



CSOP 032 – Medical Cardiac Arrest

Version No: 2.0

Effective date: 06/10/2023

APPROVALS

	Name	Date	Signature
Original Document Author:	Steve Dick, Critical Care Paramedic Dr Matthew Wyse, HEMS Doctor		
Revised Document Prepared by:	Dr Ewan Barron		
Reviewed by:	Matthew Stringfellow, Paramedic Phil Bridle, Head of Operations		
Approval:	Dr Justin Squires, Deputy Clinical Lead		
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HISTORY

Effective Date	Version No.	Summary of Amendment
Feb 2021	1.0	Creation of CSOP
Feb 2023	2.0	Review and CSOP re-write

REFERENCES

Document Reference Number	Document Title
1	Resuscitation Council UK, Advanced Life Support https://www.resus.org.uk/resuscitation-guidelines/adult-advanced-life-support/
2	Resuscitation Council UK, Prehospital Resuscitation https://www.resus.org.uk/resuscitation-guidelines/prehospital-resuscitation/
3	Resuscitation Council UK, Post-resuscitation care https://www.resus.org.uk/resuscitation-guidelines/post-resuscitation-care/
4	JRCALC Clinical guidelines (2022) https://www.jrcalc.org.uk/

ANNEX/APPENDIX



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Document Reference Number	Document Title
1.	Tasking system for patients in cardiac arrest

1. Purpose

This CSOP guides The Air Ambulance Service (TAAS) medical arrest management.

2. Scope

This CSOP relates to the management of adult patients attended by TAAS who are in cardiac arrest and where the presumed aetiology is not traumatic. A comprehensive knowledge of the UK Resuscitation council ALS guidelines is a prerequisite for working on a TAAS platform, it is assumed TAAS clinicians will follow ALS guidelines as the initial basis for approaching adult cardiac arrest patients.

3. Organisational objective

TAAS assets should be deployed to incidents in which the extended skillset of clinical teams is likely to provide benefit to the patient. In rare circumstances TAAS resources may be utilised where the speed and/or location of TAAS resources are likely to provide a significant benefit.

4. Tasking and dispatch

The tasking of prehospital critical care resources is the responsibility of the NHS ambulance service. TAAS recognise this and will seek to guide the services with whom we work into the most appropriate use of our resources.

TAAS recognise that cardiac arrest management is a cornerstone of paramedic practice therefore TAAS assets should only be deployed to incidents where the extended skillset of clinical teams is likely to provide a benefit to the patient, and where paramedic crews request assistance. It is recognised that the information required to make nuanced tasking decisions may not always be available to the ambulance service.

The tasking criteria outlined in appendix 1 seek to target TAAS resources to cardiac arrest patients who have a reasonable likelihood of achieving a return of circulation and thus require advanced post resuscitation care, those where specific interventions may be required (e.g. hysterotomy) or where it is felt that the expertise brought by TAAS clinicians may be beneficial. It acknowledges the



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core work of ambulance services and the skills of paramedic practice.

The tasking criteria provided is intended as guidance. TAAS would encourage discussion with the shift clinical team regarding dispatch to cardiac arrests outside these criteria. These discussions should be documented as a taasBase entry under the ambulance service job number and reasons for accepting or declining tasking should be outlined. TAAS recognise the experience of clinical teams and will support on-shift clinical decision making regarding dispatch. Any declined tasking should be reported immediately to the local base manager, cases should be considered for M+M review to allow for this guidance to be reviewed.

The suggested dispatch algorithm for medical cardiac arrest patients is detailed in appendix 1.

Tasking to patients in cardiac arrest will be monitored and feedback provided to both tasking services.

5. **Advanced Life Support**

TAAS will ensure that all TAAS clinicians have verified training and competence in ALS as evidenced by a current UKRC ALS provider certificate, in-house training delivered by TAAS training team or equivalent.

Chain of survival.

The chain of survival concept recognises that there is a requirement to deliver high quality prehospital care and deliver survivors to a place of definitive care in a timely fashion. It is important to recognise the role TAAS plays in forming links in the chain of survival but recognising that attendance of a critical care asset should not hinder progress through the chain.

Initial actions

The following section seeks to provide a uniform approach to the initial management of cardiac arrest patients by TAAS clinicians.

Commencing resuscitation

There may be occasions where, despite appropriate tasking, TAAS crews arrive to find a patient in whom resuscitation should not be started. Resuscitation should not be commenced where there are signs of unequivocal death, as defined by JRCALC.



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Further, JRCALC guidelines suggest a decision not to resuscitate can be taken for:

- Patients known to be in the final stages of an advanced and irreversible condition
- Patients with a valid DNACPR/Advanced Directive/ReSPECT form

In all other patient groups, initial resuscitation efforts should be commenced as per ALS guidelines.

During assessment, signs of cases with potentially good prognosis are determined by evidence of end organ perfusion

- Spontaneous movement of limbs, eyes or respiratory activity
- ETCO₂ that is above 3.0kPA or rising with Mechanical or Manual chest compression
- Monitored BP whilst Mechanical chest compression
- Good peripheral perfusion and no venous stasis.

Ongoing resuscitation

As an enhanced care resource, TAAS clinicians must endeavour to provide the highest quality of 'standard' ALS. Specifically, the importance of high-quality CPR with minimal "time off the chest" is crucial to successful resuscitation efforts.

The initial stages of resuscitation should be completed quickly by using simultaneous activity and should ideally be completed within five minutes of arriving on scene. In the majority of cases, these actions are likely to have been completed or at least started by the ambulance service resources prior to the arrival of TAAS. Establishing the patient's previous medical history and the history of their collapse, a decision should be made about whether to continue resuscitative efforts. When making a decision regarding resuscitation, the default decision should be to continue until all reversible causes have been excluded.

Resuscitative interventions

Where it is determined that resuscitation efforts should continue, the following should be considered.

- I. Endotracheal intubation



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Endotracheal intubation may confer benefit in some patients, particular when performed by an experienced team. Intubation should therefore be considered in cardiac arrest patients once resources permit.

Any intubation attempts should be performed to the same standard as that of an intubation during PHEA (CSOP 013). With appropriate planning it is generally possible to intubate without pausing CPR or the LUCAS device.

II. Patients in VF

In cases of refractory VF following amiodarone and where there are other factors consistent with a good prognosis consideration should be given to transportation to a Primary PCI centre with resuscitation ongoing. Further guidance is available in the TAAS Clinician Aide Memoire and the Hospital Selection and Bypass CSOP.

Double sequential shocks, provided by utilising two defibrillators, are not supported by either clinical evidence or by the device manufacturers and therefore must not be used.

III. Pulseless Electrical Activity

Where a patient presents in PEA, ultrasound could be utilised to determine the contractility of the heart. If the heart is not contracting and all reversible causes have been corrected and there are no 'special circumstances' (drowning, poisoning, pregnancy etc.) then resuscitation should be stopped.

Where the heart is seen to contract in a synchronous manner then the chance of ROSC is greater and further efforts should be made to optimise resuscitation:

- If heart appears empty, trial fluid bolus
- If heart appears poorly contractile consider small adrenaline boluses as inotrope vs. adrenaline infusion via syringe driver
- If pericardial effusion or tamponade is seen in the absence of penetrating trauma consider that myocardial or aortic root rupture has occurred in which case resuscitation will be futile. TAAS do not support pericardiocentesis. If it is believed that the pericardial effusion is not due to myocardial rupture in this circumstance if there is cardiac activity visualised, good prognostic signs and a



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reasonable chain of survival, consider whether to convey the patient to ED with chest compressions on-going.

- Consideration should be given to transporting directly to an appropriate receiving hospital if there is a response to targeted therapy.

IV. Post-resuscitation care

Following ROSC treatment should focus on preventing secondary brain and organ injury as per ALS guidelines. The following should be performed to reduce these injuries:

- Target SpO₂ 94-98%, rapidly titrate down FiO₂ in 20% increments where safe to do so. Both hyperoxia and hypoxia have been shown to contribute to further cardiac arrest and an increased frequency of additional myocardial infarction.
- Strongly consider endotracheal intubation for all patients with obtunded cerebral function. Normally do not transport patients using supraglottic airway devices unless there is a justification for doing so, such as a predicted difficult airway.
- All ventilated patients should be ventilated using the Oxylog 3000 ventilator adopting a lung protective ventilation strategy. Aim for normocapnia. Bag-valve-mask ventilation and ambulance service ventilators should only be used where TAAS equipment is unavailable.
- Maintain mean arterial blood pressure of >60mmHg as measured by NIPB on Zoll with an Adrenaline infusion.
- If evidence of an ST Elevation MI convey patient to a centre that offers Primary Cardiac Intervention (PPCI)
- Should seizures occur post cardiac arrest, levetiracetam can be given

V. ECPR – Extracorporeal Cardiopulmonary Resuscitation

ECPR / ECMO is currently not offered in any regional receiving centres as an emergency management option. This may change and guidance will be updated as it is available.

Cessation of Resuscitation

It is recognised that the significant clinical experience of TAAS clinicians may be sought in cases outside of these guidelines where resuscitation is deemed to be futile by those on scene. TAAS clinicians should not be deployed specifically to make such decisions, and these decisions should be sought from clinical advice teams within the dispatching ambulance service.



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If TAAS are on scene, when making a decision to withdraw resuscitation from a patient, clinicians should be aware that they may be operating outside of national prehospital guidelines and where empirical evidence is very limited. The anticipated clinical course of a patient in hospital may well be an influence on decision making but should not be a primary factor in deciding whether to continue or cease resuscitation.

Factors which may be involved in Cessation of Resuscitation decision making

The following factors would be associated with an adverse outcome:

- ALS has been commenced, reversible causes have been considered and excluded and when there are no positive prognostic signs
- Poisoning where on basis of information available there is no readily available antidote or where on-going resuscitation would place rescuer at risk (Organophosphate, cyanide, Organic solvents)
- Where signs of unequivocal death are appearing
- When there is no chance of maintaining the chain of survival e.g. patient unable to be safely moved despite multi agency efforts.

Underlying rhythm is not the only factor to be considered. TAAS clinicians may consider ceasing resuscitation regardless of rhythm (including refractory VF) using their clinical judgement, especially if factors such as the above are present.

TAAS clinicians must be aware that any decision to terminate resuscitation outside of JRCALC or local ambulance protocols will require careful documentation. In this instance, TAAS clinicians must ensure that the patient report form is completed comprehensively. The notification of death should be completed in line with local guidance, see CSOP 007 Recognition of life extinct.

6. Continuous improvement

There are numerous innovative treatments, interventions and devices designed to improve OOHCA outcome. It is unlikely that any of these interventions will gain empirical evidence to support their use in prehospital care. None the less, this service recognises the potential benefit that novel treatments may offer in very specific patient groups. Consequently, TAAS will remain open to the use of novel treatments and devices. Clinician feedback, supported by ongoing audit data, will be used to determine if a device should be evaluated and used within TAAS.



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Review

As medical cardiac arrests currently account for 25-35% of all TAAS incidents, and the evidence is continually being updated, this CSOP will be reviewed on an annual basis. A further interim review will also be triggered following the evaluation of any novel treatments or devices.

Abbreviations/Acronym	Description
TAAS	The Air Ambulance Service
ALS	Advanced Life Support
UKRC	UK Resuscitation Council
ROSC	Return of Spontaneous Circulation

End of Document

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