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WHITE PAPER:

STRENGTHENING CLINICAL PERFUSION IN CANADA: WORKFORCE, SUSTAINABILITY, AND THE FUTURE OF PRACTICE

Strengthening Clinical Perfusion in Canada: Workforce, Sustainability, and the Future of Practice

Clinical perfusion in Canada remains at a critical point in its evolution. The 2026 CSCP survey data provides a clear national picture of the pressures facing clinical perfusion in Canada. Perfusionists continue to support essential, high-acuity care across cardiac surgery, mechanical circulatory support, extracorporeal membrane oxygenation/extracorporeal life support (ECMO/ECLS), transplantation, blood management, education, and advanced cardiovascular programs, while facing ongoing challenges related to staffing, call burden, training capacity, scope of practice, administrative support, and uneven regional workforce disparities.

Building on the 2025 White Paper, this year's report shifts from identifying challenges to emphasizing the need for coordinated national action. Sustainable perfusion services will require alignment between student intake, clinical training capacity, certification readiness, retention, professional governance, and patient safety. As cardiac care becomes more complex, hospitals, health authorities, training programs, regulators, and policymakers must recognize perfusion as a critical healthcare profession requiring deliberate investment, meaningful inclusion in decision-making, and support structures that allow perfusionists to continue delivering safe, timely, and highly specialized care to patients across Canada. This aligns with broader national health workforce priorities, which emphasize coordinated planning across education, training, workforce distribution, data, and retention to ensure that Canadians have access to the care they need (Health Canada, 2025; Health Workforce Canada, 2026).

Workforce Challenges and Staffing Concerns

The 2026 survey data show that workforce stability remains a major challenge for clinical perfusion in Canada. Although some indicators have improved since the previous White Paper, persistent vacancies, uneven regional distribution, increased migration to the United States, and concerns around training distribution continue to shape the national workforce picture (Canadian Society of Clinical Perfusion [CSCP], 2026; Canadian Institute for Health Information [CIHI], 2025).

Departments now report an average of 10.83 full-time equivalents (FTEs), and reported vacancies have decreased from 39 to 31.9 positions. This suggests some improvement in staffing, but these gains need to be interpreted cautiously. In a small and highly specialized workforce, 31.9 vacancies remain significant, particularly because those vacancies are not evenly distributed across the country.

Vacancies place a disproportionate burden on smaller centres. Being short two or three perfusionists may seem modest nationally, but in a five-FTE program, it represents a major loss of capacity and a significant increase in call, workload, and fatigue for the remaining team. This highlights why workforce planning must consider not only the total number of vacancies, but also the proportional impact those vacancies have on smaller programs and regional service sustainability (Health Canada, 2025; Health Workforce Canada, 2026).

Quebec accounts for 56.4% of all reported vacancies, while Alberta represents 24.8%. Together, these provinces account for more than 80% of the national vacancy burden. In contrast, the seven responding Ontario centres reported no current vacancies, although this should be interpreted carefully because not all Ontario cardiac centres participated. Overall, the data suggest that workforce shortages are

concentrated outside Ontario and that national workforce planning must account for regional variation rather than assume a uniform shortage across the country.

This regional imbalance has important implications for workforce strategy. Ontario remains a key training hub, but workforce solutions that focus too heavily on Ontario may not reflect where vacancies are currently most concentrated. The challenge is not simply to increase the number of trainees; it is to ensure that training capacity, clinical placements, recruitment pathways, and retention strategies are aligned with national need (Health Canada, 2025; Health Workforce Canada, 2026).

The five-year retirement outlook is more moderate than previously estimated, with 22 retirements expected. When combined with 31.9 current vacancies, this creates a projected workforce gap of approximately 54 positions nationally. At the same time, migration to the United States has increased significantly, with the number of perfusionists leaving Canada rising from 4 last year to 16 in 2026. This does not include Canadian graduates who begin their careers in the United States. In a profession of this size, losing 16 trained clinicians in a single year is a meaningful retention concern.

Among the respondents currently working in the United States or internationally (7.9%), all indicated that they intend to maintain their CSCP certification indefinitely, suggesting they remain professionally connected to Canada. Their reasons for leaving were driven less by compensation alone and more by work-life balance, reduced call burden, flexible scheduling, stronger leadership, and improved workplace culture. When considering a return to Canada, the main barriers identified were high cost of living relative to salary, burnout from understaffed teams, and lack of administrative support. These findings suggest that repatriating Canadian perfusionists will require not only competitive compensation, but also sustainable staffing models, protected post-call recovery, better vacation access, and stronger professional recognition.

Centres experiencing staffing shortages require certified perfusionists who can independently manage cardiopulmonary bypass (CPB), ECMO, mechanical circulatory support, emergency coverage, and on-call responsibilities. Assistant or extender roles may provide limited support in specific contexts, but they cannot replace certified professionals in addressing active clinical vacancies. Overburdened centres need qualified perfusionists who can assume full clinical responsibility.

Overall, Canada's perfusion workforce challenge has become more complex. Vacancy and retirement numbers appear more stable than feared, but regional shortages, U.S. migration, and training distribution concerns continue to strain the system. Expanding training capacity alone will not solve these issues unless it is supported by clinical placement capacity, educator resources, equitable workforce distribution, and meaningful retention strategies (CIHI, 2025; Health Canada, 2025).

Canada must remain an attractive place for perfusionists to build their careers. This requires competitive compensation, manageable workloads and on-call structures, recognition of perfusionists' clinical expertise, clear career development opportunities, and workforce planning that reflects national rather than regional needs. The goal is not only to train more perfusionists, but to retain them within Canada, distribute them where they are most needed, and support them within a sustainable healthcare system (CIHI, 2025; Health Workforce Canada, 2026).

Call Burdens, Compensation, and Cost of Living Challenges

Perfusionists in Canada continue to carry a substantial on-call workload in addition to their scheduled clinical responsibilities. When calculated at the individual department level, the unweighted average was 104.6 on-call hours per FTE per month, with some departments exceeding 300 hours per FTE per month. These findings demonstrate that call burden remains significant nationally while also highlighting the uneven distribution of after-hours coverage demands across programs (CSCP, 2026).

The 2026 survey data show that 38.9% of respondents reported that their employer does not support having a day off after working during an extended overnight call shift. Only 45.0% of responding departments reported tracking overtime, while 36.8% of individual respondents reported working more than 50 hours per week, including overtime. In addition, 95.8% of respondents believe an increase in standby pay is necessary.

These findings suggest that after-hours workload remains both substantial and incompletely captured. Although 85.0% of responding departments reported having a health and safety reporting system, only 17.6% of those departments reported submitting workload alerts, and only 23.5% routinely report work periods exceeding 16 hours. This discrepancy suggests that fatigue-related risk may be under-documented, even in centres where reporting mechanisms exist (Gaba & Howard, 2002; American Society of Anesthesiologists, n.d.).

Another critical issue is the geographic reality of cardiac surgical centres being primarily located in larger, high-cost urban centres. Perfusionists are often required to live close enough to the hospital to respond rapidly to emergency cases and other time-sensitive interventions. The financial burden of housing, transportation, parking, and general cost of living therefore compounds the need for equitable standby and call-back compensation. This is particularly important given the acuity of perfusionist call responsibilities, where delays in response may directly affect patient morbidity and mortality (Statistics Canada, 2024; Canada Mortgage and Housing Corporation, 2025).

The 2026 data reinforce that standby compensation, overtime tracking, and post-call recovery policies should be treated as workforce sustainability and patient safety issues. Improved standby pay and formal recovery time after overnight call are needed to mitigate fatigue and support retention. Given the level of clinical responsibility carried by perfusionists during emergency and after-hours care, standby compensation should better reflect the risk, response expectations, and essential role perfusionists play in patient survival and surgical success.

Principles from anesthesiology and critical care medicine regarding prolonged work hours, cognitive fatigue, and risk of medical error are directly applicable to perfusion practice, where vigilance, technical precision, and rapid decision-making are required during high-acuity patient care. If the system relies on perfusionists to respond at all hours, then the system also needs to support recovery, compensation, and sustainable staffing (American Society of Anesthesiologists, n.d.; Gaba & Howard, 2002).

Administrative Leadership and Institutional Support

In the 2026 Individual Perfusionist Survey, 59.4% of respondents disagreed or strongly disagreed that they feel supported by their health authority's administrative leadership. This finding is particularly important because perfusionists are increasingly relied upon to support high-acuity and expanding clinical services. The survey responses suggest that this operational reliance is not always matched by institutional representation or meaningful inclusion in decision-making (CSCP, 2026).

A recurring theme in the 2026 data is that perfusionists feel their role is only partially understood. Nearly two thirds of respondents felt that understanding of the perfusionist role remains incomplete or inconsistent. Many described a difference between being respected in the Cardiac OR and being fully understood by the broader clinical and administrative environment. This distinction matters. Perfusionists may feel respected by direct clinical colleagues while still experiencing institutional gaps in understanding related to workload, call burden, educational responsibilities, ECMO and VAD support, equipment management, and the cognitive load associated with maintaining patient safety during high-risk procedures (Rosen et al., 2018).

In practical terms, incomplete role understanding can lead to staffing models that do not reflect actual workload, limited protected time for education and preceptorship, inadequate involvement in service expansion decisions, inconsistent continuing education support, poor post-call recovery policies, and delayed recognition of burnout risk. Several respondents called for stronger perfusion leadership structures, greater autonomy, direct involvement in decision-making, and administrators who understand the realities of small, high-acuity, call-heavy perfusion teams (Janes et al., 2021; Rosen et al., 2018).

The 2026 survey also confirms that job-related sacrifices remain routine. In the week before the survey, 88.1% of respondents reported at least one significant work-related sacrifice, and 63.4% reported four or more significant events. The most common sacrifices included changing personal or family plans because of work (70.3%), arriving home late (66.3%), skipping meals (58.4%), eating poorly balanced meals (58.4%), and sleeping less than five hours in a night (57.4%) (CSCP, 2026).

These findings suggest that many perfusion programs continue to rely on personal sacrifice and recovery-time erosion to sustain clinical service delivery. When missed meals, inadequate sleep, lack of breaks, late departures, and disrupted family life become routine, the issue is no longer simply individual resilience. It becomes a system-level concern with implications for retention, morale, burnout, clinical readiness, and patient safety (de Lima Garcia et al., 2019; Tawfik et al., 2018).

Administrative leadership is therefore central to workforce sustainability. Institutions that rely on perfusionists for increasingly complex services must also invest in the structures that allow perfusionists to practise safely and sustainably. This includes appropriate staffing, meaningful participation in operational and strategic decisions, protected time for education and quality improvement, support for clinical educators and preceptors, formal post-call recovery practices, continuing education funding, and clear leadership pathways for perfusionists within cardiac, critical care, and ECLS programs (Janes et al., 2021; Rosen et al., 2018).

A sustainable national strategy needs administrative and institutional reform alongside workforce planning. Increasing the number of trainees or graduates will not solve the problem if clinical educators are already strained, if departments lack protected teaching capacity, and if institutions continue to underestimate the operational burden carried by perfusion teams. Health authorities and hospitals must move beyond viewing perfusion as a small technical service and instead recognize it as a highly specialized clinical profession essential to modern cardiac surgery and advanced circulatory support programs (Health Canada, 2025; Janes et al., 2021).

Why Perfusionists Choose Their Profession

Despite the operational pressures facing the profession, Canadian perfusionists continue to describe their work as meaningful, highly specialized, and deeply rewarding. Respondents were drawn to perfusion because it allows them to have a direct impact on patient outcomes, participate in complex cardiac surgical care, and work at the intersection of physiology, technology, and clinical decision-making. Many described perfusion as a rare profession that combines hands-on technical skill, independent judgment, teamwork, and responsibility in a high-acuity environment.

The best parts of the profession were closely tied to purpose and professional identity. Perfusionists valued being part of life-saving procedures, supporting patients through critical moments, and bringing unique expertise to the cardiac surgical team. Autonomy, complex problem-solving, case variety, and evolving technology were also commonly identified as reasons the profession remains intellectually stimulating and professionally fulfilling.

When asked what advice they would give to someone considering perfusion, respondents encouraged future perfusionists to enter the profession with both enthusiasm and awareness. They recommended shadowing cases, speaking with practising perfusionists, understanding the realities of call and scheduling, and choosing a workplace with strong team dynamics and mentorship. Many also emphasized curiosity, resilience, continuous learning, and the importance of maintaining a healthy work-life balance.

Overall, the 2026 survey responses describe a profession that is demanding, but highly purposeful. Perfusionists are motivated by patient care, technical excellence, autonomy, and the privilege of contributing to some of the most critical moments in cardiac medicine. The message to future perfusionists is honest but positive: the career requires commitment, but for those drawn to high-acuity care, teamwork, and meaningful clinical responsibility, perfusion remains a uniquely rewarding profession (CSCP, 2026).

Balancing Workforce Expansion, Training Capacity, and Retention

Canada needs a sustainable pipeline of new perfusionists, but the 2026 data suggest that expansion has to be aligned with clinical training capacity, preceptor support, pediatric exposure, educator sustainability, and retention of existing staff. Only 23% of respondents felt that current perfusion trainee intake is very or somewhat aligned with available clinical training capacity in Canada, while 67% felt it

was not very well aligned or not aligned at all. The most commonly identified contributors were increasing trainee numbers nationally (54%), limited availability of clinical preceptors (39%), limited pediatric case availability (35%), and competing educational demands on clinical services (29%) (CSCP, 2026; Health Canada, 2025).

These findings suggest that concerns around education are not limited to individual case numbers. They reflect a broader concern that trainee volume, clinical teaching capacity, preceptor availability, and patient safety expectations are becoming increasingly mismatched. Clinical perfusion is built on hands-on experiential learning in high-acuity environments. Competency development depends on meaningful exposure to cardiopulmonary bypass, ECMO, ventricular assist devices, pediatric perfusion, and complex intraoperative decision-making under experienced supervision (McGaghie et al., 2011; Motola et al., 2013).

Several institutions are now accommodating multiple students at the same time, with some centres supervising up to three students in one placement period and as many as twelve students annually, with further increases expected. Departments remain committed to supporting the future growth of the profession, but this level of educational demand places pressure on perfusionists who are already balancing emergency call responsibilities, staffing shortages, procedural complexity, and high-acuity patient care. Many perfusionists reported concerns that growing educational responsibilities are reducing opportunities to independently manage their own cases.

Pediatric training capacity is one of the clearest examples of this pressure. While 56% of respondents felt that the current minimum requirement of 10 pediatric CPB cases is sufficient or more than sufficient, only 31% felt the requirement appropriately balances patient safety, trainee education, and national training capacity. Respondents identified limited pediatric clinical sites (86%) and increasing trainee numbers (70%) as key pressures. High-fidelity simulation received majority support as a supplement to limited pediatric exposure (53%), although concerns remain about simulation quality, skill transfer, and standardization (CSCP, 2026; McGaghie et al., 2011; Motola et al., 2013).

Continuing competence requirements were viewed more favourably. Overall, 78% of respondents felt that the current requirement of 80 cardiopulmonary bypass cases every two years was appropriate or more than sufficient, while 17% felt it was insufficient or not appropriate, and 5% were unsure. These results support maintaining the current requirement for now, while continuing to monitor how institutional case volume, non-OR perfusion responsibilities, increasing case complexity, call burden, and staffing constraints may shape future discussions around continuing competence (CSCP, 2026).

Retention remains equally important. Respondents consistently identified work-life integration, career growth opportunities, recognition, meaningful professional contribution, and continuing education support as key factors that influence long-term career sustainability. Without addressing these factors alongside workforce expansion, there is a risk of worsening burnout, weakening educator sustainability, and undermining the clinical training environment itself. Workforce growth should therefore happen only alongside clinical placement capacity, educator support, retention strategies, and patient safety safeguards (CIHI, 2025; de Lima Garcia et al., 2019).

Scope of Practice, Governance, and the Future of Perfusion:

Survey responses show that Canadian perfusionists recognize a broad and evolving professional scope, even though individual preferences vary. Respondents were nearly evenly divided between those who prefer a primarily Cardiac OR and CPB-focused role (33%), those who prefer a broad scope including ECMO/ECLS, VADs, and mechanical circulatory support (33%), and those who prefer a balanced mix of OR and ancillary activities (30%). Despite this variation, respondents strongly identified CPB (100%), ECMO/ECLS (96%), and education/training (83%) as core expectations within the profession (CSCP, 2026).

At the same time, only 58% felt that a broad, multi-modality role is very or somewhat sustainable within current staffing models, while 39% felt it was not very sustainable or not sustainable. Scope protection remains a significant concern, with 50.5% of respondents reporting that they feel their scope of practice is being threatened. Among those respondents, 94.1% did not feel their concerns were being heard. This is one of the most important findings in the 2026 survey because it suggests that the profession is evolving faster than the governance and communication structures needed to support that evolution (CSCP, 2026).

The survey also reinforces the importance of national standards in the absence of formal regulation. Most respondents were aware that perfusion is not currently a regulated health profession in Canada (90%), although only 47% felt they had a good understanding of health profession regulation more broadly. Respondents identified several implications of non-regulation, including risks to role clarity and accountability (84%), variability in scope of practice across institutions (82%), greater reliance on institutional policies (69%), and increased importance of national certification standards (63%) (CSCP, 2026; Health Workforce Canada, 2026).

There was very strong support for safeguards such as national certification standards (97%), clearly defined scopes of practice (96%), and minimum clinical exposure requirements (89%). Nearly all respondents (98%) felt that rigorous and nationally consistent education and certification standards are important. Only 1% felt that institutional oversight alone was sufficient, while two-thirds of respondents favoured exploring pathways toward formal regulation and/or maintaining strong national standards in the absence of regulation (CSCP, 2026).

To protect and advance the profession, the CSCP recommends clear advocacy within hospital administration to define and preserve the scope of perfusion practice, particularly in evolving areas such as ECMO/ECLS, mechanical circulatory support, organ perfusion, blood management, simulation, and data-driven practice. Institutions should involve perfusionists before changes are made to staffing models, role delegation, or clinical responsibilities. The CSCP also recommends expanded continuing education support, including protected time and funding, as approximately half of respondents continue to report insufficient access to professional development (Rosen et al., 2018).

Perfusionists should also be included in leadership discussions around technology, innovation, procurement, quality improvement, and program development. As perfusion practice evolves, decisions about emerging technologies, new care models, and role delegation need to be guided by the people with direct clinical expertise and accountability for patient care. The future of perfusion should not be defined by unmanaged expansion or role erosion. It should be shaped through a coordinated approach

that supports professional growth, protects patient safety, and keeps perfusion expertise central to cardiac and extracorporeal care in Canada (Health Workforce Canada, 2026; Rosen et al., 2018).

Conclusion:

The 2026 CSCP survey data reinforce a clear and urgent message: clinical perfusion in Canada is a highly skilled, deeply committed, and essential profession, but one operating under growing pressure. Perfusionists continue to report pride in the autonomy, responsibility, and life-saving nature of their work, while also identifying persistent concerns around workload, call burden, institutional understanding, scope of practice, education capacity, and professional recognition.

As cardiac surgery, ECMO, mechanical circulatory support, simulation, and emerging technologies continue to evolve, perfusionists need to be meaningfully included in the leadership, education, and policy decisions that shape the future of care. Supporting the profession will require stronger advocacy, expanded continuing education, sustainable training models, formal recognition of perfusion expertise, and clearer integration of perfusionists into hospital and national planning (Health Canada, 2025; Rosen et al., 2018).

The future of clinical perfusion should not be defined by workforce pressure alone. It should be defined by a shared commitment to safe patient care, clinical excellence, innovation, and the continued development of a profession that remains vital to cardiac care across Canada. To get there, workforce expansion, retention, education, governance, and administrative support need to be treated as connected issues rather than separate problems (CIHI, 2025; Health Canada, 2025).

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