

BMJ Open

Rural emergency care 360°: Mobilizing healthcare professionals, decision-makers, patients and citizens to improve rural emergency care in the province of Quebec, Canada: a study protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-016039
Article Type:	Protocol
Date Submitted by the Author:	07-Mar-2017
Complete List of Authors:	Fleet, Richard; Université Laval, Département de médecine familiale et de médecine d'urgence Dupuis, Gilles; Université du Québec à Montréal, Fortin, Jean-Paul; Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale Gravel, Jocelyn; SainteJustine Hospital, Emergency Ouimet, Mathieu; University of Laval, Political Science Poitras, Julien; Université Laval, Legare, France; CHU de Quebec and Université Laval,
Primary Subject Heading:	Emergency medicine
Secondary Subject Heading:	Epidemiology, Health services research
Keywords:	Rural emergency departments,, Health care, Performance, Unwarranted variations in practice

SCHOLARONE™
Manuscripts

1
2
3
4
5
6 **Rural emergency care 360°: Mobilizing healthcare professionals, decision-makers, patients**
7
8 **and citizens to improve rural emergency care in the province of Quebec, Canada: a study**
9
10 **protocol**
11
12
13
14
15
16

17 **Richard Fleet, MD, PhD^{1,2}, Gilles Dupuis, PhD³, Jean-Paul Fortin, MD⁴, Jocelyn Gravel,**
18 **MD, MSc⁵, Mathieu Ouimet, PhD⁶, Julien Poitras, MD^{1,2}, France Légaré, MD, PhD⁷**
19
20
21
22
23
24
25
26

27 ¹Department of Family and Emergency Medicine, Université Laval, Quebec, QC, Canada;

28
29 ²Research Chair in Emergency Medicine, CHAU-Hôtel-Dieu de Lévis (Université Laval); Lévis,
30
31 QC, Canada;

32
33
34 ³Department of Psychology, Université du Québec à Montréal, Montreal, QC, Canada ;

35
36 ⁴Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale, Québec,
37
38 Canada ;

39
40 ⁵CHU Sainte-Justine, Université de Montréal, Montréal, Canada ;

41
42
43 ⁶Department of Political Science, Université Laval, Quebec, QC, Canada;

44
45
46 ⁷Department of Family Medicine and Emergency Medicine, Knowledge Transfer and Health
47
48 Technology Assessment Group of the CHU de Québec Research Centre, Unité de Recherche
49
50 Évaluative, Université Laval, Quebec, QC, Canada.
51
52
53
54
55
56
57
58
59
60

1
2
3 **Corresponding author:** Dr. Richard Fleet; CSSS Alphonse-Desjardins Research Centre, Hôtel-
4
5 Dieu de Lévis, 143 Wolfe Street, Lévis, QC, Canada, G6V 3Z1. Phone: +1 418-835-7121 ext.
6
7
8 3173; Fax: +1 418-835-7276; Email:

9
10 rfleet@videotron.ca
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

Abstract:

Introduction: Emergency departments (EDs) are an important safety net for rural populations. Results of our earlier studies suggest that rural Canadian hospitals have limited access to advanced imaging services and intensive care Units (ICUs) and that patients are transferred over large distances. They also revealed significant geographical variations in rural services. In the absence of national standards, our studies raise questions about inequities in rural access to emergency services and the risks for citizens. Our goal is to build recommendations for improving services by mobilizing stakeholders interested in rural emergency care. With help and full engagement of stakeholders, we will 1) identify solutions for improving quality and performance in rural emergency departments; 2) formulate and prioritize recommendations; 3) transfer knowledge of the recommendations to rural emergency departments and support operationalization ; 4) assess knowledge transfer and explore further impacts of this participatory action research project.

Methodology. We will use a participatory action research approach. We will plan for a governance structure that includes all stakeholder's representatives so throughout this project, stakeholders are fully engaged at every step. Our sample will be 26 emergency departments in rural Quebec. We will conduct semi-structured individual and focus group interviews with relevant and representative participants, including patients and citizens (estimated N=200). Interviews will be thematically analyzed to extract potential solutions and other qualitative information.

An expert panel (± 15) will use an analysis grid to develop consensus recommendations from solutions suggested and will evaluate feasibility, impacts, costs, conditions for implementation,

1
2
3 and establish monitoring indicators. Recommendations will be transferred to stakeholders using
4
5 tailored knowledge translation strategies (web platform, meetings, etc.).
6
7
8

9
10 **Discussion and expected results.** This study will result in a comprehensive consensus list of
11
12 feasible and high-priority recommendations enabling decision-makers in emergency care to
13
14 implement improvements in rural emergency care in Quebec.
15
16

17
18
19 **Ethics and dissemination:** This protocol has been approved by the CSSS Alphonse-Desjardins
20
21 research ethics committee (Project number: MP 2017 - 009).
22
23
24

25 26 27 **Strengths of this study**

- 28
29 • First research project to mobilize a diverse group of stakeholders to find solutions for
30
31 improving care and services in Quebec rural emergency departments;
32
33
- 34
35 • Consensus on a comprehensive list of feasible and high-priority recommendations for
36
37 improving the performance of Quebec rural emergency departments;
38
39
- 40
41 • Recommendations will be immediately applicable and we will explore their impact by
42
43 evaluating and monitoring this knowledge mobilization initiative.
44
45

46 47 **Methodological limitation**

- 48
49 • Participant selection not –randomized but theoretically representative;
50
51
- 52
53 • Time-consuming involvement numerous and busy participants may limit recruitment
54
55

56 **Word count:** Abstract 317; Main text 2531
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Keywords: Rural emergency departments, Health care, Performance, Unwarranted variations in practice, Participatory action research

For peer review only

Introduction

Providing high-quality emergency care in rural areas poses specific challenges that are understudied. Rural emergency departments (EDs) treat four million patients per year in Canada, representing 30% of all emergency consultations, while those living in rural areas are only 20% of the whole population [1-3]. Compared with urban populations, rural populations are older, in poorer health, and more at risk of injury [4-8]. Rural EDs represent an important safety net for rural populations, especially in contexts where there are few alternatives to hospital emergency services, many people are without a family doctor, and recruiting and retaining physicians is difficult [9]. Our previous work showed that access to care and services varies from one part of Canada to another (rural/urban, rural/rural) [3, 10]. In fact, 74% of rural EDs in Quebec have 24/7 access to a general surgeon, ICU and CT scans, elsewhere in the country fewer than 20% of EDs have access to these services[3, 10]. These variations in access to care suggest inequities in accessibility, quality and effectiveness of ED care and services across rural and urban EDs and raise questions about Canada's universal healthcare system. Moreover, in the past decade a wave of centralization of healthcare services has taken place, largely because of budgetary constraints and a shortage of medical personnel. This has led to a reduction of services in rural areas and the closure of several small community hospitals, contributing to the wide variations in practice observed today [2, 11, 12]. In the present context of growing needs and limited resources, policy-makers are reviewing emergency services and their place in the continuum of care. Policy-makers need evidence to inform their choices about allocation of emergency care and services for vulnerable populations in remote areas [2, 13, 14]. In 1997, the Canadian Association of Emergency Physicians (CAEP) made several recommendations about improving medical practice in rural EDs across the country [15]. However, the field of emergency medicine has evolved

1
2
3 significantly over the past 15 years [16] , and an update of these recommendations that is based
4
5 on recent evidence is needed.
6
7

8
9
10 The Quebec Ministry of Health and Social Services (MSSS) published an ED management guide
11
12 (Guide de gestion de l'urgence, 2000, updated 2006) [17], but it is clear that its use is not
13
14 widespread in rural EDs[16]. In spite of appeals for change, there is thus a crying need for
15
16 standards for rural EDs that their managers can turn to[2, 12, 13].
17
18

19
20
21 The main objective of this innovative participatory action research project is therefore to address
22
23 these practice variations and the absence of standards applied in the context of Quebec's rural
24
25 EDs. In collaboration with more than 200 rural emergency stakeholders and citizens, we plan to
26
27 co-produce recommendations for improving the performance of EDs that are both evidence-based
28
29 and respectful of the realities on the ground. Collaboration among stakeholders will identify
30
31 promising interventions, especially in the continuum of care, based on best evidence and on best
32
33 practices in similar situations. This process will bring existing solutions to light and adapt them to
34
35 the realities of rural contexts, increasing likelihood of the implementation of the
36
37 recommendations.
38
39
40
41
42
43
44

45
46 Potentials solutions for improving accessibility, quality and effectiveness of rural EDs Through
47
48 our extensive literature review, the results of our earlier research, the expertise of our
49
50 multidisciplinary team and the experience of our partners we have already identified the
51
52 following solutions that could improve accessibility, quality and cost-effectiveness in rural
53
54 emergency care and services: improvement of emergency prehospital care (e.g. optimization of
55
56 transfers); use of new technologies (e.g. telemedicine, Point of Care Ultrasound (POCUS) ;
57
58
59
60

1
2
3 optimal use of resources (e.g. access to medical specialists and facilities); training (e.g.
4 simulation-based learning) and improved management procedures (e.g. facilitating the
5 implementation of the ED management guide (“Guide de Gestion de l’urgence”); standardize
6 databases for better measurement of quality indicators).
7
8
9
10
11
12
13

14 **Improving emergency prehospital care using remote monitoring**

15
16
17
18
19
20 The distances between tertiary care hospitals and rural residents limit their access to specialist
21 services and facilities. Our data suggests that most rural EDs are more than 300 km from tertiary
22 and secondary care trauma units, and an average of 300 inter-hospital transfers are required per
23 year in each rural ED [3, 16] . The quality of emergency care in rural areas thus depends on the
24 capacity to perform procedures locally and transfer patients who require it to the nearest referral
25 centre after stabilizing them [18, 19] . This process must be both timely and safe. Inter-hospital
26 transfers, however, are expensive and expose patients to complications (e.g. road accidents) [20,
27 21]. Moreover, many patients who are in pain or have not been stabilized require a medical or
28 nursing escort, which can cause staff shortages in the emergency room and is very expensive
29 [22]. One promising solution is prehospital remote monitoring, whereby ambulance personnel
30 and nurses can be supported from a distance [23].
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

48 Training medical personnel Unlike emergency medicine professionals in urban areas, those in
49 rural areas are proportionally less exposed to various medical situations, including trauma [24],
50 and other serious clinical conditions. In addition, according to our data, one third of rural
51 physicians have less than five years of practice experience and only 6% have had extra
52 emergency medicine training. Rural physicians are requesting this training [25]. Simulation-
53
54
55
56
57
58
59
60

1
2
3 based learning or clinical immersion programs are promising innovations in medical education
4
5 that could meet the educational needs of rural emergency medicine professionals [26, 27].
6
7
8
9

10 **Quality improvement through standardization**

11
12 The use of care protocols or guidelines in treating some emergency conditions, such as sepsis
13 [28], strokes [29], cardiovascular problems as well as trauma could improve the quality of care
14 [28, 30]. This would be a relevant and evidence-based approach to reducing practice variations.
15
16 However, the actual use of care protocols and their impacts on patient-care are unknown, in both
17
18 rural and urban contexts.
19
20
21
22
23
24
25
26

27 **Objectives**

28
29 The main objectives of this study are therefore to

- 30
31 1) Identify solutions for improving quality and performance in rural emergency departments by
32 mobilise stakeholders (decision-makers, professionals, patients and citizens);
33
34 2) Formulate and prioritise recommendations based on solutions identified;
35
36 3) Transfer knowledge of recommendations to improve quality and performance in rural EDs and
37 support their operationalisation;
38
39 4) Assess knowledge transfer and explore further impacts of the participatory action research
40 project.
41
42
43
44
45
46
47
48
49

50 **Methodology**

51
52 We chose to use a participatory action research approach for this multipronged project [31]. Our
53 hypothesis is that this process of knowledge co-construction will facilitate implementation of the
54
55 recommendations.
56
57
58
59
60

Selection of EDs and study participants

Participating rural EDs will be the same as in our earlier projects and represent 100% of Quebec rural EDs (N=26). Briefly, these are hospitals that offer 24/7 emergency coverage, including inpatient beds, and are situated in “rural or small towns” according to the Statistics Canada’s [32] definition (population more than 10,000 but density of less than 400 people per km², population less than 10,000 but density of more than 400 people per km², or population less than 10,000 and density of less than 400 people per km²). Two principles will guide the recruitment of participants: diverse points of view and data saturation [33]. Selection of participants for interviews will also proceed according to these criteria. Respect for representativity of the different types of EDs under study will take precedent over a statistical based representativity in recruiting all players and especially patients/citizens, in keeping with a research approach that emphasizes public involvement [34]. Recruitment will focus on relevant professions/positions. Local media and snowballing will be used for recruitment purposes. In addition, a “champion” will be identified in each rural ED. The champion approach is often used in projects where the researchers are far away from the study site. Champions are people who know the culture of the site and its particular concerns [35, 36]. They will collaborate with the research team throughout the project, especially as recruitment facilitators and knowledge brokers.

Data collection:

Objective 1: Mobilise stakeholders to propose solutions for improving quality and performance in rural EDs

1
2
3 In the first phase of the project, the multiple stakeholders will be invited to participate in semi-
4 structured focus groups [37] or individual interviews [38] to discuss potential solutions for
5 improving accessibility, quality and effectiveness in rural EDs. The interview guide will address
6 topics relating to the particularities of each rural region, the health and social care services
7 available, the current situation of emergency services, the roles of the various emergency
8 professionals, potential solutions for improving services, and barriers and facilitators to
9 implementing these solutions.
10
11
12
13
14
15
16
17
18
19

20
21
22 Interviews will be planned as follows: a) ± 40 individual interviews with decision makers at all
23 levels or the health system: “Ministère de la Santé et des Services sociaux (MSSS)”, regional
24 health and social care centres, local point of care; b) ± four focus groups (± seven participants
25 each), one for each profession identified (physicians, nurses, prehospital emergency services,
26 psychosocial care); c) ± four focus groups with patients and citizens, one for each of the
27 following categories: patient committee members, mayors, community workers, concerned
28 citizens. The number of interviews will be increased until data saturation is reached. They will be
29 led by a research professional with experience in qualitative research and will be recorded and
30 transcribed verbatim.
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45

46 Thematic analysis of data using N’Vivo software will generate a coding tree (themes and
47 subthemes) of solutions for improving performance in rural EDs. Qualitative information about
48 these solutions (context, feasibility) will also be extracted [39]. The robustness and clarity of the
49 categories will also be assessed through discussion with the research team [40].
50
51
52
53
54
55
56
57

58 ***Objective 2: Formulate and prioritise recommendations based on solutions identified***
59
60

1
2
3
4
5
6 In the second phase of the project, the solutions identified through mobilizing stakeholders
7
8 (Objective 1) will be submitted to a panel of experts. This panel will formulate consensual
9
10 recommendations based on the solutions extracted and will evaluate their feasibility, impacts,
11
12 costs and conditions for their implementation. The expert panel (± 12) will include members of
13
14 the research team, academia, university hospitals, professional associations and colleges as well
15
16 as our rural champions and partners [41].
17
18
19
20
21

22 Selection criteria will be based on peer recognition and individual credibility. This panel will also
23
24 establish monitoring indicators for implementing the recommendations. The experts will use a
25
26 multidimensional analysis grid to evaluate each of the solutions identified in Phase 1 using a five-
27
28 point Likert scale and commenting on each measure. They will assign a priority to each measure
29
30 based on their assessment of , 1) effectiveness, 2) security or negative externalities, 3) costs, 4)
31
32 organizational impact (implementation). They will also be asked to comment on the conditions
33
34 for its implementation and indicate relevant monitoring indicators. Finally, in order to compare
35
36 solutions, the research team in collaboration with expert panel, will determine the weight of each
37
38 criteria Ex. Efficiency 30%, Security 30%, Costs, 10%, Organizational impact, 10% VS same
39
40 weight for all criteria.
41
42
43
44
45
46
47

48 Data from this analysis grid will be used to guide discussions during the second expert
49
50 consultation, which will take place in person during a two-day meeting. Through their
51
52 deliberations, they will reach a consensus about the priority of the identified solutions and their
53
54 feasibility, with help from a facilitator with expertise in consensus activities. The consensus
55
56 recommendations (detailed descriptions, priority, feasibility, cost estimate etc.) will be compiled
57
58
59
60

1
2
3 in a document that will be the main deliverable at this stage. The document will also mention
4
5 other suggestions raised during Phase 1 but that were not part of the final consensus.
6
7
8
9

10 **3) Transfer knowledge of recommendations to improve quality and performance in** 11 12 **rural EDs and support their operationalisation** 13

14
15
16
17 In Phase 3, the knowledge translation phase, the consensus recommendations produced in Phase
18
19 2 will be transferred to all the stakeholders involved in suggesting solutions and developing
20
21 recommendations in Phases 1 and 2. A variety of strategies will be implemented to connect with
22
23 stakeholders and accompany them in understanding, adapting, and adopting the
24
25 recommendations. The possible strategies (conferences, videoconferences, websites, social
26
27 media, communities of practice, etc.) will be defined according to the nature of the
28
29 recommendations that emerge from the research process and through discussion with our
30
31 stakeholders (our partners, site champions etc.). We will take care to adapt the knowledge,
32
33 messages and interventions to the needs of each audience. Our collaborators and co-researchers
34
35 will all contribute to accompanying the rural sites depending on the needs expressed in each case,
36
37 in a spirit of fostering partnerships between central and remote locations so that each can
38
39 understand the situation of the other.
40
41
42
43
44
45
46
47

48 **Objective 4: Assess knowledge transfer and explore further impacts of the participatory** 49 50 **action research project** 51

52
53
54
55 We will assess the knowledge transfer and operationalisation in the targeted local sites with a
56
57 questionnaire validated beforehand that uses a Likert scale followed by open questions. The
58
59
60

1
2
3 survey will assess a) knowledge of the recommendations; b) implementation of solutions to
4 address identified barriers and facilitators; c) intention to adopt proposed solutions d) barriers and
5 facilitators experienced on site by those implementing the recommendations; and e) satisfaction
6 with the project/its relevance.
7
8
9
10
11

12
13
14
15 This online survey will take place at the end of Phase 3 (Period 0), then again five and eight
16 months later. This survey will also enable us to measure the extent of stakeholders' participation
17 in the project and retention rates, and to identify characteristics of sites that adopted (or not) some
18 of the solutions and characteristics of the solutions that had the most impact.
19
20
21
22
23
24

25
26
27 The second part of our evaluation will be an exploratory assessment of the impacts of the changes
28 initiated. Given that adopting recommendations takes time, the real impact of resulting changes
29 on the performance of EDs could occur later, perhaps outside the project timetable. However, we
30 will conduct an exploratory quantitative analysis of the associations between adoption of the
31 recommendations and performance measures in emergency using the indicators determined by
32 the expert panel in Phase 2. These indicators will be based mostly on those of the MSSS, the
33 "Direction des soins urgents, de la traumatologie et du continuum Clinique (DSUTCC)" and the
34 Canadian Institute for Health Information, as well as quality of care indicators proposed by
35 Schull et al. [42], which we validated in earlier studies [43]. Some of the recommendations
36 (training, telemedicine, etc.) may have an immediate impact on certain performance and quality
37 of care indicators, and these will be measured (e.g. number of transfers, duration of transfers,
38 treatment of specific conditions, etc.).
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54

55 56 57 **Discussion and expected results** 58 59 60

1
2
3 This study is based on a participatory action research approach that fosters the application of
4 scientific knowledge in practice and management [44, 45]. Our research should therefore result in
5 relevant recommendations that are likely to be adopted. The recommendations resulting from this
6 project could be added to a new version of the Quebec emergency management guide (MSSS,
7 2006) and piloted by the, which is one of the knowledge users in this study. The results are also
8 eagerly awaited by other emergency medicine associations and representatives in other provinces.
9 This research experience, involving large-scale mobilisation, will serve as a model for improving
10 performance in all areas of our health and social care system.
11
12
13
14
15
16
17
18
19
20
21
22
23

24 Finally, we will be contributing to the science of knowledge translation. Ours is the only team
25 focusing on mobilising rural communities to contribute to a reflection on rural emergency care.
26 We will document knowledge translation strategies that are effective in this context, which is
27 currently a gap in the literature [46].
28
29
30
31
32
33
34
35

36 **Acknowledgements**

37 We wish to thank the rural emergency staff of the province of Québec for participating in our
38 previous study as well of the the “Direction des soins critiques et urgents Ministère de la Santé et
39 des Services sociaux “. We also wish to thank our collaborators : Denise Trudel, Jean-Guy
40 Trottier, Dr Alain Tanguay, Dre H el ene Sylvain, Mr. Daniel Par e, Dr Jean Ouellet, Dr Gilles
41 Lortie, Dr Antoine Groulx, Dr Jean Marc Chauny, Mr. Maxime Laviolette, Mr. Patrice Aubertin,
42 Dr Alex Pool, Dr Jeff Plant , Mr. Louis Luc Beaudoin, Mr. Jean-Fran ois Racine and and Mrs
43 Catherine Turgeon-Pelchat.
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Competing interests and Funding

The authors declare not having any financial or other conflicts of interest related to the submission. The research project is supported from the "Fonds de Recherche du Québec – Santé (FRQS) " 32825.

Authors Contributors:

RF was responsible for the original idea, literature review and study design. He drafted the initial manuscript and its revised versions. GD, JPF, JG, FL, MO, JP contributed significantly to the manuscript drafting and preparation, revision and formatting the manuscript. RF have contributed to various aspects of the study design with input relating to their specific expertise in the field. All authors read and approved the final manuscript.

References

1. Statistics Canada. Population, urban and rural, by province and territory. Available at: <http://www.statcan.gc.ca/tables-tableaux/sumsom/l01/cst01/demo62f-eng.htm>. Accessed November 18, 2014.
2. Fleet R, Archambault P, Plant J, Poitras J. Access to emergency care in rural Canada: should we be concerned? *Cjem*. 2013;15(4):191-3.
3. Fleet R, Poitras J, Maltais-Giguere J, Villa J, Archambault P. A descriptive study of access to services in a random sample of Canadian rural emergency departments. *BMJ open*. 2013;3(11):e003876.
4. Canadian Institute for Health Information. How Healthy Are Rural Canadians? An Assessment of Their Health Status and Health Determinants. Ottawa2006.
5. Fatovich DM, Jacobs IG. The relationship between remoteness and trauma deaths in Western Australia. *The Journal of trauma*. 2009;67(5):910-4.
6. S L. Rural Canada: Access to health care. Available at: <http://publications.gc.ca/Collection-R/LoPBdP/BP/prb0245-e.htm>. (Accessed September 26, 2014).
7. Peek-Asa C, Zwerling C, Stallones L. Acute traumatic injuries in rural populations. *American journal of public health*. 2004;94(10):1689-93.
8. Zakrison T, Ball CG, Kirkpatrick AW. Trauma in Canada: a spirit of equity & collaboration. *World journal of surgery*. 2013;37(9):2086-93.
9. Gauthier J HJ, Lamarche P, Lévesque JF, Morin D. Entre adaptabilité et fragilité : les conditions d'accès aux services de santé des communautés rurales et éloignées. Institut national de santé publique du Québec 2009.

- 1
2
3 10. Fleet R, Pelletier C, Marcoux J, et al. Differences in access to services in rural emergency
4 departments of Quebec and Ontario. *PloS one*. 2015;10(4):e0123746.
- 5
6
7
8 11. R C. Is regionalization working? *CMAJ*. 2010;182(4):331-2.
- 9
10 12. Fleet R, Plant J, Ness R, Moola S. Patient advocacy by rural emergency physicians after
11 major service cuts: the case of Nelson, BC. *Canadian journal of rural medicine : the*
12 *official journal of the Society of Rural Physicians of Canada = Journal canadien de la*
13 *medecine rurale : le journal officiel de la Societe de medecine rurale du Canada*.
14 2013;18(2):56-61.
- 15
16
17 13. Romanow RBoV. The Future of Health Care in Canada. [Online, 2002]. Available at:
18 http://www.ubcmj.com/pdf/ubcmj_2_2_2011_7-8.pdf (Accessed september 29, 2015).
- 19
20
21 14. Bilbey N LS. Canadian Health Care: A Focus on Rural Medicine. *UBCMJ*; 2011.
22 Available at: http://www.ubcmj.com/pdf/ubcmj_2_2_2011_7-8.pdf (Accessed september
23 29, 2015).
- 24
25
26 15. Canadian Association of Emergency Physicians. Recommendations for the management
27 of rural, remote and isolated emergency health care facilities in Canada. 1997. Available
28 at: [http://caep.ca/resources/position-statements-andguidelines/
29 management-rural-remote-
30 and-isolated-emergency-health-c](http://caep.ca/resources/position-statements-andguidelines/management-rural-remote-and-isolated-emergency-health-c) (Accesse September 26, 2014).
- 31
32
33 16. Fleet R, Poitras J, Archambault P, et al. Portrait of rural emergency departments in
34 Quebec and utilization of the provincial emergency department management Guide: cross
35 sectional survey. *BMC health services research*. 2015;15:572.
- 36
37
38 17. Ministère De La Santé Et Des Services Sociaux Du Québec. Guide de gestion de
39 l'urgence. Québec: Gouvernement du Québec; 2006.
- 40
41
42 18. Fleet R, Poitras J. Have we killed the golden hour of trauma? *Annals of emergency*
43 *medicine*. 2011;57(1):73-4; author reply 4-5.
- 44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3 19. Rourke JT, Kennard M. Emergency patient transfers from rural hospitals: a regional
4 study. *Cjem*. 2001;3(4):296-301.
5
6
- 7
8 20. Bosk EA, Veinot T, Iwashyna TJ. Which patients and where: a qualitative study of patient
9 transfers from community hospitals. *Medical care*. 2011;49(6):592-8.
10
11
- 12
13 21. Hains IM, Marks A, Georgiou A, Westbrook JI. Non-emergency patient transport: what
14 are the quality and safety issues? A systematic review. *International journal for quality in*
15 *health care : journal of the International Society for Quality in Health Care*.
16 2011;23(1):68-75.
17
18
19
- 20
21 22. Ministère de la santé et des services sociaux. Services préhospitaliers: Urgence d'agir
22 Rapport du Comité national sur les services préhospitaliers d'urgence (2014). Available
23 at: <http://publications.msss.gouv.qc.ca/acrobat/f/documentation/2014/14-929-01W.pdf>
24 (Accessed october 27, 2015).
25
26
27
28
- 29
30 23. Charash WE, Caputo MP, Clark H, et al. Telemedicine to a moving ambulance improves
31 outcome after trauma in simulated patients. *The Journal of trauma*. 2011;71(1):49-54;
32 discussion 5.
33
34
35
36
37
- 38
39 24. Waymack JR, Markwell S, Milbrandt JC, Clark TR. Comparison of rates of emergency
40 department procedures and critical diagnoses in metropolitan and rural hospitals. *Rural*
41 *and remote health*. 2015;15(4):3298.
42
43
44
- 45
46 25. Drouin MA, Fleet R, Poitras J, et al. The Quebec rural emergency department project: a
47 cross-sectional study of a potential two-pronged strategy in the knowledge transfer
48 process. *PloS one*. 2015;10(4):e0120523.
49
50
51
- 52
53 26. Agha S, Alhamrani AY, Khan MA. Satisfaction of medical students with simulation based
54 learning. *Saudi medical journal*. 2015;36(6):731-6.
55
56
57
58
59
60

- 1
2
3 27. Lateef F. Simulation-based learning: Just like the real thing. *Journal of emergencies, trauma, and shock*. 2010;3(4):348-52.
4
5
6
7
8 28. Kuan WS, Ibrahim I, Leong BS, et al. Emergency Department Management of Sepsis
9 Patients: A Randomized, Goal-Oriented, Noninvasive Sepsis Trial. *Annals of emergency medicine*. 2016;67(3):367-78.e3.
10
11
12
13
14 29. Canadian Stroke Best Practice Recommendations. *Hyperacute stroke care* (2015).
15 Available at: <http://www.strokebestpractices.ca/> (Accessed september 29, 2015).
16
17
18
19 30. Stewart M, Bledsoe J, Madsen T, et al. Utilization and Safety of a Pulmonary Embolism
20 Treatment Protocol in an Emergency Department Observation Unit. *Critical pathways in cardiology*. 2015;14(3):87-9.
21
22
23
24
25
26
27 31. Smith L RL, Schmidt M. Best practices in the reporting of participatory action research:
28 Embracing both the forest and the trees. *The Counselling Psychologist*. 2010;38(8):1115-
29 1138.
30
31
32
33 32. Statistique Canada, Definitions of rural. *Rural and Small Town Canada Analysis Bulletin*.
34 2001;3(3):1- 17.
35
36
37
38 33. L S-Z. Comment peut-on construire un échantillonnage scientifiquement valide?
39 *Recherches Qualitatives*; 2007(5):99-111.
40
41
42
43 34. Boivin A, Lehoux P, Burgers J, Grol R. What are the key ingredients for effective public
44 involvement in health care improvement and policy decisions? A randomized trial process
45 evaluation. *The Milbank quarterly*. 2014;92(2):319-50.
46
47
48
49 35. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering
50 implementation of health services research findings into practice: a consolidated
51 framework for advancing implementation science. *Implementation science : IS*.
52 2009;4:50.
53
54
55
56
57
58
59
60

- 1
2
3 36. MacDougall C, Fudge E. Planning and recruiting the sample for focus groups and in-
4 depth interviews. *Qualitative health research*. 2001;11(1):117-26.
5
6
7
8 37. Morgan DLaRAK. *The Focus Group Kit (six book set)*. Thousand Oaks, Calif: Sage.
9 1998.
10
11
12 38. Savoie-Zajc L. L'entrevue semi-dirigée. Dans B. Gauthier (Dir.) : *Recherche sociale : de*
13 *la problématique à la collecte de données (5e édition)*. Québec, Québec : Presses de
14 l'Université du Québec. 2009.
15
16
17
18
19 39. Paillé P, & Mucchielli, A. *L'analyse qualitative en sciences humaines et sociales*. Armand
20 Colin. 2012.
21
22
23
24 40. Thomas D. A General Inductive Approach for Analyzing Qualitative Evaluation Data.
25 2006; 27 (2): 237-246.
26
27
28
29 41. Jones J, Hunter D. Consensus methods for medical and health services research. *BMJ*
30 (Clinical research ed). 1995;311(7001):376-80.
31
32
33
34 42. Schull MJ HC, Guttman A, Leaver CA, Vermeulen M, Rowe BH, Anderson GM,
35 Zwarenstein M. . Development of a Consensus on Evidence-Based Quality of Care
36 Indicators for Canadian Emergency Departments. ICES Investigative Report. Toronto:
37 Institute for Clinical Evaluative Sciences; 2010.
38
39
40
41
42
43 43. Layani G, Fleet R, Dallaire R, et al. The challenges of measuring quality-of-care
44 indicators in rural emergency departments: a cross-sectional descriptive study. *CMAJ*
45 *open*. 2016;4(3):E398-e403.
46
47
48
49
50 44. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research:
51 assessing partnership approaches to improve public health. *Annual review of public*
52 *health*. 1998;19:173-202.
53
54
55
56
57
58
59
60

- 1
2
3 45. Jagosh J, Macaulay AC, Pluye P, et al. Uncovering the benefits of participatory research:
4 implications of a realist review for health research and practice. *The Milbank quarterly*.
5 2012;90(2):311-46.
6
7
8
9
10 46. Parsons JE, Merlin TL, Taylor JE, Wilkinson D, Hiller JE. Evidence-based practice in
11 rural and remote clinical practice: where is the evidence? *The Australian journal of rural*
12 *health*. 2003;11(5):242-8.
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

BMJ Open

Rural emergency care 360°: Mobilizing healthcare professionals, decision-makers, patients and citizens to improve rural emergency care in the province of Quebec, Canada: a qualitative study protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-016039.R1
Article Type:	Protocol
Date Submitted by the Author:	26-Apr-2017
Complete List of Authors:	Fleet, Richard; Université Laval, Département de médecine familiale et de médecine d'urgence Dupuis, Gilles; Université du Québec à Montréal, Fortin, Jean-Paul; Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale Gravel, Jocelyn; SainteJustine Hospital, Emergency Ouimet, Mathieu; University of Laval, Political Science Poitras, Julien; Université Laval, Legare, France; CHU de Quebec and Université Laval,
Primary Subject Heading:	Emergency medicine
Secondary Subject Heading:	Health services research, Medical management, Qualitative research
Keywords:	Rural emergency departments,, Health care, Performance, Unwarranted variations in practice

SCHOLARONE™
Manuscripts

1
2
3
4
5
6 **Rural emergency care 360°: Mobilizing healthcare professionals, decision-makers, patients**
7 **and citizens to improve rural emergency care in the province of Quebec, Canada: a**
8 **qualitative study protocol**
9
10
11
12
13
14
15
16

17 **Richard Fleet, MD, PhD^{1,2}, Gilles Dupuis, PhD³, Jean-Paul Fortin, MD⁴, Jocelyn Gravel,**
18 **MD, MSc⁵, Mathieu Ouimet, PhD⁶, Julien Poitras, MD^{1,2}, France Légaré, MD, PhD⁷**
19
20
21
22
23
24
25
26

27 ¹Department of Family and Emergency Medicine, Université Laval, Quebec, QC, Canada;

28
29 ²Research Chair in Emergency Medicine, CHAU-Hôtel-Dieu de Lévis (Université Laval); Lévis,
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 **Corresponding author:** Dr. Richard Fleet; CSSS Alphonse-Desjardins Research Centre, Hôtel-
4
5 Dieu de Lévis, 143 Wolfe Street, Lévis, QC, Canada, G6V 3Z1. Phone: +1 418-835-7121 ext.
6
7
8 3173; Fax: +1 418-835-7276; Email: rfleet@videotron.ca
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

Abstract:

Introduction: Emergency departments (EDs) are an important safety net for rural populations. Results of our earlier studies suggest that rural Canadian hospitals have limited access to advanced imaging services and intensive care Units (ICUs) and that patients are transferred over large distances. They also revealed significant geographical variations in rural services. In the absence of national standards, our studies raise questions about inequities in rural access to emergency services and the risks for citizens. Our goal is to build recommendations for improving services by mobilizing stakeholders interested in rural emergency care. With help and full engagement of stakeholders, we will 1) identify solutions for improving quality and performance in rural emergency departments; 2) formulate and prioritize recommendations; 3) transfer knowledge of the recommendations to rural emergency departments and support operationalization; 4) assess knowledge transfer and explore further impacts of this participatory action research project.

Methodology: We will use a participatory action research approach. We will plan for a governance structure that includes all stakeholders' representatives so throughout this project, stakeholders are fully engaged at every step. Our sample will be 26 emergency departments in rural Quebec. We will conduct semi-structured individual and focus group interviews with relevant and representative participants, including patients and citizens (estimated N=200). Interviews will be thematically analyzed to extract potential solutions and other qualitative information.

An expert panel (± 15) will use an analysis grid to develop consensus recommendations from solutions suggested and will evaluate feasibility, impacts, costs, conditions for implementation,

1
2
3 and establish monitoring indicators. Recommendations will be transferred to stakeholders using
4
5 tailored knowledge translation strategies (web platform, meetings, etc.).
6
7
8
9

10 **Discussion and expected results:** This study will result in a comprehensive consensus list of
11
12 feasible and high-priority recommendations enabling decision-makers in emergency care to
13
14 implement improvements in rural emergency care in Quebec.
15
16

17
18
19 **Ethics and dissemination:** This protocol has been approved by the CSSS Alphonse-Desjardins
20
21 research ethics committee (Project number: MP 2017 - 009).
22
23
24

25
26
27 **Strengths of this study:**

- 28
29
30
 - First research project to mobilize a diverse group of stakeholders to find solutions for
31
32 improving care and services in Quebec rural emergency departments;
 - Consensus on a comprehensive list of feasible and high-priority recommendations for
33
34 improving the performance of Quebec rural emergency departments;
 - Recommendations will be immediately applicable and we will explore their impact by
35
36 evaluating and monitoring this knowledge mobilization initiative.
37
38
39
40
41
42
43
44

45
46 **Methodological limitation:**

- 47
48
 - Participant selection not –randomized but theoretically representative;
 - Interviews and committee participation is time-consuming and participants with busy
49
50 schedules may decline participation or may not continue to the end of the study.
51
52
53
54

55
56 **Word count:** Abstract 295; Main text 2750
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Keywords: Rural emergency departments, Health care, Performance, Unwarranted variations in practice, Participatory action research

For peer review only

Introduction

Providing high-quality emergency care in rural areas poses specific challenges that are understudied. Rural emergency departments (EDs) treat four million patients per year in Canada, representing 30% of all emergency consultations, while those living in rural areas are only 20% of the whole population (1-3). Compared with urban populations, rural populations are older, in poorer health, and more at risk of injury (4-8). Rural EDs represent an important safety net for rural populations, especially in contexts where there are few alternatives to hospital emergency services, many people are without a family doctor, and recruiting and retaining physicians is difficult (9). Our previous work showed that access to care and services varies from one part of Canada to another (rural/urban, rural/rural) (3, 10). In fact, 74% of rural EDs in Quebec have 24/7 access to a general surgeon, ICU and CT scans, elsewhere in the country fewer than 20% of EDs have access to these services (3, 10). These variations in access to care suggest inequities in accessibility, quality and effectiveness of ED care and services across rural and urban EDs and raise questions about Canada's universal healthcare system. Moreover, in the past decade a wave of centralization of healthcare services has taken place, largely because of budgetary constraints and a shortage of medical personnel. This has led to a reduction of services in rural areas and the closure of several small community hospitals, contributing to the wide variations in practice observed today (2, 11, 12). In the present context of growing needs and limited resources, policy-makers are reviewing emergency services and their place in the continuum of care. Policy-makers need evidence to inform their choices about allocation of emergency care and services for vulnerable populations in remote areas (2, 13, 14). In 1997, the Canadian Association of Emergency Physicians (CAEP) made several recommendations about improving medical practice in rural EDs across the country (15). However, the field of emergency medicine has evolved

1
2
3 significantly over the past 15 years (16), and an update of these recommendations that is based on
4
5 recent evidence is needed.
6
7

8
9
10 The Quebec Ministry of Health and Social Services (MSSS) published an ED management guide
11
12 (Guide de gestion de l'urgence, 2000, updated 2006) (17), but it is clear that its use is not
13
14 widespread in rural EDs (16). In spite of appeals for change, there is thus an urgent need for
15
16 standards for rural EDs that managers of these EDs can turn to (2, 12, 13).
17
18

19
20
21 The main objective of this innovative participatory action research project is therefore to address
22
23 these practice variations and the absence of standards applied in the context of Quebec's rural
24
25 EDs. In collaboration with more than 200 rural emergency stakeholders and citizens, we plan to
26
27 co-produce recommendations for improving the performance of EDs that are both evidence-based
28
29 and respectful of the constraints of real world concerns. Collaboration among stakeholders will
30
31 identify promising interventions, especially in the continuum of care, based on best evidence and
32
33 on best practices in similar situations. This process will bring existing solutions to light and adapt
34
35 them to the realities of rural contexts, increasing likelihood of the implementation of the
36
37 recommendations.
38
39
40
41
42
43
44
45

46 **Potentials solutions for improving accessibility, quality and effectiveness of rural EDs**

47
48 Through our literature review and the results of our earlier research, the expertise of our
49
50 multidisciplinary team and the experience of our partners we have already identified the
51
52 following solutions that could improve accessibility, quality and cost-effectiveness in rural
53
54 emergency care and services: improvement of emergency prehospital care (e.g. optimization of
55
56 transfers); use of new technologies (e.g. telemedicine, Point of Care Ultrasound (POCUS));
57
58
59
60

1
2
3 optimal use of resources (e.g. access to medical specialists and facilities); training (e.g.
4 simulation-based learning) and improved management procedures (e.g. facilitating the
5 implementation of the ED management guide (“Guide de gestion de l’urgence”); standardize
6 databases for better measurement of quality indicators). These solutions will be proposed to
7 participants of our study in order to validate the potential usefulness and applicability.
8
9

17 **Improving emergency prehospital care using remote monitoring**

19 The distances between tertiary care hospitals and rural residents limit their access to specialist
20 services and facilities. Our data suggests that most rural EDs are more than 300 km from tertiary
21 and secondary care trauma units, and an average of 300 inter-hospital transfers are required per
22 year in each rural ED (3, 16). The quality of emergency care in rural areas thus depends on the
23 capacity to perform procedures locally and transfer patients who require it to the nearest referral
24 centre after stabilizing them (18, 19). This process must be both timely and safe. Inter-hospital
25 transfers, however, are expensive and expose patients to complications (e.g. road accidents) (20,
26 21). Moreover, many patients who are in pain or have not been stabilized require a medical or
27 nursing escort, which can cause staff shortages in the emergency room and is very expensive
28 (22). One promising solution is prehospital remote monitoring, whereby ambulance personnel
29 and nurses can be supported from a distance (23).
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

48 **Training medical personnel**

49 Unlike emergency medicine professionals in urban areas, those in rural areas are proportionally
50 less exposed to various medical situations, including managing trauma related injuries (24), and
51 other serious clinical conditions. In addition, according to our data, one third of rural physicians
52 have less than five years of practice experience and only 6% have had extra emergency medicine
53
54
55
56
57
58
59
60

1
2
3 training – CCFP (EM) Canadian College of Family Medicine certification of special competency
4
5 in emergency medicine (total of 3 years post-graduate (MD) training), or Fellowship of the Royal
6
7 College of Physicians speciality in emergency medicine (FRCPE) (5 years post-graduate (MD)
8
9 training. Rural physicians are requesting additional training (25). Simulation-based learning or
10
11 clinical immersion programs are promising innovations in medical education that could meet the
12
13 educational needs of rural emergency medicine professionals (26, 27).
14
15
16
17
18
19

20 **Quality improvement through standardization**

21
22 The use of care protocols or guidelines in treating some emergency conditions, such as sepsis
23
24 (28), strokes (29), cardiovascular problems as well as trauma could improve the quality of care
25
26 (28, 30). This would be a relevant and evidence-based approach to reducing practice variations.
27
28 However, the actual use of care protocols in both rural and urban contexts and their respective
29
30 impacts on patient-care and health are unknown.
31
32
33
34
35

36 **Objectives**

37
38 The main objectives of this study are therefore to:

- 39
40
41 1) Identify solutions for improving quality and performance in rural emergency departments by
42
43 mobilizing stakeholders (decision-makers, professionals, patients and citizens);
44
45 2) Formulate and prioritize recommendations based on solutions identified;
46
47
48 3) Transfer knowledge of recommendations to improve quality and performance in rural EDs and
49
50 support the implementation of the recommendations and identified solutions;
51
52 4) Assess knowledge transfer and explore further impacts of the participatory action research
53
54 project.
55
56
57
58
59
60

Methodology

We chose to use a participatory action research approach for this multipronged project (31). Our hypothesis is that this process of knowledge co-construction will facilitate implementation of the recommendations.

Selection of EDs and study participants

Participating rural EDs will mostly be the same as in our earlier projects and represent 100% of Quebec rural EDs (N=26). Ongoing changes, including mergers, in the Quebec hospital system may slightly affect our selection criteria at the time of the study's onset. Briefly, these are hospitals that offer 24/7 emergency coverage, including inpatient beds, and are situated in "rural or small towns" according to the Statistics Canada's (32) definition (population more than 10,000 but density of less than 400 people per km², population less than 10,000 but density of more than 400 people per km², or population less than 10,000 and density of less than 400 people per km² (we are revising as per changes in recent census). Two principles will guide the recruitment of participants: participant's characteristics which are susceptible to give rise to different viewpoints (e.g. years of experience, shift work, profession, etc.) and data saturation (33). Respect for representativity of the different types of EDs under study will take precedent over a statistically-based representativity in recruiting all stakeholders. Patient/citizens selection, will follow a research approach that emphasizes public involvement (34). For health care professionals, recruitment will focus on relevant professions/positions best suited to answer our ED specific questions: physicians, nurses, head nurses, administrators, diagnostic technicians, laboratory technicians, psychosocial professionals, pre-hospital emergency professionals. Local media and snowballing will be used for recruitment purposes. In addition, a "champion" will be identified in each rural ED. The criteria for the recruitment of the champions go as follow: 1) the champions

1
2
3 must by familiar with the ED and, 2) they may occupy any function as long as they have good
4
5 knowledge of the ED and its staff. The champion approach is often used in projects where the
6
7 researchers are far away from the study site. Champions are people who know the culture of the
8
9 site and its particular concerns (35, 36). They will collaborate with the research team throughout
10
11 the project, especially as recruitment facilitators and knowledge brokers.
12
13
14

15 16 17 **Data collection:**

18 19 ***Objective 1: Mobilize stakeholders to propose solutions for improving quality and performance*** 20 21 ***in rural EDs*** 22 23 24

25
26
27 In the first phase of the project, the multiple stakeholders will be invited to participate in semi-
28
29 structured focus groups (37) or individual interviews (38) to discuss potential solutions for
30
31 improving accessibility, quality and effectiveness in rural EDs. The interview guide will address
32
33 topics relating to the particularities of each rural region (e.g. the health and social care services
34
35 available, the current situation of emergency services, the roles of the various emergency
36
37 professionals, potential solutions for improving services, and barriers and facilitators to
38
39 implementing these solutions).
40
41
42
43
44

45
46 Interviews will be planned as follows: a) ± 40 individual interviews with decision makers at all
47
48 levels or the health system: “Ministère de la Santé et des Services sociaux (MSSS)”, regional
49
50 health and social care centres, local point of care; b) ± four focus groups (± seven participants
51
52 each), one for each profession identified (physicians, nurses, prehospital emergency services,
53
54 psychosocial care); c) ± four focus groups with patients and citizens, one for each of the
55
56 following categories: patient committee members, mayors, community workers, concerned
57
58
59
60

1
2
3 citizens. The number of interviews will be increased until data saturation is reached. They will be
4
5 led by a research professional with experience in qualitative research and will be recorded and
6
7 transcribed verbatim.
8
9

10
11
12 Thematic analysis of data using NVivo software will generate a coding tree (themes and
13
14 subthemes) of solutions for improving performance in rural EDs. Qualitative information about
15
16 these solutions (context, feasibility) will also be extracted (39). The robustness and clarity of the
17
18 categories will also be assessed through discussion with the research team (40).
19
20
21

22
23
24 ***Objective 2: Formulate and prioritize recommendations based on solutions identified***
25
26

27
28
29 In the second phase of the project, the solutions identified through mobilizing stakeholders
30
31 (Objective 1) will be submitted to a panel of experts. This panel will formulate consensual
32
33 recommendations based on the solutions extracted and will evaluate their feasibility, impacts,
34
35 costs and conditions for their implementation. The expert panel (± 12) will include members of
36
37 the research team, academia, university hospitals, professional associations and colleges as well
38
39 as our rural champions and partners (41). Selection criteria will be based on peer recognition and
40
41 individual credibility. This panel will also establish monitoring indicators for implementing the
42
43 recommendations.
44
45
46
47

48
49
50 A two-phase process will be used to establish the consensual recommendations. First, an
51
52 anonymous by Email process will be implemented and, second, a nominal face-to-face process
53
54 will be used to generate those consensual recommendations.
55
56
57
58
59
60

1
2
3 The anonymous by Email process will use a multidimensional analysis grid that will be sent to
4 the experts so that they will be able to evaluate each of the solutions identified in Phase 1 of the
5 study. The data collection tool will contain a five-point Likert scale used to rate the solutions and
6 open-ended spaces to comment on each measure. They will assign a priority to each measure
7 based on their assessment of, 1) effectiveness, 2) security or negative externalities, 3) costs, 4)
8 organizational impact (implementation). They will also be asked to comment on the conditions
9 for its implementation and indicate relevant monitoring indicators. Finally, in order to compare
10 solutions, the research team in collaboration with the expert panel will determine the weight of
11 each criteria (e.g. Efficiency 30%, Security 30%, Costs 20%, Organizational impact 20%).
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

27 Data from this analysis grid will be used to guide discussions during the second face-to-face
28 nominal process with the experts which will take place in person during a two-day meeting.
29 Through this nominal process, they will reach a consensus about the priority of the identified
30 solutions and their feasibility, with help from a facilitator with expertise in consensus activities.
31 The consensus recommendations (detailed descriptions, priority, feasibility, cost estimates, etc.)
32 will be compiled in a document that will be the main deliverable at this stage. The document will
33 also mention other suggestions raised during Phase 1 but that were not part of the final consensus.
34
35
36
37
38
39
40
41
42
43
44
45
46
47

48 ***Objective 3: Transfer knowledge of recommendations to improve quality and performance in***
49 ***rural EDs and support their implementation***
50
51
52

53
54
55 In Phase 3, the knowledge translation phase, the consensus recommendations produced in Phase
56 2 will be transferred to all the stakeholders involved in suggesting solutions and developing
57
58
59
60

1
2
3 recommendations in Phases 1 and 2. A variety of strategies will be implemented to connect with
4 stakeholders and accompany them in understanding, adapting, and adopting the
5 recommendations. The possible strategies (conferences, videoconferences, websites, social
6 media, communities of practice, etc.) will be defined according to the nature of the
7 recommendations that emerge from the research process and through discussion with our
8 stakeholders (our partners, site champions, etc.). We will take care to adapt the knowledge,
9 messages and interventions to the needs of each audience. Our collaborators and co-researchers
10 will all contribute to accompanying the rural sites depending on the needs expressed in each case,
11 in a spirit of fostering partnerships between central and remote locations so that each can
12 understand the situation of the other.
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

29 ***Objective 4: Assess knowledge transfer and explore further impacts of the participatory action***
30 ***research project***
31
32
33
34
35

36 We will assess the knowledge transfer and implementation in the targeted local sites with a
37 questionnaire validated beforehand that uses a Likert scale followed by open questions. The
38 survey will assess a) knowledge of the recommendations; b) implementation of solutions to
39 address identified barriers and facilitators; c) intention to adopt proposed solutions; d) barriers
40 and facilitators experienced on site by those implementing the recommendations; and e)
41 satisfaction with the project/its relevance.
42
43
44
45
46
47
48
49
50
51
52

53 This online survey will take place at the end of Phase 3 (Period 0), then again five and eight
54 months later. This survey will also enable us to measure the extent of stakeholders' participation
55
56
57
58
59
60

1
2
3 in the project and retention rates, and to identify characteristics of sites that adopted (or not) some
4
5 of the solutions and characteristics of the solutions that had the most impact.
6
7

8
9
10 The second part of our evaluation will be an exploratory assessment of the impacts of the changes
11
12 initiated. Given that adopting recommendations takes time, the real impact of resulting changes
13
14 on the performance of EDs could occur later, perhaps outside the project timetable. However, we
15
16 will conduct an exploratory quantitative analysis of the associations between adoption of the
17
18 recommendations and performance measures in emergency using the indicators determined by
19
20 the expert panel in Phase 2. These indicators will be based mostly on those of the MSSS, the
21
22 “Direction des soins urgents, de la traumatologie et du continuum clinique (DSUTCC)” and the
23
24 Canadian Institute for Health Information, as well as quality of care indicators proposed by
25
26 Schull et al. (42), which we validated in earlier studies (43). Some of the recommendations
27
28 (training, telemedicine, etc.) may have an immediate impact on certain performance and quality
29
30 of care indicators, and these will be measured (e.g. number of transfers, duration of transfers,
31
32 treatment of specific conditions, etc.).
33
34
35
36
37
38
39
40

41 **Discussion and expected results**

42
43 This study is based on a participatory action research approach that fosters the application of
44
45 scientific knowledge in practice and management (44, 45). Our research should therefore result in
46
47 relevant recommendations that are likely to be adopted. The recommendations resulting from this
48
49 project could be added to a new version of the Quebec emergency management guide (MSSS,
50
51 2006) and piloted by the DSUTCC, which is one of the knowledge users in this study. The results
52
53 are also eagerly awaited by other emergency medicine associations and representatives in other
54
55
56
57
58
59
60

1
2
3 provinces. This research experience, involving large-scale mobilization, will hopefully serve as a
4
5 model for improving performance in all areas of our health and social care system.
6
7

8
9
10 Finally, we will be contributing to the science of knowledge translation. We will document
11
12 knowledge translation strategies that are effective in this context, which is currently a gap in the
13
14 literature (46).
15
16

17 18 19 **Acknowledgements**

20 We wish to thank the rural emergency staff of the province of Québec for participating in our
21
22 previous study as well of the “Direction des soins critiques et urgents Ministère de la Santé et des
23
24 Services sociaux”. We also wish to thank our collaborators : Denise Trudel, Jean-Guy Trottier,
25
26 Dr Alain Tanguay, Mme Hélène Sylvain, Mr. Daniel Paré, Dr Jean Ouellet, Dr Gilles Lortie, Dr
27
28 Antoine Groulx, Dr Jean Marc Chauny, Mr. Maxime Laviolette, Mr. Patrice Aubertin, Dr Alex
29
30 Pool, Dr Jeff Plant, Mr. Louis Luc Beaudoin, Mr. Jean-François Racine and Mrs Catherine
31
32 Turgeon-Pelchat.
33
34
35
36
37
38
39
40
41
42

43 44 **Competing interests and Funding**

45 The authors declare not having any financial or other conflicts of interest related to the
46
47 submission. The research project is supported from the "Fonds de Recherche du Québec – Santé
48
49 (FRQS) " 32825.
50
51
52
53
54
55
56
57
58
59
60

Authors Contributors:

RF was responsible for the original idea, literature review and study design. He drafted the initial manuscript and its revised versions. GD, JPF, JG, FL, MO, JP contributed significantly to the manuscript drafting and preparation, revision and formatting the manuscript. RF has contributed to various aspects of the study design with input relating to their specific expertise in the field.

All authors read and approved the final manuscript.

For peer review only

References

1. Statistics Canada. Population, urban and rural, by province and territory. Available at: <http://www.statcan.gc.ca/tables-tableaux/sumsot/101/cst01/demo62f-eng.htm>. Accessed November 18, 2014.
2. Fleet R, Archambault P, Plant J, Poitras J. Access to emergency care in rural Canada: should we be concerned? *Cjem*. 2013;15(4):191-3.
3. Fleet R, Poitras J, Maltais-Giguere J, Villa J, Archambault P. A descriptive study of access to services in a random sample of Canadian rural emergency departments. *BMJ Open*. 2013;3(11):e003876.
4. Canadian Institute for Health Information. How Healthy Are Rural Canadians? An Assessment of Their Health Status and Health Determinants. Ottawa 2006.
5. Fatovich DM, Jacobs IG. The relationship between remoteness and trauma deaths in Western Australia. *J Trauma*. 2009;67(5):910-4.
6. S L. Rural Canada: Access to health care. Available at: <http://publications.gc.ca/Collection-R/LoPBdP/BP/prb0245-e.htm>. (Accessed September 26, 2014).
7. Peek-Asa C, Zwerling C, Stallones L. Acute traumatic injuries in rural populations. *Am J Public Health*. 2004;94(10):1689-93.
8. Zakrisson T, Ball CG, Kirkpatrick AW. Trauma in Canada: a spirit of equity & collaboration. *World J Surg*. 2013;37(9):2086-93.
9. Gauthier J HJ, Lamarche P, Lévesque JF, Morin D. Entre adaptabilité et fragilité : les conditions d'accès aux services de santé des communautés rurales et éloignées. Institut national de santé publique du Québec 2009.
10. Fleet R, Pelletier C, Marcoux J, Maltais-Giguere J, Archambault P, Audette LD, et al. Differences in access to services in rural emergency departments of Quebec and Ontario. *PLoS One*. 2015;10(4):e0123746.
11. R C. Is regionalization working? *CMAJ*. 2010;182(4):331-2.
12. Fleet R, Plant J, Ness R, Moola S. Patient advocacy by rural emergency physicians after major service cuts: the case of Nelson, BC. *Can J Rural Med*. 2013;18(2):56-61.
13. Romanow RBoV. The Future of Health Care in Canada. [Online, 2002]. Available at: http://www.ubcmj.com/pdf/ubcmj_2_2_2011_7-8.pdf (Accessed september 29, 2015).
14. Bilbey N LS. Canadian Health Care: A Focus on Rural Medicine. *UBCMJ*; 2011. Available at: http://www.ubcmj.com/pdf/ubcmj_2_2_2011_7-8.pdf (Accessed september 29, 2015).
15. Canadian Association of Emergency Physicians. Recommendations for the management of rural, remote and isolated emergency health care facilities in Canada. 1997. Available at: <http://caep.ca/resources/position-statements-andguidelines/> management-rural-remote-and-isolated-emergency-health-c (Accessed September 26, 2014).
16. Fleet R, Poitras J, Archambault P, Tounkara FK, Chauny JM, Ouimet M, et al. Portrait of rural emergency departments in Quebec and utilization of the provincial emergency department management Guide: cross sectional survey. *BMC Health Serv Res*. 2015;15:572.

17. Ministère De La Santé Et Des Services Sociaux Du Québec. Guide de gestion de l'urgence. Québec: Gouvernement du Québec; 2006.
18. Fleet R, Poitras J. Have we killed the golden hour of trauma? *Ann Emerg Med*. 2011;57(1):73-4; author reply 4-5.
19. Rourke JT, Kennard M. Emergency patient transfers from rural hospitals: a regional study. *Cjem*. 2001;3(4):296-301.
20. Bosk EA, Veinot T, Iwashyna TJ. Which patients and where: a qualitative study of patient transfers from community hospitals. *Med Care*. 2011;49(6):592-8.
21. Hains IM, Marks A, Georgiou A, Westbrook JI. Non-emergency patient transport: what are the quality and safety issues? A systematic review. *Int J Qual Health Care*. 2011;23(1):68-75.
22. Ministère de la santé et des services sociaux. Services préhospitaliers: Urgence d'agir Rapport du Comité national sur les services préhospitaliers d'urgence (2014). Available at: <http://publications.msss.gouv.qc.ca/acrobat/f/documentation/2014/14-929-01W.pdf> (Accessed october 27, 2015).
23. Charash WE, Caputo MP, Clark H, Callas PW, Rogers FB, Crookes BA, et al. Telemedicine to a moving ambulance improves outcome after trauma in simulated patients. *J Trauma*. 2011;71(1):49-54; discussion 5.
24. Waymack JR, Markwell S, Milbrandt JC, Clark TR. Comparison of rates of emergency department procedures and critical diagnoses in metropolitan and rural hospitals. *Rural Remote Health*. 2015;15(4):3298.
25. Drouin MA, Fleet R, Poitras J, Archambault P, Chauny JM, Levesque JF, et al. The Quebec rural emergency department project: a cross-sectional study of a potential two-pronged strategy in the knowledge transfer process. *PLoS One*. 2015;10(4):e0120523.
26. Agha S, Alhamrani AY, Khan MA. Satisfaction of medical students with simulation based learning. *Saudi Med J*. 2015;36(6):731-6.
27. Lateef F. Simulation-based learning: Just like the real thing. *J Emerg Trauma Shock*. 2010;3(4):348-52.
28. Kuan WS, Ibrahim I, Leong BS, Jain S, Lu Q, Cheung YB, et al. Emergency Department Management of Sepsis Patients: A Randomized, Goal-Oriented, Noninvasive Sepsis Trial. *Ann Emerg Med*. 2016;67(3):367-78.e3.
29. Canadian Stroke Best Practice Recommendations. Hyperacute stroke care (2015). Available at: <http://www.strokebestpractices.ca/> (Accessed september 29, 2015).
30. Stewart M, Bledsoe J, Madsen T, Sturges Z, McGuire T, Rayner T, et al. Utilization and Safety of a Pulmonary Embolism Treatment Protocol in an Emergency Department Observation Unit. *Crit Pathw Cardiol*. 2015;14(3):87-9.
31. Smith L RL, Schmidt M. Best practices in the reporting of participatory action research: Embracing both the forest and the trees. *The Counselling Psychologist*. 2010;38(8):1115-1138.
32. Statistique Canada, Definitions of rural. Rural and Small Town Canada Analysis Bulletin. 2001;3(3):1- 17.

- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 - 9
 - 10
 - 11
 - 12
 - 13
 - 14
 - 15
 - 16
 - 17
 - 18
 - 19
 - 20
 - 21
 - 22
 - 23
 - 24
 - 25
 - 26
 - 27
 - 28
 - 29
 - 30
 - 31
 - 32
 - 33
 - 34
 - 35
 - 36
 - 37
 - 38
 - 39
 - 40
 - 41
 - 42
 - 43
 - 44
 - 45
 - 46
 - 47
 - 48
 - 49
 - 50
 - 51
 - 52
 - 53
 - 54
 - 55
 - 56
 - 57
 - 58
 - 59
 - 60
33. Savoie-Zajc L. Comment peut-on construire un échantillonnage scientifiquement valide? *Recherches Qualitatives*; 2007(5):99-111.
34. Boivin A, Lehoux P, Burgers J, Grol R. What are the key ingredients for effective public involvement in health care improvement and policy decisions? A randomized trial process evaluation. *Milbank Q.* 2014;92(2):319-50.
35. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009;4:50.
36. MacDougall C, Fudge E. Planning and recruiting the sample for focus groups and in-depth interviews. *Qual Health Res.* 2001;11(1):117-26.
37. Morgan DLaRAK. *The Focus Group Kit* (six book set). Thousand Oaks, Calif: Sage. 1998.
38. Savoie-Zajc L. L'entrevue semi-dirigée. Dans B. Gauthier (Dir.) : *Recherche sociale : de la problématique à la collecte de données* (5e édition). Québec, Québec : Presses de l'Université du Québec. 2009.
39. Paillé P, & Mucchielli, A. *L'analyse qualitative en sciences humaines et sociales*. Armand Colin. 2012.
40. Thomas D. A General Inductive Approach for Analyzing Qualitative Evaluation Data. 2006; 27 (2): 237-246.
41. Jones J, Hunter D. Consensus methods for medical and health services research. *Bmj.* 1995;311(7001):376-80.
42. Schull MJ HC, Guttman A, Leaver CA, Vermeulen M, Rowe BH, Anderson GM, Zwarenstein M. . Development of a Consensus on Evidence-Based Quality of Care Indicators for Canadian Emergency Departments. ICES Investigative Report. Toronto: Institute for Clinical Evaluative Sciences; 2010.
43. Layani G, Fleet R, Dallaire R, Tounkara FK, Poitras J, Archambault P, et al. The challenges of measuring quality-of-care indicators in rural emergency departments: a cross-sectional descriptive study. *CMAJ Open.* 2016;4(3):E398-e403.
44. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health.* 1998;19:173-202.
45. Jagosh J, Macaulay AC, Pluye P, Salsberg J, Bush PL, Henderson J, et al. Uncovering the benefits of participatory research: implications of a realist review for health research and practice. *Milbank Q.* 2012;90(2):311-46.
46. Parsons JE, Merlin TL, Taylor JE, Wilkinson D, Hiller JE. Evidence-based practice in rural and remote clinical practice: where is the evidence? *Aust J Rural Health.* 2003;11(5):242-8.

STROBE Statement—Checklist of items that should be included in reports of *cohort studies*

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract <i>In the title and in the abstract</i>
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found <i>The study protocol is defined pages 3 - 4</i>
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported <i>Pages 6 - 7</i>
Objectives	3	State specific objectives, including any prespecified hypotheses <i>Page 7</i>
Methods		
Study design	4	Present key elements of study design early in the paper <i>Page 9</i>
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection <i>Pages 10 - 11</i>
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Pages 10 - 11</i>
		(b) For matched studies, give matching criteria and number of exposed and unexposed <i>NA (Qualitative study)</i>
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable <i>Pages 11 - 13</i>
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group <i>Pages 11 - 12</i>
Bias	9	Describe any efforts to address potential sources of bias <i>Pages 12 - 13</i>
Study size	10	Explain how the study size was arrived at <i>Pages 11 - 13</i>
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why <i>NA</i>
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding <i>NA (Qualitative study)</i>
		(b) Describe any methods used to examine subgroups and interactions <i>NA (Qualitative study)</i>
		(c) Explain how missing data were addressed <i>NA (Qualitative study)</i>
		(d) If applicable, explain how loss to follow-up was addressed <i>NA (Qualitative study)</i>
		(e) Describe any sensitivity analyses <i>NA (Qualitative study)</i>

Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed <i>NA (Study protocol)</i>
		(b) Give reasons for non-participation at each stage <i>NA (Study protocol)</i>
		(c) Consider use of a flow diagram <i>NA (Study protocol)</i>
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders <i>NA (Study protocol)</i>
		(b) Indicate number of participants with missing data for each variable of interest <i>NA (Study protocol)</i>
		(c) Summarise follow-up time (eg, average and total amount) <i>NA (Study protocol)</i>
Outcome data	15*	Report numbers of outcome events or summary measures over time <i>NA (Study protocol)</i>
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included <i>NA (Study protocol)</i>
		(b) Report category boundaries when continuous variables were categorized <i>NA (Study protocol)</i>
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period <i>NA (Study protocol)</i>
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses <i>NA (Study protocol)</i>
Discussion		
Key results	18	Summarise key results with reference to study objectives <i>NA (Study protocol)</i>
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias <i>NA (Study protocol)</i>
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence <i>NA (Study protocol)</i>
Generalisability	21	Discuss the generalisability (external validity) of the study results
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based <i>NA (Study protocol) This information will be reported in the article</i>

*Give information separately for exposed and unexposed groups.

1 **Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and
2 published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely
3 available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at
4 <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is
5 available at <http://www.strobe-statement.org>.
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

BMJ Open

Rural emergency care 360°: Mobilizing healthcare professionals, decision-makers, patients and citizens to improve rural emergency care in the province of Quebec, Canada: a qualitative study protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2017-016039.R2
Article Type:	Protocol
Date Submitted by the Author:	09-Jun-2017
Complete List of Authors:	Fleet, Richard; Université Laval, Département de médecine familiale et de médecine d'urgence Dupuis, Gilles; Université du Québec à Montréal, Fortin, Jean-Paul; Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale Gravel, Jocelyn; SainteJustine Hospital, Emergency Ouimet, Mathieu; University of Laval, Political Science Poitras, Julien; Université Laval, Legare, France; CHU de Quebec and Université Laval,
Primary Subject Heading:	Emergency medicine
Secondary Subject Heading:	Health services research, Medical management, Qualitative research
Keywords:	Rural emergency departments,, Health care, Performance, Unwarranted variations in practice

SCHOLARONE™
Manuscripts

1
2
3 **Rural emergency care 360°: Mobilizing healthcare professionals, decision-makers, patients**
4 **and citizens to improve rural emergency care in the province of Quebec, Canada: a**
5 **qualitative study protocol**
6
7
8
9

10
11
12
13
14
15 **Richard Fleet, MD, PhD^{1,2}, Gilles Dupuis, PhD³, Jean-Paul Fortin, MD⁴, Jocelyn Gravel,**
16 **MD, MSc⁵, Mathieu Ouimet, PhD⁶, Julien Poitras, MD^{1,2}, France Légaré, MD, PhD⁷**
17
18
19
20
21
22
23

24 ¹Department of Family and Emergency Medicine, Université Laval, Quebec, QC, Canada;

25
26
27 ²Research Chair in Emergency Medicine, CHAU-Hôtel-Dieu de Lévis (Université Laval); Lévis,
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

QC, Canada;

³Department of Psychology, Université du Québec à Montréal, Montreal, QC, Canada ;

⁴Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale, Québec,
Canada ;

⁵CHU Sainte-Justine, Université de Montréal, Montréal, Canada ;

⁶Department of Political Science, Université Laval, Quebec, QC, Canada;

⁷Department of Family Medicine and Emergency Medicine, Knowledge Transfer and Health
Technology Assessment Group of the CHU de Québec Research Centre, Unité de Recherche
Évaluative, Université Laval, Quebec, QC, Canada.

Corresponding author: Dr. Richard Fleet; CSSS Alphonse-Desjardins Research Centre, Hôtel-
Dieu de Lévis, 143 Wolfe Street, Lévis, QC, Canada, G6V 3Z1. Phone: +1 418-835-7121 ext.
3173; Fax: +1 418-835-7276; Email: rfleet@videotron.ca

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

Abstract:

Introduction: Emergency departments (EDs) are an important safety net for rural populations. Results of our earlier studies suggest that rural Canadian hospitals have limited access to advanced imaging services and intensive care Units (ICUs) and that patients are transferred over large distances. They also revealed significant geographical variations in rural services. In the absence of national standards, our studies raise questions about inequities in rural access to emergency services and the risks for citizens. Our goal is to build recommendations for improving services by mobilizing stakeholders interested in rural emergency care. With help and full engagement of stakeholders, we will 1) identify solutions for improving quality and performance in rural emergency departments; 2) formulate and prioritize recommendations; 3) transfer knowledge of the recommendations to rural emergency departments and support operationalization; 4) assess knowledge transfer and explore further impacts of this participatory action research project.

Methodology: We will use a participatory action research approach. We will plan for a governance structure that includes all stakeholders' representatives so throughout this project, stakeholders are fully engaged at every step. Our sample will be 26 emergency departments in rural Quebec. We will conduct semi-structured individual and focus group interviews with relevant and representative participants, including patients and citizens (estimated N=200). Interviews will be thematically analyzed to extract potential solutions and other qualitative information.

An expert panel (± 15) will use an analysis grid to develop consensus recommendations from solutions suggested and will evaluate feasibility, impacts, costs, conditions for implementation,

1
2
3 and establish monitoring indicators. Recommendations will be transferred to stakeholders using
4
5 tailored knowledge translation strategies (web platform, meetings, etc.).
6
7
8
9

10 **Discussion and expected results:** This study will result in a comprehensive consensus list of
11
12 feasible and high-priority recommendations enabling decision-makers in emergency care to
13
14 implement improvements in rural emergency care in Quebec.
15
16
17
18
19

20 **Ethics and dissemination:** This protocol has been approved by the CSSS Alphonse-Desjardins
21
22 research ethics committee (Project number: MP 2017 - 009). The qualitative material will be kept
23
24 confidential and the data will be presented in a way that respects confidentiality. The
25
26 dissemination plan for the study includes publications in scientific and professional journals. We
27
28 will also use social media to disseminate our findings and activities such as communications in
29
30 public conferences.
31
32
33
34
35
36

37 **Strengths of this study:**

- 38 • First research project to mobilize a diverse group of stakeholders to find solutions for
39
40 improving care and services in Quebec rural emergency departments;
41
42
- 43 • Consensus on a comprehensive list of feasible and high-priority recommendations for
44
45 improving the performance of Quebec rural emergency departments;
46
47
- 48 • Recommendations will be immediately applicable and we will explore their impact by
49
50 evaluating and monitoring this knowledge mobilization initiative.
51
52
53
54
55
56
57
58
59
60

Methodological limitation:

- Participant selection not –randomized but theoretically representative;
- Interviews and committee participation is time-consuming and participants with busy schedules may decline participation or may not continue to the end of the study.

Word count: Abstract 295; Main text 2912

Keywords: Rural emergency departments, Health care, Performance, Unwarranted variations in practice, Participatory action research

Introduction

Providing high-quality emergency care in rural areas poses specific challenges that are understudied. Rural emergency departments (EDs) treat four million patients per year in Canada, representing 30% of all emergency consultations, while those living in rural areas are only 20% of the whole population (1-3). Compared with urban populations, rural populations are older, in poorer health, and more at risk of injury (4-8). Rural EDs represent an important safety net for rural populations, especially in contexts where there are few alternatives to hospital emergency services, many people are without a family doctor, and recruiting and retaining physicians is difficult (9). Our previous work showed that access to care and services varies from one part of Canada to another (rural/urban, rural/rural) (3, 10). In fact, 74% of rural EDs in Quebec have 24/7 access to a general surgeon, ICU and CT scans, elsewhere in the country fewer than 20% of EDs have access to these services (3, 10). These variations in access to care suggest inequities in accessibility, quality and effectiveness of ED care and services across rural and urban EDs and raise questions about Canada's universal healthcare system. Moreover, in the past decade a wave of centralization of healthcare services has taken place, largely because of budgetary constraints and a shortage of medical personnel. This has led to a reduction of services in rural areas and the closure of several small community hospitals, contributing to the wide variations in practice observed today (2, 11, 12). In the present context of growing needs and limited resources, policy-makers are reviewing emergency services and their place in the continuum of care. Policy-makers need evidence to inform their choices about allocation of emergency care and services for vulnerable populations in remote areas (2, 13, 14). In 1997, the Canadian Association of Emergency Physicians (CAEP) made several recommendations about improving medical practice in rural EDs across the country (15). However, the field of emergency medicine has evolved

1
2
3 significantly over the past 15 years (16), and an update of these recommendations that is based on
4
5 recent evidence is needed.
6
7
8
9

10 The Quebec Ministry of Health and Social Services (MSSS) published an ED management guide
11 (Guide de gestion de l'urgence, 2000, updated 2006) (17), but it is clear that its use is not
12 widespread in rural EDs (16). In spite of appeals for change, there is thus an urgent need for
13 standards for rural EDs that managers of these EDs can turn to (2, 12, 13).
14
15
16
17
18
19
20
21

22 The main objective of this innovative participatory action research project is therefore to address
23 these practice variations and the absence of standards applied in the context of Quebec's rural
24 EDs. In collaboration with more than 200 rural emergency stakeholders and citizens, we plan to
25 co-produce recommendations for improving the performance of EDs that are both evidence-based
26 and respectful of the constraints of real world concerns. We use the MSSS definition of
27 performance which includes access, quality and optimisation dimensions. This definition is in
28 accordance with the conceptual framework and the needs of the majority of the stakeholders of
29 the research who are members of the Québec Health System (18). Collaboration among
30 stakeholders will identify promising interventions, especially in the continuum of care, based on
31 best evidence and on best practices in similar situations. This process will bring existing solutions
32 to light and adapt them to the realities of rural contexts, increasing likelihood of the
33 implementation of the recommendations. We use the knowledge transfer (KT) framework
34 developed by the National Public Health Institute of Québec (19) which allows us to focus on the
35 different steps from coproduction to use of knowledge. It also highlights the multiple KT
36 strategies from dissemination to appropriation of knowledge. This framework justifies the
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 participatory research approach used in this project and gives us guidelines to evaluate the KT
4
5
6 process.
7
8
9

10 **Potentials solutions for improving accessibility, quality and effectiveness of rural EDs**

11
12 Through our literature review and the results of our earlier research, the expertise of our
13 multidisciplinary team and the experience of our partners we have already identified the
14 following solutions that could improve accessibility, quality and cost-effectiveness in rural
15 emergency care and services: improvement of emergency prehospital care (e.g. optimization of
16 transfers); use of new technologies (e.g. telemedicine, Point of Care Ultrasound (POCUS));
17 optimal use of resources (e.g. access to medical specialists and facilities); training (e.g.
18 simulation-based learning) and improved management procedures (e.g. facilitating the
19 implementation of the ED management guide (“Guide de gestion de l’urgence”); standardize
20 databases for better measurement of quality indicators). These solutions will be proposed to
21 participants of our study in order to validate the potential usefulness and applicability.
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38

39 **Improving emergency prehospital care using remote monitoring**

40
41 The distances between tertiary care hospitals and rural residents limit their access to specialist
42 services and facilities. Our data suggests that most rural EDs are more than 300 km from tertiary
43 and secondary care trauma units, and an average of 300 inter-hospital transfers are required per
44 year in each rural ED (3, 16). The quality of emergency care in rural areas thus depends on the
45 capacity to perform procedures locally and transfer patients who require it to the nearest referral
46 centre after stabilizing them (20, 21). This process must be both timely and safe. Inter-hospital
47 transfers, however, are expensive and expose patients to complications (e.g. road accidents) (22,
48 23). Moreover, many patients who are in pain or have not been stabilized require a medical or
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 nursing escort, which can cause staff shortages in the emergency room and is very expensive
4
5 (24). One promising solution is prehospital remote monitoring, whereby ambulance personnel
6
7 and nurses can be supported from a distance (25).
8
9

10 11 12 **Training medical personnel**

13
14 Compare to emergency medicine professionals in urban areas, those in rural areas are
15
16 proportionally less exposed to various medical situations, including managing trauma related
17
18 injuries (26), and other serious clinical conditions. In addition, according to our data, one third of
19
20 rural physicians have less than five years of practice experience and only 6% have had extra
21
22 emergency medicine training – CCFP (EM) Canadian College of Family Medicine certification
23
24 of special competency in emergency medicine (total of 3 years post-graduate (MD) training), or
25
26 Fellowship of the Royal College of Physicians speciality in emergency medicine (FRCP) (5 years
27
28 post-graduate (MD) training. Rural physicians are requesting additional training (27). Simulation-
29
30 based learning or clinical immersion programs are promising innovations in medical education
31
32 that could meet the educational needs of rural emergency physicians (28, 29).
33
34
35
36
37
38
39
40

41 **Quality improvement through standardization**

42
43 The use of care protocols or guidelines in treating some emergency conditions, such as sepsis
44
45 (30), strokes (31), cardiovascular problems as well as trauma could improve the quality of care
46
47 (30, 32). This would be a relevant and evidence-based approach to reducing practice variations.
48
49 However, the actual use of care protocols in both rural and urban contexts and their respective
50
51 impacts on patient-care and health are unknown.
52
53
54
55
56
57
58
59
60

Objectives

The main objectives of this study are therefore to:

- 1) Identify solutions for improving quality and performance in rural emergency departments by mobilizing stakeholders (decision-makers, professionals, patients and citizens);
- 2) Formulate and prioritize recommendations based on solutions identified;
- 3) Transfer knowledge of recommendations to improve quality and performance in rural EDs and support the implementation of the recommendations and identified solutions;
- 4) Assess knowledge transfer and explore further impacts of the participatory action research project.

Methodology

We chose to use a participatory action research approach for this multipronged project (33). Our hypothesis is that this process of knowledge co-construction will facilitate implementation of the recommendations.

Selection of EDs and study participants

Participating rural EDs will mostly be the same as in our earlier projects and represent 100% of Quebec rural EDs (N=26). Ongoing changes, including mergers, in the Quebec hospital system may slightly affect our selection criteria at the time of the study's onset. Briefly, these are hospitals that offer 24/7 emergency coverage, including inpatient beds, and are situated in "rural or small towns" according to the Statistics Canada's (34) definition (population more than 10,000 but density of less than 400 people per km², population less than 10,000 but density of more than 400 people per km², or population less than 10,000 and density of less than 400 people per km² (we are revising as per changes in recent census). Two principles will guide the recruitment of

1
2
3 participants: participant's characteristics which are susceptible to give rise to different viewpoints
4 (e.g. years of experience, shift work, profession, etc.) and data saturation (35). Respect for
5
6 representativity of the different types of EDs under study will take precedent over a statistically-
7
8 based representativity in recruiting all stakeholders. Patient/citizens selection, will follow a
9
10 research approach that emphasizes public involvement (36). For health care professionals,
11
12 recruitment will focus on relevant professions/positions best suited to answer our ED specific
13
14 questions: physicians, nurses, head nurses, administrators, diagnostic technicians, laboratory
15
16 technicians, psychosocial professionals, pre-hospital emergency professionals. Local media and
17
18 snowballing will be used for recruitment purposes. In addition, a "champion" will be identified in
19
20 each rural ED. The criteria for the recruitment of the champions go as follow: 1) the champions
21
22 must by familiar with the ED and, 2) they may occupy any function as long as they have good
23
24 knowledge of the ED and its staff. The champion approach is often used in projects where the
25
26 researchers are far away from the study site. Champions are people who know the culture of the
27
28 site and its particular concerns (37, 38). They will collaborate with the research team throughout
29
30 the project, especially as recruitment facilitators and knowledge brokers.
31
32
33
34
35
36
37
38
39
40

41 **Data collection:**

42 43 ***Objective 1: Mobilize stakeholders to propose solutions for improving quality and performance*** 44 45 ***in rural EDs*** 46 47 48 49

50
51 In the first phase of the project, the multiple stakeholders will be invited to participate in semi-
52
53 structured focus groups (39) or individual interviews (40) to discuss potential solutions for
54
55 improving accessibility, quality and effectiveness in rural EDs. The interview guide will address
56
57 topics relating to the particularities of each rural region (e.g. the health and social care services
58
59
60

1
2
3 available, the current situation of emergency services, the roles of the various emergency
4 professionals, potential solutions for improving services, and barriers and facilitators to
5 implementing these solutions).
6
7
8
9

10
11
12 Interviews will be planned as follows: a) \pm 40 individual interviews with decision makers at all
13 levels or the health system: “Ministère de la Santé et des Services sociaux (MSSS)”, regional
14 health and social care centres, local point of care; b) \pm four focus groups (\pm seven participants
15 each), one for each profession identified (physicians, nurses, prehospital emergency services,
16 psychosocial care); c) \pm four focus groups with patients and citizens, one for each of the
17 following categories: patient committee members, mayors, community workers, concerned
18 citizens. The number of interviews will be increased until data saturation is reached. They will be
19 led by a research professional with experience in qualitative research and will be recorded and
20 transcribed verbatim.
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35

36 Thematic analysis of data using NVivo software will generate a coding tree (themes and
37 subthemes) of solutions for improving performance in rural EDs. Qualitative information about
38 these solutions (context, feasibility) will also be extracted (41). The robustness and clarity of the
39 categories will also be assessed through discussion with the research team (42). We will provide
40 the COREQ checklist for the reporting of qualitative studies with the manuscript that will present
41 the qualitative results.
42
43
44
45
46
47
48
49
50
51
52

53 ***Objective 2: Formulate and prioritize recommendations based on solutions identified***

54
55 In the second phase of the project, the solutions identified through mobilizing stakeholders
56 (Objective 1) will be submitted to a panel of experts. This panel will formulate consensual
57
58
59
60

1
2
3 recommendations based on the solutions extracted and will evaluate their feasibility, impacts,
4 costs and conditions for their implementation. The expert panel (± 12) will include members of
5 the research team, academia, university hospitals, professional associations and colleges as well
6 as our rural champions and partners (43). Selection criteria will be based on peer recognition and
7 individual credibility. This panel will also establish monitoring indicators for implementing the
8 recommendations.
9

10
11
12
13
14
15
16
17
18
19
20 A two-phase process will be used to establish the consensual recommendations. First, an
21 anonymous by Email process will be implemented and, second, a nominal face-to-face process
22 will be used to generate those consensual recommendations.
23
24
25
26
27

28
29 The anonymous by Email process will use a multidimensional analysis grid that will be sent to
30 the experts so that they will be able to evaluate each of the solutions identified in Phase 1 of the
31 study. The data collection tool will contain a five-point Likert scale used to rate the solutions and
32 open-ended spaces to comment on each measure. They will assign a priority to each measure
33 based on their assessment of, 1) effectiveness, 2) security or negative externalities, 3) costs, 4)
34 organizational impact (implementation). They will also be asked to comment on the conditions
35 for its implementation and indicate relevant monitoring indicators. Finally, in order to compare
36 solutions, the research team in collaboration with the expert panel will determine the weight of
37 each criteria (e.g. Efficiency 30%, Security 30%, Costs 20%, Organizational impact 20%).
38
39
40
41
42
43
44
45
46
47
48
49
50

51
52
53 Data from this analysis grid will be used to guide discussions during the second face-to-face
54 nominal process with the experts which will take place in person during a two-day meeting.
55 Through this nominal process, they will reach a consensus about the priority of the identified
56
57
58
59
60

1
2
3 solutions and their feasibility, with help from a facilitator with expertise in consensus activities.
4
5 The consensus recommendations (detailed descriptions, priority, feasibility, cost estimates, etc.)
6
7 will be compiled in a document that will be the main deliverable at this stage. The document will
8
9 also mention other suggestions raised during Phase 1 but that were not part of the final consensus.
10
11

12
13
14
15 ***Objective 3: Transfer recommendations to improve quality and performance in rural EDs and***
16
17 ***support their implementation***
18

19
20 In Phase 3, the consensus recommendations produced in Phase 2 will be presented to all
21
22 stakeholders involved in Phases 1 and 2 and to others stakeholders from the EDs involved in the
23
24 research. A variety of strategies will be implemented to connect with stakeholders and
25
26 accompany them in understanding, adapting, and, eventually, adopting the recommendations. The
27
28 possible strategies (conferences, videoconferences, websites, social media, communities of
29
30 practice, etc.) will be defined according to the nature of the recommendations that emerge from
31
32 the research process and through discussions with the stakeholders (our partners, site champions,
33
34 etc.). As researchers, we will have a key role in coproducing, presenting and adapting the
35
36 knowledge. We will also support the reception, adoption and appropriation of knowledge by
37
38 acting as a networking hub for participating EDs and members of our expert panel and by
39
40 suggesting tools to implement some solutions. Our collaborators and co-researchers will all
41
42 contribute to accompany the rural sites depending of the needs expressed in each case, in a spirit
43
44 of fostering partnership between central and remote locations so that each can understand the
45
46 situation of the others.
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 ***Objective 4: Assess knowledge transfer and explore further impacts of the participatory action***
4
5 ***research project***
6

7
8 We will assess the knowledge transfer and implementation in the targeted local sites with a
9
10 questionnaire validated beforehand that uses a Likert scale followed by open questions. The
11
12 survey will assess a) knowledge of the recommendations; b) implementation of solutions to
13
14 address identified barriers and facilitators; c) intention to adopt proposed solutions; d) barriers
15
16 and facilitators experienced on site by those implementing the recommendations; and e)
17
18 satisfaction with the project/its relevance.
19
20

21
22
23
24 This online survey will take place at the end of Phase 3 (Period 0), then again five and eight
25
26 months later. This survey will also enable us to measure the extent of stakeholders' participation
27
28 in the project and retention rates, and to identify characteristics of sites that adopted (or not) some
29
30 of the solutions and characteristics of the solutions that had the most impact.
31
32

33
34
35
36 The second part of our evaluation will be an exploratory assessment of the impacts of the changes
37
38 initiated. Given that adopting recommendations takes time, the real impact of resulting changes
39
40 on the performance of EDs could occur later, perhaps outside the project timetable. However, we
41
42 will conduct an exploratory quantitative analysis of the associations between adoption of the
43
44 recommendations and performance measures in emergency using the indicators determined by
45
46 the expert panel in Phase 2. These indicators will be based mostly on those of the MSSS, the
47
48 "Direction des soins urgents, de la traumatologie et du continuum clinique (DSUTCC)" and the
49
50 Canadian Institute for Health Information, as well as quality of care indicators proposed by
51
52 Schull et al. (44), which we validated in earlier studies (45). Some of the recommendations
53
54 (training, telemedicine, etc.) may have an immediate impact on certain performance and quality
55
56
57
58
59
60

1
2
3 of care indicators, and these will be measured (e.g. number of transfers, duration of transfers,
4
5 treatment of specific conditions, etc.).
6
7
8
9

10 **Discussion and expected results**

11
12 This study is based on a participatory action research approach that fosters the application of
13 scientific knowledge in practice and management (46, 47). Our research should therefore result in
14 relevant recommendations that are likely to be adopted. The recommendations resulting from this
15 project could be added to a new version of the Quebec emergency management guide (MSSS,
16 2006) and piloted by the DSUTCC, which is one of the knowledge users in this study. The results
17 are also eagerly awaited by other emergency medicine associations and representatives in other
18 provinces. This research experience, involving large-scale mobilization, will hopefully serve as a
19 model for improving performance in all areas of our health and social care system.
20
21
22
23
24
25
26
27
28
29
30
31

32
33
34 Finally, we will be contributing to the science of knowledge translation. We will document
35 knowledge translation strategies that are effective in this context, which is currently a gap in the
36 literature (48).
37
38
39
40
41
42

43 **Acknowledgements**

44
45 We wish to thank the rural emergency staff of the province of Québec for participating in our
46 previous study as well of the “Direction des soins critiques et urgents Ministère de la Santé et des
47 Services sociaux”. We also wish to thank our collaborators: Denise Trudel, Jean-Guy Trottier, Dr
48 Alain Tanguay, Mme Hélène Sylvain, Mr. Daniel Paré, Dr Jean Ouellet, Dr Gilles Lortie, Dr
49 Antoine Groulx, Dr Jean Marc Chauny, Mr. Maxime Laviolette, Mr. Patrice Aubertin, Dr Alex
50
51
52
53
54
55
56
57
58
59
60

1
2
3 Pool, Dr Jeff Plant, Mr. Louis Luc Beaudoin, Mr. Jean-François Racine and Mrs Catherine
4
5 Turgeon-Pelchat.
6
7
8
9

10 **Competing interests and Funding**

11
12 The authors declare not having any financial or other conflicts of interest related to the
13 submission. The research project is supported from the "Fonds de Recherche du Québec – Santé
14 (FRQS) " 32825.
15
16
17
18
19

20 **Authors Contributors:**

21
22 RF was responsible for the original idea, literature review and study design. He drafted the initial
23 manuscript and its revised versions. GD, JPF, JG, FL, MO, JP contributed significantly to the
24 manuscript drafting and preparation, revision and formatting the manuscript. RF has contributed
25 to various aspects of the study design with input relating to their specific expertise in the field.
26
27
28
29
30
31
32 All authors read and approved the final manuscript.
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

References

1. Statistics Canada. Population, urban and rural, by province and territory. Available at: <http://www.statcan.gc.ca/tables-tableaux/sumsoms/101/cst01/demo62f-eng.htm>. Accessed November 18, 2014.
2. Fleet R, Archambault P, Plant J, Poitras J. Access to emergency care in rural Canada: should we be concerned? *Cjem*. 2013;15(4):191-3.
3. Fleet R, Poitras J, Maltais-Giguere J, Villa J, Archambault P. A descriptive study of access to services in a random sample of Canadian rural emergency departments. *BMJ Open*. 2013;3(11):e003876.
4. Canadian Institute for Health Information. How Healthy Are Rural Canadians? An Assessment of Their Health Status and Health Determinants. Ottawa 2006.
5. Fatovich DM, Jacobs IG. The relationship between remoteness and trauma deaths in Western Australia. *J Trauma*. 2009;67(5):910-4.
6. S L. Rural Canada: Access to health care. Available at: <http://publications.gc.ca/Collection-R/LoPBdP/BP/prb0245-e.htm>. (Accessed September 26, 2014).
7. Peek-Asa C, Zwerling C, Stallones L. Acute traumatic injuries in rural populations. *Am J Public Health*. 2004;94(10):1689-93.
8. Zakrisson T, Ball CG, Kirkpatrick AW. Trauma in Canada: a spirit of equity & collaboration. *World J Surg*. 2013;37(9):2086-93.
9. Gauthier J HJ, Lamarche P, Lévesque JF, Morin D. Entre adaptabilité et fragilité : les conditions d'accès aux services de santé des communautés rurales et éloignées. Institut national de santé publique du Québec 2009.
10. Fleet R, Pelletier C, Marcoux J, Maltais-Giguere J, Archambault P, Audette LD, et al. Differences in access to services in rural emergency departments of Quebec and Ontario. *PLoS One*. 2015;10(4):e0123746.
11. R C. Is regionalization working? *CMAJ*. 2010;182(4):331-2.
12. Fleet R, Plant J, Ness R, Moola S. Patient advocacy by rural emergency physicians after major service cuts: the case of Nelson, BC. *Can J Rural Med*. 2013;18(2):56-61.
13. Romanow RBoV. The Future of Health Care in Canada. [Online, 2002]. Available at: http://www.ubcmj.com/pdf/ubcmj_2_2_2011_7-8.pdf (Accessed september 29, 2015).
14. Bilbey N LS. Canadian Health Care: A Focus on Rural Medicine. *UBCMJ*; 2011. Available at: http://www.ubcmj.com/pdf/ubcmj_2_2_2011_7-8.pdf (Accessed september 29, 2015).

- 1
2
3 15. Canadian Association of Emergency Physicians. Recommendations for the management of
4 rural, remote and isolated emergency health care facilities in Canada. 1997. Available at:
5 <http://caep.ca/resources/position-statements-andguidelines/> management-rural-remote-and-
6 isolated-emergency-health-c (Accesse September 26, 2014).
7
8
- 9 16. Fleet R, Poitras J, Archambault P, Tounkara FK, Chauny JM, Ouimet M, et al. Portrait of
10 rural emergency departments in Quebec and utilization of the provincial emergency
11 department management Guide: cross sectional survey. BMC Health Serv Res.
12 2015;15:572.
13
- 14 17. Ministère de la Santé et des Services sociaux du Québec. Guide de gestion de l'urgence.
15 Québec: Gouvernement du Québec; 2006.
16
17
- 18 18. Ministère de la Santé et des Services sociaux du Québec. Cadre de référence ministériel
19 d'évaluation de la performance du système public de santé et de services sociaux à des fins
20 de gestion. 2012:25 pages.
21
- 22 19. Institut national de santé publique du Québec. Animer un processus de transfert des
23 connaissances : bilan des connaissances et outil d'animation. 2009.
24
25
- 26 20. Fleet R, Poitras J. Have we killed the golden hour of trauma? Ann Emerg Med.
27 2011;57(1):73-4; author reply 4-5.
28
- 29 21. Rourke JT, Kennard M. Emergency patient transfers from rural hospitals: a regional study.
30 Cjem. 2001;3(4):296-301.
31
32
- 33 22. Bosk EA, Veinot T, Iwashyna TJ. Which patients and where: a qualitative study of patient
34 transfers from community hospitals. Med Care. 2011;49(6):592-8.
35
- 36 23. Hains IM, Marks A, Georgiou A, Westbrook JI. Non-emergency patient transport: what are
37 the quality and safety issues? A systematic review. Int J Qual Health Care. 2011;23(1):68-
38 75.
39
- 40 24. Ministère de la Santé et des Services sociaux. Services préhospitaliers: Urgence d'agir
41 Rapport du Comité national sur les services préhospitaliers d'urgence (2014). Available at:
42 <http://publications.msss.gouv.qc.ca/acrobat/f/documentation/2014/14-929-01W.pdf>
43 (Accessed october 27, 2015).
44
45
- 46 25. Charash WE, Caputo MP, Clark H, Callas PW, Rogers FB, Crookes BA, et al.
47 Telemedicine to a moving ambulance improves outcome after trauma in simulated patients.
48 J Trauma. 2011;71(1):49-54; discussion 5.
49
50
- 51 26. Waymack JR, Markwell S, Milbrandt JC, Clark TR. Comparison of rates of emergency
52 department procedures and critical diagnoses in metropolitan and rural hospitals. Rural
53 Remote Health. 2015;15(4):3298.
54
55
56
57
58
59
60

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
27. Drouin MA, Fleet R, Poitras J, Archambault P, Chauny JM, Levesque JF, et al. The Quebec rural emergency department project: a cross-sectional study of a potential two-pronged strategy in the knowledge transfer process. *PLoS One*. 2015;10(4):e0120523.
 28. Agha S, Alhamrani AY, Khan MA. Satisfaction of medical students with simulation based learning. *Saudi Med J*. 2015;36(6):731-6.
 29. Lateef F. Simulation-based learning: Just like the real thing. *J Emerg Trauma Shock*. 2010;3(4):348-52.
 30. Kuan WS, Ibrahim I, Leong BS, Jain S, Lu Q, Cheung YB, et al. Emergency Department Management of Sepsis Patients: A Randomized, Goal-Oriented, Noninvasive Sepsis Trial. *Ann Emerg Med*. 2016;67(3):367-78.e3.
 31. Canadian Stroke Best Practice Recommendations. Hyperacute stroke care (2015). Available at: <http://www.strokebestpractices.ca/> (Accessed september 29, 2015).
 32. Stewart M, Bledsoe J, Madsen T, Sturges Z, McGuire T, Rayner T, et al. Utilization and Safety of a Pulmonary Embolism Treatment Protocol in an Emergency Department Observation Unit. *Crit Pathw Cardiol*. 2015;14(3):87-9.
 33. Smith L RL, Schmidt M. Best practices in the reporting of participatory action research: Embracing both the forest and the trees. *The Counselling Psychologist*. 2010;38(8):1115-1138.
 34. Statistique Canada, Definitions of rural. *Rural and Small Town Canada Analysis Bulletin*. 2001;3(3):1- 17.
 35. Savoie-Zajc L. Comment peut-on construire un échantillonnage scientifiquement valide? *Recherches Qualitatives*; 2007(5):99-111.
 36. Boivin A, Lehoux P, Burgers J, Grol R. What are the key ingredients for effective public involvement in health care improvement and policy decisions? A randomized trial process evaluation. *Milbank Q*. 2014;92(2):319-50.
 37. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009;4:50.
 38. MacDougall C, Fudge E. Planning and recruiting the sample for focus groups and in-depth interviews. *Qual Health Res*. 2001;11(1):117-26.
 39. Morgan DL, Keueger, R. A. *The Focus Group Kit (six book set)*. Thousand Oaks, Calif: Sage. 1998.
 40. Savoie-Zajc L. L'entrevue semi-dirigée. Dans B. Gauthier (Dir.) : *Recherche sociale : de la problématique à la collecte de données (5e édition)*. Québec, Québec : Presses de l'Université du Québec. 2009.

- 1
- 2
- 3 41. Paillé P, & Mucchielli, A. L'analyse qualitative en sciences humaines et sociales. Armand
- 4 Colin. 2012.
- 5
- 6
- 7 42. Thomas D. A General Inductive Approach for Analyzing Qualitative Evaluation Data.
- 8 2006; 27 (2): 237-246.
- 9
- 10 43. Jones J, Hunter D. Consensus methods for medical and health services research. *Bmj*.
- 11 1995;311(7001):376-80.
- 12
- 13 44. Schull MJ HC, Guttman A, Leaver CA, Vermeulen M, Rowe BH, Anderson GM,
- 14 Zwarenstein M. . Development of a Consensus on Evidence-Based Quality of Care
- 15 Indicators for Canadian Emergency Departments. ICES Investigative Report. Toronto:
- 16 Institute for Clinical Evaluative Sciences; 2010.
- 17
- 18
- 19 45. Layani G, Fleet R, Dallaire R, Tounkara FK, Poitras J, Archambault P, et al. The challenges
- 20 of measuring quality-of-care indicators in rural emergency departments: a cross-sectional
- 21 descriptive study. *CMAJ Open*. 2016;4(3):E398-e403.
- 22
- 23
- 24 46. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research:
- 25 assessing partnership approaches to improve public health. *Annu Rev Public Health*.
- 26 1998;19:173-202.
- 27
- 28 47. Jagosh J, Macaulay AC, Pluye P, Salsberg J, Bush PL, Henderson J, et al. Uncovering the
- 29 benefits of participatory research: implications of a realist review for health research and
- 30 practice. *Milbank Q*. 2012;90(2):311-46.
- 31
- 32
- 33 48. Parsons JE, Merlin TL, Taylor JE, Wilkinson D, Hiller JE. Evidence-based practice in rural
- 34 and remote clinical practice: where is the evidence? *Aust J Rural Health*. 2003;11(5):242-8.
- 35
- 36
- 37
- 38
- 39
- 40
- 41
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
- 59
- 60