The Canadian Society of Clinical Perfusion

La Société Canadienne de Perfusion Clinique

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National Entry-Level Competency Profile for Clinical Perfusionists

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Preface

The National Entry-Level Competency Profile for Clinical Perfusionists was first developed by the Canadian Society of Clinical Perfusion (CSCP) in 1996. Revisions were published in 2003, 2009 and 2015. The competency profile outlines the compulsory skills of an entry-to-practice perfusionist to provide safe, effective, compassionate, and ethical patient care in a variety of work environments. Companion resources are used in conjunction with the profile to provide further guidance and details to support the competencies outlined within the profile.

Entry-level perfusionists are recognized as ready for certification for entry-to-practice, directly following completion of a Canadian accredited education program. This competency profile provides the foundation for the certification examination content, as well as aids in the building and maintenance of the curriculum in the Canadian accredited educational programs.

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Purpose of the Competency Profile

The CSCP has developed the competency profile in the public interest to enable the safe, effective, and ethical practice of clinical perfusion. The competency profile lists the competencies expected, as a minimum, of perfusionists at entry-to-practice.

The primary purposes of the competency profile are:

- To inform the content of the CSCP certification examination, working in concert with the examination blueprint to ensure that the requirements for certification reflect entry-to-practice needs.
- To inform the curriculum of perfusionist education programs, working in concert with the accreditation process to ensure that program outcomes reflect entry-to-practice needs.

The competency profile may serve other purposes within the profession and the CSCP encourages the appropriate use of the profile by all stakeholders in clinical perfusion.

The Perfusionist Profession

Perfusionists are members of an open-heart surgical team whose primary role is to conduct cardiopulmonary bypass using a heart-lung machine and other ancillary devices. They prepare and operate equipment and work collaboratively with other team members to monitor and optimize the patient's blood flow and other vital signs during open heart surgery, and are responsible for administering intravenous fluids, blood products and anesthetic drugs. Perfusionists also operate extra-corporeal life support equipment, ventricular assist devices and intra-aortic balloon pumps.

Conceptual Framework of the Competency Profile

The competency profile derives its value from the belief that competence in professional practice is enabled by the ability to proficiently perform specific practice tasks**.**

We define competency as *the ability to perform a specific practice task to a prescribed level of proficiency*.

At entry-to-practice, entry-level proficiency is expected, as a minimum, in the tasks that comprise the competency profile.

At entry-level, a perfusionist is academically and clinically prepared to contribute productively within a healthcare team. When presented with routine situations, the entry-level perfusionist performs relevant competencies in a manner consistent with accepted standards of the profession and within a reasonable timeframe.

The entry-level perfusionist uses professional judgement and critical thinking to reach decisions, anticipate outcomes and to respond appropriately, using the best information and evidence available to adapt to individual patient needs and varying contexts of practice. Working autonomously in their area of responsibility, the entry-level perfusionist understands their own limitations and when to seek appropriate consultation. The entry-level perfusionist is self-aware, takes initiative and can identify and appraise relevant resources to help inform and build their practice. Using effective communication and collaboration with other members of the healthcare team, entry-level perfusionists provide quality patient and family-centered care.

More specifically, the following assumptions are made regarding the entry-level perfusionist:

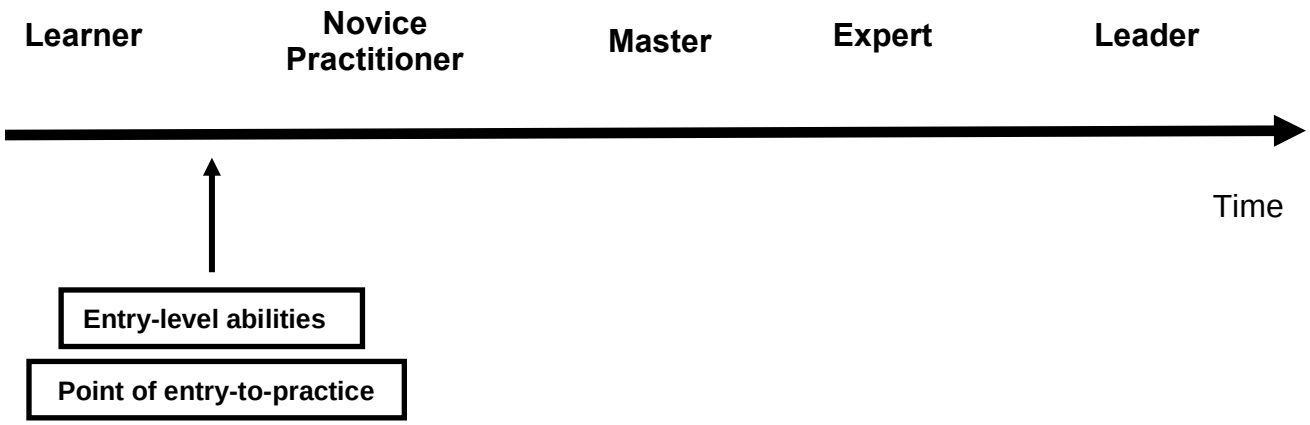
1. When presented with routine situations, the entry-level perfusionist performs relevant tasks in a manner consistent with generally accepted standards in the profession, autonomously, and within a reasonable timeframe. The entry-level perfusionist anticipates what outcomes to expect in each situation, and responds appropriately, selecting and performing competencies in an informed manner.
2. The entry-level perfusionist recognizes unusual, difficult to resolve and complex situations which may be beyond her / his capacity. The entry-level perfusionist takes appropriate steps to address these situations, which may include consulting with others, seeking supervision or mentorship, reviewing literature or documentation, and referring the situation to a more experienced perfusionist.

With time and experience, it is recognized that an entry-level perfusionist will progress to higher levels of proficiency across the competency areas. As lifelong learners, each perfusionist assumes responsibility for their continued competence and pursuit of professional growth and knowledge.

The competencies listed in the competency profile should be regarded as an integrated set of abilities, each competency informing and qualifying the others. Competencies are applied in practice, according to the practice context.

Following entry-to-practice, a perfusionist's competency set will continue to evolve. Higher levels of proficiency can be achieved by learning from the guidance of more experienced colleagues and from continued professional development. As the professional scope of practice continues to evolve, new abilities and techniques are likely to occur and support the notion of continuous growth and learning. This is illustrated graphically below.

Development of abilities over career span



It is important to recognize that entry-to-practice abilities may not be retained over time. If certain competencies are not utilized in the practice setting, level of proficiency may deteriorate, and some level of updating or refreshment may be necessary before these competencies can be proficiently performed in the workplace.

Structural Framework and Assumptions

A simple structural framework has been used to organize the 81 competencies included in the competency profile. Competencies are grouped into the following 5 functional areas of practice, and the required assessment environment is noted following each competency:

1. Safe Work Practice
2. Planning & Clinical Decision Making
3. Technical Expertise
4. Clinical Practice
5. Professional Responsibilities

Competency Profile Development Process

In 2022, the CSCP initiated a project to review and validate the Competency Profile and the Exam Blueprint for the certification examination. Yardstick, a Meazure Learning Company, was tasked with providing psychometric expertise and guiding the project to completion.

The main purpose of this project was to obtain an evaluation of a comprehensive set of competencies for the safe and effective practice of perfusionists in Canada. The information gathered from these comprehensive reviews is used to ensure that the examinations are aligned with current practice and knowledge of the profession. The objectives of this 2022 review were two-fold:

1) To validate the Framework with subject matter experts.
2) Update exam specifications for the CSCP Examination.

The Committee reviewed the collected data and adjusted the proposed competencies. The competency profile was then submitted to the CSCP Board of Directors for final review and approval.

Competencies

Competencies	
1. Safe Work Practice	
1	Document and report unsafe situations.
2	Apply universal precautions.
3	Perform aseptic and sterile techniques.
4	Handle biohazardous and dangerous materials.
5	Complete pre-bypass checklist.
2. Planning & Clinical Decision Making	
1	Apply knowledge of anatomy and physiology in planning and clinical decision making.
2	Apply knowledge of pathophysiology in planning and clinical decision making.
3	Apply knowledge of biochemistry in planning and clinical decision making.
4	Apply knowledge of hematology in planning and clinical decision making.
5	Apply knowledge of pharmacology in planning and clinical decision making.
6	Apply knowledge of physics in planning and clinical decision making.
7	Obtain relevant data from patient records.
8	Obtain relevant physiological data.
9	Analyze and interpret data to develop a patient-specific perfusion plan.
10	Adapt plan in response to patient directives.
11	Respond to uncommon clinical presentations.
3. Technical Expertise	
1	Select equipment, supplies, and techniques to meet patient requirements.
2	Demonstrate an understanding of reservoirs.
3	Prepare blood pumps.
4	Prepare gas delivery and analyzing devices.
5	Demonstrate an understanding of filters.
6	Prepare myocardial preservation devices.
7	Demonstrate an understanding of venting.
8	Prepare temperature control equipment.
9	Prepare and test safety devices.
10	Prepare ultrafiltration and hemodialysis devices.
11	Prepare Vacuum Assist Venous Drainage devices (VAVD).
12	Prepare coagulation monitoring devices.
13	Prepare in-line monitors.
14	Prepare hemodynamic monitoring devices.

Competencies	
15	Prepare autologous blood processing devices.
16	Prepare equipment for minimally invasive cardiac surgery.
17	Prepare Left Heart Bypass (LHBP) systems.
18	Prepare Intra-Aortic Balloon Pump (IABP) and catheters.
19	Prepare Extracorporeal Membrane Oxygenation (ECMO).
20	Prepare Ventricular Assist Devices (VADs).
4. Clinical Practice	
1	Perform calculations to assist in clinical decision making.
2	Determine and administer pharmacological agents and solutions via the extracorporeal circuit.
3	Monitor reservoirs.
4	Operate blood pumps.
5	Operate oxygenators.
6	Operate gas delivery and analyzing devices.
7	Monitor filters.
8	Operate myocardial preservation devices.
9	Operate temperature control equipment.
10	Operate safety devices.
11	Operate ultrafiltration devices and hemodialyzers.
12	Operate Vacuum Assist Venous Drainage devices (VAVD).
13	Operate and respond to in-line monitoring devices.
14	Analyze the data of hemodynamic monitors.
15	Monitor and respond to cerebral monitoring devices.
16	Monitor and respond to blood analysis results.
17	Monitor and respond to coagulation analysis results.
18	Handle and store blood products for clinical administration.
19	Administer blood products and derivatives.
20	Operate autologous blood processing devices.
21	Operate Intra-Aortic Balloon Pumps (IABP).
22	Operate veno-arterial Extracorporeal Membrane Oxygenation (ECMO).
23	Operate veno-venous Extracorporeal Membrane Oxygenation (ECMO).
24	Operate Ventricular Assist Devices (VADs).
25	Participate in the implementation and management of uncommon procedures.
26	Operate equipment for minimally invasive cardiac surgery.
27	Operate Left Heart Bypass (LHBP) systems.

Competencies	
28	Participate in the implementation and management of hypothermia and circulatory arrest techniques.
29	Participate in the implementation and management of cerebral perfusion.
30	Initiate intervention when a change in patient status is detected.
31	Record patient information, perfusion plan and perfusion interventions performed.
32	Transport patient requiring cardiopulmonary support.
33	Respond to emergency situations.
5. Professional Responsibilities	
1	Adhere to CSCP *Standards of Practice.*
2	Adhere to CSCP *Mission and Code of Ethics*.
3	Adhere to CSCP *Role of the perfusionist*.
4	Follow principles of Diversity, Equity, and Inclusivity.
5	Respect patient's right to determine course of treatment.
6	Provide information to patient and support persons in a manner that assists in their understanding and decision making.
7	Participate effectively as a member of an interdisciplinary team.
8	Apply evidence-based knowledge and skills, and technological innovations, to practice.
9	Participate in the development and implementation of institutional and departmental policies, procedures, and protocols.
10	Maintain awareness of and work within level of individual knowledge, skills, and experience.
11	Participate in opportunities for ongoing education, self-development, and professional growth.
12	Follow and contribute to quality assurance strategies.