

Out-of-hospital cardiac arrest surveillance in Canada: a survey of national resources

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ABSTRACT

Objective: The general objective of this study was to explore the challenges of establishing an out-of-hospital cardiac arrest (OOHCA) surveillance program in Canada. More specifically, we attempted to determine the organizational structure of the delivery of emergency medical services (EMS) in Canada, describe the cardiac arrest data collection infrastructure in each province and determine which OOHCA variables are being collected.

Methods: We conducted a national survey of 82 independent EMS health authorities in Canada. Methodology experts developed the survey and distribution using a modified Dillman technique. We distributed 67 surveys electronically (84%) and the rest by regular mail. We weighted each survey response by the population of the catchment area represented by the responding health authority (2004 census). Descriptive statistics are reported.

Results: We received 60 completed surveys, representing a 73% response rate. The responding health authorities' catchment areas represented 80% of the Canadian population (territories excluded). Our survey results highlight a lack of common OOHCA data definitions used among health authorities, sporadic use of data quality assurance procedures, rare linkages to in-hospital survival outcomes and potential confidentiality issues. Other challenges raised by respondents included determining warehousing location and finding financial resources for a national OOHCA registry.

Conclusion: Results from this survey demonstrate that, although it is challenging, it is possible to collect OOHCA data and access in-hospital survival outcomes. Collaborative efforts with the Resuscitation Outcomes Consortium and other potential provincial partners should be explored.

Keywords: heart arrest, emergency medical services, population surveillance

RÉSUMÉ

Objectif : L'objectif général de cette étude était d'explorer les difficultés inhérentes à la création d'un programme de surveillance des arrêts cardiaques extra-hospitaliers (ACEH) au Canada. Plus précisément, nous avons tenté de déterminer la structure organisationnelle de la prestation des services médicaux d'urgence (SMU) au Canada, de décrire l'infrastructure de collecte de données sur les ACEH dans chaque province et de déterminer quelles données sur les variables sont recueillies.

Méthodes : Nous avons mené une enquête nationale auprès de 82 régions de la santé indépendantes chargées de la prestation de services médicaux d'urgence au Canada. Des experts en méthodologie ont élaboré le questionnaire, et sa distribution a été faite selon une version modifiée de la méthode Dillman. Nous avons envoyé 67 questionnaires par voie électronique (84 %), et le reste par courrier ordinaire. Nous avons pondéré chaque réponse en fonction du bassin de population que desservent les régions de la santé répondantes (recensement de 2004). Nous présentons des statistiques descriptives.

Résultats : Nous avons reçu 60 questionnaires remplis, pour un taux de réponse de 73 %. Les régions desservies par les régions de la santé répondantes représentaient 80 % de la population du Canada (à l'exclusion des territoires). Les résultats de notre enquête révèlent un manque d'uniformité quant aux définitions des données sur les ACEH utilisées par les différentes régions de la santé, l'utilisation sporadique de procédures d'assurance de la qualité des données, le rare couplage des données avec les résultats de la survie à l'hôpital et des problèmes potentiels de confidentialité. Au nombre des autres difficultés mentionnées par les répondants, citons la détermination du lieu d'entreposage d'un registre national sur les arrêts cardiaques extra-hospitaliers et l'identification de ressources financières pour ce registre.

Conclusion : Les résultats de cette enquête montrent qu'il est possible de recueillir des données sur les ACEH et d'avoir accès aux résultats de la survie à l'hôpital, bien que cela présente des défis. Nous recommandons que soit explorées les possibilités de collaboration avec le Consortium sur les résultats de la réanimation et d'autres partenaires provinciaux.

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INTRODUCTION

There are approximately 40 000 victims of cardiac arrest each year in Canada.¹ Cardiac arrest is defined as “the cessation of cardiac mechanical activity as confirmed by the absence of signs of circulation.”² It is invariably fatal if not treated within minutes. Forty percent of all cardiac arrest deaths occur suddenly and constitute the first manifestation of heart disease for some people.³ Approximately 70% of all cardiac arrests occur in the prehospital setting.⁴ Among these out-of-hospital cardiac arrests (OOHCAs), 85% occur in the victim’s residence.⁵ Currently in Canada, the overall survival rate to hospital discharge rarely exceeds 5%.⁵

Current prehospital treatment strategies for OOHCA are based on relatively weak data, often from animal investigations or uncontrolled human studies. In 2000, the Post-resuscitative and Initial Utility in Life Saving Efforts (PULSE) international workshop identified numerous knowledge gaps in the care for victims of cardiac arrest.^{6,7} Among these gaps, PULSE identified the need to develop regional, national and international cardiac arrest registries. In 2004, the International Liaison Committee on Resuscitation (ILCOR), in collaboration with 7 international resuscitation councils, published a revised and simplified Utstein template to facilitate the collection of information on cardiac arrest and cardiopulmonary resuscitation for resuscitation registries.² The same year, the Canadian Cardiovascular Outcomes Research Team collaborated with researchers in emergency medicine to publish an article entitled “Cardiac arrest care and emergency medical services in Canada.”⁸ This project highlighted regional variations in survival outcomes, and an overall paucity of comprehensive information on OOHCA in Canada.

To test new interventions and ultimately improve overall survival for OOHCA victims, we need access to good quality prehospital and in-hospital data that are captured and recorded in a systematic and consistent fashion. There currently is no uniform program in place to collect information on OOHCA in Canada. The general objective of this study was to explore the challenges of establishing an OOHCA surveillance program in Canada. More specifically, we attempted to determine the organizational structure of the delivery of emergency medical services (EMS) in Canada, describe the OOHCA data collection infrastructure in each province and determine which OOHCA variables are being collected.

METHODS

Study design

We conducted a national survey to obtain information on the current status of OOHCA data collection across Canada. Because we did not collect information on human subjects, this survey did not require review by our institution’s ethics review board.

Survey instrument

We developed the survey instrument after reviewing the literature on cardiac arrest registries, and incorporated the findings from a consensus publication by ILCOR.² This ILCOR publication represents a consensus among cardiac arrest researchers from 7 international resuscitation councils, listing a set of core variables that should be routinely collected for OOHCA and cardiopulmonary resuscitation as part of a resuscitation registry. We included these core variables in our survey in an effort to determine whether these patient and system characteristics variables are captured across Canada. A panel of experts from the Ottawa Hospital Research Institute, the Heart and Stroke Foundation of Canada, the Public Health Agency of Canada, the Canadian Institute for Health Information and Statistics Canada reviewed the survey instrument for content and face-validity.

In order to establish our distribution list, we searched the Web and obtained contact information for each provincial ministry of health. We subsequently contacted several representatives from each provincial ministry of health by telephone and/or by electronic mail to determine who was responsible for prehospital emergency services at the ministry, to obtain a list and contact information for each responsible regional health authority in the province, and to determine whether a provincial OOHCA registry already existed. We defined “health authority” as any administrative entity responsible for the delivery of prehospital care in a well-defined geographical area. In addition, we contacted several cardiac arrest researchers, EMS program managers and EMS medical directors in each province to verify the completeness of our distribution list, which can be found in Appendix 1.

We distributed the survey in both official languages using a modified Dillman approach to all identified EMS health authorities in Canada (territories excepted). Participants were asked to provide information on their EMS organization, data collection infrastructure and

ability to collect information on specific patient and system characteristics.

Data management and analysis

We entered data into an Access database (Microsoft Corp.), and randomly selected 25% of surveys to verify for data entry errors or omissions. We further ensured data quality using visual database inspection and verification of expected data ranges.

Because a respondent could represent a small regional health authority or an entire province, we weighted each survey response by the population of the catchment area represented by the health authority. We based population weights on Jul. 1, 2004, demographic statistics available from Statistics Canada.⁸ Weighting procedures have been well described for population-based surveys.⁹⁻¹² They provide more accurate estimates of the effective response rate, and can account for inequities in sampling and probabilities of selective representativeness. We performed a series of simple descriptive analyses using SPSS 11.0 (SPSS Inc.) and Excel (Microsoft Corp.).

RESULTS

We distributed the survey in March 2005 to each of the 82 independent health authorities identified across Canada; we sent 67 (84%) electronically and the rest by regular mail. We received 60 completed surveys, representing a 73% response rate. The responding health authorities' catchment areas represented 80% of the

Canadian population (weighted response rate). Characteristics of the survey respondents and their population weights are presented in Tables 1 and 2.

The organizational structure of EMS varies across the country. In British Columbia, Nova Scotia and Prince Edward Island, EMS leadership comes directly from a single regulatory provincial body. In other regions (representing 61% of the Canadian population), EMS is coordinated and administered by the regional health authorities, under the regulatory supervision of a provincial body. In few regions (representing 17% of the Canadian population), the regional health authority operates independently from a provincial regulatory body. In addition to land ambulances, most regions (89%) use a multiple-tier response system for OOHCA emergencies consisting of firefighters (90%), police officers (49%) and first responders (40%).

Information on data collection infrastructure is presented in Table 3. Although several health authorities are moving toward electronic prehospital data capture, most continue to use paper charts for patient care reports. These patient care reports are usually standard within a given province, but they vary in content among provinces. Most regional health authorities maintain an OOHCA database. Two provinces, British Columbia and Nova Scotia, already maintain a provincial OOHCA registry. Data entered into these databases come from the paramedic's patient care report, and, in some cases, from the 911 dispatch centres. A minority of respondents reported the ability to link with in-hospital outcome databases. The case identifiers most often used for data linkage are a run number assigned by the EMS

Table 1. Survey sample and response rates, including population represented by respondents

Province	Population (2004)*	No. of surveys received/no. of regional health authorities surveyed†	Participation, %	Population represented, %
British Columbia	4 196 400	1/1	100	100
Alberta	3 201 900	6/9	67	59
Saskatchewan	995 400	7/12	58	55
Manitoba	1 170 300	8/11	73	66
Ontario	12 392 700	18/22	82	79
Quebec‡	7 542 800	11/15	73	87
New Brunswick	751 400	4/7	57	38
Nova Scotia	937 000	1/1	100	100
Prince Edward Island	137 900	1/1	100	100
Newfoundland and Labrador	517 000	3/3	100	100
Total	31 946 300	60/82	73	80

*Statistics Canada data.⁸

†Provincial delivery of emergency medical services care is the responsibility of 1 or more regional health authority.

‡Contact information could not be confirmed for 3 regional health authorities.

Table 2. Characteristics of survey respondents (n = 60)

Characteristic	No. (%) of respondents
Position	
EMS program manager	37 (62)
EMS medical director	18 (30)
Data analyst	4 (7)
Cardiac arrest researcher	1 (2)
Background	
Paramedic	31 (52)
Physician	18 (30)
Health care administrator	7 (12)
Nurse	2 (3)
Business administrator	1 (2)
Respiratory therapist	1 (2)

EMS = emergency medical services.

system, followed by the victim’s name. Information is most commonly entered manually into a database, and most respondents report using the Utstein template and data definitions for data entry. Data quality are insured using rudimentary methods such as simple visual inspection in the majority of cases. Among those entering OOHCA data in a database, only 70% mentioned being unable to pool their information with another region. More than confidentiality issues, respondents believe it is the lack of available resources causing the inability to pool their information. When data from more than one region are pooled, it is performed manually most of the time.

Information on patient and system characteristics collected by the regional health authorities surveyed is presented in Table 4. Although most respondents reported

Table 3. Data collection infrastructure (n = 60 surveys, representing a population of 25 462 403) (part 1 of 2)

Survey question	% of responses* (weighted by population represented)										
	Canada†	BC†	Alta.†	Sask.†	Man.†	Ont.†‡	Que.†	NB†	NS†	PEI†	NL†
<u>Data collection</u>											
Paramedics enter clinical data on											
paper chart	80	100	53	65	97	59	100	100	100	100	100
electronic chart	20	0	47	35	3	41	0	0	0	0	0
The form used to enter clinical data is											
standard in the whole province	82	100	48	65	97	100	47	100	100	100	100
standard in the region only	18	0	52	35	0	0	53	0	0	0	0
<u>Data entry and definitions</u>											
OOHCA data is entered in a database (n = 51 surveys, population represented = 24 835 258)	98	100	98	58	98	100	100	99	100	0	62
Source of information for the database											
EMS call sheets (charts)	100	100	100	100	100	100	100	100	100	—	100
dispatch information	77	100	100	75	1	87	53	53	100	—	0
link with in-hospital outcome databases	27	0	3	60	0	6	76	29	100	—	0
Cases in the database are identified using											
run number	92	100	97	100	99	100	75	100	100	—	0
patient name	69	100	100	88	10	94	10	81	100	—	0
hospital number	27	0	0	0	0	58	14	29	0	—	0
health insurance number	20	100	0	60	5	0	10	0	0	—	0
Data is entered in the database											
manually	97	100	100	85	100	100	89	100	100	—	100
electronically	36	100	47	75	0	0	56	0	0	—	0
We use the Utstein template and definitions	83	100	97	88	1	72	100	0	100	—	0
<u>Data quality</u>											
Mean % of cardiac arrest reports submitted for data entry (range)	98 (65–100)	90	98 (90–100)	100	100	97 (65–100)	97 (70–100)	100	100	—	100
Verification of the information entered											
visual inspection	95	100	100	87	99	100	84	53	100	—	100
software protocols	28	0	2	60	1	26	63	53	0	—	0
double data entry	18	0	0	13	0	41	6	0	0	—	0

Continued on next page

using the Utstein template for OOHCA data collection, we observed great variation in what information is collected and entered into OOHCA databases across the country. For example, only 80% of respondents reported being able to specify whether an OOHCA case was of cardiac etiology in their database. Demographic information on the victim including age, date of birth, sex and location when cardiac arrest occurred was captured in the majority of databases. However, information pertaining to events occurring before paramedics' arrival was more variably captured; these variables included estimated time of collapse, estimated time cardiopulmonary resuscitation (CPR) was initiated, differentiating between CPR provided by citizen, fire or police, and the quality of CPR provided. In addition, there is great variability in the ability to collect information following prehospital interventions, including survival to the emergency department, survival to hospital discharge,

neurologic status at discharge and time of death. Although 50% of respondents reported the ability to collect information on survival to hospital discharge, only a minority of them reported the ability to link with in-hospital outcome databases electronically.

DISCUSSION

There currently is no national OOHCA surveillance program in Canada. The goal of this study was to explore the challenges of establishing such a program. The first step in establishing whether this is possible or not is to determine how and what information is being collected. We accomplished this by administering a survey to regional health authorities responsible for the delivery of EMS Services in the 10 provinces of Canada. The response rate was high, representing regions served by a large proportion of the Canadian population.

Table 3. Data collection infrastructure (n = 60 surveys, representing a population of 25 462 403) (part 2 of 2)

Survey question	% of responses* (weighted by population represented)										
	Canada†	BC†	Alta.†	Sask.†	Man.†	Ont.†‡	Que.†	NB†	NS†	PEI†	NL†
<u>Data pooling and warehousing</u>											
Data from more than 1 region is not pooled (n = 30 surveys, population represented = 17 452 688)	70	0	98	11	90	88	96	29	0	—	0
prevented by issues other than confidentiality	72	—	44	—	100	85	60	100	—	—	—
prevented by confidentiality issues	46	—	97	0	99	30	47	100	—	—	—
Data from more than 1 region is pooled (n = 21 surveys, population represented = 7 382 570)	30	100	2	89	10	12	4	71	100	—	100
manually	86	100	100	84	0	94	0	0	100	—	0
electronically	72	100	0	83	100	24	100	100	0	—	0
using a case identifier	64	100	0	68	0	17	0	74	0	—	0
Final data repository (n = 51 surveys, population represented = 24 835 258)											
local database	57	0	100	74	89	95	33	29	0	—	0
provincial database	29	100	0	27	11	0	24	71	100	—	100
regional database	13	0	0	0	0	5	43	0	0	—	0
<u>Data reporting</u> (n = 51 surveys, population represented = 24 835 258)											
OOHCA data reports are circulated											
annually	70	0	98	0	0	83	100	0	100	—	0
on demand	48	100	2	87	96	64	0	53	0	—	100
quarterly	36	100	0	13	1	48	0	29	0	—	0
never	2	0	0	0	3	0	0	19	0	—	0
OOHCA data is not entered in a database (n = 9 surveys, population represented = 627 145)	3	0	2	42	2	0	0	1	0	0	38

EMS = emergency medical services; OOHCA = out-of-hospital cardiac arrest.
 *Cumulative percentages may reach beyond 100% where more than 1 answer is possible.
 †Canada, n = 25 462 403; British Columbia, n = 4 196 400; Alberta, n = 1 896 398; Saskatchewan, n = 542 506; Manitoba, n = 767 549; Ontario, n = 9 783 119; Quebec, n = 6 559 970; New Brunswick, n = 288 821; Nova Scotia, n = 772 740; Prince Edward Island, n = 137 900; Newfoundland and Labrador, n = 517 000.
 ‡Information appearing in this table does not reflect ongoing activities by the Ontario Cardiac Arrest Database.

The survey results indicate that systems are in place that could be upgraded for the purpose of a national OOHCA surveillance program. When we reviewed the literature on this topic, we also identified a number of ongoing provincial initiatives that could potentially facilitate the implementation of an OOHCA surveillance program in Canada. For example, the Western Electronic Health Record Regional Collaborative has been created to accelerate the delivery of electronic health records in British Columbia, Alberta, Saskatchewan and Manitoba. The Health Information Solutions Centre is working with 5 of Saskatchewan's midsized regions to implement

common, shared health care computer systems through a project called Integrated Clinical Systems.¹³ The Western Health Information Collaboration is a collaboration among the western provinces and territories to meet their health information needs.¹⁴ One of their initiatives is called the Ambulance Patient Care Information System. In Ontario, prehospital and in-hospital data on cardiac arrests in 20 cities have been routinely collected in a database since 1991 for the Ontario Prehospital Advanced Life Support (OPALS) study.¹⁵ In 2005, the Resuscitation Outcomes Consortium (ROC) was established to facilitate clinical research on OOHCA and major trauma

Table 4. Patient and system data collected (n = 60 surveys, representing a population of 25 462 403)

Data	% of respondents who answered that they collect the data (weighted by population represented)										
	Canada*	BC*	Alta.*	Sask.*	Man.*	Ont.*†	Que.*	NB*	NS*	PEI*	NL*
Total annual number of OOHCA's	96	100	98	85	98	96	100	82	100	0	62
No. of arrests of cardiac etiology	80	100	52	94	10	74	96	80	100	0	0
No. for which resuscitation was attempted	95	100	98	100	98	96	96	82	100	100	0
Age	97	100	98	100	10	100	100	100	100	100	95
Date of birth	92	100	98	100	97	85	93	100	100	100	95
Sex	98	100	98	100	97	97	100	100	100	100	95
Location when cardiac arrest occurred	94	100	98	100	98	94	88	100	100	100	95
Witness status	91	100	52	99	4	97	96	80	100	100	95
Witnessed by EMS or citizen	94	100	95	99	10	97	96	80	100	100	95
Type of tier system response	84	100	98	23	93	85	83	80	0	0	95
Date of arrest	99	100	98	100	98	100	96	100	100	100	95
Estimated time of collapse	52	100	96	58	98	41	25	100	0	100	33
Time of 911 call	93	100	98	100	98	93	84	99	100	100	95
Time of crew notification	95	100	98	100	98	97	88	100	100	100	95
Time crew mobile	94	100	95	100	98	94	88	100	100	100	95
Time of arrival at the scene by the first vehicle with a defibrillator	87	100	95	100	98	80	93	100	0	100	95
Time of first rhythm analysis	63	100	56	58	10	53	67	100	0	0	95
Initial rhythm on arrival of first crew	94	100	98	100	11	100	100	100	0	100	95
Time of first defibrillation	78	100	95	58	11	88	50	100	100	0	95
Agent who performed first defibrillation (PAD, firefighter, police, EMS)	95	100	98	100	98	95	90	99	100	100	95
Provision of bystander CPR	91	100	52	100	11	97	96	100	100	100	62
Differentiate between CPR given by police, firefighter or citizen	48	100	52	14	9	24	49	47	100	0	95
Quality of CPR provided	15	0	50	43	6	2	33	0	0	0	62
Time CPR was first attempted	45	100	55	58	10	29	34	99	0	100	62
Return of spontaneous circulation	95	100	98	100	8	97	100	99	100	100	62
Survived the event to emergency department	66	100	98	100	95	47	67	80	0	100	0
Survived to hospital discharge	50	0	53	51	0	44	94	80	100	0	0
Neurologic status at discharge	27	0	53	16	0	9	61	28	100	0	0
Discharge location type	18	0	53	43	0	12	33	0	0	0	0
Time of death	33	0	55	52	4	30	55	0	0	100	62

CPR = cardiopulmonary resuscitation; EMS = emergency medical services; OOHCA = out-of-hospital cardiac arrest; PAD = public access defibrillation.

*Canada, n = 25 462 403; British Columbia, n = 4 196 400; Alberta, n = 1 896 398; Saskatchewan, n = 542 506; Manitoba, n = 767 549; Ontario, n = 9 783 119; Quebec, n = 6 559 970; New Brunswick, n = 288 821; Nova Scotia, n = 772 740; Prince Edward Island, n = 137 900; Newfoundland and Labrador, n = 517 000.

†Information appearing in this table does not reflect ongoing activities by the Ontario Cardiac Arrest Database.

victims.¹⁶ British Columbia, Toronto and many of the original OPALS communities participate in this initiative, and share a common OOHCA epidemiologic registry, also referred to as “epistry.”¹⁷

Although there are many ongoing initiatives that could facilitate the implementation of a national OOHCA surveillance program, the survey results highlight a number of important challenges that would need to be addressed and overcome. First, some of the core Utstein data elements are being captured only sporadically. It is also essential to have access to in-hospital survival statistics in order to evaluate the impact of prehospital interventions; we have discovered that only a minority of health authorities have access to such information. Second, we have noticed some variability in the way some health authorities interpret the Utstein data element definitions; common definitions would need to be adopted for the entire registry. Third, although the lack of resources appeared to be the major factor limiting the ability of respondents to share data among themselves, confidentiality issues may also represent a potential barrier to the implementation of a national OOHCA surveillance program. In the case of British Columbia, participation in a national OOHCA surveillance program could lead to contractual breaches with sponsor manufacturers such as Medtronic, Laritol and Space Lab. Finally, although the ROC and a Canadian OOHCA surveillance program have much in common in terms of variable selection and definitions, each data registry initiative differs in its potential ability to adequately represent a broad range of urban and rural communities in Canada. Moreover, it is possible both initiatives will be in competition for the same sources of funding.

It is important to acknowledge the potential limitations of this survey. First, we were unable to ascertain the construct validity of the survey tool, and could not produce any pilot data owing to the tight timelines imposed on the project. Second, despite our success in collecting information from a representative sample of the country, we were unable to obtain a response rate higher than 60% for Alberta, Saskatchewan and New Brunswick. This being said, we were able to collect information from most large urban communities in those 3 provinces. Third, although respondents made diligent efforts to answer the questions in our survey to the best of their understanding, our analysis remains dependent on the accuracy of the information that was provided to us. Finally, the unit of analysis used was “the regional health authority responsible for OOHCA collection.” In some

cases, this meant a region very sparsely populated; for others, this may have meant a whole province. For this reason, we decided to weigh each survey response by their respective catchment area; these adjusted rates, although somewhat artificial, can help us draw more appropriate conclusions. We made no assumptions regarding nonresponding health authorities.

In conclusion, the results of this survey demonstrate the possibility of collecting OOHCA data and accessing in-hospital survival outcomes. Future efforts should be concentrated in establishing common data definitions according to a common template, ensuring uniform data quality, establishing and maintaining linkages to in-hospital survival outcomes, addressing potential confidentiality issues in each province, determining warehousing location, finding financial resources for the project, and exploring collaborative efforts with the ROC and other potential provincial partners.

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Appendix 1. List of regional health authorities by province (part 1 of 2)

British Columbia

Provincial Health Services Authority
Northern Health Authority
Interior Health Authority
Vancouver Island Health Authority
Vancouver Coastal Health Authority
Fraser Health Authority

Alberta

Capital Health Regional Health Authority
David Thompson Health Region
Palliser Regional Health Authority
East Central Regional Health Authority
Aspen Regional Authority
Peace Country Regional Health Authority
Northern Lights Regional Health Authority
Chinook Regional Health Authority
Calgary Regional Health Authority

Saskatchewan

Saskatoon Regional Health Authority
Athabasca Regional Health Authority
Cypress Regional Health Authority
Five Hills Regional Health Authority
Heartland Regional Health Authority
Keewatin Yatte Regional Health Authority
Kelsey Trail Regional Health Authority

Mamawetan Churchill River Regional Health Authority
Prince Albert Parkland Regional Health Authority
Regina Qu'appelle Regional Health Authority
Sun Country Regional Health Authority
Sunrise Regional Health Authority

Manitoba

Assiniboine Regional Health Authority
Brandon Regional Health Authority
Burntwood Regional Health Authority
Churchill Regional Health Authority
Interlake Regional Health Authority
Norman Regional Health Authority
North Eastman Health Association Inc.
Central Regional Health Authority
South Eastman Regional Health Authority
Winnipeg Regional Health Authority
Parkland Regional Health Authority

Ontario

Eastern Region
Greater Toronto Area
Southwest Region
Eastern Region
Northeast Region
Northwest Region

Continued on next page

Appendix 1. List of regional health authorities by province (part 2 of 2)

Nova Scotia

Pictou Regional Health Authority
 South Shore Regional Health Authority
 Southwest Regional Health Authority
 Annapolis Valley Regional Health Authority
 Colchester East Hants Regional Health Authority
 Cumberland Regional Health Authority
 Capital Health Regional Authority
 Guysborough Antigonish Strait Health Authority
 Cape Breton District Health Authority

New Brunswick

River Valley Regional Health Authority
 Beausejour Regional Health Authority
 Restigouche Regional Health Authority
 Regional Authority Four
 Miramichi Regional Health Authority
 Acadie-Bathurst Regional Health Authority
 Atlantic Health Sciences Corporation

Newfoundland and Labrador

Eastern Region: Avalon Health Care Institutions Board,
 Peninsulas Health Care Corporation
 Capital Region: Health Care Corporation of St. John's
 Central Region: Central East Health Care Institutions Board,
 Central West Health Corporation
 Western Region: Western Health Care Corporation
 Labrador Region: Labrador Health Corporation

Prince Edward Island

West Prince Health Region
 East Prince Health Region
 Queen's Health Region
 King's Health Region
 Provincial Health Services Authority

Quebec

Bas-Saint-Laurent Health and Social Services Centre
 Saguenay-Lac-Saint-Jean Health and Social Services Centre
 Capitale-Nationale Health and Social Services Centre
 Mauricie et Centre du Quebec Health and Social Services Centre
 Centre
 Estrie Health and Social Services Centre
 Montreal Health and Social Services Centre
 Outaouais Health and Social Services Centre
 Abitibi-Temiscamingue Health and Social Services Centre
 Cote-Nord Health and Social Services Centre
 Nord-du-Quebec Health and Social Services Centre
 Gaspesie-Iles-de-la-Madeleine Health and Social Services Centre
 Chaudiere-Appalaches Health and Social Services Centre
 Laval Health and Social Services Centre
 Lanaudiere Health and Social Services Centre
 Laurentides Health and Social Services Centre
 Monteregie Health and Social Services Centre
 Nuavik Health and Social Services Centre
 Terres-Cries-de-la-Baie-James Health and Social Services Centre

Change of address

We require 6 to 8 weeks' notice to ensure uninterrupted service. Please send your current mailing label, new address and the effective date of change to:

Canadian Association of Emergency Physicians

104-1785 Alta Vista Dr.
 Ottawa ON K1G 3Y6
 613 523-3343
 fax 613 523-0190
 admin@caep.ca

Changement d'adresse

Il nous faut de 6 à 8 semaines d'avis afin de vous assurer une livraison ininterrompue. Veuillez faire parvenir votre étiquette d'adresse actuelle, votre nouvelle adresse et la date de la prise d'effet du changement, à l'attention du

Association canadienne des médecins d'urgence

104-1785, prom. Alta Vista
 Ottawa ON K1G 3Y6
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