

OMD Podcast: Post-ROSC Care

Summary Points:

- Why Post-ROSC Care is Important
- The H-Bombs and Friends
- Post-ROSC Tips
- The Post-ROSC ABCs



• Why Post-ROSC Care Is Important

- Cardiac arrest is a massive stress on the body
 - Decreased perfusion to the organs
 - Relative tissue hypoxia
 - Harsh ACLS drugs
 - Physical trauma
- The brain and heart are extremely vulnerable at this time
 - Need to optimize the supply of oxygen, glucose and blood and minimize underlying metabolic demand
 - Imagine your patient just had a traumatic brain injury; the protective care is very similar
 - What you do in this period can truly alter the patient's survival and neurological outcome
- Good post-ROSC care decreases risk of repeat arrest and poor neurologic outcomes
- Components of the care can help determine the cause of the arrest and may dictate care at the ED

• The H-Bombs and Friends

THE H-BOMBS

- Hypotension – Causes additional damage to brain and heart by failing to perfuse the tissue
 - Fails to perfuse heart, increased risk of repeat arrest
 - Fails to perfuse brain, increased risk of anoxic injury and poor neuro outcome
 - Aim for normal BP unless trauma
- Hypoxia - Causes additional damage to brain and heart by failing to oxygenate the tissue
 - Fails to oxygenate heart, increased risk of repeat arrest
 - Fails to oxygenate brain, increased risk of anoxic injury and poor neuro outcome
 - Aim for 94-99% SPO2
- Hyperventilation – Causes poor perfusion of the brain and can decrease blood return to heart
 - Causes vasoconstriction in brain, leads to poor perfusion of the brain, increased risk of anoxic injury and poor neuro outcome
 - Aggressive bagging can cause increased intrathoracic pressure and decrease cardiac return – causes hypotension and poor perfusion leading to increased risk of repeat arrest and poor outcomes
 - Aim for normal EtCO2

ASSOCIATED POST-ROSC ITEMS (Friends)

-Hypoglycemia – Can cause repeat arrest and worsen tissue damage

-Aim for normo-glycemia (70+)

-Bradycardia – Causes poor perfusion (similar to hypotension) and additional damage to brain and heart

-Fails to perfuse heart, increased risk of repeat arrest

-Fails to perfuse brain, increased risk of anoxic injury and poor neuro outcome

The H-Bombs and Friends		
The H-Bombs	Hypotension	Increases risk of repeat arrest and worse neurologic outcomes due to poor perfusion
	Hypoxia	Increases risk of repeat arrest and worse neurologic outcomes due to poor oxygenation
	Hyperventilation	Can decrease blood return (see hypotension) and cause vasoconstriction in the brain
Associated Post-ROSC Items	Bradycardia	Increases risk of repeat arrest and worse neurologic outcomes due to poor perfusion
	Hypoglycemia	Increases risk of repeat arrest and worse neurologic outcomes due to poor tissue death

- **Post-ROSC Care Tips**

-USE CRASHING PATIENT ALGORITHM AS YOUR GUIDE

-After achieving ROSC, need to ensure that all your efforts aren't wasted

-Premature movement will greatly increase risk of loss of ROSC

-Getting a dead patient to the hospital quickly means a lot less than getting a live one there slowly

-Do a 10-minute "no fly zone" or "timeout" before moving regardless of stability

-Critical time for assessment, stabilization and packaging for transport

-Most risky time post-ROSC

-Prepare to move or prepare to fail

-During this time, code-dose epi may wear off and lead to decompensation

-PRIOR TO MOVING must meet goals or implement exit strategy

-DO NOT ROSC AND RUN

-First seconds to minutes

- Keep a finger on the pulse continuously, consider marking place with sharpie
 - Great BLS/FRO job; Ideally keep that person on it for 10 min.
 - Will give you early warning for worsening
- Immediately check a FULL set of VS (and a glucose if you haven't already)
- Continuous cardiac monitoring (don't disconnect if possible)
 - Eyes on monitor as much as possible
- Monitor ETCO2 closely
 - A sudden drop in EtCO2 can indicate repeat arrest (check a pulse immediately)
 - Gradual worsening of EtCO2 can indicate decompensation that needs intervention to prevent arrest
 - Can be an indication of loss of ROSC
- Consider Logistics early
 - Do you need a fire-rider to help in transport
 - MINIMAL to NO Monitor disconnection during transports
 - Plan ahead and be thorough
 - Consider keeping MCD back-board in place

- **The Post-ROSC ABCs**

- Airway:

- Most are going to need continued PPV (BVM), and will likely need airway protection
- Optimize your patient for a safe intubation (try to meet your goals)
 - Quick King if cannot meet intubation
- Sedation likely not needed for these airways unless patient biting/gagging
 - Be cautious using sedation in these patients
 - They are on the edge, sedation may push them over
- Be ready to deal with hypotension caused by meds and positive pressure ventilation (IVF and Push dose pressor or Norepinephrine drip ready)

GOAL: Rapidly control airway to facilitate oxygenation and ventilation

- Breathing:

- Oxygenation
 - One of the most important things to monitor
 - Without good oxygenation, risk of recurrent arrest is very high
 - Prevent hypoxia and aggressively treat it.
 - Maintain SpO2 94-99%
 - Prevent hyperoxia (SPO2 100+) as this also leads to injury to the brain
 - Another case of more isn't better
- Ventilation
 - DO NOT OVER VENTILATE or attempt to "normalize" EtCO2
 - Will cause decreased blood flow to brain and may reduce blood return to heart
 - EtCO2 reading may not be "normal" either due to low perfusion
 - Target a RR of 8-12 BPM

GOAL: Maintain sats of 94-99% with RR between 8-12 BPM to prevent over-ventilation

-Circulation:

- Ensure good access for resuscitation (bilateral IVs or IO)
- Blood Pressure:
 - Consistent BP monitoring to watch for hypotension
 - Especially important after taking the airway and switching to positive pressure ventilation
 - Strongly consider having either a push-dose epi or norepinephrine drip “on deck” and ready to go to immediately address instability and prevent rearrest.
- Heart Rate
 - Watch for VT and bradycardia
 - Can quickly lead to decompensation and contribute to hypotension
 - In Post-ROSC bradycardia
 - Be aggressive with pacing, goal to keep HR >60BPM
 - Aggressively titrate to Max current
 - Use Pulse-Ox and Pulses to ensure mechanical capture
 - BE AWARE; pacing can mask early signs of loss of ROSC
 - Masks EKG changes (widening, worsening brady)
 - Can artificially reassure that patient is ok until they crash
 - Close monitoring of EtCO₂ and SPO₂ to look at perfusion is CRITICAL
 - If pacing, change to Epi drip

GOAL: Maintain normal BP (SBP 90+) to promote good perfusion with close BP monitoring and to keep HR >60 BPM with pressors or pacing

-Dextrose:

- Check a fingerstick early to ensure that hypoglycemia does not cause repeat arrest
- Supplement glucose as needed to maintain a normal level

GOAL: Maintain normo-glycemia (70+)

-EKG:

- Critical to look for STEMI as a cause of arrest
- Do 8-10 minutes after ROSC to allow all critical interventions to be performed
 - More accurate for detecting underlying STEMI when delayed

GOAL: Obtain an EKG 8-10 minutes post-ROSC to look for underlying pathology

SUMMARY IN BRIEF

- Post-ROSC Care is critical to the survival and neurologic outcome of your patient
- Use the Crashing Patient Protocol as a Guide
- Use a 10-minute no fly zone to get critical actions done and provide close monitoring
- Watch for the H-Bombs (hypotension, hypoxia, hyperventilation) and friends (bradycardia, hypoglycemia)
- Remember that pacing can mask a worsening patient, close monitoring even more critical (EtCO₂ and SPO₂)

Post-ROSC ABC's

A

GOAL: Rapidly control airway to facilitate oxygenation and ventilation

Tips: Watch for hypotension with positive pressure ventilation

B

GOAL: Maintain sats of 94%+ with RR between 8-12 BPM to prevent over-ventilation

Tips: Do not over-ventilate the patient and avoid hyperoxia (SpO₂>100%)

C

GOAL: Maintain normal BP (SBP 90+) to promote good perfusion with close BP monitoring and to keep HR >60 BPM with pressors or pacing

Tips: Be aggressive with Pressors and Pacing, Be aware that Pacing can mask worsening

D

GOAL: Maintain normo-glycemia (70+)

Tips: Check Early on Post-ROSC and fix early

E

GOAL: Obtain an EKG 8-10 minutes post-ROSC to look for underlying pathology

Tips: Get all of your critical cares above done before doing EKG