INTRODUCTION

In patients with cardio-pulmonary arrest, vigorous resuscitation attempts must be undertaken whenever there is a chance of survival, however remote.

Nevertheless, it is possible to identify patients in whom there is absolutely no chance of survival, and where resuscitation would be both futile and distressing for relatives, friends and healthcare personnel and where time and resources would be wasted undertaking such measures.

The views of an attending General Practitioner (GP) or relevant third party should be considered.

CONDITIONS UNEQUIVOCALLY ASSOCIATED WITH DEATH WHERE RESUSCITATION SHOULD NOT BE ATTEMPTED

All the conditions, listed below, are unequivocally associated with death in ALL age groups (see below for further details):

1. massive cranial and cerebral destruction
2. hemicorporectomy
3. massive truncal injury incompatible with life including decapitation
4. decomposition/putrefaction
5. incineration
6. hypostasis
7. rigor mortis

In the newborn, fetal maceration is a contraindication to attempted resuscitation.

FURTHER DETAILS

Decapitation: Self evidently incompatible with life.

Massive cranial and cerebral destruction: Where the injuries are considered by the ambulance clinician to be incompatible with life.

Hemicorporectomy (or similar massive injury): Where the injuries are considered by the ambulance clinician to be incompatible with life.

Decomposition/putrefaction: Where tissue damage indicates that the patient has been dead for some hours, days or longer.

Incineration: The presence of full thickness burns with charring of greater than 95% of the body surface.

Hypostasis: The pooling of blood in congested vessels in the dependent part of the body in the position in which it lies after death (**See Guidance Note 1**).

Rigor mortis: The stiffness occurring after death from the post mortem breakdown of enzymes in the muscle fibres (**See Guidance Note 2**).

In all other cases resuscitation must be commenced and the facts pertaining to the arrest must be established.

Following arrival and the recognition of pulselessness and apnoea (in the presence of a patent airway), chest compression and ventilations should be commenced whilst the facts of the collapse are ascertained.

IN THE FOLLOWING CONDITIONS RESUSCITATION CAN BE DISCONTINUED

- The presence of a DNAR (Do Not Attempt Resuscitation) order or an Advanced Directive (Living Will) that states the wish of the patient not to undergo attempted resuscitation (**see 3b**).
- When the patient's death is expected due to terminal illness.
- Efforts would be futile if **ALL** the following exist together:
  - 15 minutes since the onset of collapse
  - no bystander CPR prior to arrival of the ambulance
  - the absence of any of the exclusion factors on the flowchart (**Appendix 1**)
  - asystole (flat line) for >30 seconds on the ECG monitor screen.
- Submersion of adults for longer than 1 hour, children longer than 1.5 hours (**NOTE:** submersion **NOT** immersion) (**See Guidance Note 3**).

Whenever possible a confirmatory ECG, demonstrating asystole, should be documented as evidence of death. In this situation a 3 or 4 electrode system using limbs alone will cause minimum disturbance to the deceased. If a paper ECG trace cannot be taken it is permissible to make a diagnosis of asystole from the screen alone (**NOTE:** due caution must be applied in respect of electrode contact, gain and, where possible, using more than one ECG lead).

The use of the flow chart shown in **Appendix 1** is recommended.

If efforts are NOT deemed to be futile then resuscitation must continue to establish the patients' response to Advanced Life Support interventions. If the patient does not respond despite full ALS intervention and remains asystolic

for >20 minutes then the resuscitation attempt may be discontinued.

Removal of endotracheal tubes and/or indwelling cannulae should be in accordance with local protocol.

DO NOT ATTEMPT RESUSCITATION (DNAR) / ADVANCED DIRECTIVE (LIVING WILL)[1]

Ambulance clinicians should initiate resuscitation unless:

1. A formal DNAR[2] order is in place, either written and handed to the ambulance crew or verbally received and recorded by Ambulance Control from the patient's attendant requesting the ambulance providing that:
   a. the order is seen and corroborated by the ambulance crew on arrival
   b. the decision to resuscitate relates to the condition for which the DNAR order is in force: resuscitation should not be withheld for coincidental conditions.
2. A known terminally ill patient is being transferred to a palliative or terminal care facility (unless contrary instructions have been issued or the patient and/or carers express a specific wish for resuscitation to be attempted). Such information may be passed to and recorded by Ambulance Control as above.
3. An Advanced Directive (Living Will) has been accepted by the treating physician (patient's GP or Hospital Consultant) as a DNAR order. This should be communicated to Ambulance Control and logged against the patient's address.
   a. Patients may have an Advanced Directive (Living Will) although it is not legally necessary for the refusal to be made in writing or formally witnessed. This specifies how they would like to be treated in the case of future incapacity. Case law is now clear that an advance refusal of treatment that is valid, and applicable to subsequent circumstances in which the patient lacks capacity, is legally binding. An advance refusal is valid if made voluntarily by an appropriately informed person with capacity. Staff should respect the wishes stated in such a document.
   b. In an out of hospital emergency environment, there may be situations where there is doubt about the validity of an advance refusal or DNAR order. If staff are **NOT** satisfied that the patient had made a prior and specific request to refuse treatment, they should continue to provide all clinical care in the normal way.

ACTION TO BE TAKEN AFTER DEATH HAS BEEN ESTABLISHED

In light of the fact that earlier guidelines have been in use by a number of Services for almost 10 years, we no longer believe that it is necessary for a medical practitioner to attend to confirm the fact of death. Moreover, the new GP Contract contains no obligation for a GP to do so when requested to attend by Ambulance Control.

Services should be encouraged, in conjunction with their coroner's service (or Procurator Fiscal in Scotland), to develop a local procedure for handling the body once death has been verified by ambulance personnel.

As a guide the attached procedure (**Appendix 2**) and record form (**Appendix 3**) are suggested.

We further propose the adoption of a locally approved leaflet for handing to bereaved relatives.

GUIDANCE NOTE 1

Initially, hypostatic staining may appear as small round patches looking rather like bruises, but later these coalesce to merge as the familiar pattern. Above the hypostatic engorgement there is obvious pallor of the skin. The presence of hypostasis is diagnostic of death – the appearance is not present in a live patient. In extremely cold conditions hypostasis may be bright red in colour, and in carbon monoxide poisoning it is characteristically 'cherry red' in appearance.

GUIDANCE NOTE 2

Rigor mortis occurs first in the small muscles of the face, next in the arms, then in the legs (30 minutes to 3 hours). Children will show a more rapid onset of rigor because of their large surface area/body mass ratio. The recognition of rigor mortis can be made difficult where, rarely, death has occurred from tetanus or strychnine poisoning. It is stated that the diagnosis of rigor mortis can be confirmed by firmly pressing on a joint such as the knee, when the rigor mortis will be abolished and the joint becomes flaccid.

In some, rigidity never develops (infants, cachectic individuals and the aged) whilst in others it may become apparent more rapidly (in conditions in which muscle glycogen is depleted): exertion (which includes struggling), strychnine poisoning, local heat (from a fire, hot room or direct sunlight).

Rigor should not be confused with cadaveric spasm (sometimes referred to *as instant rigor mortis*) which develops immediately after death without preceding

flaccidity following intense physical and/or emotional activity. Examples include: death by drowning or a fall from a height. In contrast with true rigor mortis only one group of muscles is affected and NOT the whole body. Rigor mortis will develop subsequently.

GUIDANCE NOTE 3

Submersion victims

With thanks to Dr F StC Golden for his advice in this specialist area.[3]

Attempting to predict criteria for commencing resuscitative efforts on victims found in water is fraught with danger because of many interacting factors that may contribute to extending accepted anoxic survival times. Chief among these is the heat exchange that occurs in the lungs following aspiration of water.

Should the water temperature be very cold, it will rapidly cool the blood in the pulmonary circulation, which in turn selectively cools the brain for as long as a viable cardiac output continues. Should brain temperature be rapidly cooled to a degree where protection from hypoxia/anoxia is possible (circa 20°C) in the 70 seconds or thereabouts before cardiac failure occurs, then the chances of successful resuscitation are considerably enhanced even if cardio respiratory arrest has been present for an hour or more. For this outcome to be likely, the water temperature has to be near freezing, and usually, but not necessarily, the body mass relatively small. Hence the majority of the accounts of successful resuscitation after submersion pertain to small children being rescued from 'ice water'.

It would seem prudent that resuscitative efforts **should** be made on:

1. Those with a witnessed **submersion** time of 10-15 minutes or less, even though they appear to be dead on rescue.
2. All those where there is a possibility of their being able to breathe from a pocket of air while underwater.
3. All those submerged for up to an hour in ice water or for longer (1.5 hours) in small children.
4. Anyone showing any signs of life on initial rescue.
5. Those whose airway has been only intermittently submerged for the duration of their immersion, e.g. those wearing lifejackets but in whom the airway is being intermittently submerged, provided the body still has a reasonably fresh appearance.

Resuscitative efforts are unlikely to be successful in those submerged for periods exceeding 15 minutes with the exception of those in categories 2-5 above.

Key Points – Recognition of Life Extinct by Ambulance Clinicians

- Ambulance clinicians are increasingly called upon to diagnose death and initiate the appropriate responses to death.
- In patients with cardio pulmonary arrest, vigorous resuscitation efforts must be made whenever there is a chance of survival however remote.
- Some conditions are incompatible with recovery and in these cases resuscitation need not be attempted.
- In some situations, once the facts of the patient/situation/etc are known, resuscitation efforts can be discontinued.
- Patients can and do make anticipatory decisions NOT to be resuscitated. An Advanced Directive (Living Will), if verifiable, must be respected.

REFERENCES

[1] Part 2: Ethical Aspects of CPR and ECC. *Resuscitation* 2000;46(1-3):17.

[2] British Medical Association. Decisions relating to cardio-pulmonary resuscitation. A joint statement from the British Medical Association, The Resuscitation Council (UK) and the Royal College of Nursing. London: Ethics Department, British Medical Association, 2002.

[3] Golden F, Tipton M. *Essentials of Sea Survival.* Leeds: Human Kinetics, 2002.

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Baskett P, Fisher J, Marsden AK. Recognition of death by ambulance personnel. *JRCALC Newsletter* 1996:1.

Marsden AK, Ng GA, Dalziel K. When is it futile for ambulance personnel to initiate cardio-pulmonary resuscitation? *BMJ* 1995;311(6996):49-51.

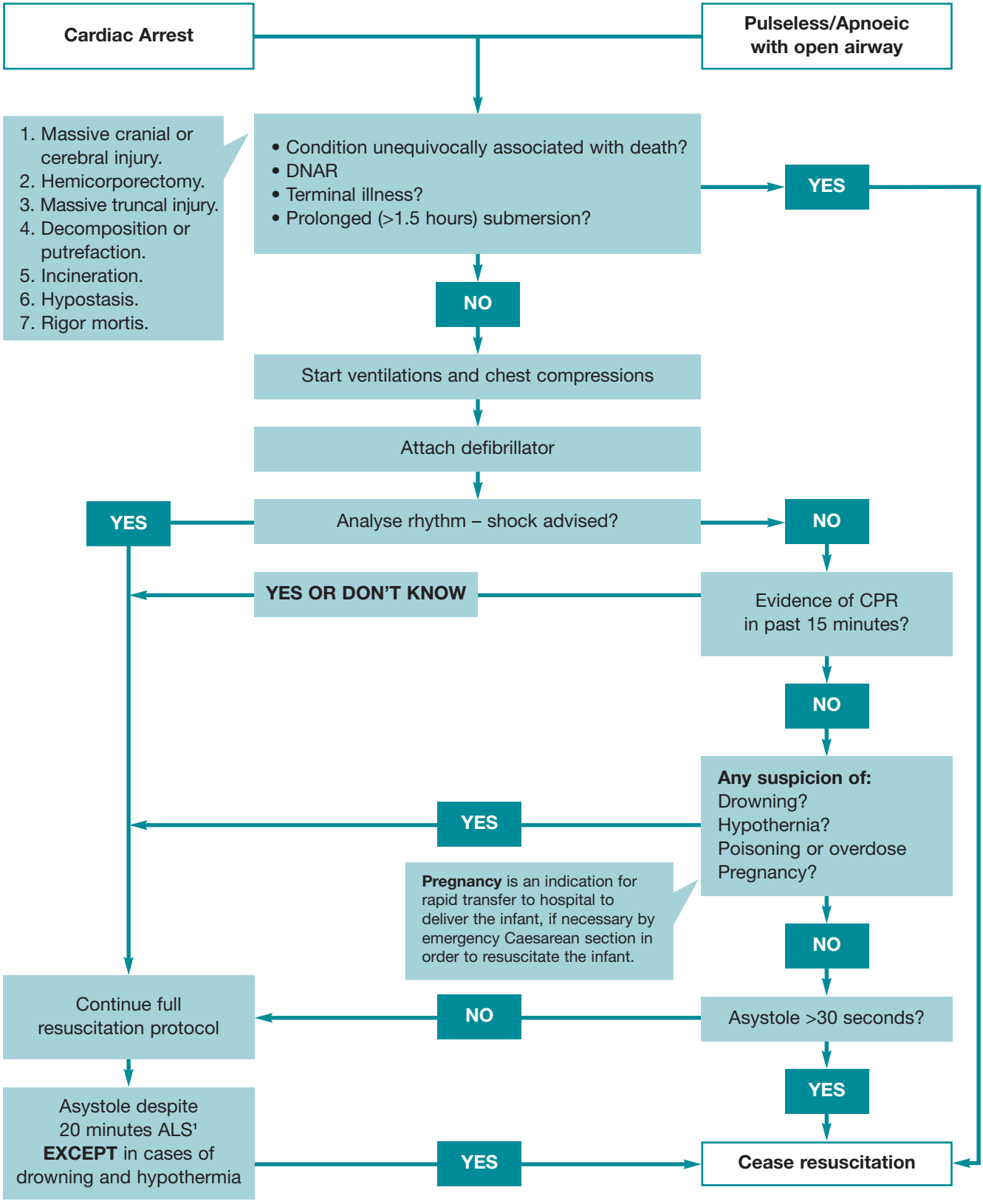
Home Office. Reforming the Coroner and Death Certification Service. A Position Paper. London: The Stationery Office, 2004.

Joint Royal Colleges Ambulance Service Liaison Committee and Ambulance Service Association. JRCALC Clinical Practice Guidelines 2004 for use in UK Ambulance Services. IHCD: Norwich, 2004.

METHODOLOGY

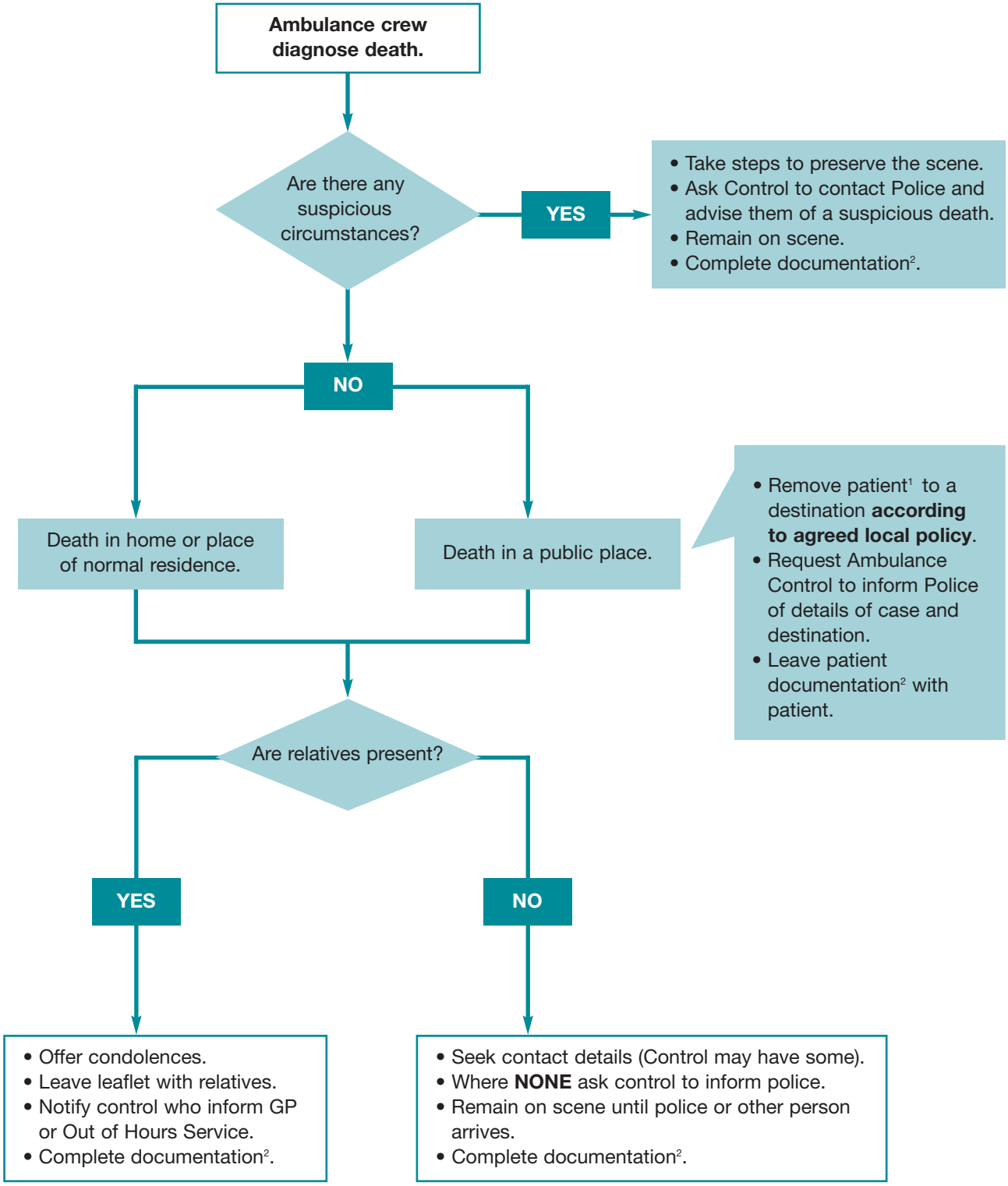
Refer to methodology section.

Appendix 1 – Recognition of Life Extinct by Ambulance Clinicians



[1]Crews without ALS capability should **Load and Go** at the earliest opportunity.

Appendix 2 – Action to be taken after Verification of Fact of Death



[1]The Ambulance Service has a responsibility to remove the patient from public gaze. Operational policy will be agreed locally with Police and Coroner's services.
[2]A suggested example of Verification of Fact of Death report is attached as Appendix C.

Appendix 3 – Record Form

CONFIDENTIAL **PRF Number:** ____

VERIFICATION OF FACT OF DEATH

Date: _____ **Time of verification of death:** _____ **hrs**

Patient's Name: _____

Patient's Address: _____

_____

_____

Age or Date of Birth: _____

GP Name: _____

GP Address: _____

1. Condition unequivocally associated with death ***State Condition:*** _____ ❑
2. Patient pulseless and apnoeic where one or more of the following facts are established:
   - DNAR or Validated Advanced Directive (Living Will) ❑
   - Expected death as a result of terminal illness (incl. during transport) ❑
   - Asystole with no evidence of CPR in past 15 minutes and NO signs of: ❑

     a. DROWNING
     b. HYPOTHERMIA
     c. POISONING OR OVERDOSE
     d. PREGNANCY
   - Asystole **AND** prolonged submersion ***State Duration:*** _____ ❑
3. Following 20 minutes of Advanced Life Support where **ALL** the following are confirmed: ❑
   - NO PALPABLE PULSES
   - NO HEART SOUNDS
   - NO RESPIRATORY SOUNDS
   - PUPILS FIXED AND DILATED
   - ASYSTOLE ON ECG FOR 30 SECONDS

	Circle		
Control notified	**YES**	**NO**	Time _____ hrs
Request police contact	**YES**	**NO**	Time _____ hrs
Police (if requested) on scene	**YES**	**NO**	Time _____ hrs
Request GP contact	**YES**	**NO**	Time _____ hrs
GP (if requested) on scene	**YES**	**NO**	Time _____ hrs
Relatives/Neighbours contacted	**YES**	**NO**	Time _____ hrs
Minister of Religion contacted	**YES**	**NO**	Time _____ hrs

Verified by: _____ **Call Sign/PIN:** _____

Witnessed by: _____ **Call Sign/PIN:** _____

Station: _____