



The Canadian Society  
of Clinical Perfusion

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La Société Canadienne  
de Perfusion Clinique

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# **National Entry-Level Competency profile for Clinical Perfusionists**

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with assistance from Dr. David Cane, Catalysis Consulting



## 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 and 2009.

This latest version, dated September 2015, was developed to ensure that the profile remains current with perfusion practice and complies with the *Guiding Principles for National Competency Profiles* (March 2014) and the *Template for Submission of a Revised National Competency Profile* (March 2014) published by Canadian Medical Association Conjoint Accreditation Services.

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## **Purpose of the Competency Profile**

CSCP has developed the competency profile in the public interest, to enable safe, effective and ethical practice of clinical perfusion. The competency profile provides a listing of 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 CSCP encourages its appropriate use 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 behind 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 “a 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.



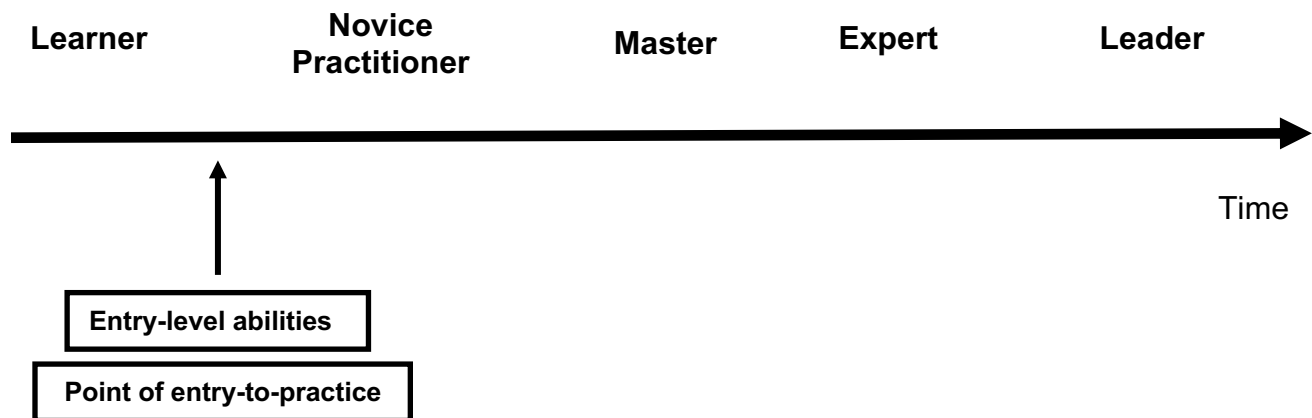
Entry-level proficiency is characterized as follows:

- ❖ 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 a given situation, and responds appropriately, selecting and performing competencies in an informed manner.
- ❖ 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.

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. Learning from experience, from the guidance of more experienced colleagues and from professional development will lead to higher levels of proficiency; also, new abilities may be added. 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.

### **Competency Assessment in Education Programs**

This version of the competency profile introduces for the first time an *assessment environment* (AE) for each competency. The AE is used within the accreditation process to denote the setting in which education programs must, in the final instance, assess student proficiency.

Three AEs are defined, as follows:

- ❖ In an *Academic* (A) assessment environment, each student's cognitive learning related to the competency must be assessed through a written or oral examination. Student performance in the academic environment should be judged in the context of the definition of entry-level proficiency provided above.
- ❖ In a *Simulated* (S) assessment environment, each student should have previously undergone academic assessment related to the competency, but in the final instance assessment must involve simulation in which hands-on ability is demonstrated in a setting that simulates clinical practice. Simulation may include: the use of purpose-designed perfusion simulators; the manipulation of perfusion-related equipment in a laboratory setting; role plays in which other students act as co-workers or patients. Student performance in the simulated environment should be judged in the context of the definition of entry-level proficiency provided above.
- ❖ In a *Clinical* (C) assessment environment, each student should have previously undergone academic and (where appropriate) simulated assessment related to the competency, but the final assessment must take place in a clinical setting where the student performs clinical functions under the supervision of a qualified perfusionist. Student performance in the clinical environment should be judged in the context of the definition of entry-level proficiency provided above.



### **Structural Framework and Assumptions**

A simple structural framework has been used to organize the 107 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**

The 2015 competency profile was developed and validated between November 2014 and June 2015. CSCP's Accreditation, Certification and Examination (ACE) Committee was responsible for the process, which was facilitated by a consultant specializing in outcome-based learning (Dr David Cane of Catalysis Consulting, [www.catalysisconsulting.net](http://www.catalysisconsulting.net)).

The Committee's priorities in updating the 2009 competency profile were as follows:

- ❖ To develop a better articulated conceptual framework for the profile
- ❖ To reflect current and projected-future perfusion practice with regard to both changing technology and the healthcare environment
- ❖ To provide an improved balance of competency expectations across all areas of practice (by increasing profile content on professionalism, communication, foundational knowledge and clinical reasoning, and decreasing the "assumptions" previously noted externally to the profile)
- ❖ To create a more concise, explicit and unambiguous standard (by reducing repetition, eliminating the use of examples and using more focused wording)
- ❖ To include assessment environments that denote the setting in which education programs must assess student proficiency

The Committee developed proposed competencies through a combination of face-to-face and distance-based work using online meeting technology to reach consensus.



For initial content the Committee drew upon the 2009 competency profile, competency profiles of related professions, the expertise of its members, and the knowledge of the consultant.

A consultation draft of the profile was finalized in March 2015 and consultation took place with four stakeholder categories:

- ❖ CSCP members (working perfusionists), by online survey.
- ❖ Clinical perfusion departments, by online survey.
- ❖ Physicians and physician groups who work with perfusionists, by direct consultation.
- ❖ Perfusionist education programs, by direct consultation.

The Committee reviewed feedback and made some adjustments to the proposed competencies. The competency profile was then submitted to the CSCP Board of Directors for final review and approval.



## Competencies

Competencies		Assessment Environment
<b>1. Safe Work Practice</b>		
1	Maintain a safe and organized work area.	C
2	Document and report unsafe situations which are beyond personal control.	A
3	Apply universal precautions.	C
4	Perform aseptic and sterile techniques.	C
5	Handle biohazardous and dangerous materials.	C
6	Clean, disinfect, and store equipment.	C
<b>2. Planning &amp; Clinical Decision Making</b>		
1	Apply knowledge of anatomy, physiology and pathophysiology in planning and clinical decision making.	C
2	Apply knowledge of biochemistry and hematology in planning and clinical decision making.	C
3	Apply knowledge of pharmacology in planning and clinical decision making.	C
4	Apply knowledge of physics in planning and clinical decision making.	C
5	Incorporate ethical principles into planning and clinical decision making.	C
6	Obtain relevant data from patient records.	C
7	Obtain relevant physiological data.	C
8	Analyze and interpret data to guide perfusion plan.	C
9	Respond to uncommon clinical presentations.	A
10	Develop a patient-specific perfusion plan.	C
11	Adapt plan in response to patient directives.	A
12	Record patient information, perfusion plan and perfusion interventions performed.	C
<b>3. Technical Expertise</b>		
1	Select equipment, supplies, and techniques to meet patient requirements.	C
2	Inspect, calibrate and maintain perfusion-related equipment for quality assurance purposes.	C
3	Contribute to the evaluation of new equipment and techniques.	A
4	Prepare cardiopulmonary bypass systems.	C
5	Prepare blood pumps (including centrifugal and roller pumps).	C
6	Prepare gas delivery and analyzing devices.	C
7	Prepare myocardial preservation devices.	C
8	Prepare and test safety devices.	C
9	Prepare temperature control equipment.	C





Competencies		Assessment Environment
10	Prepare in-line monitors.	C
11	Prepare blood analyzers.	A
12	Prepare filters.	C
13	Prepare reservoirs.	C
14	Prepare coagulation monitoring devices.	C
15	Prepare ultrafiltration devices and hemodialyzers.	C
16	Prepare hemodynamic monitoring devices.	C
17	Prepare intra-aortic balloon catheter and pump.	S
18	Prepare autologous blood processing devices.	C
19	Prepare extracorporeal life support (ECLS).	S
20	Prepare ventricular assist devices (VADs).	A
21	Prepare equipment for minimally invasive cardiac surgery.	A
22	Prepare left heart bypass (LHBP) systems.	A
23	Prepare mechanical circulatory support devices and respiratory assist devices.	A
24	Prepare pharmacological agents and solutions.	C
25	Prepare vacuum assist venous drainage devices.	C
26	Complete pre-bypass checklist.	C
<b>4. Clinical Practice</b>		
1	Operate cardiopulmonary bypass systems.	C
2	Operate blood pumps (including centrifugal and roller pumps).	C
3	Operate oxygenation devices.	C
4	Operate gas delivery and analyzing devices.	C
5	Operate myocardial preservation devices.	C
6	Operate safety devices.	C
7	Operate temperature control equipment.	C
8	Monitor and respond to perfusion system parameters.	C
9	Monitor and respond to cerebral monitoring devices.	A
10	Monitor and respond to blood analysis results.	C
11	Select and utilize priming solutions.	C
12	Handle and store blood products for clinical administration.	C
13	Administer blood products.	C
14	Determine and administer pharmacological agents and solutions via the extracorporeal circuit.	C
15	Perform calculations to assist in clinical decision making.	C
16	Operate and respond to in-line devices.	C
17	Operate blood analyzers.	A



Competencies		Assessment Environment
18	Monitor filters.	C
19	Monitor reservoirs.	C
20	Operate coagulation monitoring devices.	C
21	Operate ultrafiltration devices and hemodialyzers.	C
22	Operate hemodynamic monitoring devices.	C
23	Operate intra-aortic balloon pumps.	S
24	Operate autologous blood processing devices,	C
25	Operate extracorporeal life support (ECLS).	S
26	Operate ventricular assist devices (VADs).	A
27	Operate left heart bypass (LHBP) systems.	A
28	Operate equipment for minimally invasive cardiac surgery.	A
29	Operate vacuum assist venous drainage devices.	S
30	Participate in the implementation and management of mechanical circulatory support devices and respiratory assist devices.	A
31	Participate in the implementation and management of uncommon procedures.	A
32	Participate in the implementation and management of deep hypothermia and circulatory arrest techniques (DHCA).	A
33	Participate in the implementation and management of cerebral perfusion.	A
34	Transport patient requiring cardiopulmonary support.	A
35	Take proactive action to maintain optimal functionality of equipment.	C
36	Communicate effectively during the procedure with all members of the health care team.	C
37	Respond to emergency situations.	S
38	Assist with overall evaluation of patient status.	C
<b>5. Professional Responsibilities</b>		
1	Adhere to CSCP <i>Basic Standards of Practice</i> .	A
2	Adhere to CSCP <i>Code of Ethics</i> .	A
3	Maintain CSCP certification.	A
4	Treat others respectfully.	C
5	Communicate clearly, both orally and in writing.	C
6	Provide information to patient and support persons in a manner that assists in their understanding and decision making.	A
7	Respect patient's right to determine course of treatment.	A
8	Respect confidentiality of patient information.	C
9	Manage time and workload effectively.	C



Competencies		Assessment Environment
10	Maintain awareness of and work within level of individual knowledge, skills and experience.	C
11	Accept responsibility for decisions and actions.	C
12	Participate effectively as a member of an interdisciplinary team.	C
13	Share knowledge to assist the learning of colleagues.	A
14	Engage in collaborative practice.	A
15	Respond constructively to feedback.	C
16	Apply basic conflict resolution strategies.	S
17	Reflect on individual performance and set goals for improvement.	C
18	Participate in opportunities for ongoing education, self-development, and professional growth.	A
19	Access and critically assess information in professional literature.	A
20	Apply new evidence-based knowledge and skills, and technological innovations, to practice.	A
21	Participate with colleagues in professional activities.	A
22	Follow institutional and departmental policies, procedures and protocols.	C
23	Contribute to the development and updating of policies, procedures and protocols.	A
24	Contribute to departmental quality assurance initiatives.	A
25	Practice and promote stewardship of material and financial resources.	C