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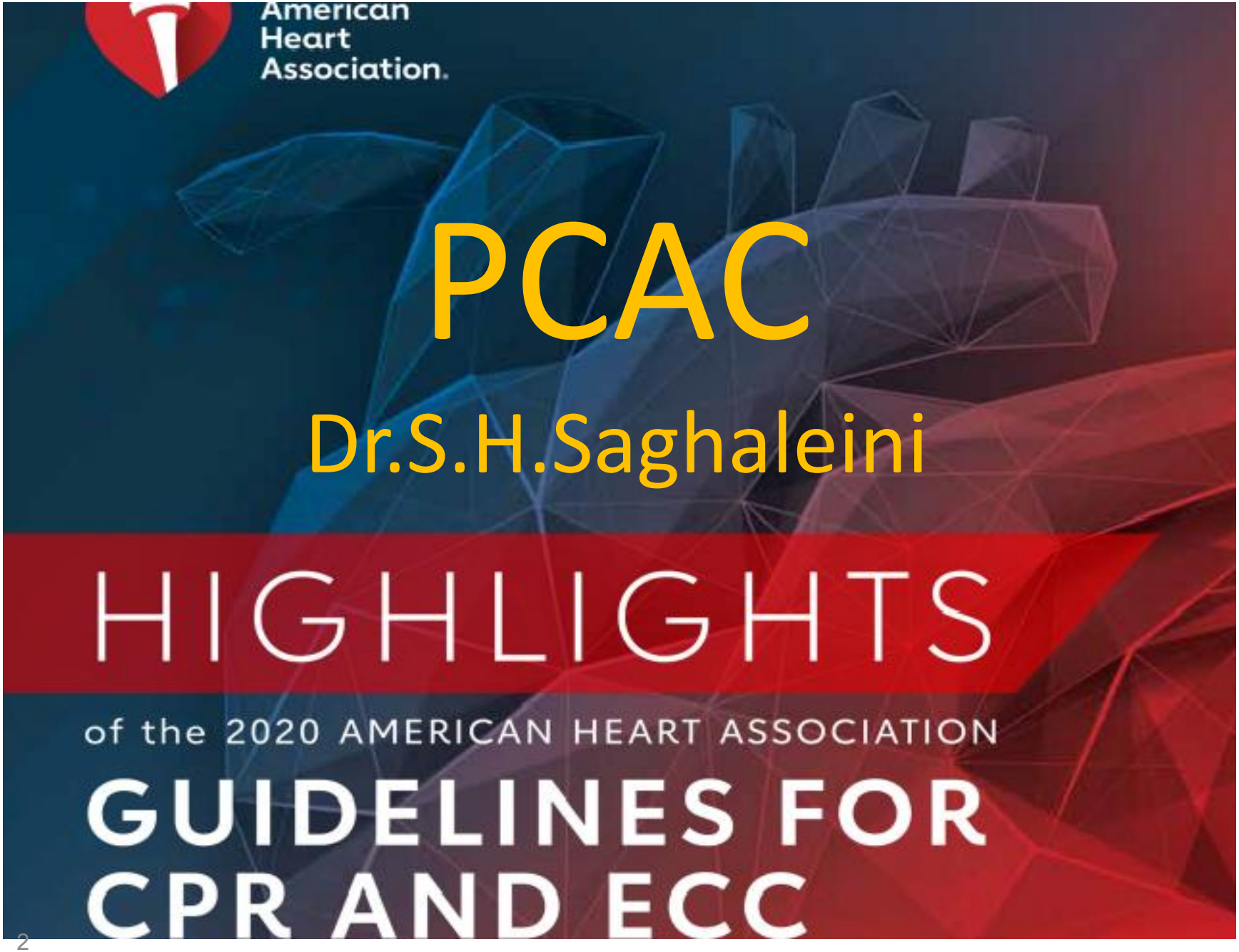

American
Heart
Association.
PCAC
Dr.S.H.Saghaleini
HIGHLIGHTS
of the 2020 AMERICAN HEART ASSOCIATION
GUIDELINES FOR
CPR AND ECC


IHCA
Early Recognition and Prevention
Activation of Emergency Response
High-Quality CPR
Defibrillation
Post-Cardiac Arrest Care
Recovery
OHCA

- Approximately 50% to 60% of patients successfully resuscitated from OHCA do not survive.
- After ROSC global ischemia/reperfusion (I/R) injury results in potentially devastating neurologic disability

- The primary cause of death among post-resuscitation patients is brain injury.

- However, clinical trials have shown that targeted temperature management (TTM) after ROSC can improve outcomes.

General Approach

- Critical care support to optimize cardiovascular indices and vital organ perfusion, and prevent repeat cardiac arrest (or provide rapid treatment of re-arrest if it occurs)
- Interventional cardiac catheterization for possible percutaneous coronary intervention (PCI) if needed
- TTM for at least 24 hours in attempts to prevent permanent neurologic injury

Hemodynamic Support

- Hemodynamic instability occurs in approximately 50% of patients who survive to ICU admission after ROSC, and thus the need for aggressive hemodynamic support (e.g., continuous infusion of vasoactive agents and perhaps advanced hemodynamic monitoring) should be anticipated

- Severe, but potentially reversible, global myocardial dysfunction is common after ROSC.
- The etiology is thought to be ischemia/reperfusion injury, but treatment with defibrillation (if applied) could also contribute

- An ECG may be helpful in hemodynamic assessment after ROSC to determine if global myocardial depression is present, as this may affect decisions on vasoactive drug support (e.g., dobutamine) or mechanical augmentation (e.g., intraaortic balloon counterpulsation) until the myocardial function recovers.

Seizure

- Seizures are not uncommon after anoxic brain injury.
- Routine seizure prophylaxis is not currently recommended in post–cardiac arrest syndrome
- Continuous EEG monitoring (if available) can be useful, especially if continuous administration of neuromuscular blocking agents becomes necessary for any reason

Targeted Temperature Management

- The current AHA guidelines recommend at least 24 hours of TTM targeting 32°C to 36°C for comatose survivors of OHCA caused by VF or pulseless VT, as well as non-VF/pulseless VT and IHCA
- Appropriate selection of candidates for TTM is clearly important.

- If a patient does not follow verbal commands after ROSC is achieved, this indicates that the patient is at risk for brain injury and TTM should be strongly considered.
- If a patient is clearly following commands immediately after ROSC, then significant brain injury is less likely and it is probably reasonable to withhold TTM

- There are multiple potential methods for inducing TTM, including specialized external or intravascular cooling devices for TTM, or a combination of conventional cooling methods such as ice packs, cooling blankets, and cold (4°C) intravenous saline infusion.
- Compared with the use of specialized cooling devices, overshoot (body temperature<31 C) is a not uncommon occurrence with use of ice packs, cooling blankets, and cold saline

Complications

- Bradycardia
- “cold diuresis” resulting in hypovolemia and electrolyte derangements
- Hyperglycemia
- Coagulopathy
- Increased risk of secondary infection

- Bradycardia is a normal response to hypothermia.
- It is typically not recommended to treat bradycardia during TTM as long as the blood pressure, lactate, mixed venous saturation, and urine output are sufficient, even with heart rates less than 40 beats/min
- Fever is not uncommon in the post–cardiac arrest population because of the intense pro-inflammatory response to ischemia /reperfusion

Neurologic Prognostication

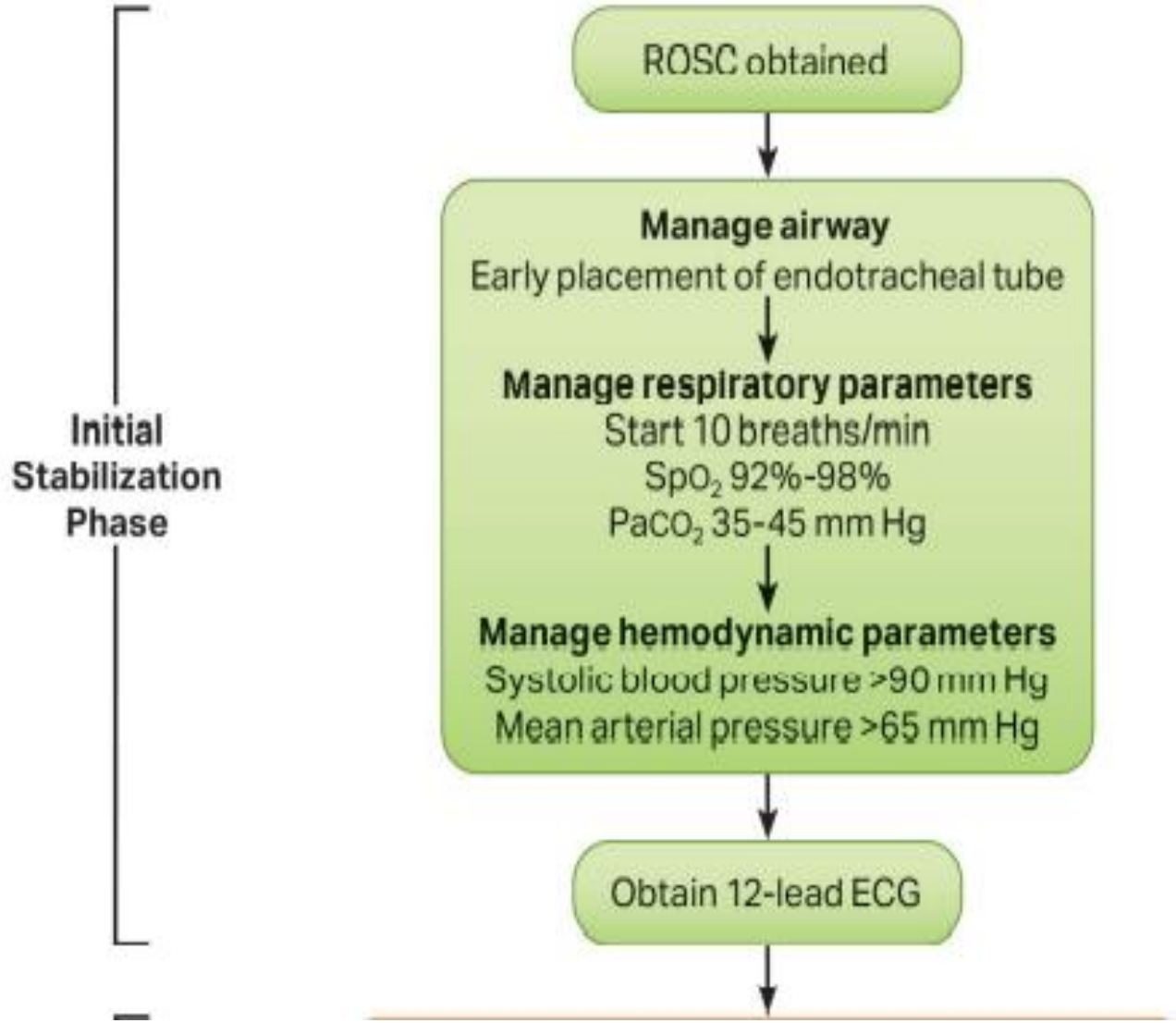
- In general, the recommended approach is to wait a minimum of 72 hours after ROSC before neurologic prognostication

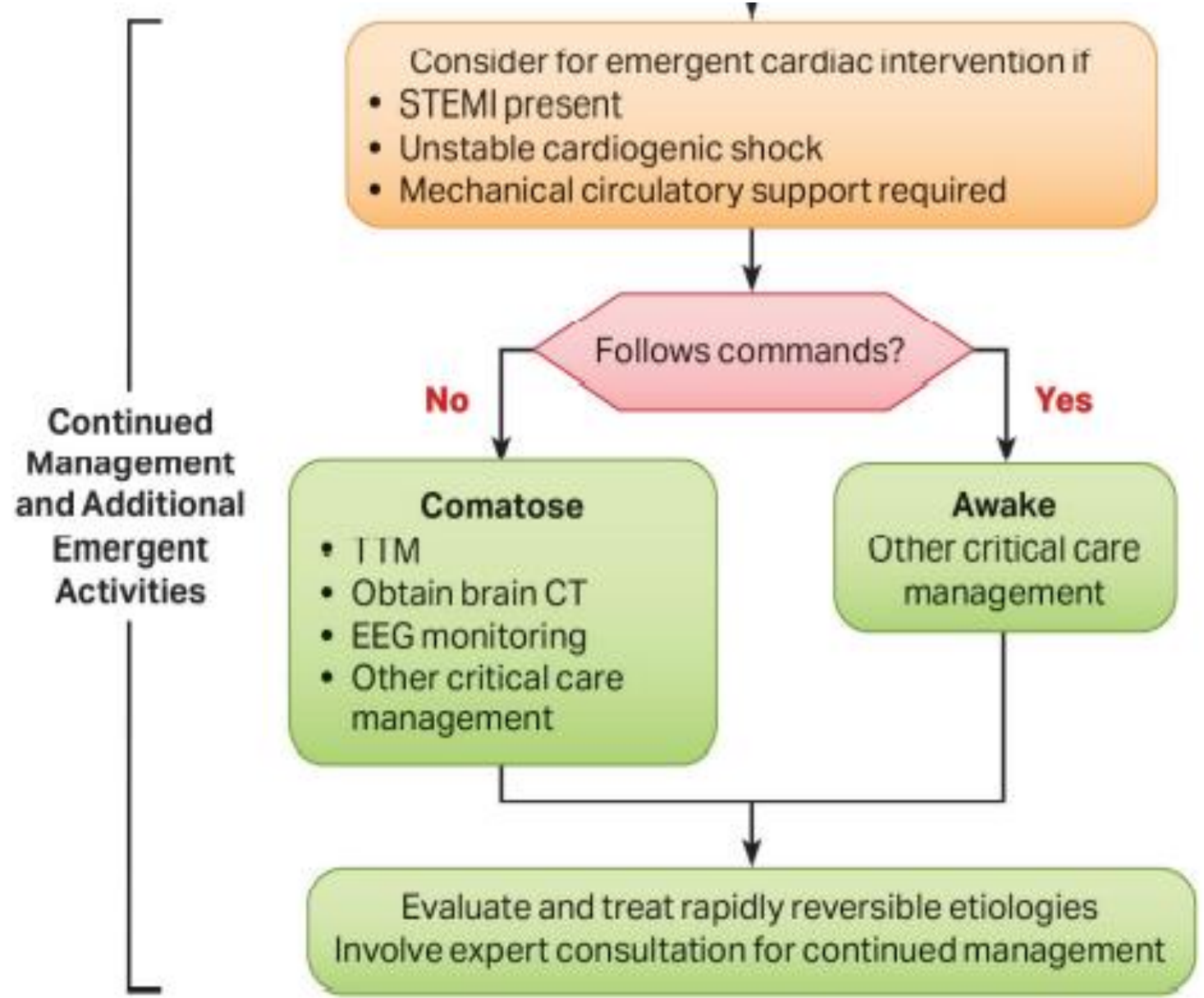
- Bilateral absence of pupillary reflexes at 72 hours after cardiac arrest is highly predictive of poor neurologic outcome with or without TTM with an false-positive ratio of about 0.5%

- Myoclonus accompanied by malignant EEG findings is a more reliable predictor of poor neurologic outcome

- Loss of gray-white matter differentiation on a CT scan of the brain has been shown to be a reliable predictor of poor outcome

Figure 7. Adult Post-Cardiac Arrest Care Algorithm.




Consider for emergent cardiac intervention if
• STEMI present
• Unstable cardiogenic shock
• Mechanical circulatory support required
Follows commands?
No
Yes
Comatose
• TTM
• Obtain brain CT
• EEG monitoring
• Other critical care management
Awake
Other critical care management
Evaluate and treat rapidly reversible etiologies
Involve expert consultation for continued management
Continued Management and Additional Emergent Activities

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/**h**yperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary

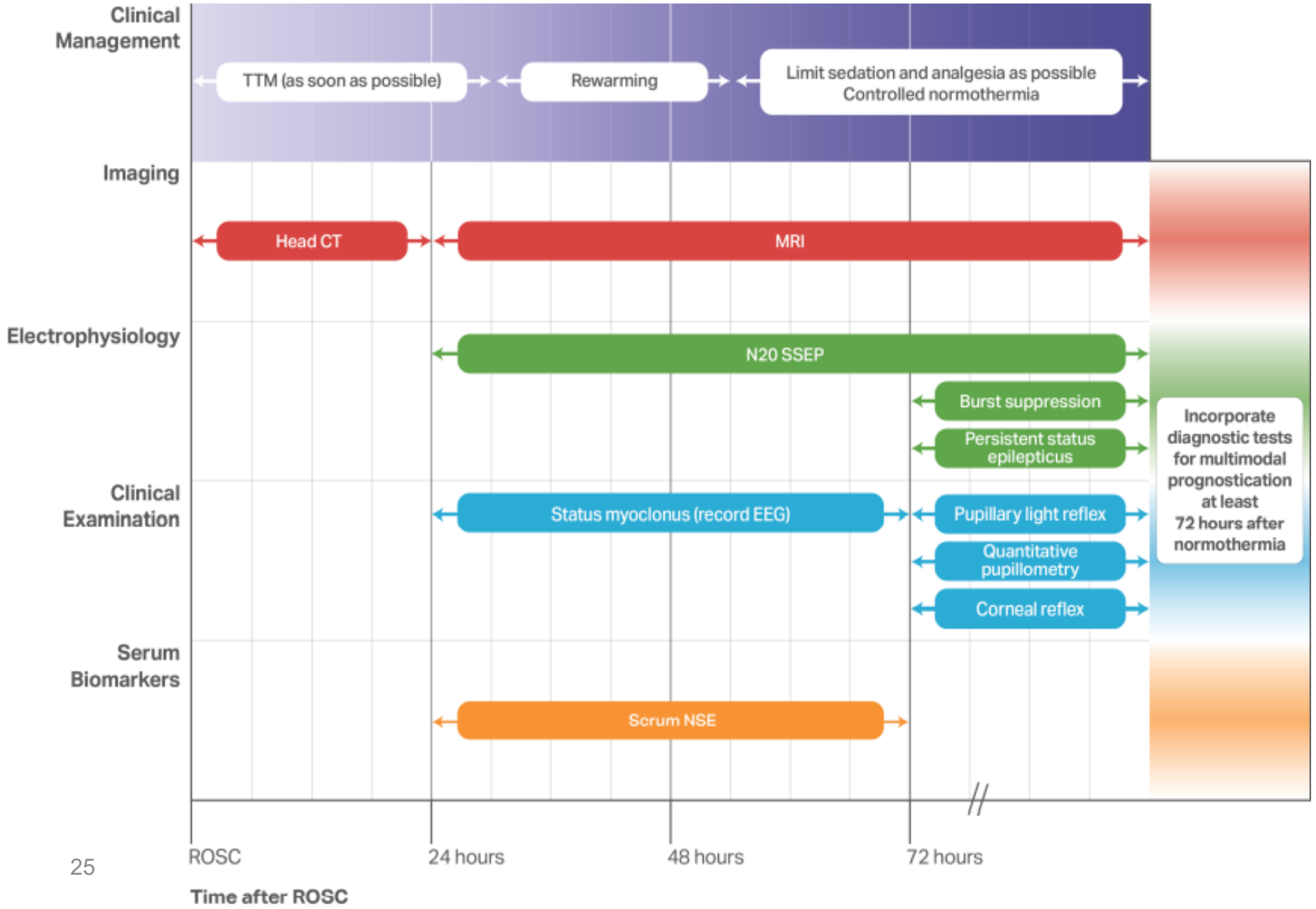
Post–Cardiac Arrest Care and Neuroprognostication

- The 2020 Guidelines contain significant new clinical data about optimal care in the days after cardiac arrest.
- Recommendations from the 2015 AHA Guidelines Update for CPR and ECC about treatment of hypotension, titrating oxygen to avoid both hypoxia and hyperoxia, detection and treatment of seizures, and targeted temperature management were reaffirmed with new supporting evidence.

- The 2020 Guidelines evaluate 19 different modalities and specific findings and present the evidence for each

- A new diagram presents this multimodal approach to neuro-prognostication

Recommended approach to multimodal neuro-prognostication after cardiac arrest



Care and Support During Recovery

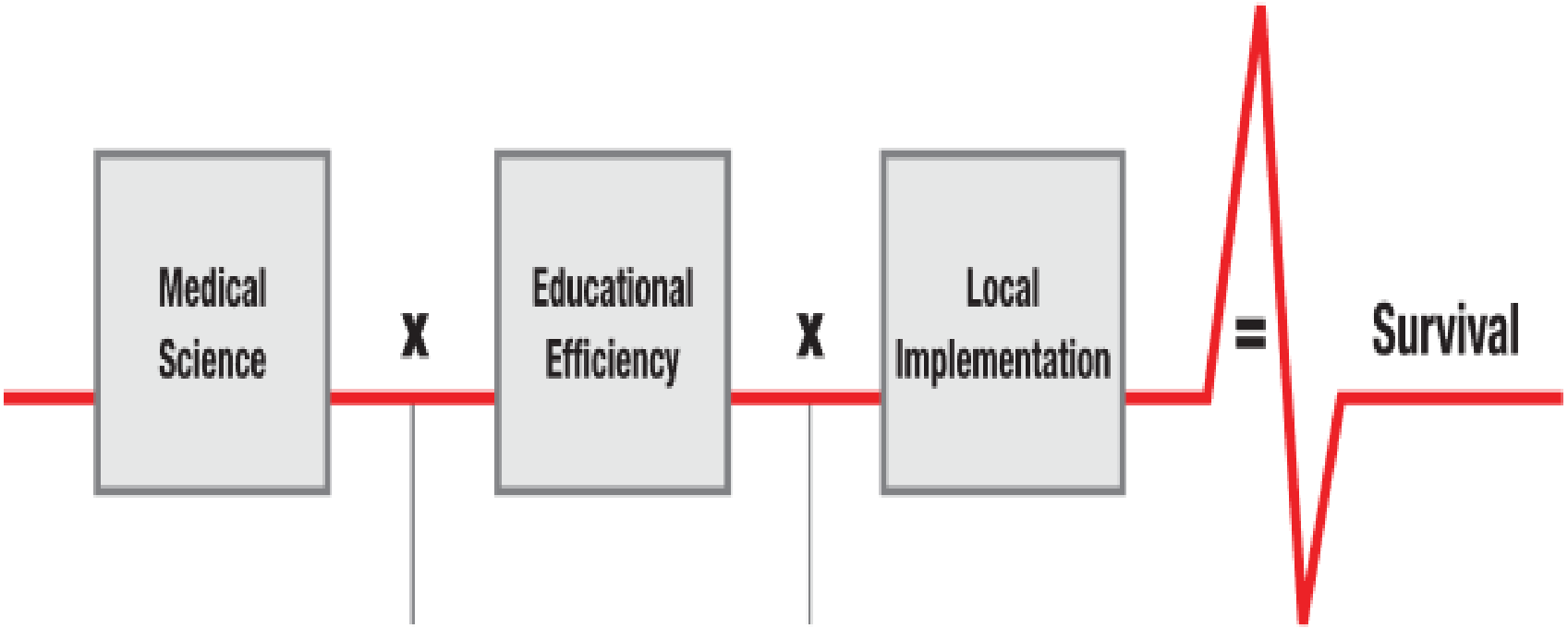
- 2020 (New): We recommend that cardiac arrest survivors have multimodal rehabilitation assessment and treatment for physical, neurologic, cardiopulmonary, and cognitive impairments before discharge from the hospital.

- 2020 (New): We recommend structured assessment for anxiety, depression, posttraumatic stress, and fatigue for cardiac arrest survivors and their caregivers.

Why?

- The process of recovering from cardiac arrest extends long after the initial hospitalization.
- Support is needed during recovery to ensure optimal physical, cognitive, and emotional well-being and return to social/role functioning.
- This process should be initiated during the initial hospitalization and continue as long as needed.

The Utstein Formula for Survival



TOP 6 TAKE-HOME MESSAGES: SYSTEMS OF CARE

1

Recovery is a critical component of the resuscitation Chain of Survival

2

Efforts to support the ability and willingness of members of the general public to perform CPR and to use an AED, improve resuscitation outcomes in communities

3

Novel methods to use mobile phone technology to alert trained lay rescuers of events requiring CPR have shown promise in some urban communities and deserve more study

4

Emergency system telecommunicators can instruct bystanders to perform hands-only CPR for adults.

The No-No-Go framework is effective.

5

Early warning scoring systems and rapid response teams can prevent cardiac arrest in both pediatric and adult hospitals, but the literature is too varied to understand what components of these systems are associated with benefit.

6

Cognitive aids may improve resuscitation performance by untrained laypersons, but their use results in a delay to starting CPR.

More development and study are needed before these systems can be fully endorsed


ANY
QUESTIONS