

Position Statement: Clinical Perfusion Scope of Practice

AUSTRALIAN AND NEW ZEALAND COLLEGE OF PERFUSIONISTS

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Position

The Australian and New Zealand College of Perfusion (ANZCP) and the Australian and New Zealand Board of Perfusion (ANZBP) recognise clinical perfusion as a distinct, highly specialised, and safety-critical health profession.

It is the position of the ANZCP and ANZBP that only credentialed, appropriately educated, appropriately trained, and authorised clinical perfusion professionals should perform clinical perfusion functions and operate extracorporeal and organ perfusion technologies within their defined scope of practice. This position reflects the inherent patient safety risks, high-consequence decision-making, and complex physiological and technological demands associated with extracorporeal support.

Clinical perfusion is not limited to operating equipment. It is the real-time clinical management of a patient's circulation, gas exchange, oxygen delivery, anticoagulation, temperature, acid-base balance, blood conservation, patient blood management, and end-organ protection when these functions are mechanically supported or replaced. Perfusion practice requires the integration of advanced scientific knowledge, technical expertise, clinical judgement, risk management, and multidisciplinary communication in time-critical environments.

Clinical perfusionists devote their professional careers to the safe practice of extracorporeal circulation, most notably in cardiopulmonary bypass (CPB) and extracorporeal membrane oxygenation (ECMO), and, where authorised within governed service models, in other forms of extracorporeal life support, mechanical circulatory support (MCS), ventricular assist devices (VADs), organ perfusion, organ preservation, transplantation support, normothermic regional perfusion (NRP), hyperthermic chemotherapy delivery, and patient blood management strategies such as intraoperative cell salvage (ICS).

Why the Perfusion Profession Is Essential

Clinical perfusion is a profession of direct and immediate consequence to human life. During extracorporeal support, the perfusionist assumes responsibility for systems that temporarily replace or support the essential physiological functions of the heart, lungs, and, in some settings, broader organ perfusion. Errors or deficiencies in judgement, training, monitoring, circuit management, anticoagulation, or escalation may result in catastrophic patient harm. For this reason, the ANZCP and ANZBP affirm that clinical perfusion is a specialist profession requiring dedicated

professional formation, not a task that can be safely substituted by local exposure, partial upskilling, or informal role extension alone.

The profession demands deep and sustained expertise in, at minimum:

- cardiovascular, respiratory, renal, and systemic physiology
- pathophysiology relevant to cardiac surgery, critical illness, and extracorporeal support
- pharmacology, anticoagulation, and reversal strategies
- haematology, haemostasis, and transfusion principles
- acid-base and blood gas interpretation
- temperature management and metabolic control
- extracorporeal circuit design, device function, and biomedical safety principles
- troubleshooting of complex equipment and failure modes
- crisis resource management, escalation, and human factors in high-risk environments.

Clinical perfusionists are therefore not merely equipment operators; they are specialist clinicians who apply scientific, technical, and clinical expertise to preserve life, protect organs, and reduce preventable harm in some of the most acute environments in health care.

Education, Training, Credentialling, and Ongoing Competence

Safe perfusion practice depends on a formal foundation of education, structured clinical training, supervised experience, assessment of competence, and ongoing professional maintenance of standards.

The ANZCP and ANZBP consider the following to be essential to safe practice:

- appropriate tertiary education in relevant biomedical and clinical sciences
- formal perfusion education and training aligned with recognised professional standards
- supervised clinical experience under approved governance frameworks
- successful assessment against defined competency and credentialling requirements
- continuing professional development, recertification, and maintenance of practice standards
- participation in quality assurance, incident review, reflective practice, and service governance.

Credentialling is not an administrative formality. It is a patient safety safeguard that provides assurance that a practitioner has met recognised standards of knowledge, skill, judgement, and professional accountability. Similarly, recertification and continuing professional development are necessary because perfusion practice evolves with changes in technology, evidence, risk controls, surgical complexity, and models of extracorporeal support.

Scope of Practice

The clinical perfusionist scope of practice includes, but is not limited to, the following domains.

1. Extracorporeal circuit preparation, verification, and safe operation

- selection, assembly, priming, configuration, and verification of extracorporeal circuits and associated components
- execution of pre-use checks, safety verification processes, and structured checklists
- operation of cardiopulmonary bypass systems and associated devices, including management of venous drainage, blood flow, arterial line pressure, gas exchange, and temperature control
- interpretation of monitoring data and alarms, with immediate troubleshooting and escalation during equipment or circuit failure
- implementation of risk controls to prevent or manage air embolism, particulate embolism, haemolysis, clot formation, line rupture, leakage, and other circuit-related hazards.

2. Physiological management during extracorporeal support

- application of oxygen delivery and oxygen consumption principles to determine appropriate perfusion strategy and targets
- real-time management of perfusion pressure, blood flow, temperature profile, and systemic stability
- interpretation of blood gases, acid-base balance, electrolytes, metabolic parameters, and relevant trends, with implementation of timely clinical responses
- management of haemodilution and associated physiological consequences, including strategies to minimise iatrogenic harm
- recognition of patient instability and activation of escalation pathways during time-critical events.

3. Anticoagulation, haemostasis, and patient blood management

- anticoagulation planning, monitoring, and reversal in collaboration with the multidisciplinary team
- haemostasis risk management during extracorporeal circulation, including responses to bleeding and coagulopathy risk
- integration of blood conservation strategies, cell salvage interfaces where applicable, and patient blood management (PBM) principles
- stewardship of blood products and related resources within clinical governance frameworks.

4. Myocardial protection and intraoperative support strategies

- preparation, delivery, and adjustment of cardioplegia and myocardial protection strategies
- integration of myocardial protection practice with the surgical plan, patient pathology, and physiological response
- support of intraoperative strategy changes, including emergent conversion, re-initiation of bypass, and crisis management.

5. Extracorporeal membrane oxygenation and extracorporeal life support

- clinical and technical responsibilities for extracorporeal membrane oxygenation consistent with local governance, credentialing, and defined service roles

- circuit oversight, monitoring, troubleshooting, physiological optimisation, and escalation within agreed models of care
- contribution to safe initiation, transport, transition, weaning, and emergency response in accordance with approved protocols.

6. Mechanical circulatory support

- clinical and technical responsibilities relating to ventricular assist devices and other mechanical circulatory support platforms, consistent with local governance and credentialling
- device and circuit management, interpretation of monitoring, troubleshooting, and escalation for alarms and failure modes
- support for perioperative and critical care phases where perfusion expertise is required for safe operation and decision-making.

7. Organ donation, retrieval, preservation, and transplantation support

- perfusion-related responsibilities in organ retrieval and transplantation support where applicable, including extracorporeal support required to enable safe procurement or transplantation pathways under local governance
- operation of organ preservation and perfusion systems, including ex vivo organ perfusion platforms, with adherence to protocolised safety controls
- normothermic regional perfusion and related donation pathway perfusion technologies where formally governed and where perfusion practice is credentialled and authorised
- integration with donor and recipient teams, with escalation in time-critical settings.

8. Crisis management and safety-critical escalation

- recognition of life-threatening circuit, device, and physiological events, and initiation of immediate corrective action
- structured communication and escalation to theatre, intensive care unit, transplant, and retrieval teams
- application of crisis resource management principles and adherence to safety systems under pressure.

9. Governance, quality, and professional accountability

- compliance with protocols, policies, standard operating procedures (SOPs), and safety systems
- structured documentation of perfusion parameters, events, decisions, and interventions
- participation in incident reporting, morbidity review, quality improvement, equipment risk management, and service governance
- contribution to professional accountability, ethical practice, and patient-centred care.

10. Equipment maintenance, infection prevention, and system safety

- advanced understanding of perfusion-related equipment, including heart-lung machines, extracorporeal circuits, heater-cooler devices, and associated monitoring systems
- oversight of equipment readiness, maintenance interfaces, infection prevention measures, and risk mitigation processes
- contribution to safe technology adoption, validation, and lifecycle governance.

11. Education, supervision, and professional leadership

- contribution to education, supervision, mentoring, and assessment of perfusion trainees within approved frameworks
- support of capability development in multidisciplinary teams regarding extracorporeal support systems and safety processes
- contribution to the advancement of perfusion standards, professional leadership, and service improvement.

Scope Boundaries and Representation

As perfusion practice is safety-critical, health services must ensure that perfusion titles, role descriptions, and representations accurately reflect credentialing status, authorisation, and defined scope of practice. Local exposure, orientation, short-course familiarity, or role-specific upskilling do not in themselves constitute recognised perfusion education, clinical training, certification, or credentialled practice. These activities must not be represented as equivalent to recognised perfusion training or certification unless they occur within an approved ANZCP and ANZBP framework or an equivalent formally recognised governance pathway.

Where services provide cardiopulmonary bypass, extracorporeal membrane oxygenation, mechanical circulatory support, ventricular assist device support, organ preservation perfusion technologies, transplantation perfusion support, or normothermic regional perfusion, these activities must be delivered within governed clinical environments by appropriately educated, trained, credentialled, and authorised perfusion professionals.

Conclusion

The ANZCP and ANZBP affirm that clinical perfusion is a distinct and essential safety-critical profession. The complexity of extracorporeal circulation, the immediacy of risk, and the consequences of error require practitioners who are specifically educated, clinically trained, formally credentialled, and professionally accountable for this work.

Protecting the integrity of perfusion scope of practice is therefore fundamental to patient safety, service quality, workforce standards, and public trust. The profession exists to ensure that extracorporeal support is delivered by clinicians who have devoted their careers to the safe and expert management of these highly specialised therapies.