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Pulseless Arrest Algorithm review.

The most recent full scientific guidelines updates were done in 2005 by scientific committees from ILCOR - the International Liaison Committee on Resuscitation, and the AHA ECC - the Emergency Cardiovascular Care Programs committees at the American Heart Association.

All patients with pulseless arrest (dead people); that is, *no pulse, no blood pressure, unconscious and unresponsive*, have now been placed into one single algorithm. In the past there were three – PEA, Asystole and V Fib/Pulseless VT as separate algorithms.

The main idea of this single algorithm is to clearly identify BLS skills, such as CPR, as being of primary importance. They are listed in the first box and the information box on the bottom of the algorithm.

The pulseless arrest algorithm should be thought of as one long continuum of CPR, only interrupted for 10 seconds or so at a time to perform pulse checks, after each CPR interval.

Note: Each and every cycle of CPR should be 5 full cycles of 30:2 in all adults, *before intubation*. After intubation, the compression rate is 100 per minute, the breaths from the BVM are approximately every 6 to 8 seconds, and there is no pause in CPR for ventilations *after* intubation is accomplished.

The next most important decision to make is whether the rhythm present requires a *shock*, or not. Ventricular Fibrillation and Pulseless Ventricular Tachycardia are *disorganized* electrical rhythms, which provide no cardiac output. These need to be stopped (terminated) in order for the patient to be able to resume normal sinus electrical function and normal heart function. This is the function of electrical shock defibrillation. This is the left hand arm of the algorithm.

The right hand arm of the algorithm, Asystole and Electrical Mechanical Dissociation, are rhythms seen on the monitor, which are either not conducting through the AV node (EMD or PEA), or, there is simply no electrical rhythm or heart function present (Asystole).

EMD is an *organized* rhythm, but provides no motor activity, therefore no forward blood flow and no cardiac output. EMD should be thought of as a *condition*, not a rhythm – it can show up as almost any rhythm on the monitor, the key is the disconnection from motor activity – the pulseless dead patient. Normal Sinus Tachycardia is the most common rhythm seen at the beginning of EMD. The mechanical and medical treatments for EMD are trying to re-establish the connection between electrical activity and cardiac muscle function.

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In Asystole the patient is *dead*, so giving a shock of electricity just prolongs the refractory time of the AV node, so the patient is *more* dead and *less* likely to revive. Electrical shock, whether cardioversion or defibrillation is contraindicated in Asystole.

The medication recommendations in the new GL 2005 pulseless arrest algorithm have changed.

Vasopressin has been added to the Asystole or PEA algorithm, as a first or second choice, just like in PA. You may use Atropine for slow PEA or Asystole.

Procainamide has been dropped from pulseless arrest – it is still recommended in the separate tachycardia algorithm.

ALL medications are to be given during one of the CPR cycles; so, it actually prepares the patient for the NEXT cycle of shock.

There are 5 possible medications in this algorithm, two vasopressors and three anti-arrhythmic medications. A vasopressor is tried first, then an anti-arrhythmic is added.

VASOPRESSOR

Vasopressin, 40 units as a one time only dose. It may be given as the first or second choice, but only given one time.

Epinephrine, the old stand-by. It is given as a standard dose, 1 mg, “every three to five minutes”. You will have to decide, as the team leader, whether you will give it every CPR cycle or every other CPR cycle. You have to know this drug for every ACLS and PALS course you will ever take.

ANTIARRHYTHMIC

Start with either amiodarone or lidocaine, for now they are considered equivalent, this may change in 2010.

Amiodarone. Easier to give than lidocaine. Give as a 300 mg bolus, then you may repeat this one time, at a lower 150 mg bolus. Then stop, if it’s not working.

Lidocaine. Much more complicated to figure out the proper dosing. Not a great drug for patients with left heart failure or dysfunction. You have to guess the weight of the patient to estimate the dose.

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You may give this medication a total of three times. The first dose is 1 to 1.5 mg/kg. (So average male dead patient gets 75 to 100 mg as an IVP). If this doesn't work, give another 0.5 to 0.75 mg/kg. (Second dose average dead male patient of 35 to 50 mg). You can do this second dose amount one more time. NOTE: we usually give way too much of this medication during a cardiac arrest.

Magnesium. This is ONLY for the subset of Torsade de Pointe, *not for the other pulseless arrest rhythms*. You only need to give 1 to 2 grams (this will be about 4 cc). Put it in a 20cc syringe with 10cc D5W and slow push it in – or – in a small 50 cc bag of D5W and drip it in as a slow infusion.

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