



ANZCA and FPM CPD Program

Cardiovascular Perfusion (CP) Crisis Emergency Response Session Guideline

Purpose

This guideline assists hospitals, private practice groups and other course providers develop and conduct Cardiovascular Perfusion Crisis Emergency Response (ER) sessions. It defines the learning objectives and other requirements for education providers to become recognised Cardiovascular Perfusion ER providers for the purposes of the [ANZCA and FPM CPD program](#).

For CPD participants, this guideline provides information on recognition of Cardiovascular Perfusion ER Sessions and how to record this activity.

Related documents

1. [Cardiovascular Perfusion Crisis ER Activity recognition of suitability application form](#)
Course providers must apply for college recognition of your session as a suitable Cardiovascular Perfusion Crisis ER activity for the ANZCA and FPM CPD program. Providers are encouraged to develop sessions that also satisfy local needs, incorporating local staff, work environments and equipment.

Importance of Cardiovascular Perfusion (CP) Crisis ER education

Cardiovascular perfusion crises are rare. Deterioration may occur rapidly with severe morbidity if not managed with expert knowledge and skill.

Perfusionists and Anaesthetists involved in Cardiothoracic Anaesthesia require the skills to competently assess and manage various crises which involve the heart lung machine (also defined as the cardiopulmonary bypass pump, CPB pump or the pump) in order to rapidly restore native or artificial circulation. A team-based approach is required.

Definitions

Clinical Lead: The medical officer nominated by each department, group, or other education provider should provide oversight of the CP Crisis ER sessions conducted by that provider but does not need to be directly involved in each CP Crisis ER session.

- Must be an anaesthetist with appropriate skills and experience to oversee the development of session content, ideally with medical education experience and/or credentials.
- Algorithms used must be specific to the specialised equipment in use (e.g. Quantum or Essenz Heart lung machine, circuit design), due to the significant differences in user management of crises.
- Should develop a provider course for the algorithm being taught, where one has been established.
- May assume the role of lead facilitator for a particular session.

Lead Facilitator: The doctor who oversees the conduct of a specific CP Crisis ER session.

- Must be a specialist with appropriate skills and experience.
- Must be appropriately skilled and experienced to deliver the session content.
- Ideally will have medical education experience and/or credentials.

Instructor: A health professional who conducts the individual “hands-on” skills stations/ scenario rehearsals with guidance from the lead facilitator.

- May not be a medical officer.
- Must be appropriately skilled and experienced to deliver the session content.
- Ideally will have medical education experience and/or credentials.

Recommended resources

Each department should have emergency response algorithms which are specific to the equipment in use. These should be utilised for the session. These sessions also provide a useful opportunity to review departmental algorithms.

Session format

The CP Crisis ER session must be presented face-to-face. The equipment necessary to simulate crises and their management must be available for use.

Learning objectives

Mandatory learning objectives

As a minimum, CP Crisis ER sessions must provide the opportunity for participants to meet the learning objectives listed below. Objectives marked with an asterisk (*) require each participant to actively engage in activities to practice this skill during the session.

By the end of the education session, participants will be able to:

1. Diagnose and manage the four key perfusion crises which are oxygenator failure, arterial pump failure, boot line rupture and air embolism. This can be applied to ECMO or CPB as required.*
2. Demonstrate appropriate leadership, including clear instruction and communication with other members of the operating theatre.*
3. Recognise the non-technical and teamwork skills that are vital in the management of cardiac arrest.
4. Oxygenator Failure*
 - a. Recognise signs of oxygenator failure
 - b. Discuss strategies for optimising the failing oxygenator
 - c. Discuss indicators for oxygenator changeout or separation from bypass/ECMO
 - d. Explain preparation for oxygenator changeout
 - e. Demonstrate an oxygenator changeout
 - f. Describe management after oxygenator failure
5. Arterial pump failure*
 - a. Identify the possible causes of arterial/ECMO pump failure
 - b. Explain the various mechanisms to resume arterial pump function
 - c. Demonstrate hand cranking
 - d. Discuss the risks associated with hand cranking and strategies to mitigate them
 - e. Discuss or demonstrate arterial pump changeover
6. Boot line rupture*
 - a. Discuss causes of boot line rupture
 - b. Discuss or demonstrate boot line replacement
7. Air embolism*
 - a. Recognise air embolism
 - b. Initiate management to minimise adverse effects on the patient of an air embolism
 - c. Demonstrate de-airing of the patient circuit
 - d. Discuss troubleshooting if air is found in the circuit

Optional learning objectives

CP Crisis ER session providers may elect to expand the focus of teaching to include additional objectives if it is deemed that this would facilitate more effective teaching for the particular target audience. Suggestions for consideration include:

- Inability to induce cardiac arrest with cardioplegia and its management
- Inability to rewarm and its management
- Troubleshooting high arterial line pressure and its management
- Discuss the role of cognitive aids in the management of crises*
- Discuss the legal, ethical and occupational health and safety issues associated with cardiovascular perfusion crisis management
- Describe documentation and report requirements
- Rapid priming of HLM
- Rapid priming of ECMO
- ECMO trouble shooting e.g. access insufficiency

Session structure

Each CP Crisis ER session:

1. Must include pre-course reading on relevant algorithms/guidelines and relevant foundation knowledge for the session.
2. May be delivered as a continuous session or in parts (provided other criteria in this guideline are met).
3. Must have a minimum total duration of ninety (90) minutes and provide hand-on activities, including scenario-based rehearsal to achieve learning objectives marked with an asterisk (*) above. A minimum of eighty (80) minutes of group practice is recommended.
4. Be conducted by a lead facilitator with at least one instructor per eight participants. Facilitators/instructors must observe each participant working through scenarios and provide verbal feedback to ensure they are achieving the session learning objectives.
5. Must include a variety of team-based scenarios.
6. Include use of the following equipment:
 - Heart lung machine and/or ECMO setup with high (e.g. Calafia) or low fidelity patient simulator (e.g. second reservoir)
 - Additional equipment routinely available during cardiopulmonary bypass/ECMO e.g. line clamps, additional oxygen supply, and priming/additional fluid.
 - Crisis specific equipment e.g. additional oxygenator or boot line.Equipment should be specified clearly in the departmental policy.
7. Course directors who wish to record information relating to the performance or conduct of participants must obtain written consent and adhere to the privacy policies of their organisation and location. ANZCA does not collect this information and it is optional for the course provider and director to do so.
8. Each session should maintain sensitivity to the diverse characteristics of its participants and patients. This may include appropriate acknowledgment of indigenous peoples at the commencement of the session.

Session materials

The following materials (in hard or electronic format) may be provided to facilitators and/or participants, as relevant:

- Facilitator guide (including equipment list, scenario outlines, and a guide to the safe use of the defibrillator/s to be used)
- Participant list (date, venue, participant names)

- Session learning objectives and outline
- ER protocols
- Session evaluation form

Certificate of completion, including ANZCA recognition code and session duration in hours must be provided to participants.

ANZCA and FPM CPD portfolio recording

Participants record this activity under

- Category 3 *Emergency response: Cardiovascular Perfusion Crisis ER* with the Certificate of completion uploaded as evidence.

Facilitators who are also CPD participants record this activity under

- Category 3 *Emergency response: Cardiovascular Perfusion Crisis ER* with confirmation of facilitation uploaded as evidence.

Change control register

Version	Author/s	Reviewed by	Approved by	Approval date	Sections modified
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