Current Debates in Cardiac Arrest Care by Gabriela Rifkind

Initial Project Objective

Research current debates and innovations in cardiac arrest care and analyze the available evidence.

Areas of investigation include: •Optimum timing for administering medication •Which medications to administer during a cardiac arrest

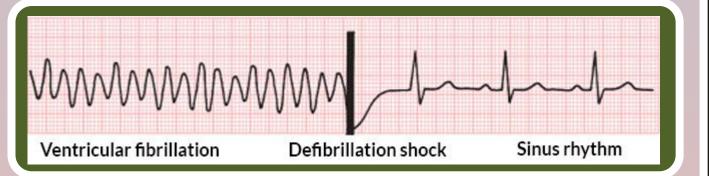
- •Alternative placement of defibrillator pads
- •Use of ultrasound in determining presence of cardiac contractions in suspected pulseless electrical activity (PEA) •ECMO in cardiac arrest

Project Challenges

EMS is largely based on trial and error and anecdotal evidence. There is a lack of high quality randomized controlled trials in prehospital medicine. Existing research tends to be inconclusive or contradictory. Many studies are unable to, or fail to understand, the need to control for certain confounding variables which are critical to obtaining clearer data.

What is a Cardiac Arrest?

The American Heart Association defines cardiac arrest as "the abrupt loss of heart function". Cardiac arrest can be caused by a variety of factors including, •Arrhythmias (ventricular fibrillation or ventricular tachycardia) •Myocardial Infarction (heart attack) Anything forcing the heart to attempt to function without adequate resources (blood, oxygen, sugar, etc) •Trauma



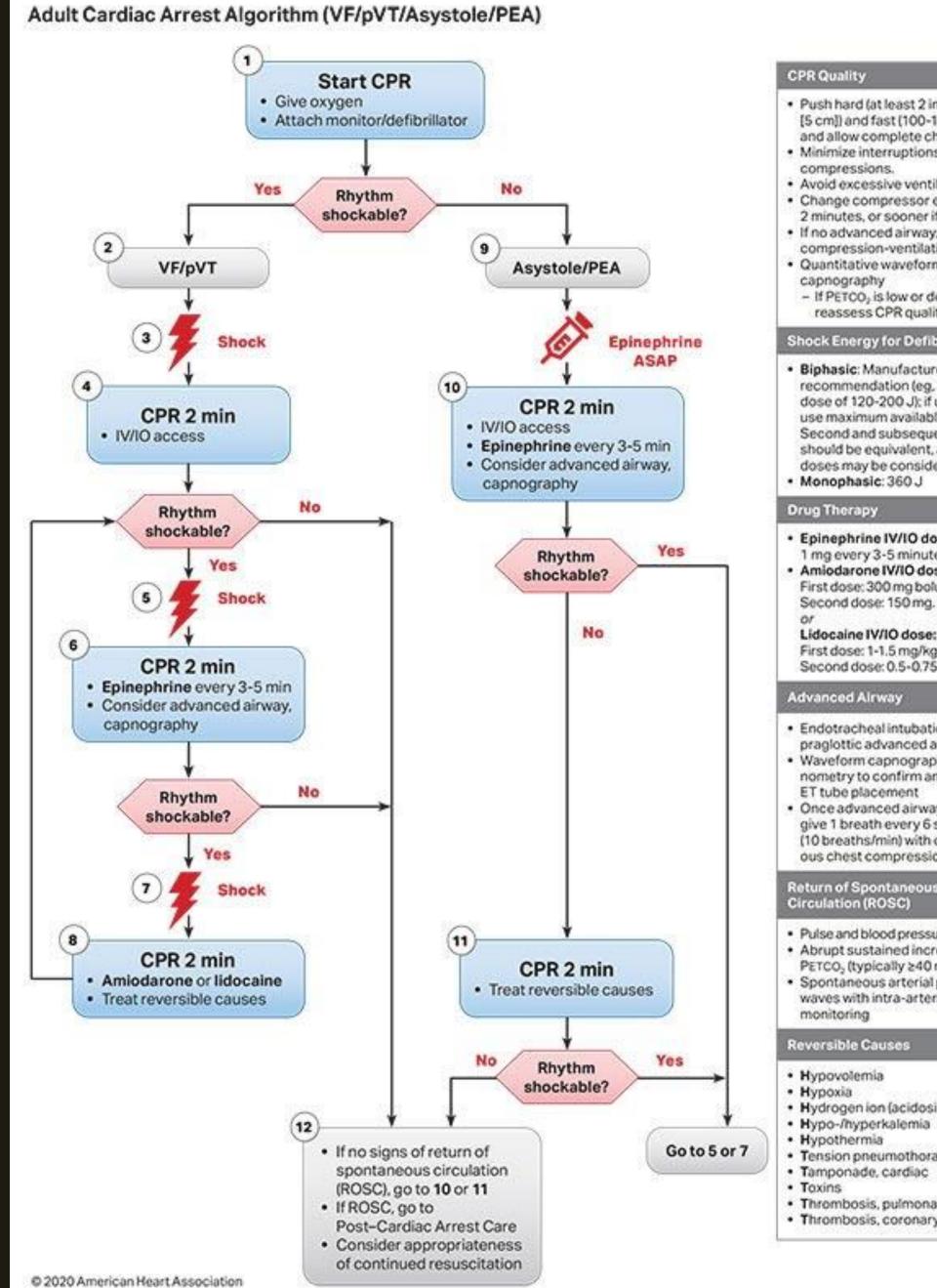
Optimum Time for Administering Medication?

Studies have largely failed to validate the use of medications in cardiac arrest. Most studies seem not to control well for confounding variables. Most studies are too small to draw definitive conclusions.

•Metabolic Disturbances

Current Cardiac Arrest Guidelines

AHA 2020 Adult Cardiac Arrest Algorithm The AHA makes recommendations for the dose, type, and timing of medication administration during cardiac arrests



CPR Quality

- Push hard (at least 2 inche [5 cm]) and fast (100-120/mi and allow complete chest n

- nutes, or sooner if fatigu
- dvanced airway, 30:2
- Quantitative waveform
- If PETCO, is low or decreasing reassess CPR quality

ock Energy for Defibrilla

Biphasic: Manufacture recommendation (eg. initial dose of 120-200 J); if unknown, use maximum available Second and subsequent doses should be equivalent, and highe 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.

Lidocaine IV/IO dose First dose: 1-1.5 mg/kg Second dose: 0.5-0.75 mg/kg.

dvanced Airway

- Endotracheal intubation or supraglottic advanced airway Waveform capnography or cap nometry to confirm and monito ET tube placement
- Once advanced airway in place give 1 breath every 6 seconds (10 breaths/min) with continu ous chest compression:

eturn of Spontaneou irculation (ROSC)

- Pulse and blood pressure Abrupt sustained increase in PETCO, (typically >40 mm Hg)
- Spontaneous arterial pressure waves with intra-arteria monitoring

versible Causes

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

Alternative Placement of Defibrillator Pads?

Alternatives to standard pad placement may better defibrillate the necessary portions of the heart.

Studies conflict on which defibrillation pad placement is best.



Plans for Concluding the Project

- Paper summarizing research \bullet
- Make recommendations on
- trial design for the future