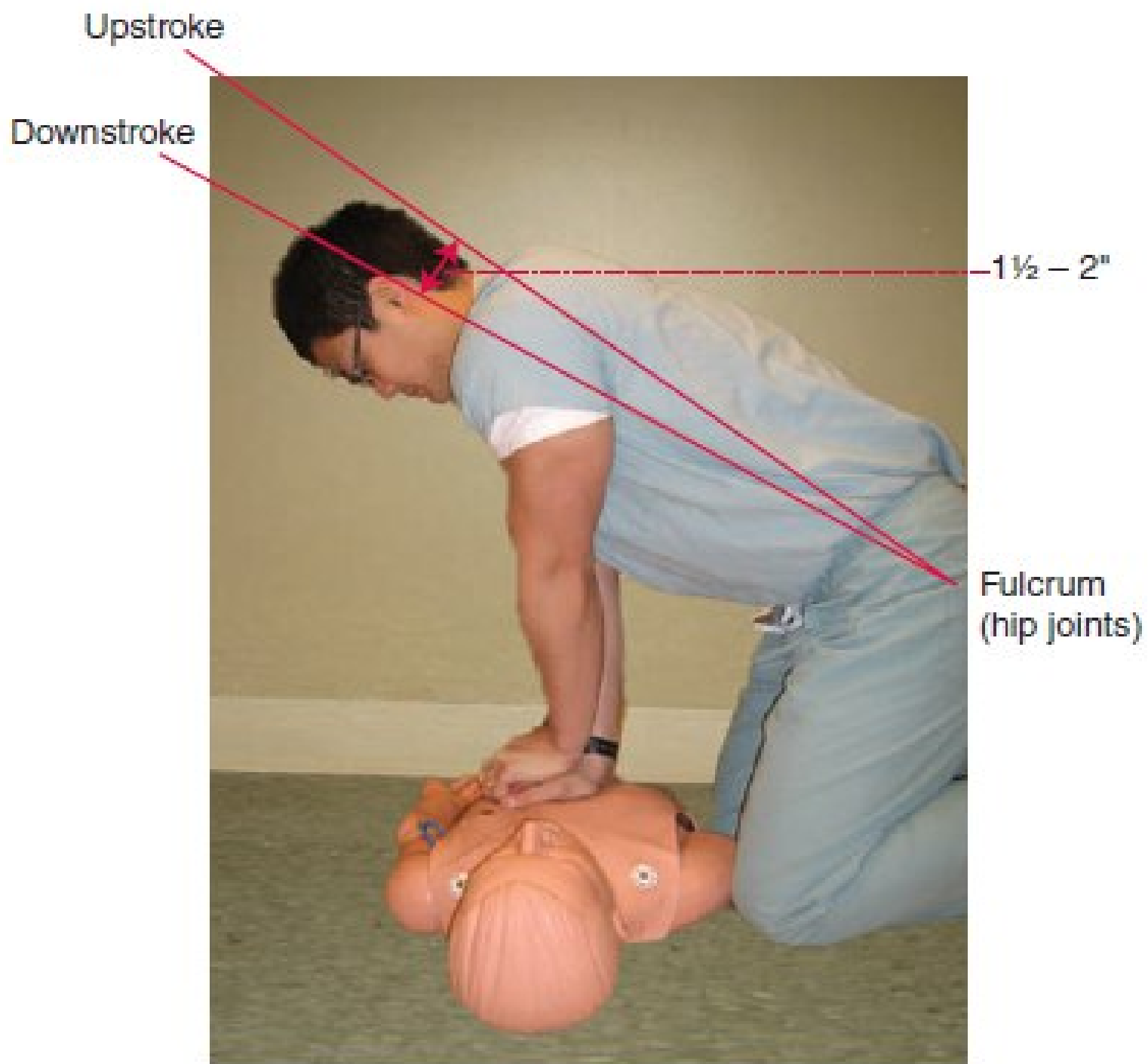
Minimized interruption

Reversible cause of cardiac arrest

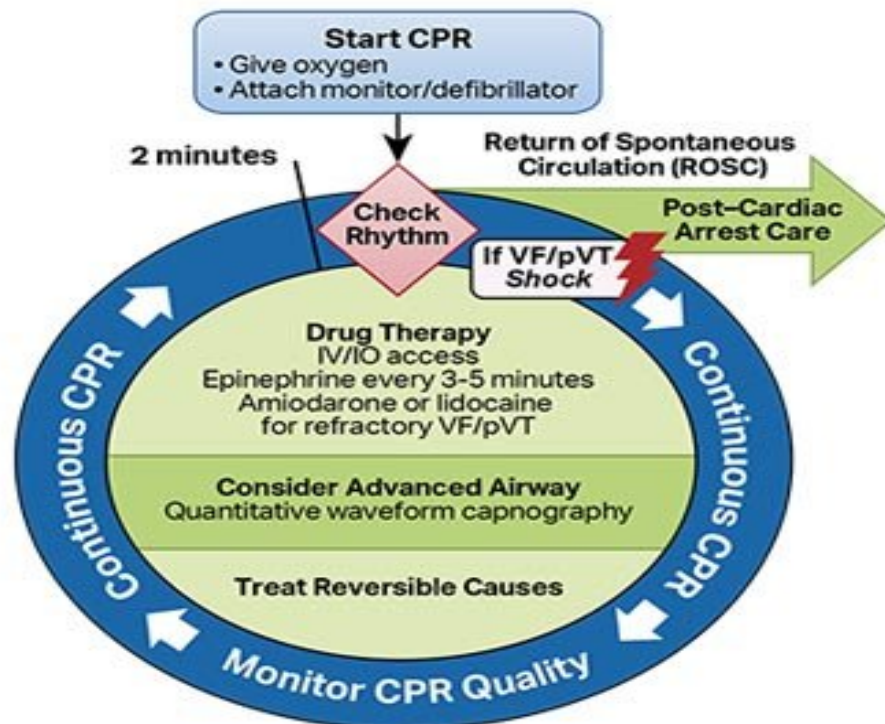
H	T
Hypovolemia	Tension pneumothorax
Hypoxia	Cardiac Tamponade
Hypo-hyper kalemia	Pulmonary Thrombosis
H-ion acidosis	Coronary Thrombosis
Hypothermia	Toxins

← Emergency





Adult Cardiac Arrest Circular Algorithm



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 PETCO₂ 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

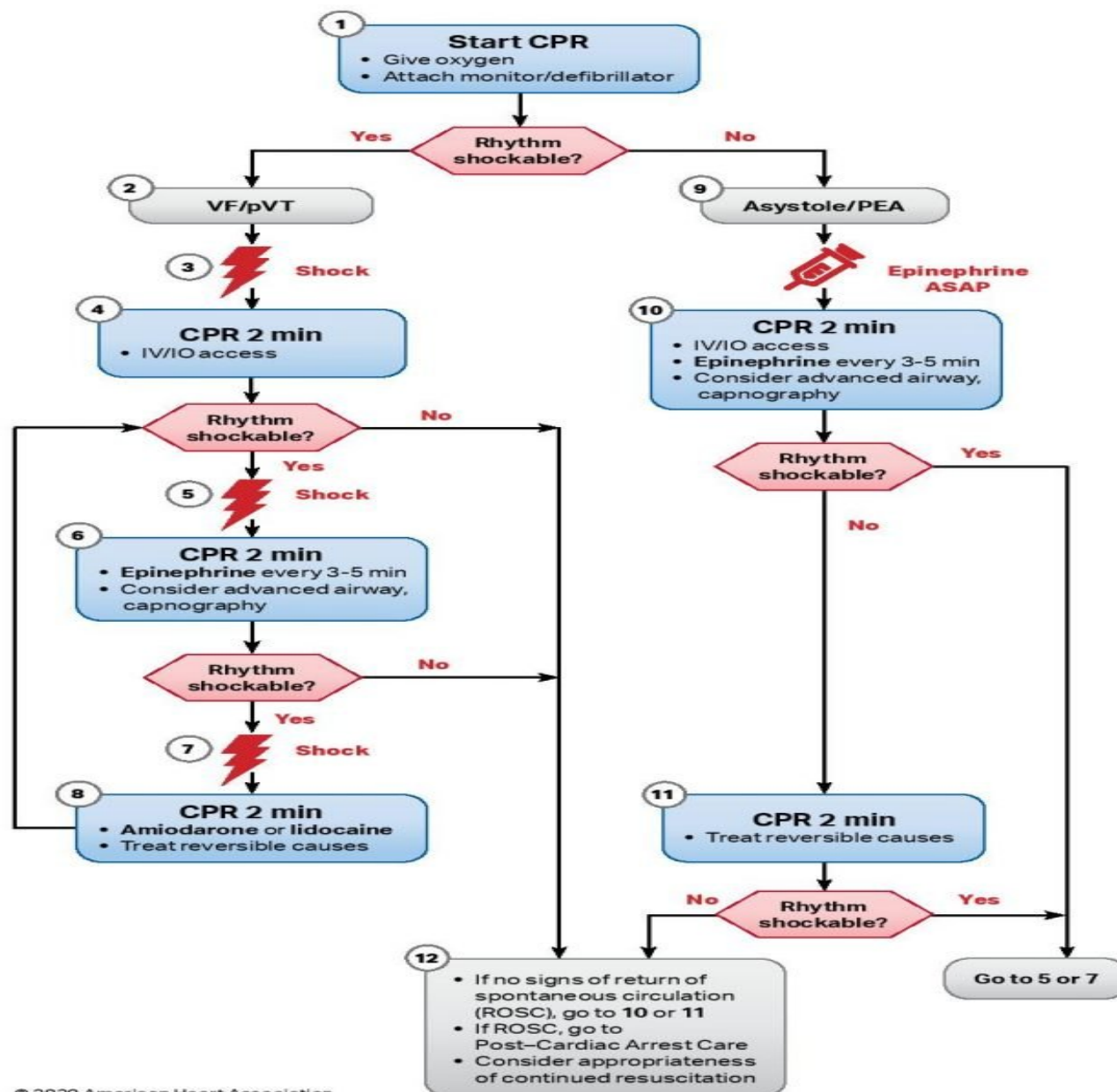
Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

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

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- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

**Assess appropriateness for clinical condition.
Heart rate typically $\geq 150/\text{min}$ if tachyarrhythmia.**

Identify and Treat Underlying Cause

- Maintain patient airway; assist breathing as necessary
- Oxygen as indicated
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry

Persistent Tachyarrhythmia Causing:

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

Y

Synchronized Cardioversion*

- Consider sedation
- If regular narrow complex, consider adenosine

N

**Wide QRS?
0.12 second**

Y

- IV access and 12-lead ECG if available
- Consider adenosine only if regular and monomorphic
- Consider antiarrhythmic infusion
- Consider expert consultation

N

- IV access and 12-lead ECG if available
- Vagal maneuvers
- Adenosine (if regular)
- β -Blocker or calcium channel blocker
- Consider expert consultation

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:

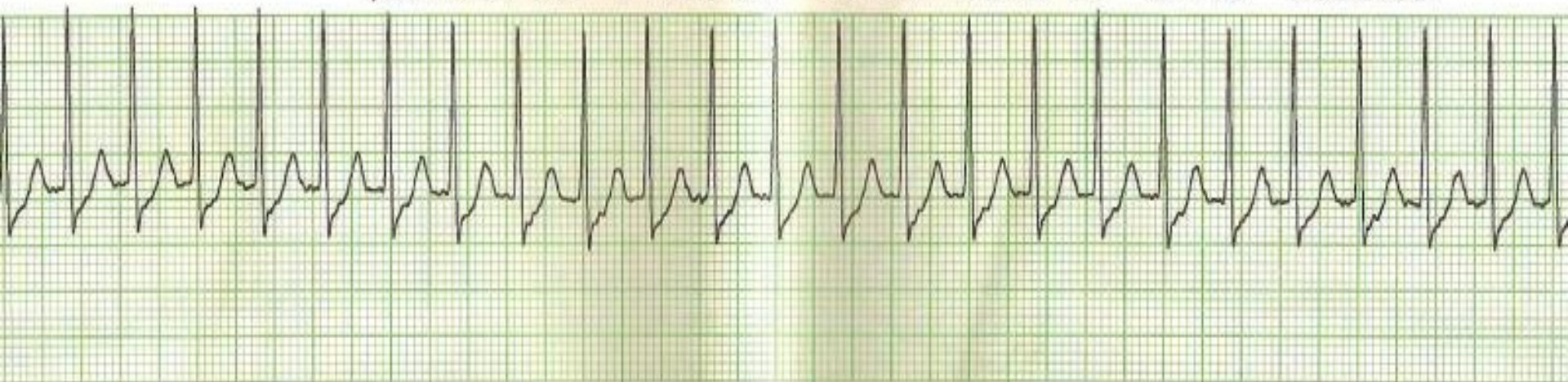
First dose: 150 mg over 10 minutes.

Repeat as needed if VT recurs. Follow
by maintenance infusion of 1 mg/min
for first 6 hours.

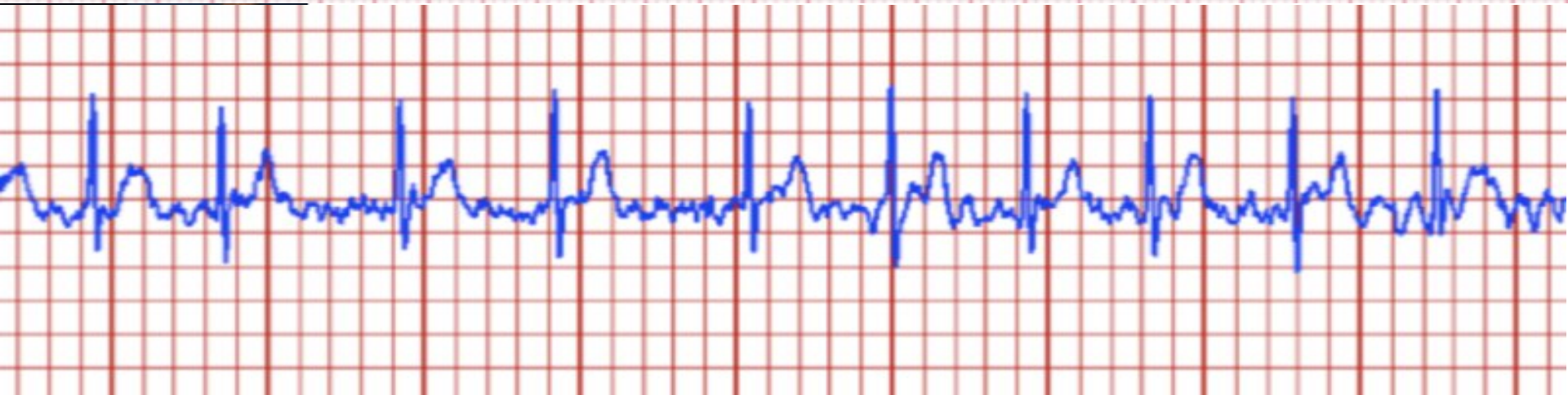
Sotalol IV Dose:

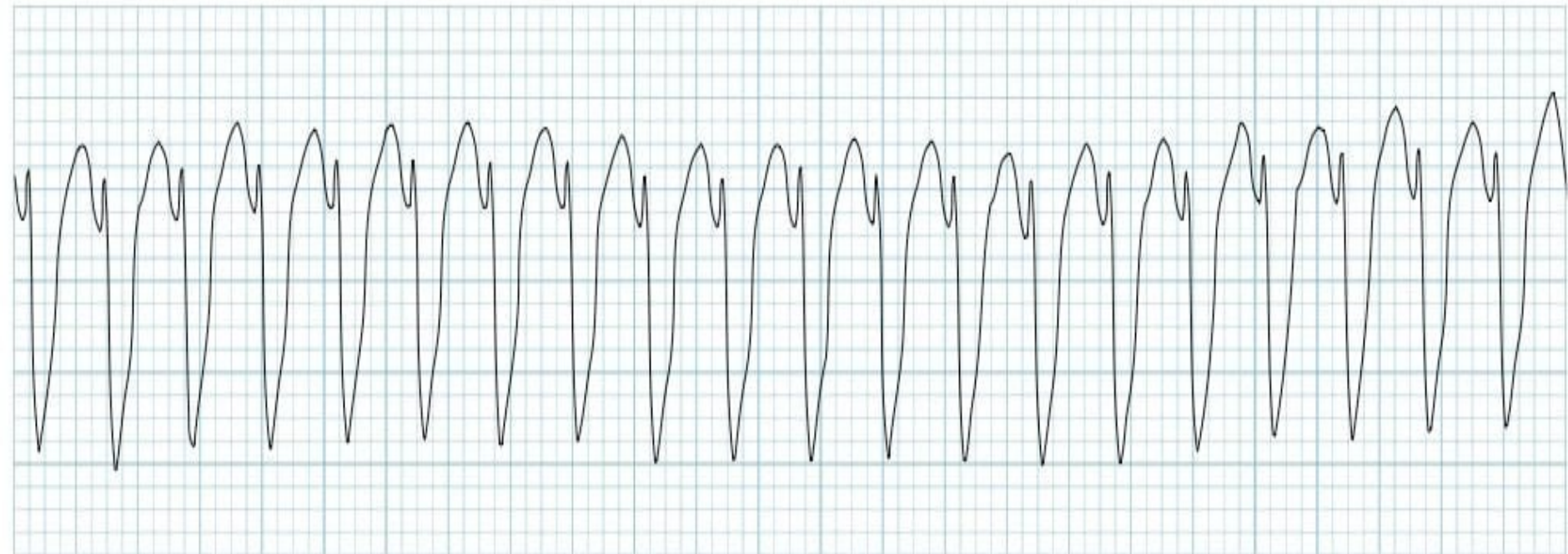
100 mg (1.5 mg/kg) over 5 minutes.
Avoid if prolonged QT.

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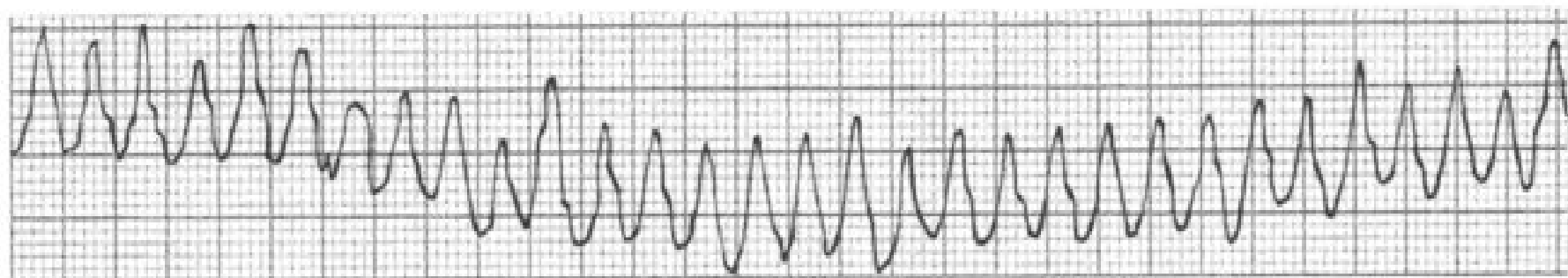


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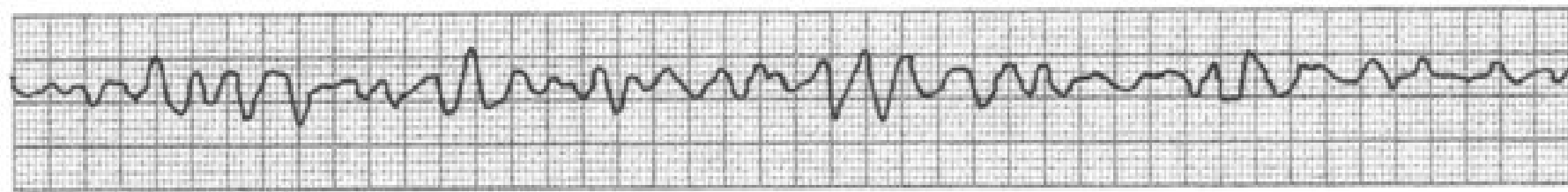




A



B



Assess appropriateness for clinical condition.
Heart rate typically <50/min if bradyarrhythmia.

Identify and treat underlying cause

- Maintain patent airway; assist breathing as necessary
- Oxygen (if hypoxemic)
- Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
- IV access
- 12-Lead ECG if available; don't delay therapy
- Consider possible hypoxic and toxicologic causes

**Persistent
bradyarrhythmia causing:**

- Hypotension?
- Acutely altered mental status?
- Signs of shock?
- Ischemic chest discomfort?
- Acute heart failure?

No

Monitor and observe

Yes

Atropine

If atropine ineffective:

- Transcutaneous pacing
and/or
- Dopamine infusion
or
- Epinephrine infusion

Consider:

- Expert consultation
- Transvenous pacing

Doses/Details

Atropine IV dose:

First dose: 1 mg bolus.
Repeat every 3-5 minutes.
Maximum: 3 mg.

Dopamine IV infusion:

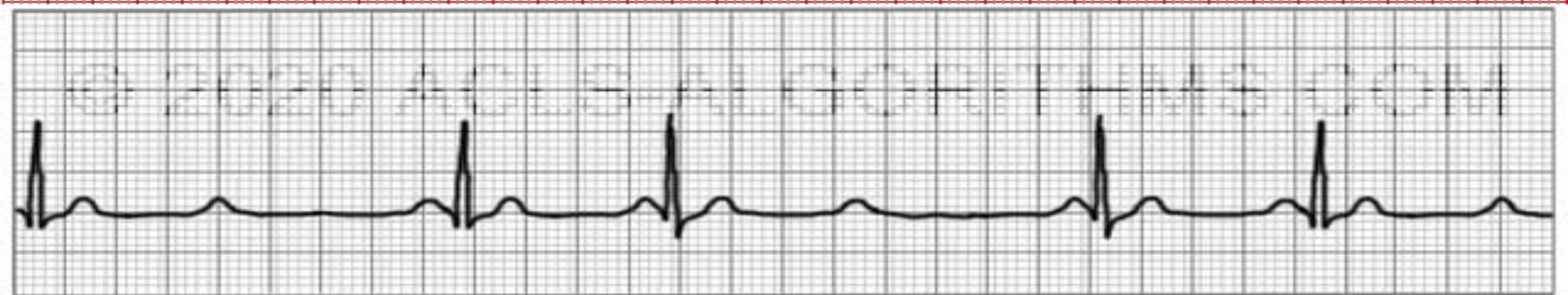
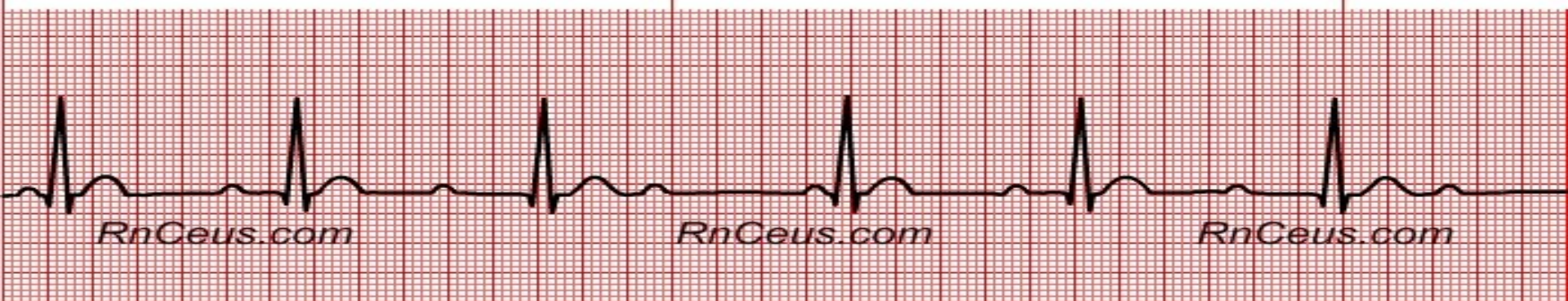
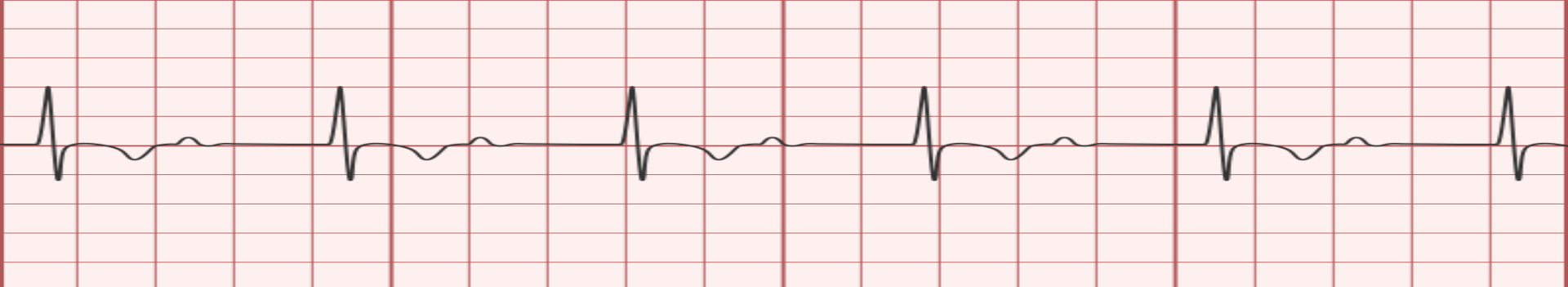
Usual infusion rate is
5-20 mcg/kg per minute.
Titrate to patient response;
taper slowly.

Epinephrine IV infusion:

2-10 mcg per minute infusion.
Titrate to patient response.

Causes:

- Myocardial ischemia/
infarction
- Drugs/toxicologic (eg,
calcium-channel blockers,
beta blockers, digoxin)
- Hypoxia
- Electrolyte abnormality
(eg, hyperkalemia)



ROSC

Advance airway

Fluids resuscitation

Induce hypothermia

ECG 12 leads



TAKE A BREATH

References

Judith E. Tintinalli, MD, MS, Tintinalli's
Emergency Medicine A Comprehensive Study
Guide, Ninth Edition, 2020

American Heart Association AHA, 2020

ROSEN'S EMERGENCY MEDICINE: CONCEPTS
AND CLINICAL PRACTICE, NINTH EDITION,
2018

Thank you

