



UBC CENTRE FOR
HEALTH SERVICES AND
POLICY RESEARCH

In Pursuit of Quality

Opportunities to improve patient
experiences in British Columbian
emergency departments

January 2009



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THE UNIVERSITY OF BRITISH COLUMBIA

Library and Archives Canada Cataloguing in Publication

Watson, Diane E.

In pursuit of quality [electronic resource] : opportunities to improve patient experiences in British Columbian emergency departments / Diane E. Watson, Sandra Peterson, Charlyn Black.

Includes bibliographical references.

ISBN 978-1-897085-15-8

1. Hospitals--Emergency services--British Columbia. 2. Emergency medical services--British Columbia. 3. Patient satisfaction--British Columbia. 4. Hospital care--British Columbia. 5. Health services accessibility--British Columbia. I. Black, Charlyn, 1954- II. Peterson, Sandra III. University of British Columbia. Centre for Health Services and Policy Research IV. Title.

RA975.5.E5W3 2008

362.18'09711

C2008-907887-X



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About CHSPR

The Centre for Health Services and Policy Research (CHSPR) is an independent research centre based at the University of British Columbia. CHSPR's mission is to advance scientific enquiry into issues of health in population groups, and ways in which health services can best be organized, funded and delivered. Our researchers carry out a diverse program of applied health services and population health research under this agenda. The Centre's work is:

- Independent
- Population-based
- Policy relevant
- Interdisciplinary
- Privacy sensitive

CHSPR aims to contribute to the improvement of population health by ensuring our research is relevant to contemporary health policy concerns and by working closely with decision makers to actively translate research findings into policy options. Our researchers are active participants in many policy-making forums and provide advice and assistance to both government and non-government organizations in British Columbia (BC), Canada and abroad.

Funding and support

CHSPR receives core funding from the BC Ministry of Health Services, and ongoing support from the University of British Columbia. This enables the Centre to focus on research that has a direct role in informing policy and health reform, and facilitates CHSPR's continuing development of the BC Linked Health Database.

Our researchers are also funded by competitive external grants from provincial, national and international funding agencies. They include the Canadian Health Services Research Foundation, the Canadian Institutes of Health Research, the Commonwealth Fund, Health Canada, the Michael Smith Foundation for Health Research, and WorkSafeBC.

Data services: BC Linked Health Database

Much of CHSPR's research is made possible through the BC Linked Health Database, a valuable resource of data relating to the encounters of BC residents with various health care and other systems in the province. These data are used in a de-identified form for applied health services and population health research deemed to be in the public interest.

CHSPR has developed strict policies and procedures to protect the confidentiality and security of these data holdings and fully complies with all legislative acts governing the protection and use of sensitive information. CHSPR has over 30 years of experience in handling data from the BC Ministry of Health Services and other professional bodies, and acts as the access point for researchers wishing to use these data for research in the public interest.

Acknowledgements

Under the direction of the Deputy Minister of Health Services and Chief Executive Officers of the health authorities of British Columbia (BC), a Patient Satisfaction Steering Committee has undertaken to learn and share information about experiences BC residents have with health care they receive in the province. In 2008, that Steering Committee engaged our team to glean insights from a survey they conducted in BC emergency departments in 2007 under a contract with NRC+Picker (www.nrcpicker.com). This report relies on survey data collected by NRC+Picker and analyses by CHSPR faculty and staff.

Between February and April 2007 more than 50,000 people sought care in BC emergency departments. Over 16,800 of these patients completed a survey in order to share information about their first-hand experiences with that care. Their contributions made this report possible.

This project benefited from the contributions of many other individuals. In particular, we would like to acknowledge the expert advice provided by Lena Cuthbertson, Co-Chair BC Patient Satisfaction Steering Committee and Kevin Samra from the Ministry of Health Services. We are also thankful for feedback from Michael Murray who authored the first descriptive report using the same survey data. Thanks to a number of faculty at the UBC School of Population and Public Health for assistance in statistical modeling and interpretation. Alicia Priest assisted with copy-editing and Dawn Mooney assisted with graphics, layout and design.

The BC health authorities provided funding for this project under an agreement between them and the BC Ministry of Health Services. The Behavioural Research Ethics Board of the University of British Columbia approved of the analyses.

The conclusions are those of the authors and no official endorsement by health authorities or the BC Ministry of Health Services is intended or should be inferred.



Executive summary



Canadians have become increasingly concerned about lack of timely access to needed health services and the quality of their care. These views have not gone unnoticed—health care policy-makers, administrators, and clinicians are taking action to ensure that many more people have positive experiences with health care services.

Every day in British Columbia (BC), thousands of patients who suffer from life-threatening or severe illnesses and injuries receive care in emergency departments. Many people also use emergency departments as a regular source of care or when their regular medical doctor is not available. Whatever the reason they visit, patients' experiences influence their views about quality of care.

While clinical experts can best judge the degree to which patients receive the care that experts recommend, patients are best placed to judge the degree to which services meet their needs and expectations.

In this report, we share new insights about what 16,800 patients said about their experiences with the care they received in BC emergency departments in 2007. We take a close look at the factors that drive patient ratings of quality, as well as the degree to which patients reported very positive experiences, in order to identify what health care professionals do well and should continue to do. We also take a close look at the minority of patients who report negative experiences, to provide perspective about what can be done to address the factors underlying these experiences and prevent similar experiences in the future.

What did we learn about factors that underlie patient views on overall quality of care in BC emergency departments?

In 2007, the vast majority of patients in BC said that quality of care in emergency departments was excellent (27%), very good (32%) or good (24%). The most important factor influencing those who said their overall quality of care was excellent, was the degree to which they considered staff to be courteous. What mattered also, although to a lesser extent, was: teamwork, comprehensiveness of services and availability of nurses.

A minority of patients in the province (16%) had negative experiences in emergency departments, reporting the overall quality of care they received as fair (11%) or poor (5%). Similar to those who reported positive experiences, those who reported negative ratings cited staff courtesy as the most important factor. Other things also mattered, but to a lesser extent: comprehensiveness of services, teamwork and waiting too long to see a doctor.*

Together, these findings contain the following important lessons for ensuring that most patients in BC continue to report positive experiences and fewer patients report negative experiences:

- the factors that underlie patient ratings of both positive and negative reports of the overall quality of care in emergency departments are remarkably similar;
- the degree to which staff are considered to be courteous is the most important factor influencing patient ratings of quality;
- when health care professionals do well on factors that underlie these ratings, then patients offer high ratings of overall quality of care; and
- when health care professionals do poorly in those areas, patients are very likely to offer negative ratings of overall quality of the care they receive in emergency departments.

What did we learn about the performance of emergency departments in BC on factors that matter to patients?

In 2007, the vast majority of patients in BC said that overall quality of care was excellent, very good or good and that health care professionals do well on the list of things that influence their views on quality. For example, many patients said that staff courtesy was excellent (31%), very good (33%) or good (23%). Similarly, many said that teamwork was excellent (27%), very good (35%) or good (25%) and that the availability of nurses was excellent (19%), very good (29%) or good (28%). A majority said that they completely (60%) or somewhat (30%) agree that they received all the services they need at the emergency department. When asked if they waited too long to see a doctor, one in five said “definitely” (18%) and slightly more (28%) said “yes, somewhat”. Half said “no” (52%).

There is variation across types of hospitals and health regions about patient views on overall quality and ratings on the factors that matter to them. Accordingly, we offer an array of graphics in this report so that health care professionals can learn what their patients have to say. We found that patients’ characteristics (e.g. age, ethnicity) and their presentation at emergency departments (e.g. time of day, acuity) had some influence on their views about overall quality of care. Since patients from different types of hospitals and health regions differ in these characteristics, we used statistical methods to risk-adjust performance metrics. Importantly, we found that the rank order of highest and lowest performance across different types of hospitals and health regions remained unchanged even after sophisticated analysis was conducted to account for differences in the characteristics of patients and their presentation at emergency departments. This is true for other measures profiled in this report.

* This is the patients’ view on the length of their wait for doctors, not the length of wait for nurses or the overall time in emergency departments.



We explored the data to better understand views of the majority of patients who said they had positive experiences in order to identify what could be done to emulate these circumstances with other patients. Across BC, 27 per cent of patients in BC who said overall quality of care was excellent also rated staff courtesy as excellent or very good (99%). Similarly, almost all of these patients rated teamwork as excellent or very good (97%). Virtually all said they received all the services they needed (98%). Few waited more than two hours for a doctor (3%) though some said their wait was too long (16%). In contrast, 16% of patients offer negative ratings of overall quality of care and the majority of these individuals offered negative ratings of staff courtesy (62%) and teamwork (53%). Additionally, four in 10 said they did not receive all the services they needed (39%), one-third waited more than two hours for a doctor (29%) and the vast majority said their wait was too long (89%).

Among patients who reported negative experiences, those who presented in pain represent a unique group. The more pain patients experience, the more likely they are to rate overall quality of care negatively. Patients in severe pain are twice as likely to offer negative overall ratings and patients who are in moderate/mild pain are, in turn, 1.4 times as likely as those in no pain to report negative overall ratings of quality of care. Importantly, patients who said they were in severe or moderate/mild pain represent the majority (74%) of all patients who offer negative ratings of overall quality of care. Thus, one approach to improving ratings of overall quality in emergency departments would be to pay particular attention to improving the experiences of patients who experience pain.

Given recent policy initiatives to reduce wait times in emergency departments across BC and elsewhere in Canada, we also attempted to better understand issues related to patient views on ‘waiting too long’ to see a doctor. Across all patients, we determined that most patients in BC who waited less than half an hour did not mind the

wait and patients who waited between half an hour and two hours were tolerant of the wait. But 96 per cent of the patients who waited more than two hours to see a doctor reported that the wait was definitely (71%) or somewhat (25%) too long. This suggests that patients seem to reach a tipping point after which they become less tolerant.

A final reflection is that despite the attention paid by policy-makers, clinicians and the media to reducing wait times in emergency departments, we found that patient perceptions of staff courtesy emerged as the most important factor influencing their reports of overall quality of care. This suggests that efforts to improve quality should focus more broadly so that other factors such as staff courtesy to patients, ensuring that patients receive the full set of services they need, and supporting team-based interaction with patients, are also addressed—in addition to wait times.

We hope that this report will be used to congratulate health care professionals on the work they do with patients in emergency departments and to give them more information about where to target future efforts to ensure that fewer and fewer patients have negative views regarding the overall quality of care they receive.

Introduction

Canadians have become increasingly concerned about lack of timely access to needed health services and the quality of that care.¹ These views have not gone unnoticed—health care policy-makers, administrators and clinicians are taking action to ensure that patients have more positive experiences with health services (see Learning from British Columbia’s Experiences with Health Care, below).

Quality of health care is a multi-faceted concept and measuring it requires an assessment from many different perspectives. Clinical quality and patient safety require valid and reliable measurements of the degree to which patients receive the care that experts recommend. Similarly, the degree to which care is patient-centred requires standardized and scientifically sound measurements of experiences. Patient-centred care has been identified as one of six* domains of quality. This domain focuses on “the patient’s experiences of illness and health care and on the systems that work or fail to work to meet individual patients’ needs”.²

Every day in BC, thousands of patients who suffer from life-threatening or severe illnesses and injuries receive care in emergency departments. Many people also use emergency departments as a regular source of care³ or when their regular medical doctor is not available.⁴ Not surprisingly, this is often true in many rural areas but it also occurs in urban communities where small groups of people frequently use emergency departments for issues such as mental health care.⁵ Whatever the reason they visit, patients have first-hand experiences that influence their views about overall quality of care in emergency departments.

LEARNING FROM BRITISH COLUMBIAN’S EXPERIENCES WITH HEALTH CARE

In 2003, the Deputy Minister of Health Services, other Ministry executives, and the Chief Executive Officers of the health authorities struck a steering committee to commission and oversee surveys of patients across BC to obtain information for quality improvement initiatives. In 2003, that BC Patient Satisfaction Steering Committee conducted its first survey to understand patient experiences with health care in emergency departments. Results were released in October 2004. Between 2003 and 2007, the steering committee surveyed patients who received other types of health care services and then health care workers used that information to improve services. In 2007, the spotlight was directed again toward patients’ understanding and reporting on the accessibility and quality of emergency department services. The Ministry of Health Services coordinated the public release of these results in January 2008.⁶

In 2008, the BC Patient Satisfaction steering committee requested that CHSPR conduct analyses of the 2007 survey of patient-reported experiences to identify opportunities to improve patient ratings of quality of care in emergency departments so that they could best target improvement initiatives in those areas. This report is the result.

* The other five domains of quality include: safety, effectiveness, timeliness, efficiency and equity.



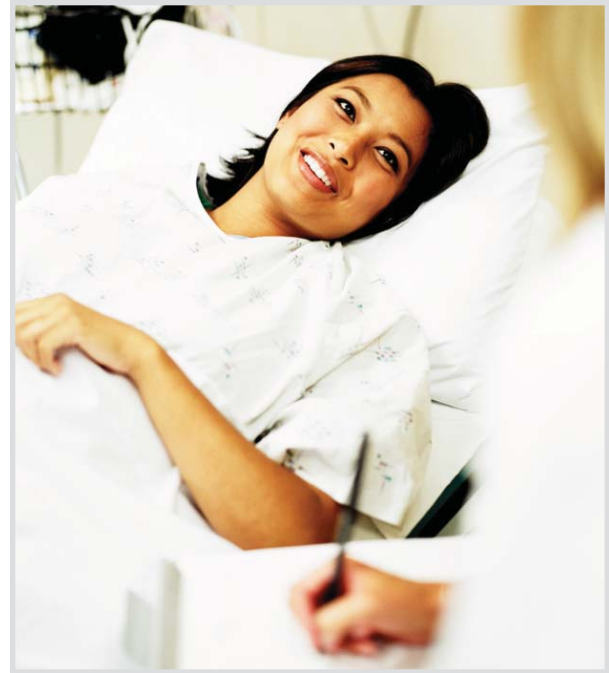
What did we do?

In order to identify factors that drive positive or negative patient ratings of the overall quality of care in emergency departments, we used results of a province-wide survey completed by more than 16,800 patients who visited one of 110 facilities in BC in 2007 (see About the Emergency Care Sector Survey, following page). We included data from the subset of survey respondents who completed 80 per cent or more of questions and also answered a question regarding overall quality of care. This cohort is not substantively different from all individuals who completed the survey. A detailed summary of the analyses methods is provided in Appendix A, a detailed list of all survey items used in these analyses is provided in Appendix B, and statistical findings are provided in Appendices C to G. All appendices are available at www.chspr.ubc.ca.

In addition to describing patients' overall assessments of the quality of their care, we used statistics to identify: **patient characteristics** (age, gender, ethnicity, etc.); their **presenting characteristics**, referring to the circumstances at the time of the visit (time of day, reason for visit, etc.); and their **care experiences**, referring to patient perceptions about the nature and process of their care (waiting, staff courtesy, how well staff work as a team, availability of nurses, etc.). All patient characteristics, presenting characteristics and care experiences are listed in Appendix B.

We first assessed the degree to which patient and presenting characteristics underlie patient ratings of overall quality of care. Then, we considered these factors in tandem with information on care experiences to determine: (a) which experiences most influence the likelihood that a patient will report positive or negative ratings of overall quality, (b) the magnitude of influence that care experiences have on positive or negative patient ratings and (c) the relative magnitude of influence of patient and presenting characteristics as well as experiences with care.

Finally, we illustrated the degree to which facilities and/or regions vary on the kind of care experiences that most



influence patient ratings of quality. Throughout the report we include graphics to illuminate the distribution of patient ratings across all response categories; select graphics include notations that summarize where there are statistically significant differences between facilities and/or regions after accounting for differences between patient characteristics and/or their presentation at emergency departments. This information is intended to provide a baseline against which future performance can be gauged.

There is variation across types of hospitals and health regions about patient views on overall quality and ratings on the factors that matter to them. We found that patients' characteristics (e.g. age, ethnicity) and their presentation at emergency departments (e.g. time of day, acuity) had some influence on their views about overall quality of care. Since patients from different types of hospitals and health regions differ in these characteristics, we used statistical methods to risk-adjust performance metrics. Importantly, we found that the rank order of highest and lowest performance across different types of hospitals and health regions remained unchanged even after sophisticated analysis was conducted to account

for differences in the characteristics of patients and their presentation at emergency departments. This is true for other measures profiled in this report (Appendix G).

In order to identify the factors that drive **positive patient ratings** we focused on the group of patients that reported that the overall quality of care they received in an emergency department was excellent (27% of respondents who completed the vast majority of survey questions). Then, we used statistical techniques to identify the factors and experiences that differentiate this group from patients who reported that the overall quality of care was very good, good, fair or poor (all remaining respondents).

To identify the factors that drive **negative patient ratings** of the overall quality of care, we used the same approach in reverse. That is, we identified the factors and experiences that differentiate the group of patients who reported fair or poor ratings of overall quality of care (16% of people who completed the vast majority of survey questions) from those that offered excellent, very good or good ratings (all remaining respondents). Because we found that patients who reported having pain rated their experiences differently than those who did not, we conducted special analyses of this group of patients.





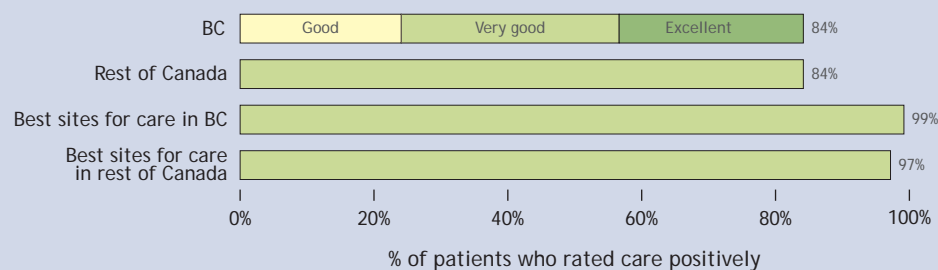
ABOUT THE EMERGENCY CARE SECTOR SURVEY

Between February 1 and April 30, 2007 thousands of people visited one of 110 emergency departments across BC. A stratified, random sample of patients who had scheduled or unscheduled visits were mailed an Emergency Care Sector Survey (n=55,613). Privacy officers for all health regions approved of this project and the Office of the Information and Privacy Commissioner was notified of this initiative. Over 16,800 individuals (32 per cent of delivered surveys) elected to complete the survey.

In January 2008, the Ministry of Health Services coordinated the public release of results of the survey as well as comparisons between BC and elsewhere in Canada. They determined that:

- The general health of patients who visit emergency departments is lower than that reported by the adult BC population. When asked to rate their general health, patients reported it to be excellent (16%), very good (29%), good (32%), fair (17%) or poor (6%). Patients were less likely to rate their general health as excellent or very good and more likely to rate their general health as good, fair or poor relative to other BC residents. In the month prior to visiting the emergency department, 45 per cent of patients reported that illness or injury kept them in bed for one or more days, with nine per cent reporting more than 10 days in bed.*
- Most patients reported that they have a regular family physician or general practitioner who they see when they have health problems (94%). Among the general population in BC, 89 per cent reported that they have a regular medical doctor.⁷
- Patients reported that the injury or illness that prompted them to go to the emergency department was extremely serious (12%), very serious (27%), moderately serious (38%), slightly serious (17%) or not at all serious (5%). The vast majority did not have an appointment for their most recent visit (93%).
- When asked to think about the overall emergency department services they received in 2007, a large majority of patients rated the quality of care as excellent, very good or good. This level of overall satisfaction with quality of care is virtually identical to that reported by patients in other provinces (Figure 1).

Figure 1» Overall ratings of quality of care in emergency departments in BC and elsewhere in Canada, 2007



* In this section, information from all survey respondents was used to derive estimates. In the rest of this report we used information from survey questionnaires that were 80 per cent complete. A detailed description of methods can be found in Appendix A.

Overall ratings of quality of care in emergency departments and the factors that underlie it

In 2007, the vast majority of patients in BC and in all health regions said that quality of care in emergency departments was excellent, very good or good.

Patients from Interior Health were more likely to report more positive ratings of overall quality of care than patients in Fraser, Vancouver Island or Northern health regions. Patients from Fraser Health were less likely to report more positive ratings of overall quality of care than in all other health regions (Figure 2). The values in Figure 2 represent actual performance ratings but notations have been made to identify where performance ratings differ significantly (from a statistical perspective) from other facilities and regions after accounting for differences in patients' predisposing and presenting characteristics.

Among those who said their overall quality of care was excellent (27%), the degree to which they considered staff to be courteous was the most important factor influencing their rating. Other things that mattered, but to a lesser extent, included: teamwork, comprehensiveness of services and availability of nurses. Among those who rated their overall quality of care as fair (11%) or poor (5%), staff courtesy was the most important influencing factor. Other things also mattered, but to a lesser extent: comprehensiveness of services, reporting too long a wait to see a doctor* and teamwork.

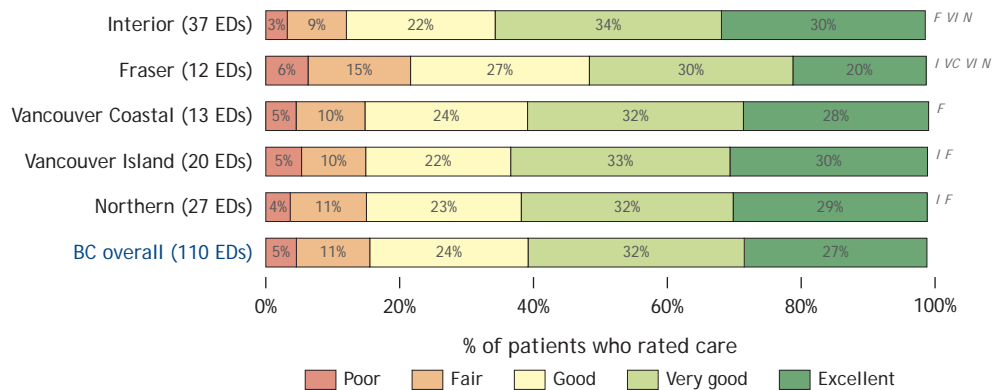
Prospectively, we conducted separate analyses to identify factors that drive positive or negative patient ratings of the overall quality of care (Appendix C and D, respectively). Why? We expected that different factors could underlie each experience so that health care professionals might need to do some things to promote positive patient ratings and other things to avoid negative ratings. In general, however, this is not the case. Importantly, the factors that drive positive patient ratings underlie negative ones. This suggests that the types of quality improvement efforts necessary to pursue high ratings of overall quality of care or to avoid negative ones are, essentially, the same.

While patients' characteristics (e.g. age, ethnicity) and their presentation at emergency departments (e.g. time of day, acuity) influence their views about overall quality of care, these characteristics had little power in predicting overall patient ratings of quality of care. More important, however, are issues within the scope of control of health care professionals, such as staff courtesy, teamwork, comprehensiveness of services, the length of wait for doctors and the availability of nurses. What is the strongest factor? The degree to which patients view staff as being courteous is the strongest factor influencing their ratings of overall quality of care (Appendix C and D). Quality improvement efforts targeted at these areas, therefore, are most likely to influence patient ratings of overall quality of care in emergency departments.

* This is the patients' view on the length of their wait for doctors, not the length of wait for nurses or the overall time in emergency departments.



Figure 2» Overall ratings of quality of care in emergency departments, by health region in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between regions ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. I=different from Interior; F=Fraser; VC=Vancouver Coastal; VI=Vancouver Island; N=Northern.

ED counts do not add to 110 because the ED administered by the Provincial Health Services Authority is not included in a region. Patient ratings from that facility are included in the BC overall (n=110) patient ratings.

In 2007, the vast majority of patients in BC and in all health regions said that quality of care in emergency departments was excellent, very good or good.

Improve quality by focusing on care experiences that underlie overall ratings of quality

In this section, we take a close look at the factors that most profoundly influence patient ratings of quality—factors that both matter to patients and are amenable to being influenced, managed and improved by system leaders and practitioners. We created graphics to illustrate variation across types of facilities and health regions so that health care professionals can see how their patients rate the factors most associated with overall quality of care. Then, we profile the care experiences of patients who rated their quality as excellent; in order to identify what health care professionals do well and should continue to do.

Importantly, the values in these figures represent actual performance ratings for the purposes of baseline measurement, but notations have been made to identify where performance ratings differ significantly (from a statistical perspective) from other facilities and regions after accounting for differences in patients' predisposing and presenting characteristics.

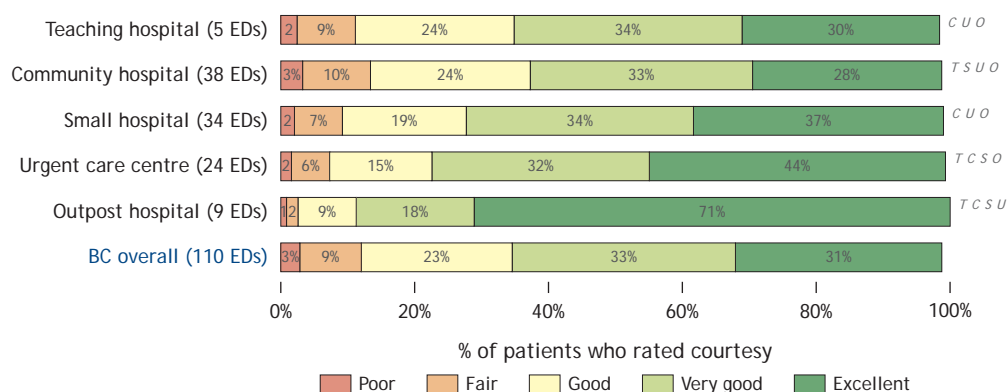
Patient experiences with staff courtesy

The degree to which patients rate staff as being courteous is among the most important issues vis-à-vis positive or negative ratings of overall quality of care in emergency departments. In order to assist health care workers to see where they are doing well and identify areas for improvement, Figures 3 and 4 offer a baseline against which future performance can be gauged.

Figures 3 and 4 illustrate that the vast majority of patients in BC and across types of hospitals and health regions offer positive ratings of staff courtesy. Additionally, both before and after accounting for differences in patients' predisposition and their presentation at emergency departments, patients rate staff courtesy at outpost hospitals the highest and rate staff courtesy at community hospitals the lowest. Patients in Interior Health report the highest ratings of staff courtesy and those in Fraser Health report the lowest.

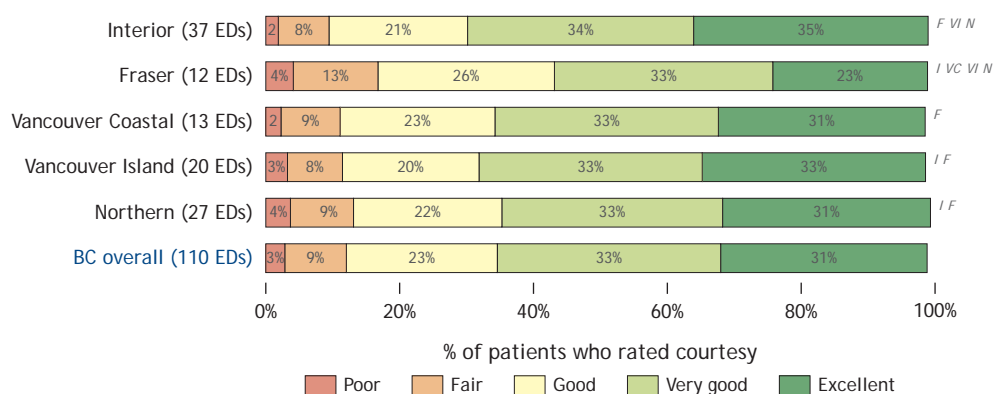


Figure 3» Patient ratings of staff courtesy in emergency departments, by type of hospital in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between facility types ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. T=different from Teaching hospital; C=Community; S=Small; U=Urgent; O=Outpost.

Figure 4» Patient ratings of staff courtesy in emergency departments, by health region in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between regions ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. I=different from Interior; F=Fraser; VC=Vancouver Coastal; VI=Vancouver Island; N=Northern.

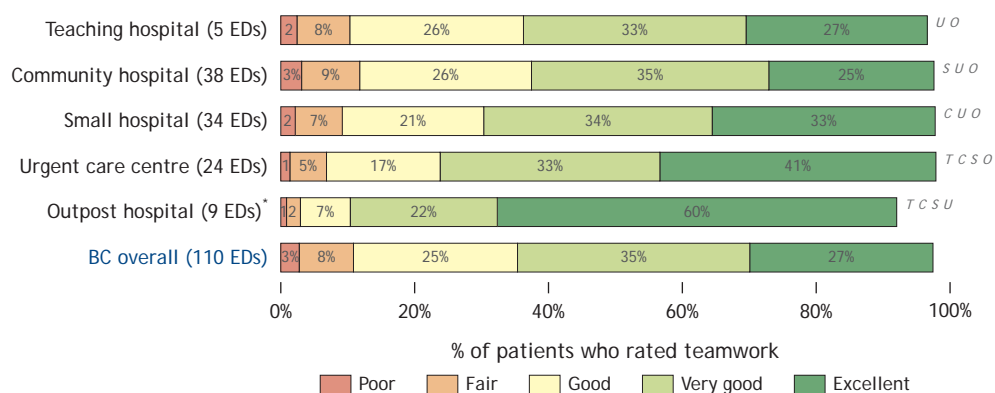
ED counts do not add to 110 because the ED administered by the Provincial Health Services Authority is not included in a region. Patient ratings from that facility are included in the BC overall (n=110) patient ratings.

Patient experiences with teamwork

The degree to which patients rate how well doctors and nurses work together (i.e. teamwork) drives positive and negative ratings of overall quality of care in emergency departments. In order to assist health care workers to see where they are doing well and identify areas for improvement, Figures 5 and 6 offer a baseline against which future performance can be gauged.

Figures 5 and 6 illustrate that the vast majority of patients in BC and across types of hospitals and health regions offer positive ratings of teamwork. Additionally, both before and after accounting for differences in patients' predisposition and presentation at emergency departments, patients rate staff teamwork at outpost hospitals the highest and teamwork at teaching and community hospitals the lowest. Patients in Fraser Health rate staff teamwork the lowest while those in all other regions report similar ratings.

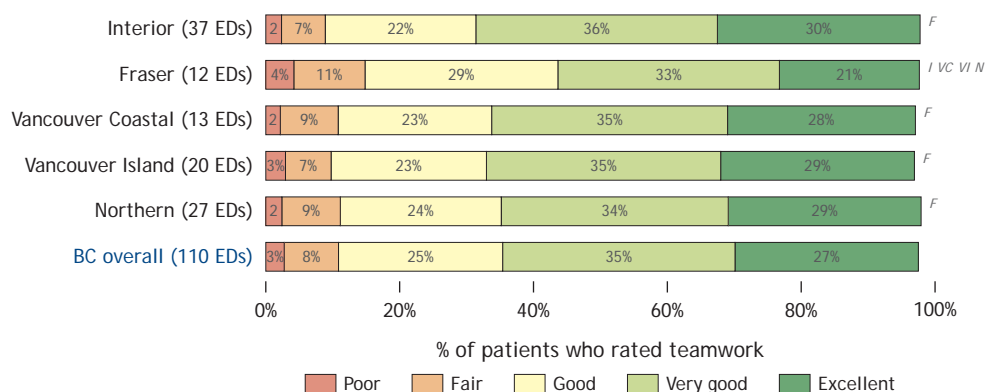
Figure 5» Patient ratings of the degree to which doctors and nurses work together in emergency departments, by type of hospital in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between facility types ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. T=different from Teaching hospital; C=Community; S=Small; U=Urgent; O=Outpost.

* Total doesn't add to 100% as many respondents didn't answer this question. It could be that these patients did not see a doctor when they visited the emergency department at an outpost hospital.

Figure 6» Patient ratings of the degree to which doctors and nurses work together in emergency departments, by health region in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between regions ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. I=different from Interior; F=Fraser; VC=Vancouver Coastal; VI=Vancouver Island; N=Northern.

ED counts do not add to 110 because the ED administered by the Provincial Health Services Authority is not included in a region. Patient ratings from that facility are included in the BC overall (n=110) patient ratings.

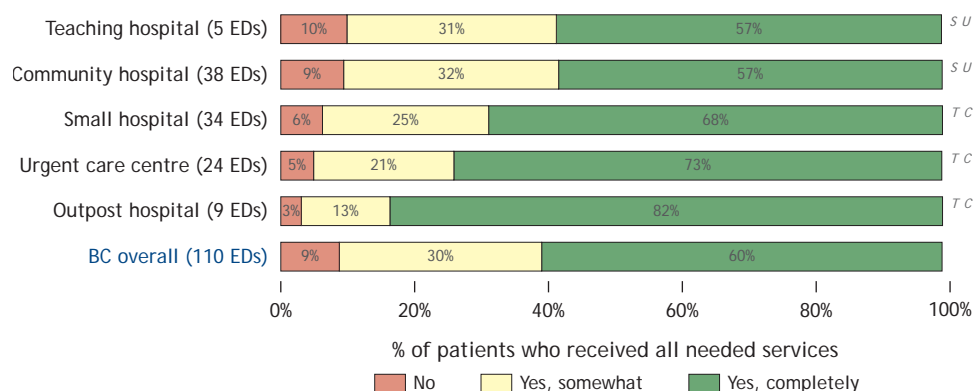


Patient experiences with comprehensive services

The degree to which patients indicate that they received all the services they needed drives their positive and negative ratings of overall quality of care in emergency departments. In order to assist health care workers to see where they are doing well and identify areas for improvement, Figures 7 and 8 offer a baseline against which future performance can be gauged.

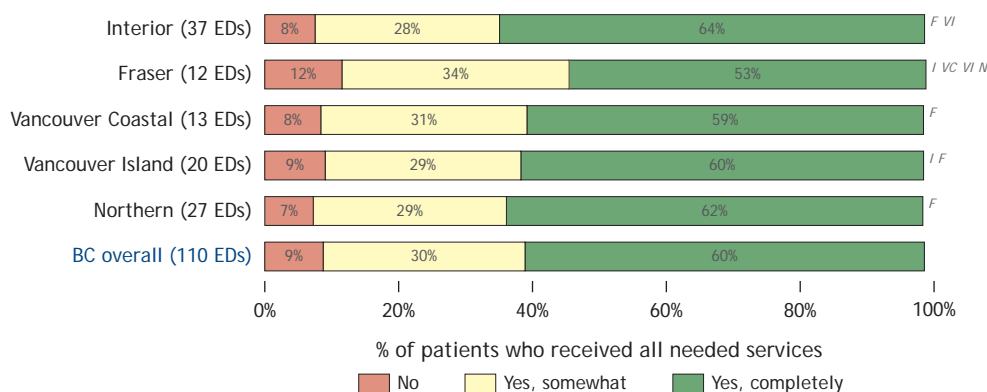
Figures 7 and 8 illustrate that the vast majority of patients in BC and across types of hospitals and health regions offer positive ratings of comprehensiveness of services. Additionally, both before and after accounting for differences in patients' predisposition and their presentation at emergency departments, patients rate comprehensiveness of services at outpost hospitals the highest and rate comprehensiveness of services at teaching and community hospitals the lowest. Patients in Interior Health report the highest ratings and those in Fraser Health report the lowest.

Figure 7» Patient ratings of the degree to which they received all the services they needed when they visited an emergency department, by type of hospital in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between facility types ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. T=different from Teaching hospital; C=Community; S=Small; U=Urgent; O=Outpost.

Figure 8» Patient ratings of the degree to which they received all the services they needed when they visited an emergency department, by health region in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between regions ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. I=different from Interior; F=Fraser; VC=Vancouver Coastal; VI=Vancouver Island; N=Northern.

ED counts do not add to 110 because the ED administered by the Provincial Health Services Authority is not included in a region. Patient ratings from that facility are included in the BC overall (n=110) patient ratings.

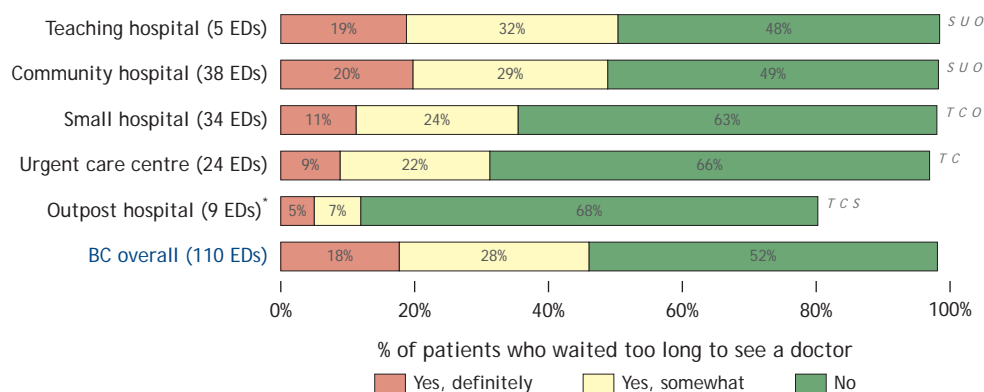
Patient experiences with waiting too long to see a doctor

The degree to which patients report that they waited too long to see an emergency department doctor drives their negative ratings of overall quality of care. Given recent policy initiatives to reduce wait times in emergency departments across BC and elsewhere in Canada, we also attempted to better understand issues related to patient views on ‘waiting too long’ to see a doctor (See A Closer Look: How Long is Too Long to Wait for a Doctor in an Emergency Department? on the following page).

In order to assist health care workers to see where they are doing well and identify areas for improvement,

Figures 9 and 10 offer a baseline against which future performance can be gauged. Figure 9 illustrates that that the majority of patients in BC and across types of hospitals and health regions offer positive ratings of wait times. Additionally, both before and after accounting for differences in patients’ predisposition and presentation at emergency departments, more patients at teaching and community hospitals report that they waited too long to see a doctor than those at small, urgent care or outpost hospitals. Figure 10 illustrates that before and after accounting for differences in patients’ predisposition and presentation at emergency departments, significantly more in Fraser Health report that they waited too long to see a doctor than those in other health regions.

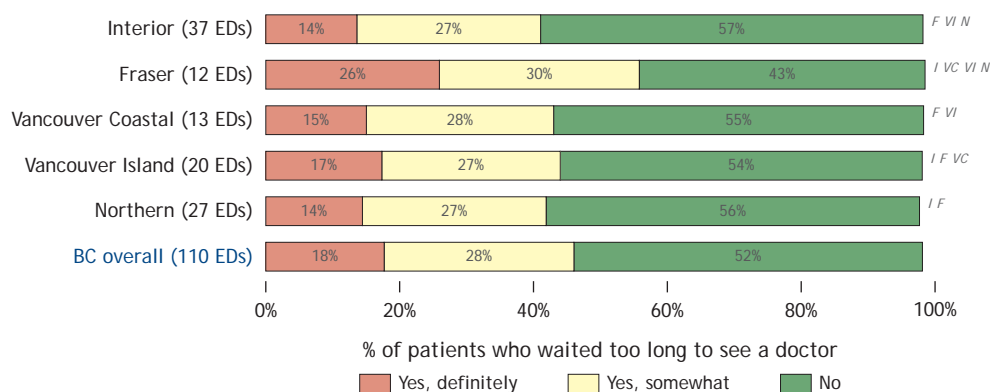
Figure 9» Patients’ assessments about the degree to which they waited too long to see a doctor when they visited an emergency department, by type of hospital in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between facility types ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. T=different from Teaching hospital; C=Community; S=Small; U=Urgent; O=Outpost.

* Total doesn't add to 100% as many respondents didn't answer this question. It could be that these patients did not see a doctor when they visited the emergency department at an outpost hospital.

Figure 10» Patients’ assessments about the degree to which they waited too long to see a doctor when they visited an emergency department, by health region in 2007



The distribution of patient ratings have not been standardized, but letters indicate significant differences between regions ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. I=different from Interior; F=Fraser; VC=Vancouver Coastal; VI=Vancouver Island; N=Northern.

ED counts do not add to 110 because the ED administered by the Provincial Health Services Authority is not included in a region. Patient ratings from that facility are included in the BC overall (n=110) patient ratings.



A CLOSER LOOK: HOW LONG IS TOO LONG TO WAIT FOR A DOCTOR IN AN EMERGENCY DEPARTMENT?

What is it about patients' emergency department experience that makes them feel their wait to see the doctor was too long? Is it the amount of time they waited, or do other experiences in the emergency department plus their predisposing or presentation characteristics contribute to their view that the wait was too long? We found that after accounting for patients' predisposition and characteristics of their presentation to emergency departments, the issue most highly associated with their view that the wait to see a doctor was definitely too long was—not surprisingly—the time they waited to see a doctor. Other types of experiences that underlie patient views on waiting too long are, in rank order, the availability of nurses, not getting help when needed, and waiting too long for test results (Appendix E).

Additional analyses suggest that most patients prefer a wait of less than half an hour but are tolerant of waits between half an hour and two hours. However, the overwhelming majority of patients (96%) who waited more than two hours report that their wait was definitely/somewhat too long. More specifically, among the people who did not wait or waited less than half an hour to see a doctor, the vast majority felt that the wait was not too long (90% and 80% respectively). Among patients who waited between half an hour and one hour, 40 per cent felt the wait was not too long, 47 per cent felt the wait was somewhat long and 13 per cent felt it was definitely too long. Among those who waited from one to two hours, 15 per cent felt the wait was not too long, 51 per cent felt the wait was somewhat too long, and 35 per cent felt the wait was definitely too long. Finally, among those who waited more than two hours, 71 per cent felt the wait was definitely too long, 25 per cent felt the wait was somewhat too long, and the remaining four per cent felt the wait was not too long (Appendix F).

A closer look at patients who experience pain reinforces the finding that most patients in pain prefer a wait of less than half an hour but become less tolerant of waits between half an hour and two hours. More specifically, among the people who did not wait or waited less than half an hour to see a doctor, four to five per cent said the wait was “definitely too long”. The same is true whether or not the patient reported experiencing pain in the emergency department. Among patients who waited between half an hour and one hour, a minority felt the wait was “definitely too long”. That is, 12 per cent of those with no pain, 13 per cent of those with moderate/mild pain and 16 percent of those with severe pain felt the wait was “definitely” too long. Among those who waited from one to two hours, 43 per cent of those in severe pain felt the wait was “definitely too long”. In comparison, 28 per cent those in no pain felt similarly. Finally, among those who waited more than two hours, 77 percent of those in severe pain felt the wait was “definitely too long” with 70 per cent of those in moderate/mild pain feeling the same and 66% of those in no pain feeling the same (Table 1).

Table 1» Per cent of patients who said the wait for doctor was “definitely too long”, by pain level and length of wait time for a doctor in 2007

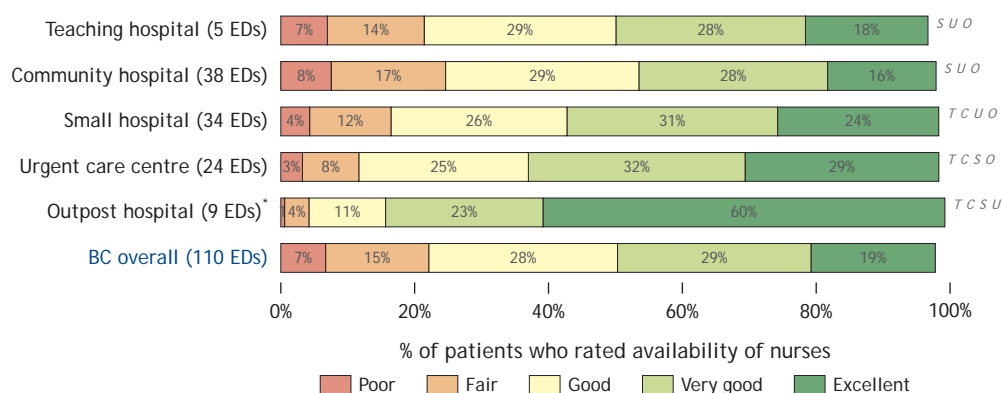
	Wait time for a doctor was “definitely too long”			
	< 30 minutes	30–60 minutes	1–2 hours	2+ hours
Severe pain	5%	16%	43%	77%
Moderate/mild pain	5%	13%	34%	70%
No pain	4%	12%	28%	66%

Patient experiences with availability of nurses

The degree to which patients rate the availability of nurses drives their positive ratings of overall quality of care. In order to assist health care workers to see where they are doing well and identify areas for improvement, Figures 11 and 12 offer a baseline against which future performance can be gauged.

Figures 11 and 12 illustrate that the majority of patients in BC and across types of hospitals and health regions offer positive ratings regarding the availability of nurses. Additionally, both before and after accounting for differences in patients' predisposition and presentation at emergency departments, patients rate the availability of nurses at outpost hospitals the highest and rate the availability of nurses at teaching and community hospitals the lowest. Patients in Fraser Health offer the lowest ratings of availability and those in Interior Health offer the highest. Patients in all other health regions offer similar ratings.

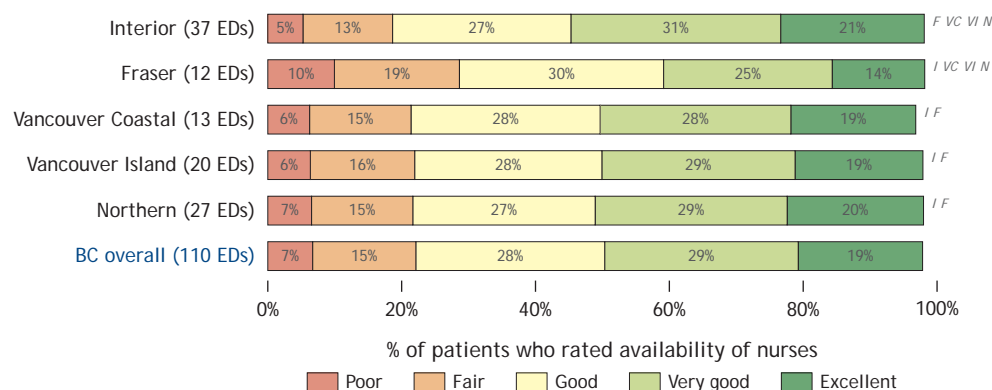
Figure 11» Patients' assessments of the availability of nurses when they visited an emergency department, by type of hospital in 2007*



The distribution of patient ratings have not been standardized, but letters indicate significant differences between facility types ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. T=different from Teaching hospital; C=Community; S=Small; U=Urgent; O=Outpost.

* Many outpost hospitals are principally or solely staffed by nurses.

Figure 12» Patients' assessments of the availability of nurses when they visited an emergency department, by health region in 2007*



The distribution of patient ratings have not been standardized, but letters indicate significant differences between regions ($p < .005$) after standardizing for differences in the predisposition of patients and their presentation at EDs. I=different from Interior; F=Fraser; VC=Vancouver Coastal; VI=Vancouver Island; N=Northern.

ED counts do not add to 110 because the ED administered by the Provincial Health Services Authority is not included in a region. Patient ratings from that facility are included in the BC overall (n=110) patient ratings.

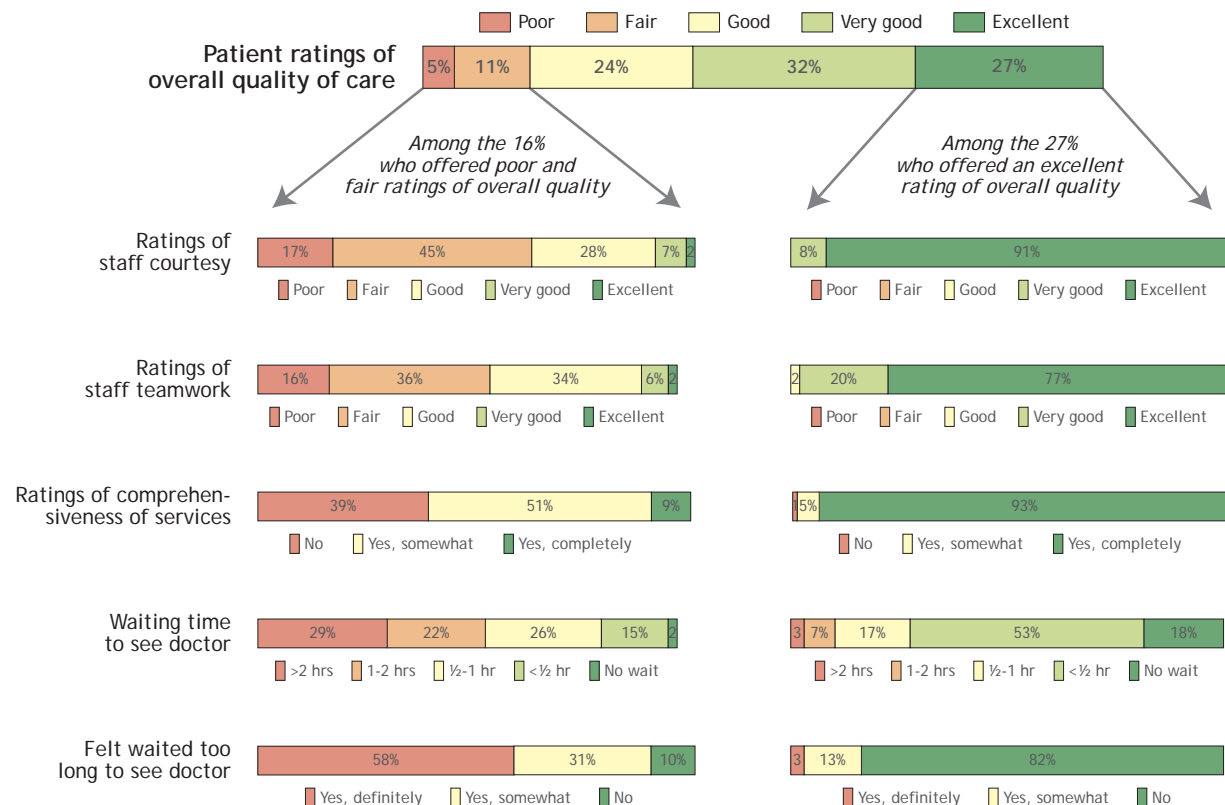


Improve quality by emulating care experiences of patients who rated their quality as excellent

In 2007, almost all patients in BC who said overall quality of care was excellent (27%) also rated staff courtesy as excellent (91%) or very good (8%). Similarly, almost all of these patients rated teamwork as excellent (77%) or very good (20%).

services they needed (98%). Few waited more than two hours for a doctor (3%) though some said their wait was too long (16%). When health care professionals do well on factors that underlie these ratings, then patients offer high ratings of overall quality of care (Figure 13).

Figure 13» A closer look at patients' care experiences among those that offer positive or negative ratings of overall quality of care received in an emergency department in 2007



This story is similar across health regions and illustrates the degree to which these factors underlie positive ratings.

- In the Interior Health region, almost all patients who said overall quality of care was excellent (30%) also rated staff courtesy as excellent (93%) or very good (6%). Similarly, almost all of these patients rated teamwork as excellent (78%) or very good (19%). Virtually all of these patients said they received all the services they needed (98%). Few waited more than two hours for a doctor (2%), though some said their wait was too long (14%).
- In the Vancouver Island Health region, almost all patients who said overall quality of care was excellent (30%) also rated staff courtesy as excellent (91%) or very good (7%). Similarly, almost all of these patients rated teamwork as excellent (76%) or very good (20%). Virtually all of these patients said they received all the services they needed (98%). Few waited more than two hours for a doctor (4%) though some said their wait was too long (17%).
- In the Northern Health region, almost all patients who said overall quality of care was excellent (29%) also rated staff courtesy as excellent (90%) or very good (9%). Similarly, almost all of these patients rated teamwork as excellent (80%) or very good (18%). Virtually all of these patients said they received all the services they needed (99%). Few waited more than two hours for a doctor (2%) though some said their wait was too long (18%).
- In the Vancouver Coastal Health region, almost all patients who said overall quality of care was excellent (28%) also rated staff courtesy as excellent (91%) or very good (8%). Similarly, almost all of these patients rated teamwork as excellent (79%) or very good (19%). Virtually all of these patients said they received all the services they needed (97%). Few waited more than two hours for a doctor (1%) though some said their wait was too long (13%).
- In Fraser Health region, almost all patients who said overall quality of care was excellent (20%) also rated staff courtesy as excellent (87%) or very good (11%). Similarly, almost all of these patients rated teamwork as excellent (73%) or very good (25%). Virtually all of these patients said they received all the services they needed (98%). Few waited more than two hours for a doctor (4%) though some said their wait was too long (20%).



Improve quality by addressing factors that underlie negative experiences to prevent similar experiences in the future

In 2007, a minority of patients in BC (16%) said that overall quality of care they received in an emergency department was fair or poor. The key factors underlying those ratings were staff courtesy, teamwork, comprehensiveness of services and waiting too long for doctors. Among these individuals, a majority offer negative ratings of staff courtesy (62%) and teamwork (53%). Four in 10 said they did not get all the services they needed (39%). One-third waited more than two hours for a doctor (29%). The vast majority said their wait was too long (89%). Clearly, when health care professionals do poorly in the areas that matter to overall ratings of quality, patients are very likely to offer negative ratings of overall quality of the care they receive in emergency departments (Figure 13).

This story is similar across health regions and illustrates the degree to which these factors underlie negative ratings and differ between patients who offer positive and negative views on overall quality of care in emergency departments.

- In the Interior Health region, 12% of patients offer negative ratings of overall quality of care. Many of these patients offer negative ratings of staff courtesy (59%) and teamwork (51%). Some of these patients said they did not get all the services they needed (39%). One-quarter waited more than two hours for a doctor (26%). Nine in 10 said their wait was too long (89%).
- In the Vancouver Island Health region, 15% of patients offer negative ratings of overall quality of care. Many of these patients offer negative ratings of staff courtesy (62%) and teamwork (50%). Some of these patients said they did not get all the services they needed (44%). One-third waited more than two hours for a doctor (32%). Nine in 10 said their wait was too long (87%).
- In the Northern Health region, 15% of patients offer

negative ratings of overall quality of care. Many of these patients offer negative ratings of staff courtesy (66%) and teamwork (55%). Some of these patients said they did not get all the services they needed (34%). One-fifth waited more than two hours for a doctor (21%). Eight in 10 said their wait was too long (84%).

- In the Vancouver Coastal Health region, 15% of patients offer negative ratings of overall quality of care. Many of these patients offer negative ratings of staff courtesy (61%) and teamwork (55%). Some of these patients said they did not get all the services they needed (40%). One-quarter waited more than two hours for a doctor (25%). Almost nine in 10 said their wait was too long (87%).
- In Fraser Health region, 22% of patients offer negative ratings of overall quality of care. Many of these patients offer negative ratings of staff courtesy (65%) and teamwork (55%). Some of these patients said they did not get all the services they needed (39%). Four in 10 waited more than two hours for a doctor (37%). Nine in 10 said their wait was too long (93%). Due to the high number of people who indicated that they waited too long, we conducted analyses similar to that outlined in Appendix C and D to identify factors among patients in Fraser Health that underlie their positive or negative ratings regarding overall quality. We suspected, prospectively, that waiting too long may jump to the top of the queue in terms of priority. But the resultant analysis indicated that staff courtesy remained the key driver underlying positive and negative ratings in Fraser Health.

One patient characteristic stands out in analyses of factors that underlie negative patient ratings. The more pain patients experience, the more likely they are to rate overall quality of care negatively. Patients who said they were in severe or moderate/mild pain represent the majority

(74%) of all patients that offer negative ratings of overall quality of care. One in five patients in severe pain (20%) offer negative ratings of staff courtesy and one-quarter offer negative ratings of overall quality of care (24%). Patients in severe pain are twice as likely to offer negative ratings and patients in moderate/mild pain are, in turn, 1.4 times as likely as those in no pain to report negative overall ratings of quality of care. When patients experience pain in emergency departments and, then view staff as not being courteous they are more likely to rate overall quality of care negatively (See Appendix D). Thus, one strategy to shrink the number of patients who hold negative views of overall quality in emergency departments is to target efforts toward those patients who experience pain.



Conclusions

Every day thousands of British Columbians receive care in emergency departments. Their experiences with that care matters to them and their families, as well as to others who want to learn about their first-hand experiences with our health care system. While expert clinicians can best judge the degree to which patients receive high quality clinical services, patients are best placed to judge the degree to which services are patient-centred.

Perhaps the most important finding of this work is that we now know that the degree to which staff are courteous, particularly to patients in pain, is the key driver of patient ratings of overall quality of care in emergency departments.

Indeed, staff courtesy is the single greatest influence on the likelihood that patients will report positive overall ratings of quality of care.

Teamwork, comprehensive services, wait times to see a doctor, views on the reasonableness of that wait and availability of nurses matter also but not as much as the courteousness of staff.



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APPENDIX A

Survey methods and statistical analyses

Under the direction of the Deputy Minister of Health Services and Chief Executive Officers of the health authorities of British Columbia (BC), a Patient Satisfaction Steering Committee has undertaken to learn and share information about the experiences that BC residents have with health care they receive in the province. In 2006 and 2007, that Steering Committee oversaw the implementation of a patient experiences survey—the Emergency Care Sector Survey under a contract with NRC+Picker (www.nrcpicker.com). This report describes a secondary analysis of this survey data.

Study participants, sampling and sample weights

The Steering Committee established and implemented a strategy to ensure a representative sample size was obtained from all participating emergency departments. Patients were randomly selected to participate, with the sample drawn from the records of patient visits at the facility level. Different sampling fractions were used for youth (ages 12 to 19) versus non-youth (less than 12 years and older than 19 years) due to the need for a different survey technique for these two populations. Different sampling strategies were used for facilities depending on their size (extra small, small, medium and large) to ensure large enough sample sizes from each.*

Patients were excluded from the survey if they had no fixed address, were infants up to 10 days old, had experienced a miscarriage or therapeutic abortion, were flagged as “do not announce” or a similar designation, or were deceased in hospital. Where possible, patients presenting with sensitive issues were also excluded, such as those

that presented with a confirmed or suspected sexual abuse and/or domestic violence, or patients who died after discharge from hospital.

Patients between the ages of 12 and 19 years (termed “youth”) were included in the study. Youth were sampled separately and mailed surveys in unmarked envelopes; that is, with no health authority or facility logo showing to mitigate privacy concerns of including this population. Mailing of surveys to youth in unmarked envelopes was undertaken as a risk mitigation strategy and was approved by both the Office of the Information and Privacy Commissioner and the Provincial Information, Privacy and Security Working Group.

Surveys with accompanying cover letters and return envelopes were mailed by NRC+Picker to patients’ home addresses starting February 22, 2007. A reminder letter and survey were sent 24 days later to those who had not yet responded. The mailed survey was in English but Chinese, Punjabi and French versions were available by calling a 1-866 number. A web based response option was also offered via a unique access code.

Weights were calculated so that mailed surveys would be representative of the province as a whole. The weights adjust for the differing sampling fractions between youth and non-youth and different sampling fractions among facilities. These weights have been applied in all analyses unless otherwise noted. Post-stratification weighting has not been done to adjust for the age/sex differences between, for example, those who were mailed surveys and those who responded.

* Due to a sampling error only a subset of the patient population for St. Paul’s Hospital (SPH) was selected to receive a survey. By the time this error was discovered it was too late to re-survey a correct sample and using the returned surveys from the incorrect sample would not provide results from a representative population. Fortunately, SPH had undertaken a survey of its emergency patient population aged 20+ years that had made visits from April through September 2006 using the same survey tool and vendor. SPH is a major source of emergency department care, so it was deemed important to include data for SPH in the analyses. Thus, although the time frame was slightly different, the 2006 responses have been used in place of the 2007 responses for SPH. These data are weighted to reflect SPH’s 2007 volumes within the province.



Survey instrument

The Emergency Care Sector Survey (ECSS) has, as its core content, questions developed and widely used in the United States. The American version was modified and tested in Canada in 2002 and field testing included three BC hospital emergency departments.* It has also been used in New Brunswick (n=353), Nova Scotia (n=4,164), Manitoba (n=385), Ontario (n=106,098) and Yukon (n=490).

The survey comes from a family of questionnaires initially developed by the Picker Institute in Boston. The Picker Institute developed a suite of questionnaires to understand the patient's experiences with health care and not just their satisfaction with it. That is, patients are asked to report on whether something good (or bad) happened or not, or to give an evaluation of some aspect of care.⁶

The survey is a 66-item questionnaire, covering six dimensions of quality (access and coordination of care, respect for patient preferences, emotional support, information and education, continuity and transition and physical comfort), as well as demographics, health status questions, and other questions such as reason for and seriousness of visit. Survey responses were linked with select administrative data such as age and gender, Canadian Triage Acuity Score (CTAS)** and time and date of visit. Emergency department facilities were grouped according to type, size, and location.

Response rates***

The overall response rate to the survey was 32% (n=16,837); this varied from 28% to 38% across health authorities in the province. The age and gender structure of respondents differed from the population who were mailed surveys. The sample of respondents included in

this report is slightly biased toward women and substantially biased toward older persons.⁶ Among completed surveys, 78% were done by the patient and 17% by someone else. Five percent did not respond to this question.

Completeness of data***

Among returned surveys, the completeness of survey questions, excluding questions within a skip pattern, ranged from 0% to 100%. Ninety-three per cent of surveys were over 80% complete, 4% were 50% to 80% complete, and a further 3% were less than 50% complete. To ensure robustness of results, only those surveys that were 80% or more complete were included in the analyses (n=15,619). A comparison of the distribution of key variables between all returned surveys and those that were 80% or more complete showed no substantial differences (Appendix B).

Statistical analyses

Figures 2 to 13 were created using responses from surveys that were 80% or more complete. The values in Figures 2 to 13 represent actual performance ratings for the purposes of baseline measurement, but notations have been made in figures 2 to 12 to identify where mean performance ratings are significantly different than other facilities and regions after accounting for differences in predisposing and presenting characteristics of the patients they serve. When making multiple comparisons between types of hospitals or health regions, a p value of 0.005 was used, rather than the 0.05 convention, to reflect a Bonferroni correction factor which is used in situations of multiple testing in order to maintain the overall level of Type I error at 95%. Figures by health region do not include Provincial Health Services Authority because it only has one emergency department, but patient ratings at that facility were included in the BC overall profiles.

* Validation of the Picker Emergency Care Survey in Canada, National Research Corporation, January 2003.

** Only 63% of weighted cases contained CTAS in the data. This varied by hospital type: CTAS was in the data for 74% of weighted cases in teaching hospitals, 63% in community hospitals, 54% in small hospitals, 57% in urgent care centres, and 0% in outpost hospitals.

*** Numbers and percents presented in this section are not weighted.

Patients who came to the emergency department because they had a scheduled appointment (1,047 respondents) were excluded from the following analyses in order to focus on a group of non-scheduled emergency patients. In addition, because the experience of patients who were in severe pain, moderate pain, mild pain or no pain was expected to be different, 198 respondents who indicated they had pain but did not indicate the severity were excluded. The final cohort used in the following analyses was further restricted to those respondents who answered the question on overall care in the Emergency Department and consisted of 14,207 respondents (weighted $n = 14,572$).

In order to focus attention on patients who have positive or negative views of their experiences in emergency departments, we selected two metrics or outcomes of interest for some of the analyses in this report, both based on the question: Overall, how would you rate the care you received in the Emergency Department? Potential answers were: Poor, Fair, Good, Very Good or Excellent.

Positive experience: adults who rate their experience in emergency department as excellent. This group represents 27% of all survey participants in the analyses.

Negative experience: adults who rate their experience in the emergency department as fair or poor. This group represents 16% of all survey participants in the analyses.

Independent variables were grouped into four categories:

- Predisposing (patient characteristics such as age, gender and general health),
- Presenting (visit characteristics such as day/time of

visit and reason for visit),

- Pain level (severe, moderate/mild or no pain/missing*), and
- Experience (system response such as wait for nurse and doctor and courtesy of nurses and doctors).

A full list of these variables can be found in Appendix B.

Categorizing the variables in this way allows us to determine separately (and combined) the influence each category has on patient experience.

Correlation matrices of variables within categories, and specific variables between categories were first examined as the variables were, potentially, highly correlated and as such could not be included simultaneously in multivariate regression models. Bivariate survey logistic regressions were performed between each independent variable and the two outcome variables.

To develop a parsimonious set of predisposing and presenting factors, variables within each category were entered into forward stepwise logistic regressions with the two outcome variables. Only those variables that entered into the models were retained for further analysis (reduced set). The reduced set of predisposing and presenting variables, as well as pain level, were then entered into a survey logistic procedure with the two outcome variables.

To determine which experience variables most influence patient rating of quality of care, a forward stepwise logistic regression was performed for the experience variables for each outcome after inclusion of the reduced set of pre-

* The layout of the skip pattern for the pain questions in the survey caused a high percent (10.6%) of respondents in our final cohort to not answer the question on if they had pain. (Respondents who had pain were instructed to go to the next question. The placement of that instruction was prior to the bubble to fill in for a 'no' response, making it logical to assume that a missing response was most likely a 'no pain' response.) If the respondent skipped the question on if they had pain but went on to fill out a severity level, they were classified as having pain with that severity level (0.8%). If, however, the respondent skipped the question on if they had pain and also skipped the question about severity level, they were grouped with the 'no pain' group (9.8%). When this group was analysed separately from the 'no pain' group in the logistic regressions, this group and the 'no pain' group had very similar odds ratios, supporting the decision to group them together. The small number of respondents (1.7%) who indicated they had no pain but also indicated a severity level were re-classified as having pain with that severity level.



disposing, presenting and pain variables. For the positive outcome a total of 18 variables entered sequentially, and for the negative outcome a total of 27 variables entered. After the first few steps, each addition variable added only marginal improvement to the fit or performance of the logistic regression as measured by the pseudo r^2 value, so variables that entered in the first four steps only are presented (between step 4 and step 5 the per cent increase in pseudo r^2 was 0.9% for the positive outcome and 1.3% for the negative outcome).

Because the results from the correlation matrix indicated that many of the experience variables are very highly correlated, and because it's useful to know the contribution of each experience variable separately from the others, five final models were created for each outcome variable. The first four final models were created for each outcome variable using survey logistic, with the reduced sets of predisposing and presenting variables and with one of the experience variables that had entered in the first four steps. The fifth final model for each outcome variable had the reduced sets of predisposing and presenting variables and all four of the experience variables that entered in the first four steps (See Appendix C and D).

Because pain level was expected to influence patient rating of experience, an interaction term was included between pain level and courtesy of ED staff in the final model for the negative outcome (See Appendix D).

Data were analyzed using SAS 9.1.3 survey procedures.

What is a pseudo r^2 value?

In linear regression models, r^2 is a standard measure of fit. It takes the values between 0 and 1, becomes larger as the model fits better and can be interpreted as the proportion of the total variability explained by the model. In logistic regression there is not an exact replica for r^2 , but there are several measures intended to mimic the r^2 measure of fit, often called a pseudo r^2 .^{*} The Cox and Snell r^2 used in this report is one such measure, and is a measure of the improvement of the full model over the intercept-only model. One

drawback with the Cox and Snell pseudo r^2 is that it cannot reach a maximum of 1, so that while the interpretation is not quite the same as an r^2 from a linear regression, it can be interpreted as an approximate measure of the amount of variance in the dependent variable accounted for by the model, with a higher value indicating better model fit.

What is an odds ratio?

An odds ratio is defined as the ratio of the odds of an event occurring in one group to the odds of it occurring in another group. It is perhaps best illustrated by an example. To take an example from the data, consider two groups of patients, those in pain and those not in pain, who are asked to rate overall quality of care. For those patients in pain, the odds of giving negative ratings of overall quality of care is estimated by:

$$\frac{\text{\# of patients in pain who gave negative ratings}}{\text{\# of patients in pain who gave other ratings}} = \frac{1,713}{7,236} = 0.237$$

The odds of patients not in pain giving negative ratings of overall quality of care is estimated by:

$$\frac{\text{\# of patients not in pain who gave negative ratings}}{\text{\# of patients not in pain who gave other ratings}} = \frac{589}{5,035} = 0.117$$

The relative chances of negative ratings in the two groups can be estimated by calculating the ratio of the pain and no pain odds, called an odds ratio:

$$OR = \frac{0.237}{0.117} = 2.03$$

The odds ratio indicates that patients in pain have twice the odds of rating overall quality as negative, compared to those patients not in pain (reference group). If the odds ratio were less than one, it would indicate that the group under consideration has lower odds of giving negative ratings as compared to the reference group, while an odds ratio of one would indicate that both groups are equally likely to give negative ratings.

What is an adjusted odds ratio?

An adjusted odds ratio is an odds ratio that is statistically adjusted (controlled) to account for contributions from other variables in the model.

^{*} It should be noted that different pseudo r^2 measures can arrive at very different values.

APPENDIX B

Survey results by predisposing characteristics, presenting characteristics and care experiences

	All returned surveys n=16,837 Weighted* n=16,850	80%+ complete data cohort n=15,619 Weighted* n=15,758
Predisposing characteristics		
Age		
0–12**	12.1%	12.5%
13–19	6.0%	6.2%
20–34	11.6%	12.1%
35–49	17.0%	17.2%
50–64	22.3%	22.5%
65–74	13.4%	13.3%
75+	17.6%	16.1%
Sex		
Female	53.6%	53.3%
Male**	46.3%	46.6%
Unknown/missing	0.1%	0.1%
Education		
Public school	12.5%	12.8%
High school	30.8%	31.8%
College, trade or technical school	25.9%	26.7%
University undergraduate	11.0%	11.4%
Post university/graduate education**	8.5%	8.7%
Missing	11.3%	8.6%
Self-reported ethnicity		
Aboriginal	3.4%	3.5%
Asian	7.6%	7.9%
Caucasian**	78.0%	79.9%
Other	4.3%	4.5%
Missing	6.7%	4.2%
Self-reported health status, in general		
Poor	5.70%	5.8%
Fair	16.2%	16.4%
Good	30.9%	31.6%
Very good	28.1%	29.2%
Excellent**	14.9%	15.5%
Missing	4.2%	1.5%
Do you have a regular family physician		
Yes**	90.4%	92.9%
No	6.0%	6.1%
Missing	3.5%	1.0%

Days in bed due to illness/injury, in past month		
None**	52.0%	53.4%
1–3 days	18.9%	19.7%
4–10 days	15.1%	15.5%
More than ten days	8.9%	9.1%
Missing	5.0%	2.2%

Patient in a hospital overnight or longer, in past 6 months		
No**	75.1%	77.3%
Yes, only one time	13.7%	14.0%
Yes, more than one time	6.9%	7.0%
Missing	4.3%	1.7%

Presenting characteristics		
Day/time of visit		
Weekday: 00:00–06:59	11.4%	11.4%
Weekday: 07:00–17:59	44.2%	44.0%
Weekday: 18:00–23:59	13.4%	13.5%
Weekend: 00:00–06:59	5.3%	5.3%
Weekend: 07:00–17:59	19.5%	19.7%
Weekend: 18:00–23:59**	6.1%	6.0%
Missing	0.1%	0.1%

Reason for visit***		
It clearly was an emergency	41.8%	43.6%
I was told to go by a health professional/BC Nurse Line	19.7%	20.4%
I didn't know if my health condition was an emergency or not**	15.6%	16.2%
There were no other options/didn't know where else to go	9.8%	10.2%
Other	4.7%	4.7%
Missing	8.3%	4.9%

Self-reported seriousness of injury/illness		
Extremely serious	11.0%	11.2%
Very serious	25.9%	26.9%
Moderately serious	36.1%	37.4%
Slightly serious	16.3%	16.8%
Not at all serious**	4.8%	4.8%
Missing	5.9%	3.0%

Canadian Acuity Triage Scale (administrative data)		
Level I – Resuscitation	0.2%	0.2%
Level II – Emergent	7.0%	7.0%
Level III – Urgent	26.0%	25.6%
Level IV – Less Urgent	24.3%	24.7%
Level V – Non Urgent**	5.3%	5.3%
Missing	37.2%	37.2%



In pain during encounter		
Severe pain	23.9%	24.7%
Mild/Moderate pain	33.8%	35.2%
No pain/missing**	40.7%	38.6%
Pain, did not indicate severity†	1.5%	1.4%

Experiences with care

Wait for nurse		
Right away**	29.0%	29.9%
15 minutes or less	33.5%	34.7%
More than 15 minutes	28.8%	29.6%
Don't know	4.2%	4.1%
Missing	4.5%	1.8%

Wait for doctor		
I did not wait at all**	8.6%	8.8%
Less than ½ hour	37.6%	39.3%
Between ½ hour and 1 hour	24.4%	25.5%
1 to 2 hours	13.5%	14.0%
More than 2 hours	9.7%	9.8%
Missing	6.3%	2.7%

Total time spent in ED		
Less than 1 hour**	13.1%	13.4%
Between 1 and 3 hours	36.7%	38.1%
Between 3 and 6 hours	24.9%	26.1%
Between 6 and 12 hours	12.9%	13.4%
More than 12 hours	6.3%	6.5%
Missing	6.0%	2.5%

Pain control		
Staff definitely did everything they could	31.5%	32.9%
Staff somewhat did everything they could	15.3%	16.0%
Staff did not do everything they could	10.5%	10.8%
Had pain, but unknown staff response	2.3%	2.1%
No pain**	27.5%	28.4%
Missing	12.9%	9.8%

Pain medication		
Not enough pain meds	4.2%	4.4%
Right amount of pain meds	26.4%	27.6%
Too much pain meds	0.6%	0.6%
Had pain, but did not get meds	24.9%	25.9%
Had pain, unknown meds	2.0%	1.7%
No pain**	28.7%	29.7%
Missing	13.3%	10.1%

Believed you/family member suffered personal injury or harm which resulted from a medical error or mistake		
Yes	2.3%	2.3%
No **	82.5%	86.0%
I don't know	5.9%	6.0%
Missing	9.3%	5.7%

Received all ED services needed		
Yes, completely**	57.2%	59.7%
Yes, somewhat	28.9%	30.2%
No	9.0%	8.7%
Missing	4.9%	1.4%

Courtesy of nurses		
Poor	2.8%	2.9%
Fair	7.9%	8.2%
Good	21.9%	22.7%
Very good	35.0%	36.3%
Excellent**	26.5%	27.7%
Missing	5.8%	2.3%

Courtesy of doctors		
Poor	2.4%	2.4%
Fair	6.4%	6.7%
Good	20.0%	20.7%
Very good	34.0%	35.2%
Excellent**	31.7%	33.1%
Missing	5.4%	1.9%

Courtesy of ED staff		
Poor	2.8%	2.8%
Fair	8.9%	9.2%
Good	21.7%	22.5%
Very good	32.1%	33.4%
Excellent**	29.4%	30.8%
Missing	5.1%	1.2%

How well doctors and nurses worked together		
Poor	2.7%	2.8%
Fair	7.8%	8.1%
Good	23.5%	24.5%
Very good	33.0%	34.7%
Excellent**	26.0%	27.4%
Missing	7.0%	2.5%

Was ED as clean as it should have been?		
Yes, definitely**	57.6%	60.1%
Yes, somewhat	27.8%	29.0%
No	8.4%	8.6%
Missing	6.2%	2.2%

Enough privacy during ED visit		
Yes, always**	57.2%	59.8%
Yes, sometimes	19.8%	20.7%
No	9.3%	9.5%
Doesn't apply	8.7%	9.0%
Missing	5.0%	0.9%

Times when did not get the help needed		
Yes, often	5.5%	5.5%
Yes, sometimes	17.0%	17.9%
No**	51.5%	53.6%
Did not need help	20.2%	21.1%
Missing	6.1%	2.0%

Availability of ED nurses		
Poor	6.6%	6.7%
Fair	14.9%	15.4%
Good	27.2%	28.2%
Very good	27.8%	28.9%
Excellent**	17.9%	18.6%
Missing	5.7%	2.3%

Waited too long to see ED doctor		
Yes, definitely	17.4%	17.7%
Yes, somewhat	27.3%	28.4%
No**	50.2%	52.1%
Missing	5.1%	1.8%

Waited too long to get ED test(s) completed		
Yes, definitely	6.3%	6.5%
Yes, somewhat	14.2%	14.7%
No**	44.1%	45.9%
Missing	35.4%	32.9%

Wait too long for other doctor/specialist		
Yes, definitely	4.7%	4.8%
Yes, somewhat	7.6%	7.9%
No**	19.3%	20.0%
No other doctor was needed	59.2%	62.1%
Missing	9.2%	5.2%

Particular doctor in charge of your care in the ED		
Yes**	69.6%	72.5%
Not sure	19.0%	19.3%
No	7.2%	7.1%
Missing	4.3%	1.1%

Confidence/trust in ED nurses		
Yes, always**	65.9%	68.7%
Yes, sometimes	23.8%	24.5%
No	4.9%	4.8%
Missing	5.4%	1.9%

Confidence/trust in ED doctors		
Yes, always**	67.3%	70.1%
Yes, sometimes	21.9%	22.7%
No	5.2%	5.2%
Missing	5.6%	1.9%

ED nurse discussed fears/anxieties		
Yes, completely**	25.0%	26.0%
Yes, somewhat	19.2%	19.9%
No	12.5%	12.7%
Did not have anxieties or fears	38.6%	40.1%
Missing	4.7%	1.2%

ED doctor discussed fears/anxieties		
Yes, completely**	36.3%	37.9%
Yes, somewhat	21.1%	21.9%
No	8.0%	8.1%
Did not have anxieties or fears	29.1%	30.4%
Missing	5.5%	1.7%

ED got messages to family/friends		
Yes**	12.2%	12.6%
No	8.7%	8.6%
I had no messages	74.5%	77.1%
Missing	4.7%	1.7%

Had enough say about ED care		
Yes, definitely**	56.1%	59.1%
Yes, somewhat	27.8%	29.1%
No	8.5%	8.7%
Missing	7.6%	3.1%

Treated with dignity/respect by ED staff		
Yes, always**	72.2%	75.4%
Yes, sometimes	17.1%	17.7%
No	5.8%	5.9%
Missing	5.0%	1.0%

ED nurses talked as if patient wasn't there		
Yes, often	3.9%	4.0%
Yes, sometimes	10.5%	10.8%
No**	80.2%	83.4%
Missing	5.3%	1.7%

ED doctors talked as if patient wasn't there		
Yes, often	3.8%	3.9%
Yes, sometimes	7.6%	7.7%
No**	82.8%	86.4%
Missing	5.7%	2.0%

ED nurses answered questions understandably		
Yes, always**	48.0%	49.8%
Yes, sometimes	20.9%	21.6%
No	4.6%	4.5%
Did not have any questions	22.3%	23.2%
Missing	4.2%	0.9%



ED doctors answered questions understandably		
Yes, always**	57.2%	59.8%
Yes, sometimes	20.1%	20.8%
No	5.0%	5.0%
Did not have any questions	12.2%	12.6%
Missing	5.5%	1.9%

ED admission answered questions		
Yes, completely**	51.1%	52.7%
Yes, somewhat	20.3%	20.7%
No	4.2%	4.3%
Did not have any questions	20.0%	20.6%
Missing	4.4%	1.7%

ED explained causes for problem understandably		
Yes, completely**	45.5%	47.9%
Yes, somewhat	23.7%	24.7%
No	8.7%	8.9%
Did not need explanation	16.4%	17.0%
Missing	5.8%	1.6%

ED explained test results understandably		
Yes, completely**	35.5%	37.2%
Yes, somewhat	14.5%	15.1%
No	11.5%	11.8%
Missing	38.5%	35.9%

Explained reason for ED wait		
Yes**	24.3%	25.1%
No	38.8%	40.1%
Did not have to wait	28.7%	29.8%
Missing	8.2%	5.0%

ED explained reasons for tests understandably		
Yes, completely**	38.2%	40.1%
Yes, somewhat	13.9%	14.3%
No	10.1%	10.4%
Missing	37.8%	35.2%

ED explained danger signals to watch for		
Yes, completely**	44.9%	47.2%
Yes, somewhat	22.0%	22.9%
No	24.7%	25.4%
Missing	8.4%	4.5%

Knew who to call with questions when left ED		
Yes**	59.0%	61.8%
No	17.4%	18.1%
Not sure	14.1%	14.7%
Missing	9.5%	5.4%

ED explained how to take new medications		
Yes, completely**	29.5%	31.0%
Yes, somewhat	6.9%	7.2%
No	7.2%	7.5%
Did not need explanation	42.4%	44.6%
Missing	13.9%	9.7%

ED explained medication side effects		
Yes, completely**	14.7%	15.5%
Yes, somewhat	7.3%	7.6%
No	17.4%	18.2%
Did not need explanation	46.3%	48.8%
Missing	14.3%	10.0%

Appt for treatment made before left ED		
Yes, with a new doctor or nurse**	10.5%	11.0%
Yes, with same doctor or nurse	6.0%	6.3%
No	29.5%	30.8%
Missing	53.9%	51.9%

Outcome variables		
Overall rating of care received		
Poor	4.7%	4.6%
Fair	10.6%	11.0%
Good	22.8%	23.6%
Very Good	30.9%	32.3%
Excellent	26.0%	27.3%
Missing	5.1%	1.3%

Positive patient ratings		
Poor/Fair/Good/Very Good	68.9%	71.5%
Excellent†	26.0%	27.3%
Missing	5.1%	1.3%

Negative patient ratings		
Good/Very Good/Excellent	79.7%	83.2%
Poor/Fair†	15.2%	15.5%
Missing	5.1%	1.3%

Facility-level groups		
Type of facility		
Teaching Hospital	16.9%	16.9%
Community Hospital	62.5%	62.7%
Small Hospital	14.7%	14.7%
Urgent Care Centre	5.4%	5.3%
Outpost Hospital	0.5%	0.4%

Health Authority		
Interior	25.5%	25.4%
Fraser	19.7%	19.9%
Vancouver Coastal	19.5%	19.6%
Vancouver Island	20.5%	20.1%
Northern	11.4%	11.4%
PHSA	3.5%	3.6%

Other		
Who responded to survey		
Patient	76.3%	78.4%
Someone else	18.5%	18.8%
Missing	5.2%	2.7%

Appointment [#]		
Yes	4.9%	5.0%
No	85.0%	88.2%
I do not know	1.4%	1.4%
Missing	8.7%	5.4%

* Weighted percents (for provincial-level report). Weights were calculated based on representativeness of full sample (N=55,613). (Representativeness of youth/non-youth within facilities (DTU/regular cases for St. Paul's Hospital); of facility volumes within HA volumes; and of HA volumes within the province.)

** Reference groups.

*** In the survey, respondents could choose more than one reason for their visit. For our analyses, respondents were assigned to one reason only in a hierarchical order, as shown in the table.

† Because the experience of patients who were in severe pain, moderate pain, mild pain or no pain was expected to be different, patients who indicated they had pain but did not indicate the severity were excluded from the final cohort.

‡ Dependent variables.

Patients who came to the emergency department because they had a scheduled appointment (n=1,047) were excluded from the final cohort in order to focus on a group of non-scheduled emergency patients.



APPENDIX C

Results of logistic regression statistical model to predict positive patient ratings of overall quality of care

In order to identify what underlies positive patient ratings of the overall quality of care in emergency departments, we used statistical methods to identify factors that are associated with the likelihood that a survey respondent would view overall quality as excellent (27 per cent of all people who completed the vast majority of survey questions).

Age, gender, ethnicity, education and general health status matter; but not that much

Older or male patients are more likely to rate overall quality of care in emergency departments positively. In fact, older adults (50+ years) are roughly two times more likely to report positive experiences compared to patients that are less than 12 years of age. Interestingly, teenagers and young adults (13 to 34 years) are least likely to report positive ratings.*

Aboriginal or Asian patients are less likely than Caucasian patients to report positive ratings of overall quality of care. Asian patients are the least likely to offer positive patient ratings.**

Patients who have high school education as their highest level of education are less likely than patients who have university and post university/graduate education to rate overall quality of care positively.***

The lower the overall health status of patients the less likely they are to rate overall quality of care positively. This is true whether health is measured on a five-point scale or by a count of the number of days spent in bed in the last month due to illness or injury.†

As a collection, these predisposing characteristics had relatively little power to predict positive patient ratings of overall quality of care.‡ When these factors are considered in tandem with presenting characteristics and with information on experiences in emergency departments, the only factor that remained important to predicting positive patient ratings was ethnicity. Therefore, predisposing characteristics such as age, gender, ethnicity and general health status influence positive patient ratings of overall quality of care but not to a great extent.

These findings suggest that factors above and beyond the predisposition of patients influence their views of overall quality of care in emergency departments.

Time of day, seriousness of illness, acuity and pain matter; but not that much

Patients who visit the emergency department between midnight and 7 a.m. are less likely to rate overall quality of care positively.§

* The adjusted odds ratio for teens and young adults was 0.80 and 0.88 ($p < .0001$), respectively. The reference group includes individuals less than 12 years. Odds ratios are adjusted for other predisposing characteristics.

** The adjusted odds ratio for Aboriginal relative to Caucasian patients is 0.79 and the adjusted odds ratio for Asian patients is 0.32 ($p < .0001$). Odds ratios are adjusted for other predisposing characteristics.

*** The adjusted odds ratio for high school relative to post university/graduate education is 0.82 ($p < .05$). Odds ratios are adjusted for other predisposing characteristics.

† The adjusted odds ratio for poor health status is 0.35 (reference group is excellent health status) ($p < .0001$). Odds ratios are adjusted for other predisposing characteristics.

‡ The pseudo r^2 value of the logistic regression model was 0.06.

The adjusted odds ratio for midnight until 7:00 am on a weekday is 0.87 and a weekend is 0.81 (reference group is weekend from 6:00 pm until midnight) ($p < .01$). Odds ratios are adjusted for predisposing and presenting characteristics.

Patients are more likely to rate overall quality of care positively if they perceive that the illness that brought them to the emergency department was extremely serious.* Patients are also more likely to rate overall quality of care positively if they have high acuity (clinician-assessed).**

The more pain patients experience, the less likely they are to rate overall quality of care positively. That is, patients who are in severe pain are less likely than those in moderate/mild pain to offer positive ratings. Patient who are in moderate/mild pain are, in turn, less likely than those in no pain to rate overall quality of care positively.***

As a collection of factors, these presenting characteristics had relatively little power to predict positive patient ratings of overall quality of care.† When these factors are considered in tandem with predisposing characteristics and with information on experiences in emergency departments, the only factor that remains important to predicting positive overall ratings of quality of care was patients' assessment of the seriousness of their illness or injury.

Therefore, presenting characteristics such as time of day, seriousness of illness (self-assessed), acuity (clinician-assessed) and pain underlie positive patient ratings of overall quality of care. However, they do not influence

ratings to a great extent. This finding suggests that factors other than patients' predisposition and their presentation at emergency departments influence their views of overall quality of care.

Teamwork and receipt of comprehensive care matter; but courtesy of emergency department staff matters most

The factor most strongly associated with positive ratings of overall quality of care is to what degree patients feel emergency department staff are courteous. In fact, patient ratings regarding staff courtesy have a very strong influence. When this factor is considered in tandem with patients' predisposing and presenting characteristics, no other experience in the emergency room matters as much.‡

Another experience that underlies positive patient ratings of overall quality of care is ratings of the degree to which doctors and nurses work together. In fact, patient ratings of teamwork influence their views of overall quality of care above and beyond the degree to which they see staff as being courteous.#

Two other factors influence positive patient ratings of overall quality of care: the degree to which patients report receiving all the services they needed## (i.e. compre-

* The adjusted odds ratio for extremely serious is 1.53 (reference group is 'not at all serious') ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.

** The adjusted odds ratio for CTAS level 1 – Resuscitation is 1.95 (reference group is 'non-urgent') ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.

*** The adjusted odds ratio for severe pain is 0.67 and the adjusted odds ratio for moderate/mild pain is 0.77 (reference group is no pain or no response to the survey question regarding pain) ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.

† The pseudo r^2 value for the logistic regression model was 0.07.

‡ The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.07. The inclusion of information on staff courtesy increased the pseudo r^2 value to 0.51 and the full forward stepwise logistic regression model had an pseudo r^2 value of 0.57 and included 18 types of survey items measuring experiences.

The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.07. The inclusion of information on teamwork increased the pseudo r^2 value to 0.42 and the full forward stepwise logistic regression model had a pseudo r^2 value of 0.57 and included 18 types of survey items measuring experiences.

The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.07. The inclusion of information on 'got all services needed' increased the pseudo r^2 value to 0.23.



hensive care) and their perception of the availability of nurses.* These factors are important but not as important as staff courtesy and teamwork.**

In summary, patient experiences in the emergency department influence their views of quality of care more

so than does their predisposition and their presentation at emergency departments. Specifically, patient experiences with staff courtesy and with teamwork are the two principal drivers of their positive ratings of overall quality of care in emergency departments, but receiving comprehensive care and the availability of nurses matters also.

Results of logistic regression statistical models for positive patient ratings of quality of care (27% of respondents). Cohort: 80% complete Emergency cohort (excludes appointments and pain level=unknown severity). Weighted n=14,572.

			Bivariate		Predisposing Reduced Set (r ² =0.0557)		Predisposing, Presenting and Pain (r ² =0.0702)		Predisposing, Presenting, Pain and Step 1 Experience variable (r ² =0.5062)		Predisposing, Presenting, Pain and Step 2 Experience variable (r ² =0.4198)		Predisposing, Presenting, Pain and Step 3 Experience variable (r ² =0.2286)		Predisposing, Presenting, Pain and Step 4 Experience variable (r ² =0.3363)		Predisposing, Presenting, Pain and Steps 1, 2, 3 and 4 Experience variable (r ² =0.5480)	
Variable	Wt N	%	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value
Predisposing																		
Age				<.0001		<.0001		<.0001		0.0047		<.0001		<.0001		<.0001		0.0806
0 to 12*	1,878	12.7																
13 to 19	947	6.4	0.79		0.80		0.85		1.02		0.92		1.01		1.00		1.19	
20 to 34	1,839	12.5	0.78		0.88		0.94		1.11		1.09		1.12		0.99		1.32	
35 to 49	2,556	17.3	1.09		1.38		1.46		1.48		1.58		1.44		1.43		1.61	
50 to 64	3,260	22.1	1.49		2.03		2.05		1.60		1.77		1.78		1.83		1.62	
65 to 74	1,924	13.0	1.55		2.27		2.21		1.74		1.74		1.76		1.90		1.62	
75 and older	2,346	15.9	1.20		1.88		1.79		1.55		1.79		1.53		1.65		1.66	
Sex				<.0001		<.0001		0.0004		0.1565		0.0814		0.0033		0.2029		0.4770
Missing	8	0.1	6.71		7.33		7.96		11.84		2.10		4.57		4.00		3.48	
Female	7,874	53.4	0.84		0.87		0.89		0.95		0.89		0.92		0.95		0.98	
Male*	6,869	46.6																
Education				0.0010		0.0452		0.0425		0.4789		0.2604		0.0302		0.0301		0.1426
Missing	1,247	8.5	0.76		0.87		0.85		0.85		0.84		0.78		0.86		0.69	
Public school	1,859	12.6	0.69		0.80		0.80		0.79		0.79		0.71		0.71		0.67	
High school	4,667	31.6	0.75		0.82		0.82		0.79		0.76		0.76		0.75		0.66	
College, trade or technical school	3,968	26.9	0.74		0.77		0.76		0.76		0.78		0.76		0.74		0.72	
University undergraduate	1,716	11.6	0.89		0.93		0.92		0.93		0.91		0.89		0.94		0.90	
Post university/graduate education*	1,294	8.8																
Self-reported ethnicity				<.0001		<.0001		<.0001		0.0358		<.0001		<.0001		<.0001		0.0463
Missing	623	4.2	0.84		0.91		0.89		1.23		1.09		1.06		0.90		1.35	
Aboriginal	494	3.4	0.64		0.79		0.78		0.98		0.82		1.01		0.89		1.08	
Asian	1,194	8.1	0.29		0.32		0.31		0.59		0.41		0.36		0.33		0.53	
Caucasian*	11,780	79.9																
Other	659	4.5	0.70		0.78		0.77		1.45		0.70		0.78		0.77		1.31	

* The pseudo r² value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.07.

The inclusion of information on 'availability of nurses' increased the pseudo r² value to 0.34.

** The pseudo r² value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.07.

The forward stepwise logistic regression model initially included staff courtesy (pseudo r² value of 0.51), then teamwork (pseudo r² value of 0.53), then 'got all services needed' (pseudo r² value of 0.541) and then 'availability of nurses' (pseudo r² value of 0.548).

Self-reported general health status				<.0001		<.0001		<.0001		0.0079		<.0001		<.0001		<.0001		0.0802
Missing	221	1.5	0.76		0.61		0.56		0.78		0.70		0.55		0.65		0.68	
Poor	848	5.7	0.51		0.35		0.33		0.61		0.55		0.38		0.48		0.77	
Fair	2,381	16.1	0.46		0.32		0.31		0.58		0.48		0.38		0.42		0.65	
Good	4,619	31.3	0.47		0.35		0.34		0.62		0.50		0.36		0.41		0.65	
Very Good	4,356	29.5	0.59		0.50		0.49		0.72		0.60		0.48		0.51		0.76	
Excellent*	2,325	15.8																
Days in bed due to illness/ injury, in past month				<.0001		0.1031		0.2851		0.2593		0.4845		0.6270		0.2347		0.3268
Missing	305	2.1	0.76		0.78		0.78		0.65		0.69		0.79		0.71		0.63	
None*	7,937	53.8																
One–three days	2,918	19.8	0.76		0.91		0.95		1.01		0.91		1.02		0.95		1.05	
Four–ten days	2,279	15.4	0.70		0.87		0.91		0.89		0.91		1.03		0.84		0.87	
More than ten days	1,313	8.9	0.76		0.86		0.85		0.79		0.90		1.11		0.97		1.01	
Presenting																		
Day/time of visit				0.0002				0.0081		0.4645		0.9878		0.1995		0.6036		0.6647
Missing	13	0.1	2.76				2.28		1.26		1.24		1.96		1.22		0.77	
Weekday, 00:00–06:59	1,701	11.5	0.86				0.87		1.10		1.10		0.94		0.87		1.23	
Weekday, 07:00–17:59	6,348	43.0	1.03				0.97		1.08		1.08		1.03		1.06		1.21	
Weekday, 18:00–23:59	2,046	13.9	1.00				1.00		1.17		1.12		1.02		0.99		1.15	
Weekend, 00:00–06:59	806	5.5	0.80				0.81		1.37		1.11		0.89		1.06		1.40	
Weekend, 07:00–17:59	2,922	19.8	0.97				0.93		0.93		1.04		0.98		0.97		1.05	
Weekend, 18:00–23:59*	914	6.2																
Reason for visit				0.0037				0.0553		0.1877		0.5975		0.3806		0.2932		0.6605
Missing	745	5.0	0.99				0.86		1.28		0.82		0.81		0.74		0.98	
It clearly was an emergency	6,547	44.4	1.01				1.01		1.15		1.01		0.99		0.99		1.09	
I was told to go by a health professional/ BCNurse Line	2,794	18.9	0.83				0.83		0.88		0.97		0.88		0.90		0.93	
I didn't know if my health condition was an emergency or not*	2,469	16.7																
There were no other options/didn't know where else to go	1,562	10.6	0.80				0.88		0.93		0.88		0.92		0.88		0.89	
Other	635	4.3	0.92				0.96		1.09		0.92		0.90		0.84		0.82	
Self-rated seriousness				<.0001				<.0001		0.0113		0.0316		<.0001		0.0314		0.0629
Missing	410	2.8	1.21				1.31		1.71		1.46		1.60		1.30		1.66	
Extremely serious	1,621	11.0	1.32				1.53		1.35		1.38		1.75		1.49		1.39	
Very serious	3,959	26.8	0.92				1.08		1.01		0.99		1.27		1.10		1.06	
Moderately serious	5,577	37.8	0.88				0.99		1.11		1.05		1.08		1.10		1.13	
Slightly serious	2,505	17.0	1.03				1.13		1.43		1.20		1.12		1.25		1.41	
Not at all serious*	679	4.6																



Canadian Triage Acuity Score				<.0001				<.0001		0.0123		0.0065		0.0009		0.0073		0.2539
Missing	5,451	37.0	1.02					1.09		0.97		1.10		1.12		1.19		0.97
Level 1 – Resuscitation	28	0.2	2.13					1.95		1.89		1.92		2.27		1.37		2.01
Level 2 – Emergent	1,052	7.1	1.44					1.33		1.03		1.49		1.39		1.60		1.14
Level 3 – Urgent	3,789	25.7	0.81					0.85		0.78		1.00		1.00		1.03		0.92
Level 4 – Less urgent	3,686	25.0	0.77					0.81		0.74		0.87		0.90		1.03		0.78
Level 5 – Non-urgent*	744	5.1																
Pain level																		
In pain during encounter				<.0001				<.0001		0.0572		0.0007		0.0609		0.0054		0.3347
Severe pain	3,738	25.3	0.68					0.67		0.79		0.74		0.90		0.77		0.84
Moderate/mild pain	5,324	36.1	0.73					0.77		0.85		0.79		0.87		0.86		0.90
No pain/missing*	5,689	38.6																
Experience																		
Courtesy of ED staff (Step 1)				<.0001						<.0001								<.0001
Missing	176	1.2	64.18							55.51								10.01
Poor*	423	2.9																
Fair	1,354	9.2	0.49							0.50								0.59
Good	3,348	22.7	0.74							0.70								0.38
Very Good	4,937	33.5	14.08							12.26								1.98
Excellent	4,513	30.6	813.02							723.03								44.35
How well doctors and nurses worked together (Step 2)				<.0001								<.0001						<.0001
Missing	357	2.4	45.09									36.43						5.31
Poor*	402	2.7																
Fair	1,209	8.2	1.46									1.50						1.25
Good	3,654	24.8	4.65									4.39						3.08
Very Good	5,131	34.8	54.31									46.00						6.22
Excellent	3,998	27.1	970.58									832.88						23.05
Got all services needed (Step 3)				<.0001										<.0001				<.0001
Missing	198	1.3	4.73											4.62				1.54
Yes, completely	8,753	59.3	20.15											20.48				4.09
Yes, somewhat	4,509	30.6	1.20											1.33				0.86
No*	1,290	8.7																
Availability of nurses (Step 4)				<.0001												<.0001		<.0001
Missing	323	2.2	15.38													14.24		6.29
Poor*	999	6.8																
Fair	2,288	15.5	2.33													2.25		3.05
Good	4,179	28.3	6.18													5.60		3.07
Very Good	4,239	28.7	26.80													23.34		5.01
Excellent	2,723	18.5	224.57													197.80		11.46

* Reference category.

APPENDIX D

Results of logistic regression statistical model to predict negative patient ratings of overall quality of care

In order to identify what underlies negative patient ratings of the overall quality of care in emergency departments, we used statistical methods to identify factors that are associated with the likelihood that a survey respondent would view overall quality as fair or poor (16 per cent of all people who completed the vast majority of survey questions).

Age, gender, ethnicity and general health status matter; but not that much

Teenagers, young adults and/or females are more likely to rate overall quality of care in emergency departments negatively. Older adults are the least likely to report negative overall patient ratings.*

Aboriginal or Asian patients are twice as likely as Caucasian patients to rate overall quality of care negatively.**

The lower the general health status of patients the more likely they are to rate overall quality of care negatively. This is true whether health is measured on a five-point scale or by a count of the number of days spent in bed in the last month due to illness or injury.***

As a collection, these predisposing characteristics had relatively little power to predict negative patient ratings of overall quality of care.† When these factors are considered in tandem with presenting characteristics and with information on experiences in emergency departments, only age remained important in predicting negative patient ratings. Therefore, predisposing characteristics such as age, gender, ethnicity and general health status influence patient ratings of overall quality of care but not to a great extent.

These findings suggest that factors above and beyond the predisposition of patients influence their views of overall quality of care in emergency departments.

Time of day, reason for the visit, seriousness of illness and acuity matter; but not that much

Patients who visit the emergency department between midnight and 7 a.m. are more likely to rate overall quality of care negatively.‡ They are also more likely to report negative ratings if they feel they ‘had no other options/ didn’t know where else to go’ or were ‘told to go [to the emergency department] by a health professional or BC Nurse Line.’#

* The adjusted odds ratio for teens and young adults was 1.63 and 1.58 ($p < .0001$), respectively. The adjusted odds for older adults 65 to 74 and 75 or older was 0.38 and 0.40 ($p < .0001$), respectively. The reference group includes individuals less than 12 years. The adjusted odds for females was 1.20 ($p < .005$). Odds ratios are adjusted for other predisposing characteristics.

** The adjusted odds ratio for Aboriginal patients is 1.93 and the adjusted odds ratio for Asian patients is 2.02 (reference group includes Caucasians) ($p < .0001$). Odds ratios are adjusted for other predisposing characteristics.

*** The adjusted odds ratio for poor health status is 2.71 (reference group is excellent health status) ($p < .0001$). The adjusted odds ratio for more than 10 days in bed is 1.72 (reference group is no days in bed with illness or injury) ($p < .0001$). Odds ratios are adjusted for other predisposing characteristics.

† The pseudo r^2 value for the logistic regression was 0.06.

‡ The adjusted odds ratio for midnight until 7:00 am on a weekday is 1.36 and weekend is 1.47 (reference group is weekend from 6:00 pm until midnight) ($p < .05$). Odds ratios are adjusted for predisposing and presenting characteristics.

The adjusted odds ratio for ‘no other options’ is 1.51 and for ‘was told to go by a health professional’ was 1.54 (reference group is didn’t know if health condition was an emergency) ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.



The more serious patients perceive the illness that brought them to emergency to be, the more likely they are to rate overall quality of care negatively.* However, they are less likely to report negative ratings if they are assessed as having a higher acuity by a clinician.**

The more pain patients experience, the more likely they are to rate overall quality of care negatively. Patients in severe pain are twice as likely to offer negative ratings and patients who are in moderate/mild pain are, in turn, 1.4 times as likely as those in no pain to report negative overall ratings of quality of care.***

As a collection of factors these presenting characteristics had relatively little power to predict negative patient ratings of overall quality of care.† When these factors are considered in tandem with patients' predisposing characteristics, as well as with information on experiences in emergency departments, only experiences with pain remained important to predicting negative patient ratings. Therefore, presenting characteristics such as time of day, reason for visit, seriousness of illness and acuity underlie positive patient ratings of overall quality of care but not to a great extent.

These findings suggest that factors above and beyond patients' predisposition and their presentation at emergency departments influence their views of overall quality of care. Their level of pain is very important, as outlined in this report.

Comprehensive services and wait times matter; but courtesy of emergency department staff matters most

The factor most strongly associated with negative patient ratings of overall quality of care is the degree to which emergency department staff is considered to be courteous. In fact, patient ratings of staff courtesy have a strong influence. When this factor is considered in tandem with predisposing and presenting characteristics, there are no other experiences in the emergency department that matter as much in predicting a negative rating.‡

However, other factors influence patient ratings of a negative experience beyond the degree to which staff are courteous.# These include the degree to which patients report they received all the services they needed,## perceived

* The adjusted odds ratio for extremely serious is 1.39, very serious is 1.32, moderately serious is 1.19 and slightly serious is 0.95 (reference group is 'not at all serious') ($p < .05$). Odds ratios are adjusted for predisposing and presenting characteristics.

** The adjusted odds ratio for Level 1 – Resuscitation is 0.64 and for Level 2 – Emergent is 0.56 (reference group is Level 5 – Non-Urgent) ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.

*** The adjusted odds ratio for severe pain is 2.10 and the adjusted odds ratio for moderate/mild pain is 1.39 (reference group is no pain or no response to the survey question regarding pain) ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.

† The pseudo r^2 value for the logistic regression was 0.08.

‡ The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.08. The inclusion of information on staff courtesy increased the pseudo r^2 value to 0.35 and the full forward stepwise logistic regression model had a pseudo r^2 value of 0.46 and included 27 types of survey items measuring experiences.

The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.08. The forward stepwise logistic regression model initially included staff courtesy (pseudo r^2 value of 0.35), then got all services needed (pseudo r^2 value of 0.39), then 'how well doctors and nurses worked together' (pseudo r^2 value of 0.41) and then 'waited to long to see an emergency department doctor' (pseudo r^2 value of 0.43). The full forward stepwise logistic regression model had a pseudo r^2 value of 0.46 and included 27 types of survey items measuring experiences.

The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.08. The inclusion of information on 'got all services needed' increased the pseudo r^2 value to 0.27.

that doctors and nurses worked together,* and/or waited too long to see an emergency department doctor.**

In summary, patients' experiences are more important than their predisposition and their presentation at emergency departments to their views of overall quality of care. Patient experiences with staff courtesy principally underlie negative patient ratings of overall quality of care in emergency departments, but comprehensive care, teamwork and waiting too long for a doctor also matter.

Staff courtesy towards patients that experience pain is pivotal

The more pain patients experience, the more likely they are to rate overall quality of care negatively.*** Patients in severe pain are twice as likely to offer negative overall ratings and patients who are in moderate/mild pain are, in turn, 1.4 times as likely as those in no pain to report negative overall ratings of quality of care. Importantly, patients who said they were in severe or moderate/mild pain represent the majority (74%) of all patients that offer negative ratings of overall quality of care.

However, patients in pain don't always report negative ratings—it very much depends on how they rate emergency department staff courtesy. When patients in mild, moderate or severe pain rate staff courtesy as excellent, very good or good, they are no more likely than patients not in pain to rate overall quality of care negatively. But when patients in mild, moderate or severe pain rate staff courtesy as fair they are more likely to rate care negatively than patients without pain who rate staff courtesy as excellent. What's more, when patients in mild, moderate or severe pain rate staff courtesy as poor they are many more times more likely to rate overall quality of care negatively than patients who have no pain and who rate staff courtesy as excellent.

* The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.08. The inclusion of information on 'how well doctors and nurses worked together' increased the pseudo r^2 value to 0.32.

** The pseudo r^2 value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.08. The inclusion of information on 'waited too long to see an emergency department doctor' increased the pseudo r^2 value to 0.23.

*** The adjusted odds ratio for severe pain is 2.10 and the adjusted odds ratio for moderate/mild pain is 1.39 (reference group is no pain or no response to the survey question regarding pain) ($p < .0001$). Odds ratios are adjusted for predisposing and presenting characteristics.



Results of logistic regression statistical models for negative patient ratings of quality of care (16% of respondents). Cohort: 80% complete Emergency cohort (excludes appointments and pain level=unknown severity). Weighted n=14,572.

			Bivariate		Predisposing Reduced Set (r ² =0.0560)		Predisposing, Presenting and Pain (r ² =0.0770)		Predisposing, Presenting, Pain and Step 1 Experience variable (r ² =0.3497)		Predisposing, Presenting, Pain and Step 2 Experience variable (r ² =0.2687)		Predisposing, Presenting, Pain and Step 3 Experience variable (r ² =0.3222)		Predisposing, Presenting, Pain and Step 4 Experience variable (r ² =0.2269)		Predisposing, Presenting, Pain and Steps 1, 2, 3 and 4 Experience variables (r ² =0.4260)		Predisposing, Presenting, Pain and Experience up to Step 4 PLUS interaction (r ² =0.4274)	
Variable	Wt N	%	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value
Predisposing																				
Age				<.0001		<.0001		<.0001		0.0004		<.0001		<.0001		<.0001		0.0518		0.0472
0 to 12*	1,878	12.7																		
13 to 19	947	6.4	1.69		1.63		1.43		1.17		1.23		1.24		1.33		1.06		1.08	
20 to 34	1,839	12.5	1.74		1.58		1.37		1.15		1.13		1.00		1.46		1.02		1.01	
35 to 49	2,556	17.3	1.34		1.11		0.92		0.90		0.91		0.87		1.10		0.86		0.85	
50 to 64	3,260	22.1	0.79		0.62		0.54		0.78		0.57		0.69		0.73		0.85		0.85	
65 to 74	1,924	13.0	0.50		0.38		0.34		0.59		0.42		0.48		0.47		0.66		0.66	
75 and older	2,346	15.9	0.59		0.40		0.38		0.57		0.42		0.40		0.49		0.58		0.57	
Sex				<.0001		0.0013		0.003		0.9032		0.0541		0.2493		0.0371		0.8412		0.8404
Missing	8	0.1	0.16		0.10		0.08		0.62		0.24		0.71		0.32		2.07		2.14	
Female	7,874	53.4	1.32		1.20		1.18		1.01		1.18		1.14		1.18		1.04		1.03	
Male*	6,869	46.6																		
Self-reported ethnicity				<.0001		<.0001		<.0001		0.1555		<.0001		0.0001		<.0001		0.4887		0.4851
Missing	623	4.2	1.70		1.49		1.51		1.19		1.16		1.23		1.48		1.08		1.09	
Aboriginal	494	3.4	2.60		1.93		1.92		1.39		1.74		1.79		1.97		1.43		1.43	
Asian	1,194	8.1	2.37		2.02		2.03		1.24		1.84		1.45		1.30		1.09		1.09	
Caucasian*	11,780	79.9	1.70																	
Other	659	4.5	1.66		1.38		1.38		1.11		1.47		1.58		1.07		1.17		1.16	
Self-reported general health status				<.0001		<.0001		<.0001		0.0072		<.0001		0.0039		<.0001		0.2055		0.1776
Missing	221	1.5	1.53		1.86		1.80		1.15		2.16		1.35		1.94		1.22		1.26	
Poor	848	5.7	1.80		2.71		2.64		1.30		2.22		1.67		2.26		1.43		1.41	
Fair	2,381	16.1	1.36		2.10		2.18		0.97		1.74		1.38		1.94		1.04		1.04	
Good	4,619	31.3	1.06		1.41		1.42		0.75		1.17		1.00		1.34		0.84		0.84	
Very Good	4,356	29.5	0.89		1.00		1.01		0.75		0.94		0.91		0.95		0.89		0.86	
Excellent*	2,325	15.8																		
Days in bed due to illness/ injury, in past month				<.0001		<.0001		0.0405		0.1887		0.5051		0.5534		0.1130		0.8753		0.8865
Missing	305	2.1	1.75		1.53		1.38		1.32		1.49		1.31		1.39		1.40		1.43	
None*	7,937	53.8																		
One–three days	2,918	19.8	1.48		1.18		1.09		1.09		0.97		1.08		1.04		1.07		1.07	
Four–ten days	2,279	15.4	1.88		1.43		1.18		1.11		1.00		1.16		1.19		1.00		1.01	
More than ten days	1,313	8.9	2.16		1.72		1.35		1.45		1.07		1.20		1.33		1.11		1.11	

Presenting																				
Day/time of visit				<.0001				0.0133		0.2288		0.1030		0.3721		0.0310		0.1298		0.1556
Missing	13	0.1	0.27				0.32		1.31		0.60		1.02		0.56		2.45		2.39	
Weekday, 00:00–06:59	1,701	11.5	1.43				1.36		1.32		1.35		1.37		1.26		1.37		1.36	
Weekday, 07:00–17:59	6,348	43.0	1.01				1.11		1.45		1.13		1.30		1.06		1.50		1.50	
Weekday, 18:00–23:59	2,046	13.9	1.01				1.02		1.09		1.06		1.14		0.99		1.08		1.08	
Weekend, 00:00–06:59	806	5.5	1.57				1.47		1.44		1.56		1.63		1.62		1.77		1.75	
Weekend, 07:00–17:59	2,922	19.8	1.00				1.08		1.22		1.03		1.20		1.01		1.19		1.21	
Weekend, 18:00–23:59*	914	6.2																		
Reason for visit				<.0001				<.0001		0.0092		0.0098		0.0460		0.0279		0.3593		0.3833
Missing	745	5.0	1.05				0.93		0.81		1.05		0.93		0.99		0.88		0.87	
It clearly was an emergency	6,547	44.4	1.57				1.19		1.05		1.17		1.14		1.02		0.94		0.94	
I was told to go by a health professional/ BC Nurse Line	2,794	18.9	1.68				1.54		1.48		1.44		1.36		1.27		1.22		1.22	
I didn't know if my health condition was an emergency or not*	2,469	16.7																		
There were no other options/didn't know where else to go	1,562	10.6	1.81				1.51		1.23		1.55		1.51		1.38		1.25		1.22	
Other	635	4.3	1.23				1.04		0.80		1.10		1.10		0.96		1.02		1.02	
Self-rated seriousness				<.0001				0.0322		0.0296		0.7918		0.0043		0.0376		0.1691		0.1698
Missing	410	2.8	1.59				1.37		1.39		1.13		1.34		1.21		1.11		1.09	
Extremely serious	1,621	11.0	1.82				1.39		1.59		1.25		1.68		1.43		1.51		1.53	
Very serious	3,959	26.8	1.67				1.32		1.70		1.14		1.63		1.16		1.43		1.45	
Moderately serious	5,577	37.8	1.38				1.19		1.33		1.08		1.27		1.10		1.14		1.16	
Slightly serious	2,505	17.0	1.03				0.95		1.07		1.00		0.99		0.86		0.96		0.97	
Not at all serious*	679	4.6																		
Canadian Triage Acuity Score				<.0001				0.0001		0.0794		0.0359		0.0415		0.9155		0.1853		0.2271
Missing	5,451	37.0	0.94				0.87		0.86		0.86		0.90		1.00		0.92		0.93	
Level 1 – Resuscitation	28	0.2	0.58				0.64		0.67		0.39		0.37		0.82		0.14		0.14	
Level 2 – Emergent	1,052	7.1	0.54				0.56		0.76		0.55		0.71		0.80		0.88		0.91	
Level 3 – Urgent	3,789	25.7	1.22				1.10		1.08		0.89		1.13		0.98		0.90		0.92	
Level 4 – Less urgent	3,686	25.0	1.16				1.09		1.13		0.99		1.09		0.98		1.05		1.07	
Level 5 – Non-urgent*	744	5.1																		
Pain level																				
In pain during encounter				<.0001				<.0001		0.0102		0.0034		0.0006		<.0001		0.6358		0.0922
Severe pain	3,738	25.3	2.69				2.10		1.40		1.40		1.52		1.65		0.94		See interaction	
Moderate/mild pain	5,324	36.1	1.60				1.39		1.25		1.12		1.23		1.23		1.06			
No pain/missing*	5,689	38.6																		



Experience																			
Courtesy of ED staff (Step 1)				<.0001						<.0001								<.0001	<.0001
Missing	176	1.2	31.36						31.70								8.10		See interaction
Poor	423	2.9	>999.9						1275.83								71.85		
Fair	1,354	9.2	395.13						356.15								31.85		
Good	3,348	22.7	26.06						25.04								4.04		
Very Good	4,937	33.5	3.53						3.53								1.48		
Excellent*	4,513	30.6																	
Got all services needed (Step 2)				<.0001						<.0001								<.0001	<.0001
Missing	198	1.3	10.51							11.82							3.31		3.41
Yes, completely*	8,753	59.3																	
Yes, somewhat	4,509	30.6	15.65							13.06							3.33		3.37
No	1,290	8.7	108.03							91.09							13.52		13.54
How well doctors and nurses worked together (Step 3)				<.0001									<.0001					<.0001	<.0001
Missing	357	2.4	53.88									62.90					5.08		5.12
Poor	402	2.7	>999.9									943.22					19.19		19.15
Fair	1,209	8.2	269.307									227.73					9.79		9.85
Good	3,654	24.8	29.27									26.99					2.88		2.91
Very Good	5,131	34.8	2.87									2.87					1.09		1.10
Excellent*	3,998	27.1																	
Waited too long to see ED doctor (Step 4)				<.0001													<.0001	<.0001	<.0001
Missing	254	1.7	3.87											3.90			1.77		1.89
Yes, definitely	2,659	18.0	35.30											30.10			7.22		7.37
Yes, somewhat	4,210	28.5	7.07											6.32			2.66		2.66
No*	7,628	51.7																	
Interaction																			
Pain level * Courtesy of ED staff																			0.0310
Severe pain, missing courtesy																		32.74	
Severe pain, poor courtesy																		207.27	
Severe pain, fair courtesy																		44.75	
Severe pain, good courtesy																		7.72	
Severe pain, very good courtesy																		4.26	
Severe pain, excellent courtesy																		1.68	
Moderate/mild pain, missing courtesy																		9.37	
Moderate/mild pain, poor courtesy																		92.83	
Moderate/mild pain, fair courtesy																		75.54	
Moderate/mild pain, good courtesy																		8.66	
Moderate/mild pain, very good courtesy																		3.01	
Moderate/mild pain, excellent courtesy																		3.56	
No pain, missing courtesy																		13.40	
No pain, poor courtesy																		175.72	
No pain, fair courtesy																		87.82	
No pain, good courtesy																		8.51	
No pain, very good courtesy																		2.27	
No pain, excellent courtesy																		1.00	

* Reference category.

APPENDIX E

Results of logistic regression statistical model to predict patient views on waiting too long to see a doctor

After accounting for patients' predisposition and characteristics of their presentation to emergency departments, the issue most highly associated with their view that the wait to see a doctor was definitely too long was—not surprisingly—the time they waited to see a doctor. Other

types of experiences that underlie patient views on waiting too long are, in rank order, the availability of nurses, not getting help when needed, and waiting too long for test results.*

Results of logistic regression statistical model to predict patient views on definitely waiting too long to see a doctor (18% of respondents). Cohort: 80% complete Emergency cohort (excludes appointments and pain level=unknown severity). Weighted n=14,497.

			Bivariate		Predisposing Reduced Set (r ² =0.0309)		Predisposing, Presenting and Pain (r ² =0.0570)		Predisposing, Presenting, Pain and Step 1 Experience variable (r ² =0.2508)		Predisposing, Presenting, Pain and Step 2 Experience variable (r ² =0.1818)		Predisposing, Presenting, Pain and Step 3 Experience variable (r ² =0.1589)		Predisposing, Presenting, Pain and Step 4 Experience variables (r ² =0.1367)		Predisposing, Presenting, Pain and Steps 1, 2, 3 and 4 Experience variables (r ² =0.3264)	
Variable	Wt N	%	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value	Odds ratio	Overall p value
Predisposing																		
Age				<.0001		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001
0 to 12*	1,878	12.7																
13 to 19	947	6.4	1.38		1.43		1.35		1.11		1.18		1.28		1.21		1.00	
20 to 34	1,839	12.5	1.22		1.18		1.10		0.85		0.95		0.95		1.13		0.80	
35 to 49	2,556	17.3	0.99		0.92		0.84		0.70		0.82		0.87		0.89		0.75	
50 to 64	3,260	22.1	0.68		0.63		0.59		0.51		0.67		0.67		0.63		0.59	
65 to 74	1,924	13.0	0.50		0.47		0.46		0.38		0.60		0.59		0.52		0.56	
75 and older	2,346	15.9	0.58		0.52		0.52		0.37		0.62		0.62		0.53		0.46	
Sex				0.0160		0.0481		0.0631		0.3467		0.4990		0.3154		0.1348		0.8063
Missing	8	0.1	0.12		0.10		0.09		0.28		0.29		0.18		0.10		0.54	
Female	7,874	53.4	1.12		1.08		1.06		1.06		0.97		0.99		1.04		0.96	
Male*	6,869	46.6																
Education				0.0160		0.0481		0.0631		0.3467		0.4990		0.3154		0.1348		0.8063
Missing	8	0.1	0.12		0.10		0.09		0.28		0.29		0.18		0.10		0.54	
Public school	7,874	53.4	1.12		1.08		1.06		1.06		0.97		0.99		1.04		0.96	
High school	6,869	46.6																
College, trade or technical school	3,968	26.9	0.74		0.77		0.76		0.76		0.78		0.76		0.74		0.72	
University undergraduate	1,716	11.6	0.89		0.93		0.92		0.93		0.91		0.89		0.94		0.90	
Post university/ graduate education*	1,294	8.8																

* The pseudo r² value of the logistic regression model with predisposing and presenting characteristics, including pain, was 0.06. The forward stepwise logistic regression model initially included wait time to see doctor (pseudo r² value of 0.25), then availability of nurses (pseudo r² value of 0.30), then not getting help when needed (pseudo r² value of 0.31) and then 'waited too long for test results' (pseudo r² value of 0.33). The full forward stepwise logistic regression model had a pseudo r² value of 0.37 and included 24 types of survey items.



Self-reported ethnicity				<.0001		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001
Missing	623	4.2	1.30		1.15		1.17		1.09		1.08		1.13		1.14		1.08	
Aboriginal	494	3.4	1.56		1.31		1.32		1.35		0.99		1.23		1.23		1.09	
Asian	1,194	8.1	2.37		2.07		2.13		1.88		2.02		1.84		1.90		1.74	
Caucasian*	11,780	79.9																
Other	659	4.5	1.70		1.45		1.49		1.70		1.78		1.43		1.37		1.83	
Self-reported general health status				0.1933		0.0002		<.0001		0.0145		0.5834		0.0830		0.0006		0.6520
Missing	221	1.5	0.91		1.09		1.03		1.04		0.79		0.88		0.96		0.81	
Poor	848	5.7	1.22		1.76		1.78		1.53		1.10		1.40		1.62		1.05	
Fair	2,381	16.1	1.02		1.46		1.54		1.50		1.05		1.33		1.51		1.17	
Good	4,619	31.3	0.91		1.17		1.18		1.16		0.92		1.10		1.16		0.98	
Very Good	4,356	29.5	0.93		1.03		1.05		1.02		0.92		1.02		1.01		0.94	
Excellent*	2,325	15.8																
Days in bed due to illness/ injury, in past month				<.0001		0.0376		0.8703		0.9136		0.9985		0.8779		0.9361		0.4372
Missing	305	2.1	1.28		1.28		1.16		1.04		1.05		0.99		1.20		0.94	
None*	7,937	53.8																
One–three days	2,918	19.8	1.28		1.10		1.03		1.04		1.01		0.93		0.98		0.96	
Four–ten days	2,279	15.4	1.37		1.18		1.00		0.96		0.99		0.92		0.99		0.92	
More than ten days	1,313	8.9	1.46		1.33		1.10		0.92		0.99		0.93		0.99		0.75	
Presenting																		
Day/time of visit				0.0195				0.0731		0.2153		0.1124		0.0157		0.0480		0.0268
Missing	13	0.1	0.23				0.31		0.37		0.74		0.29		0.26		0.48	
Weekday, 00:00–06:59	1,701	11.5	1.28				1.30		1.04		1.29		1.42		1.20		1.13	
Weekday, 07:00–17:59	6,348	43.0	1.01				1.14		1.01		1.22		1.27		1.05		1.12	
Weekday, 18:00–23:59	2,046	13.9	1.05				1.09		1.07		1.15		1.17		1.02		1.10	
Weekend, 00:00–06:59	806	5.5	0.94				0.90		0.68		0.82		0.89		0.76		0.56	
Weekend, 07:00–17:59	2,922	19.8	1.02				1.13		0.99		1.16		1.25		1.08		1.10	
Weekend, 18:00–23:59*	914	6.2																
Reason for visit				<.0001				<.0001		0.0080		0.0040		0.0004		0.0010		0.0388
Missing	745	5.0	0.89				0.94		0.94		1.02		0.70		0.80		0.79	
It clearly was an emergency	6,547	44.4	1.59				1.35		1.32		1.33		1.17		1.31		1.17	
I was told to go by a health professional/ BCNurse Line	2,794	18.9	1.70				1.61		1.44		1.54		1.46		1.50		1.31	
I didn't know if my health condition was an emergency or not*	2,469	16.7																
There were no other options/didn't know where else to go	1,562	10.6	1.61				1.41		1.52		1.42		1.39		1.34		1.46	
Other	635	4.3	1.33				1.20		1.24		1.32		1.22		1.23		1.32	
Self-rated seriousness				0.0015				0.2660		0.5589		0.4117		0.3987		0.3453		0.5773
Missing	410	2.8	1.29				1.26		1.22		1.19		1.11		1.16		1.04	
Extremely serious	1,621	11.0	1.36				1.12		1.01		1.13		0.83		1.11		0.83	
Very serious	3,959	26.8	1.50				1.25		1.10		1.23		1.04		1.21		0.97	
Moderately serious	5,577	37.8	1.25				1.10		1.01		1.05		0.98		1.05		0.90	
Slightly serious	2,505	17.0	1.07				1.00		0.89		1.01		0.91		0.97		0.80	
Not at all serious*	679	4.6																

Canadian Triage Acuity Score																	
Missing	5,451	37.0	0.77	<.0001				0.76		0.81		0.73		0.79		0.70	0.74
Level 1 – Resuscitation	28	0.2	0.57					0.64		1.36		0.79		0.59		0.79	0.94
Level 2 – Emergent	1,052	7.1	0.41					0.43		0.45		0.44		0.41		0.39	0.39
Level 3 – Urgent	3,789	25.7	1.24					1.18		0.88		1.12		1.17		1.06	0.83
Level 4 – Less urgent	3,686	25.0	1.26					1.18		1.05		1.10		1.19		1.08	0.95
Level 5 – Non-urgent*	744	5.1															

Pain level																	
In pain during encounter																	
Severe pain	3,738	25.3	2.08	<.0001				1.85		1.60		1.51		1.44		1.60	1.18
Moderate/mild pain	5,324	36.1	1.44					1.31		1.16		1.15		1.16		1.18	0.98
No pain/missing*	5,689	38.6															

Experience																	
Wait for doctor (Step 1)																	
Missing	383	2.6	16.32	<.0001						16.36							9.89
Did not wait at all*	1,229	8.3															
Less than 1/2 hour	5,821	39.5	1.16							1.09							1.07
Between 1/2 hour and 1 hour	3,774	25.6	3.72							3.16							2.14
1 to 2 hours	2,082	14.1	12.96							11.17							6.48
More than 2 hours	1,462	9.9	59.56							56.23							28.77

Availability of nurses (Step 2)																	
Missing	323	2.2	3.77	<.0001								3.83					1.63
Poor	999	6.8	36.05									30.77					6.12
Fair	2,288	15.5	9.29									8.33					2.76
Good	4,179	28.3	3.51									3.27					1.74
Very Good	4,239	28.7	1.25									1.20					0.89
Excellent*	2,723	18.5															

Did not get needed help (Step 3)																	
Missing	285	1.9	3.91	<.0001										4.25			2.73
Yes, often	796	5.4	17.79											16.18			4.72
Yes, sometimes	2,642	17.9	6.73											5.98			2.53
No*	7,946	53.9															
Did not need help	3,083	20.9	1.66											1.68			1.40

Waited too long for test results (Step 4)																	
Missing	116	0.8	4.89	<.0001											4.97		1.86
Yes, definitely	958	6.5	17.99												15.79		5.06
Yes, somewhat	2,177	14.8	3.36												2.97		1.43
No*	6,782	46.0															
Did not get any tests	4,718	32.0	2.29												2.22		1.67

* Reference category.



APPENDIX F

Relationship between wait times and patient views on waiting too long

Patient views on waiting too long to see a doctor in an emergency department	Patient self-reported wait time in an emergency department in 2007					Total
	Did not wait	< 1/2 hour	½ to 1 hour	1 to 2 hours	> 2 hours	
Yes, definitely						
Frequency (weighted cases)	47.441	260.69	493.76	712.41	1017.7	2532
Percent (%)	0.33	1.84	3.48	5.02	7.18	17.86
Row percent (%)	1.87	10.30	19.50	28.14	40.19	
Column percent (%)	3.94	4.53	13.23	34.69	70.95	
Yes, somewhat						
Frequency (weighted cases)	67.866	913.02	1750.3	1038.7	361.1	4131
Percent (%)	0.48	6.44	12.34	7.32	2.55	29.13
Row percent (%)	1.64	22.10	42.37	25.14	8.74	
Column percent (%)	5.63	15.87	46.89	50.57	25.17	
No						
Frequency (weighted cases)	1089.8	4580.8	1488.6	302.74	55.678	7517.6
Percent (%)	7.69	32.30	10.50	2.13	0.39	53.01
Row percent (%)	14.50	60.93	19.80	4.03	0.74	
Column percent (%)	90.43	79.60	39.88	14.74	3.88	
Total						
Frequency (weighted cases)	1205.09	5754.53	3732.61	2053.82	1434.45	14180.5
Percent (%)	8.50	40.58	26.32	14.48	10.12	100.00
Frequency missing=570						

APPENDIX G

Results of statistical analyses to account for differences in patient characteristics and their presentation at emergency departments on differences in patient ratings of overall quality of care

We found variation across types of hospitals and health regions about patient views on overall quality and ratings on the factors that matter to them. Simultaneously, we found that patients' characteristics and their presentation at emergency departments had some influence on patient ratings about overall quality of care. Since patients from different types of hospitals and health regions differ in these characteristics, we used statistical methods to risk-adjust performance metrics. This was done to determine the degree to which variation in these characteristics underlies differences between hospitals and regions on patient views on overall quality of care in emergency departments.

Importantly, we found that the rank order of highest and lowest performance across health regions remained unchanged even after sophisticated analysis was conducted to account for differences in the characteristics of patients and their presentation at emergency departments. This is true for other measures profiled in this report. The crude and adjusted mean or average patient rating of overall quality of care* for each health authority are slightly different but the relative rank of highest and lowest remains unchanged after risk-adjustment. Thus, accounting for differences between health regions in patient and presenting characteristics do not mitigate regional differences or alter relative rankings.

Mean and adjusted mean patient ratings of overall quality of care, by health region in 2007

	Overall patient rating of overall quality of care	
	Mean	Adjusted mean**
Interior Health	3.81	3.85
Fraser Health	3.43	3.49
Vancouver Coastal Health	3.69	3.79
Vancouver Island Health	3.72	3.75
Northern Health	3.72	3.75

* Means were calculated by assigning a value of 1 to patient ratings of poor, 2 to patient ratings of fair, 3 to patient ratings of good, 4 to patient ratings of very good and 5 to patient ratings of excellent. Thus, patient ratings of overall quality of care have the potential to range from one to five.

** Adjusted for age group, gender, education level, self-reported ethnicity, self-reported general health status, days in bed due to injury/illness in past month, day and time of emergency department visit, reason for emergency department visit, self-rated seriousness, Canadian Triage Acuity Score and pain level.



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