QUESTION 94
A 67-year-old man has a witnessed collapse. His initial rhythm is ventricular fibrillation. The ambulance crew documents return of spontaneous circulation at 17 minutes after the initial collapse. In the emergency department he is ventilated via an endotracheal tube. His blood pressure is 120/70 mmHg. He has a Glasgow coma score of 3 out of a possible 15 points (no response to pain, no eye opening, no vocalization). His ECG is shown below. Co-morbidities are limited to essential hypertension and hypercholesterolemia for some years. His temperature is now 34°C.

Which of the following is the first priority of care for this patient?
A. Brain stem death testing.
B. Coronary angiography.
C. Intravenous thrombolytics.
D. Cool to 33°C.
E. Cerebral computed tomography (CT) scan.

Cause of this pt's VF arrest is most likely AMI considering the ST elevation in V4-6 with incomplete RBBB. He also has known cardiovascular risk factors. We do not know if this patient received CPR at all as that would be a contraindication to IV thrombolytics.

Evaluation of survivor of SCD
- identification & treatment of acute reversible causes
- evaluation of structural heart disease
- neurologic & psychologic assessment
- If heritable syndrome is suspected or confirmed, evaluation of famly members

Etiology:
Causes
1) coronary heart disease (65-70%) - stable CHD or prior infarctions
   if < age 40, CHD is significantly less common, structural heart disease and primary electrical disease are more common
   SCD accounts for 30-50% of deaths in pts with HF therefore all SCD survivors with HF receive an ICD
2) other types of structural heart disease (10%)
   - myocarditis
   - hypertrophic cardiomyopathy
- arrhythmogenic R ventricular dysplasia
3) structurally normal hearts (5-10%)
4) non cardiac cause (15-35%)
  - trauma
  - bleeding
  - drug intoxicification
  - intracranial hemorrhage
  - PE
  - central airway obstruction

**Investigations**
ABG, ECG, UEC, FBE, TTE

**Diagnostic angiography**
- unclear whether or not immediate coronary angiography to exclude an ACS should be performed in all SCD survivors
- evaluated in a consecutive series of 84 such survivors of out of hospital cardiac arrest, all of whom underwent urgent catheterization and angiography.
  - 36 had ST elevation, 18 had LBBB, 8 had ST depression
  - Results: total occlusion of a coronary artery was found in 40 pts and evidence of an unstable lesion in 18
  - 9 pts without ST elevation or CP had at least one totally occluded coronary artery
  - Long term outcomes were better in the 28 pts who had successful urgent PCI

Conclusion: The results apply more directly to the pts with evidence of active ischemia. It is not known whether it should be a routine urgent angiography;

**Neurologic Assessment**
A poor clinical outcome following cardiac arrest with 97% specificity if
  - absence of papillary light response after 24hrs
  - absence of corneal reflex after 24hrs
  - absent motor responses to pain after 24hrs
  - absent motor responses after 72hrs

Evoked potentials from brainstem, auditory, visuals have not been adequately evaluated.
Somatosensory evoked potentials (SSEPs) are the best validated and most reliable of the ancillary test currently available → test N20 component of SSEP with median nerve stimulation
  - SSEPs averaged electrical responses in the CNS to somatosensory stimulation.
  - an absent N20 was 100% predictive dismal outcome

CT and MRI contribute little to assessment of the pt unless stroke, bleeding or trauma is suspected.

**Management**
1) Induced hypothermia
   - target temp 32-34 degrees for 24 hrs
   - improved neurologic outcome
   - reduced mortality

   Seen in pt with VF arrest in whom spontaneous circulation restored, even when pt remains comatose after resuscitation
2) Family counseling

**Outcome**
1) Asystole: 0-2% survive till hospital discharge
   - factors ass with successful resus: witnessed arrest, lower pt age, shorter time to arrival of EMS and no tx with atropine for bradyarrhythmia after resus
2) EMD: 11% survive until hospital d/c

3) Ventricular tachyarrhythmia:
   a) VF → 25-40% survive till hospital d/c
      - Witnessed VF had significantly greater likelihood of survival
      - Underlying cause: AMI

   b) Haemodynamically unstable VT → 65-70% survival
      - Prognosis is better in pts with monomorphic VT, potential for systemic perfusion during this more organized arrhythmia
      - Lower incidence of remote infarction and higher ejection fraction

Factors related to Outcome of resuscitation
   1) VF duration
   2) Shortening time to resuscitation
   3) Automatic external defibrillators
   4) Adequacy of CPR
   5) Timing of defibrillation
   6) Induced hypothermia

Of all the possible options, the 1st priority of the care of this patient is induced hypothermia as it is the only option that has shown to improve neurological outcome and reduce mortality. Coronary angiography is still important in this patient's management considering his ECG and the cause of his VF arrest is most likely due to CHD but it would not be the 1st priority. As for the IV thrombolytics, if the pt received CPR, it would then be contraindicated. CTbrain and brain stem death testing are part of the neurological & prognostic evaluation.