Position Statement: Clinical Perfusion Profession

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Purpose

This position statement endorsed by the Australian and New Zealand College of Perfusionists (ANZCP) and the Australian and New Zealand Board of Perfusion (ANZBP), provides health services, hospital executives, and clinical governance leaders with a clear description of the clinical perfusion profession, the expertise it requires, and why the profession relies on structured education, credentialling, and ongoing professional standards to protect patient safety. It is intended to support patient safety, professional clarity, workforce planning, health service governance, and public understanding of the role of the clinical perfusionist in contemporary health care.

Position

Clinical perfusion is a distinct, highly specialised, safety-critical allied health profession. Clinical perfusionists are responsible for the clinical management and operation of extracorporeal circulation and related life-support technologies used during cardiac surgery and, in some service models, extracorporeal life support modalities. Perfusionists are tertiary qualified allied health professionals with expertise in cardiopulmonary bypass (CPB) and associated circulatory support technologies. Perfusion practice directly determines oxygen delivery, organ perfusion, anticoagulation, temperature control, metabolic management, and physiological stability during periods when a patient's heart and/or lungs are mechanically supported. Decisions are often time-critical, made under high consequence conditions, and errors can result in immediate and catastrophic patient harm. For this reason, perfusion competence cannot be safely achieved through intermittent exposure, informal instruction, or role extension alone.

The ANZCP affirms that perfusionists devote their professional practice to perfusion as a specialty and maintain competence through ongoing clinical practice, structured professional development, and participation in clinical governance and safety systems. The standards that underpin perfusion training and credentialling exist to protect the public, support safe service delivery, and maintain confidence in perfusion services.

Why the Profession Matters

Clinical perfusionists practice in environments where errors or delays in judgement may result in catastrophic patient harm. For this reason, clinical perfusion must be recognised as a distinct profession requiring dedicated preparation and lifelong professional commitment. It cannot be reduced to device familiarity, informal role extension, or local operational exposure alone.

The clinical perfusion profession is important because it contributes directly to:

- patient survival and safety during life-sustaining extracorporeal support
- protection of the brain, heart, kidneys, lungs, and other vital organs during periods of physiological vulnerability
- safe management of highly specialised and high-risk technologies
- crisis recognition, escalation, and response in time-critical settings
- maintenance of quality systems, incident review, and professional accountability
- education, supervision, and development of future members of the profession.

Evolution of the Profession

Perfusion has evolved from a primarily intraoperative, device-centred function to a complex clinical specialty integrating advanced physiology, technology, and risk controls across diverse cardiac and extracorporeal support contexts. Contemporary perfusion practice includes increasing complexity in:

- patient blood management and haemostasis
- advanced circuit designs and equipment management
- multidisciplinary integration across theatre, ICU, and procedural environments
- infection prevention and equipment risk management
- evolving extracorporeal modalities and service expansion (including ECLS/ECMO in some models)
- patient/organ transport and retrieval
- education and research

As services expand and technologies evolve, the risk profile does not reduce; it changes. The profession's evolution therefore increases the requirement for a highly trained, credentialed, and current perfusion workforce.

Education, Training, and Credentialling

Safe clinical perfusion practice depends upon an appropriate educational foundation, structured professional training, supervised clinical experience, formal assessment of competence, and ongoing maintenance of standards.

The Australian and New Zealand College of Perfusion and the Australian and New Zealand Board of Perfusion consider the following essential to the profession:

- tertiary education in relevant biomedical and clinical sciences
- structured perfusion education and clinical training
- supervised Work Integrated Learning within approved training and governance frameworks
- formal assessment against recognised professional standards

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- credentialling processes that provide assurance of competence and accountability
- continuing professional development, recertification, reflective practice, and maintenance of currency.

Credentialling is a patient safety safeguard. It is not merely an administrative requirement. It provides assurance to patients, health services, employers, and the public that the practitioner has met recognised standards of knowledge, practical skill, judgement, and professional responsibility.

Expertise Required

Safe perfusion practice requires a depth of knowledge and applied skill that is both broad, across systems and technologies, and dynamic, to support real-time clinical decision-making. This includes, but is not limited to:

1) Advanced biomedical science and clinical physiology comprising:
    a) Cardiovascular physiology, systemic perfusion, microcirculation, and organ protection principles
    b) oxygen transport and delivery, metabolic regulation, and response to critical illness and surgical stress
    c) acid–base physiology, blood gas interpretation, electrolyte and metabolic management
    d) coagulation, anticoagulation pharmacology, haemostasis, and inflammatory responses associated with extracorporeal circulation

2) Extracorporeal circulation science
    a) circuit dynamics and pressure/flow relationships
    b) gas exchange performance, oxygenator behaviour, and ventilation/perfusion relationships within extracorporeal systems
    c) haemodilution, haemolysis risk, embolic risk (air/particulate), and mitigation strategies
    d) priming strategy impacts, monitoring interpretation, and physiological consequence management
    e) Physics and applied measurement
    f) flow, pressure, resistance, heat transfer, gas laws, and device measurement principles
    g) interpretation and limitations of sensors/monitoring and the implications for safety thresholds and alarms

3) Biomedical engineering and technology mastery
    a) Equipment and device function, alarms, troubleshooting, and response to equipment failure modes
    b) integration of safety controls, checklists, and risk mitigation strategies
    c) equipment lifecycle awareness, consumables selection, and quality assurance processes

This integrated knowledge base is essential because perfusionists do not merely “operate equipment”; they manage physiology through technology in time-critical environments.

Education and professional formation:

In Australia and New Zealand, the training pathway is a postgraduate, work-integrated learning model requiring concurrent employment in a trainee perfusion role and enrolment in a Board-recognised Master's program.

This approach exists because perfusion competence cannot be developed safely without:

- sustained exposure to appropriate case volume and case mix
- progressive responsibility under supervision
- milestone-based assessment of competence and decision-making
- consistent governance and escalation pathways during high-risk events

Perfusion education therefore represents a deliberate professional formation pathway aligned to the clinical risks of extracorporeal support.

Self-regulation, credentialling and external alignment

Clinical perfusion in Australia and New Zealand is credentialled through structured professional standards frameworks. The Australian and New Zealand College of Perfusionists is a Full Member of the National Alliance of Self-Regulating Health Professions (NASRHP), reflecting external expectations for robust certification and practice standards in self-regulated health professions. The ANZCP also identifies its certification status and currency in line with NASRHP membership expectations.

The profession is also represented within broader allied health policy and advocacy contexts. Allied Health Professions Australia (AHPA) describes itself as the national voice for allied health professions. AHPA also provides an organisational profile for the Australian and New Zealand College of Perfusionists as a peak body representing certified perfusionists.

These affiliations reinforce that perfusion training and credentialling sit within recognised professional governance expectations, not ad hoc local arrangements.

International standards and safety alignment

Internationally, mature cardiac surgery systems recognise clinical perfusion as a distinct, safety-critical profession and align practice to formal credentialling frameworks rather than informal role extension.

- United Kingdom & Ireland: Clinical Perfusion Scientists operate within a national professional framework centred on the Society of Clinical Perfusion Scientists (SCPS) and the College of Clinical Perfusion Scientists, including an accessible professional register that services and the public can reference. The UK Professional Standards Authority has also publicly engaged with the SCPS to register through its Accredited Registers process, reflecting the public-interest and safety rationale for robust credentialling structures in this field.
- United States: The professional safety expectation is similarly grounded in formal credentialling. The American Board of Cardiovascular Perfusion (ABCP) awards the Certified Clinical Perfusionist (CCP) credential through national examinations. In addition, legal regulation varies by state, with multiple jurisdictions requiring licensure or title protection for perfusion practice

Value to health services: why perfusionists are essential to safe service delivery

Clinical perfusionists contribute to patient safety and service reliability by:

- providing dedicated expertise in extracorporeal physiology and high-risk technology management
- supporting consistent implementation of protocols, checklists, and safety controls in time-critical environments
- providing escalation-ready decision-making during rapid physiological change, equipment alarms, or circuit complications
- contributing to governance systems through incident review, continuous improvement, equipment risk management, and training oversight
- sustaining workforce capability through structured supervision and competency development of trainees (within governed frameworks)

In short, perfusionists are a safety-critical workforce whose expertise is foundational to the safe conduct of cardiac surgery and extracorporeal support services.

The position of the ANZCP/ANZBP is that clinical perfusion constitutes a distinct, safety-critical profession requiring advanced, integrated expertise across physiology, biochemistry, extracorporeal circulation science, physics, and biomedical engineering. The profession's evolution and the inherent risk profile of extracorporeal support require that perfusionists are educated through structured postgraduate pathways, trained through governed work-integrated learning models, and supported by robust credentialling and professional standards frameworks. These expectations exist to protect patient safety, support clinical governance, and maintain confidence in perfusion services, and they are not discretionary.