



EM CASES SUMMARY

Prepared by Dr. Anton Helman, Nov 2015

ACLS Guidelines 2015 Update – Post Arrest Care

Written Summary and blog post prepared by Dr. Anton Helman, November 2015

Once we've achieved ROSC our job is not over. Good post-arrest care involves maintaining blood pressure and cerebral perfusion, adequate sedation, cooling and preventing hyperthermia, considering antiarrhythmic medications, optimization of tissue oxygen delivery while avoiding hyperoxia, getting patients to PCI who need it, and looking for and treating the underlying cause.

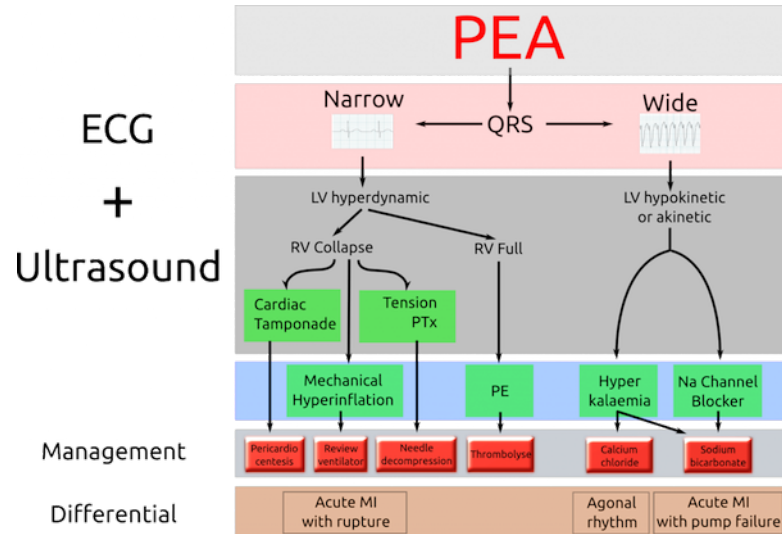
A Novel Approach to PEA Arrest

The Guidelines continue to recommend running through the H's and T's in order to arrive at a specific diagnosis and guide treatment in PEA arrest. This approach may not be ideal because the H's and T's are difficult to remember in the heat of a stressful resuscitation and some of the H's and T's rare causes of PEA (hypoxia, hypokalaemia and hypoglycaemia) or are obvious (hypoxia, hypothermia). In contrast, the approach to PEA Arrest proposed in the article 'A simplified and structured teaching tool for the evaluation and management of pulseless electrical activity' focuses

on the more likely diagnoses that require immediate treatment beyond your C-A-Bs to achieve ROSC.

This new way of thinking about PEA combines initial ECG morphology with the clinical scenario to guide the clinician to the most likely causes, and offer further diagnostic certainty using point of care ultrasound (POCUS). The first key step is to distinguish between narrow complex and wide complex PEA, with POCUS being used to help differentiate the causes of narrow complex PEA in particular.

Our experts caution that this approach should be used only when a highly skilled ultrasonographer is present and in a way that does not interrupt high quality CCR. Ideally, a designated team member provides the specific POCUS role independent of the other team members.



From Adelaide Emergency Physicians Education Resource

Antiarrhythmics in Post-Arrest Care

While we know that *intra-arrest* antiarrhythmic medications may improve rates of ROSC in ventricular fibrillation (VF) and pulseless ventricular tachycardia (pVT) arrests, there has never been a trial to show improvements in long term survival with any antiarrhythmic medication.

When it comes to giving antiarrhythmic medication *post-ROSC*, there is only one RCT of lidocaine post arrest which showed a decrease in the incidence of recurrent VF. In this study lidocaine was given both intra-arrest and continued post-ROSC. Hence, our experts recommend that *if* lidocaine is given intra-arrest and ROSC is achieved, than it is reasonable to continue a lidocaine infusion post-ROSC.

The Guidelines state that "there is inadequate evidence to support the routine use of lidocaine after cardiac arrest. However, the initiation or continuation of lidocaine may be considered immediately after ROSC from cardiac arrest due to VF/pVT."

We will need to wait for the results of the ROC-ALPS trial to give us a more clear idea of whether or not we should be using antiarrhythmics intra-arrest or post-arrest.

When to Terminate Resuscitation

The only validated rule for termination of resuscitation is for the adult *out of hospital cardiac arrest*, and it has 3 pre-hospital variables for predicting a 1-month death after OHCA:

1. No prehospital return of spontaneous circulation
2. Unshockable initial rhythm
3. Unwitnessed by bystanders

In the ED the decision to terminate resuscitation is multi-factorial and there is no absolute time cut off.

Some of the factors to consider are:

1. Age
2. Co-morbidities
2. Etco2 < 10 after 20 minutes if high quality CPR (this factor should not be used in isolation for termination of resuscitation decisions)
3. Initial VFib or recurrent VFib (our experts recommend activating the cath lab ASAP with ongoing mechanical CPR for patients in recurrent VFib or VFib 'storm')
4. Hypothermia ('hypothermic patients are not dead until they are warm and dead')

What are the Indications for Cath Lab Activation in Post Arrest Care?

The literature clearly shows that patients with an initial rhythm of Vfib or showing ongoing signs of STEMI on ECG should be considered for emergency PCI. Our experts believe that it is especially important to advocate for PCI in patients who suffer from recurrent VFib or Vfib 'storm'.

For all other patients (those without VFib or STEMI), it is unclear which patients should be transferred for PCI.

One of our experts suggests that any patient in whom a cardiac cause is suspected and no other cause is apparent should be considered for emergency PCI.

Again, similar to the decision to terminate resuscitation, multiple factors should be taken into consideration in deciding whether or not to activate the cath lab.

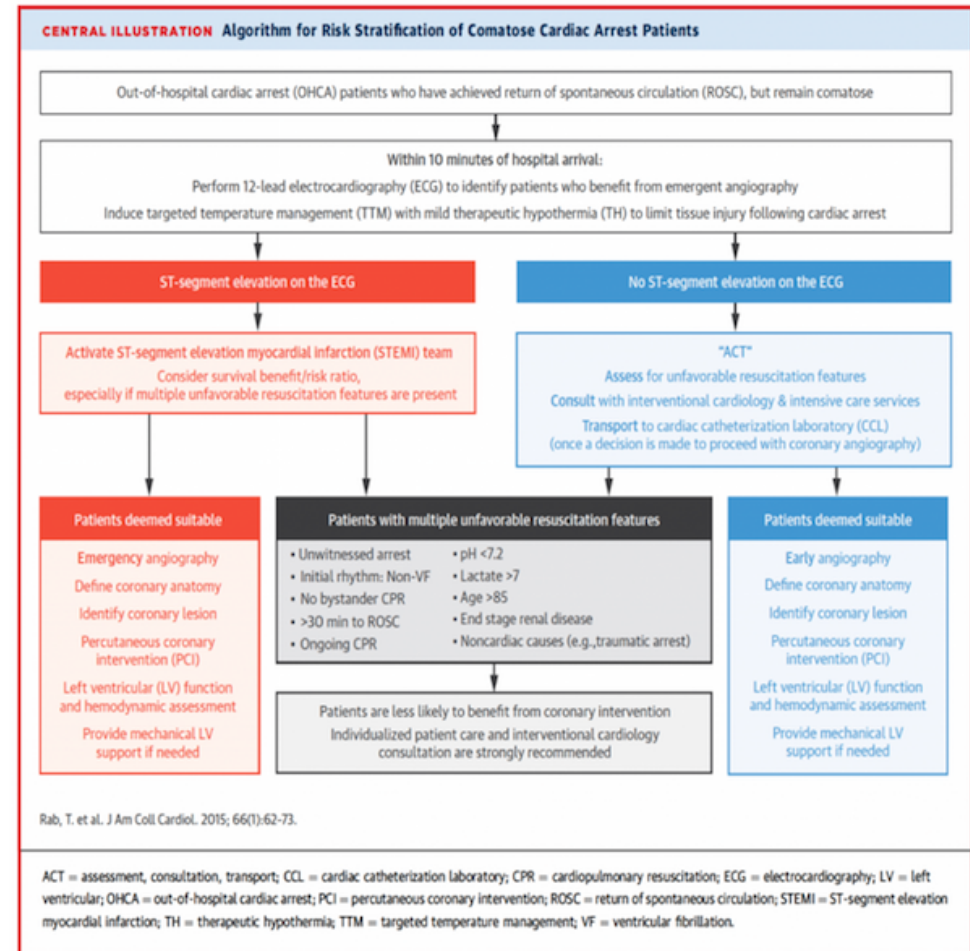
Favorable Factors include:

An elevated Troponin: A ROC paper that is currently under peer review as of November 2015 shows a clear association between a higher serum troponin level and a PCI amenable lesion as well as improved outcomes

Unfavorable Factors derived from *The Utstein Factors*:

1. Non-VFib arrest
2. Unwitnessed arrest
3. No ROSC in the field
4. Age >85

5. Clearly no cardiac cause - eg overdose, drowning
6. >30 minutes to ROSC
7. Long resuscitation time without ROSC as indicated by acidosis (pH < 7.2) and elevated lactate > 7



Targeted Temperature Management in Post Arrest Care

The Guidelines stipulate that Targeted Temperature Management (TTM) should be initiated for ALL post arrest patients who achieve a ROSC, and it's up to your intensivist what the target temperature should be between 32 and 36 degrees.

TTM... Just Do It

It is important to understand that the control arm in the TTM trial still actively cooled patients, just not to the same degree as the 32 degree arm.

A pre-hospital RCT in 2013 compared *immediate* 2L boluses of cooled saline vs in-hospital cooling and showed an *increased* rate of re-arrest and acute heart failure in the pre-hospital group that received *immediate* large boluses of cooled NS. Therefore, in terms of *when* and *how* to start cooling, Dr. Morrison recommends to wait a few minutes after ROSC to let the heart settle and then start cooled IV saline in *small* boluses.

The relative contraindications to TTM (excluded in clinical trials)

1. Intracranial event
2. Hemorrhage
3. Pregnancy

Key References

[The full AHA Guidelines in Circulation](#)

[2015 AHA Guidelines Highlights](#)

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Kudenchuk PJ, Brown SP, Daya M, et al. Resuscitation Outcomes Consortium-Amiodarone, Lidocaine or Placebo Study (ROC-ALPS): Rationale and methodology behind an out-of-hospital cardiac arrest antiarrhythmic drug trial. Am Heart J. 2014;167(5):653-9.e4.

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[Full PDF](#)

Maynard C, Longstreth WT, Nichol G, et al. Effect of prehospital induction of mild hypothermia on 3-month neurological status and 1-year survival among adults with cardiac arrest: long-term follow-up of a randomized, clinical trial. J Am Heart Assoc. 2015;4(3):e001693. [Full Article](#)