



The Canadian Society  
of Clinical Perfusion

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La Société Canadienne  
de Perfusion Clinique

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**ROLE OF  
THE PERFUSIONIST**



## THE ROLE OF THE CLINICAL PERFUSIONIST IN CANADA

Endorsed by:

**The Canadian Anaesthetist Society**  
**The Canadian Society of Cardiac Surgeons**  
**The Canadian Cardiovascular Society**

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### PURPOSE

In keeping with the fundamental objective of providing the highest standard of care for patients, the Canadian Society of Clinical Perfusion (CSCP) has prepared this document to:

1. Set forth a philosophical approach to patient care that is consistent with that of the medical profession.
2. Provide a general framework which identifies the scope of responsible and accountable practice for the Clinical Perfusionist to assist the physician in the delivery of optimal health care.
3. Contribute to the development of standards of practice for perfusionists in Canada.
4. Increase the awareness in the medical community of the unique role of the perfusionist's clinical expertise for the cardiovascular patient.
5. Define the term "perfusionist" in relation with other allied medical specialties.

### INTRODUCTION

The necessity of having perfusionists as part of the surgical team has evolved due to the increased sophistication of technical intervention developed for patients requiring assisted circulation. During the early development of perfusion technology, specialized life support equipment was developed and operated by physicians and scientists interested in extracorporeal circulation. Gradually the operation and maintenance of these devices has been assigned to the Clinical



Perfusionist, who provides direct patient care, accountable to the cardiovascular surgeon and /or related physicians.

The Canadian Society of Clinical Perfusion defines a perfusionist as:

*“An allied health professional specially trained to assist the physician in the treatment of patients requiring varieties of cardiovascular support.”*

### **TRAINING AND CERTIFICATION OF THE PERFUSIONIST**

Since the availability of cardiovascular surgery is relatively limited in Canada, only three educational programs exist for the training of a perfusionist. These programs are a postgraduate course of study offered by the Michener Institute of Applied Health Sciences, Toronto, Ontario, The University of Montreal, Montréal, Québec and British Columbia Institute of Technology, Vancouver, BC are accredited by the Conjoint Committee which is coordinated by the Canadian Medical Association. The programs are divided into didactic and clinical phases. The didactic program includes studies in subjects such as anatomy and physiology, pathophysiology, pharmacology, physics, electrocardiology, hemodynamic monitoring and cardiopulmonary technology. The clinical training program allows the student to develop specific skills in Perfusion Technology related to adult and pediatric techniques under the direct supervision of Certified Clinical Perfusionists. Physicians, perfusionists, and educators participate on an educational advisory committee, which directs the curriculum for Perfusion Education.

### **THE CERTIFIED CLINICAL PERFUSIONIST**

The certified Clinical Perfusionist has successfully completed an accredited educational program, has successfully challenged the examinations set by the Canadian Society of Clinical Perfusion (CSCP), and has received the approval of the Board of Directors.

### **PROFESSIONAL INTERACTION**

The services provided by perfusionists are an integral part of total care of patients with cardiovascular disease. The perfusionist may provide various treatment modalities as outlined by the recommended national standards for perfusion practice and individual department policies. The treatment modalities are developed by the perfusionist, surgeons and other physicians and hospital administrative staff. The recommended standards of perfusion practice



are outlined by the Canadian Society of Clinical Perfusion in the document entitled “Recommended Guidelines for the Standards of Practice of Clinical Perfusion.”

The care and support of the patient in the operative and perioperative environments necessitates a professional interaction between the perfusionist and a variety of hospital staff and emergency service personnel. The continued care of the patient may involve the cooperative efforts of perfusionists with a variety of emergency service personnel outside the hospital setting.

### **GENERAL APPROACH TO PATIENT CARE**

The Canadian Society of Clinical Perfusion suggests the following approach to patient care for the perfusionist:

- Each perfusionist is directly responsible for achieving and maintaining a high level of current knowledge and technique through recognized training programs, continuing education and maintaining certification.
- The perfusionist is responsible for the operation and monitoring of those mechanical devices used in medical/surgical procedures requiring partial or complete cardio-pulmonary bypass as well as other related support systems.
- The perfusionist’s knowledge must include specific awareness of extracorporeal physiology and mechanics (both adult and pediatric).
- The perfusionist must have a distinct awareness of the consequence of error in judgement and skill. Highly developed expertise and effective communication with all other health team members are essential in making the frequent, critical decisions required during the course of a bypass or other related perfusion procedures.

### **ROLE INVOLVEMENT CAPABILITIES OF THE CLINICAL PERFUSIONIST**

The role of the perfusionist in providing cardiovascular support has been historically outlined in broad terms but is continually being redefined as trends in patient care and treatment are updated. Although regional variations in clinical involvement of the perfusionist are evident; there are definite functions and services provided by the perfusionist in order to fulfill their responsibilities as a member of the health team.



## **THERAPEUTIC SERVICES**

The Perfusionist has undergone intensive medically supervised education and skill training in order to provide cardiovascular care that is distinctive and unique from care provided by other hospital personnel. In addition to the application of cardiopulmonary bypass for open heart surgery, the perfusionist provides additional therapeutic services which may include but are not limited to:

- The administration under prescription of various medical gases, anaesthetics, drugs, blood products, and crystalloid solutions;
- Induced hypothermia and hemodilution of various degrees;
- Ventricular assists: Right Ventricular Assist Devices (R.V.A.D.), Left Ventricular Assist Devices (L.V.A.D.), and Intra-Aortic Balloon Pumps (I.A.B.P);
- Vascular bypass during liver transplantation;
- Isolated chemotherapeutic limb perfusion;
- Long term pulmonary support, Extra-Corporeal Membrane Oxygenation (E.C.M.O);
- Hemoconcentration;
- Autotransfusion and blood salvage.

## **TECHNICAL SERVICES**

The perfusionist has developed the skills necessary to provide for a variety of cardiovascular support equipment. These technical services include but are not limited to:

- All activities related to cardiopulmonary and myocardial perfusion equipment including selection, assembly, calibration, operation, sterilization, and routine maintenance;
- Ensure Quality Assurance and minor repair of all appropriate perfusion related equipment;
- Routine monitoring of performance and function of equipment in use.
- Testing and evaluating new equipment for use.



## **PATIENT ASSESSMENT**

During cardiopulmonary bypass the perfusionist has the responsibility to:

- Analyze various hemodynamic and blood chemistry test results and manipulate the appropriate perfusion equipment or utilize the appropriate perfusion technique to maintain established guidelines.
- In consultation with the physician, provide appropriate control of the patient's cardiopulmonary and metabolic homeostasis using assessment skills.
- Assess procedure(s) to be performed as well as patient requirements and choose appropriate components for the extracorporeal circuit.

## **ADMINISTRATIVE SERVICES**

Due to the intensive clinical nature of the medical services provided by the perfusionist, it is essential that a direct line of administrative responsibility is provided between the chief perfusionist and the appropriate medical director, administrative advisor or medical board. In an efficient department of Clinical Perfusion the system is organized so that administrative direction is provided by a certified Clinical Perfusionist who has received additional training in administrative management. This manager communicates directly with the appropriate medical administrative personnel in order to provide clear and effective leadership in the Clinical Perfusion department.

## **EDUCATIONAL SERVICES**

The application of cardiovascular care techniques by the perfusionist necessitates education of many members of the health care team as well as the general public. The Certified Perfusionist, having specialized knowledge and professional expertise, can provide educational services in the following areas:

- Inservice education and orientation of various hospital personnel;
- Clinical Perfusion student education and evaluation;
- Public and community group education;



- Participation in research involving surgical, anaesthetic and perfusion related concepts associated with cardiopulmonary issues;
- Quality appraisal including surgical and perfusion related techniques, perfusion equipment selection, myocardial protection, factors affecting failure to wean from CPB as well as cardiac assist devices and extracorporeal life support systems.

### **FUTURE DIRECTIONS**

The perfusionist will continue to provide appropriate care to individuals with cardiovascular and related disorders and this role will develop and expand in response to the changing health needs of society. Additionally, the quality of education received by the Clinical Perfusionist may permit lateral and vertical mobility in other related areas of health care. It is anticipated there will be an increasing focus and role involvement in conjunction with specialized surgeons, researchers and medical communities focusing on the following objectives:

- Research and development of new equipment and techniques to long term cardiopulmonary support;
- Increasing involvement in the application and technical operation of the artificial heart;
- Consultation in the administrative structure and physical design of new departments of Clinical Perfusion;
- Provision of extracorporeal circulatory skill, techniques and knowledge for utilization on other medical specialties;
- Research and development of computer assisted cardiopulmonary bypass equipment;
- Provision of emergency back-up and support services in those cases not requiring primary cardiopulmonary bypass for surgical repair of heart disorders.