

RURAL EMERGENT HEALTH CARE:  
SELECTED PERSPECTIVES FOR THE  
ERIE-ST. CLAIR LOCAL HEALTH  
INTEGRATION NETWORK

JANUARY 2009

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For more information:

**Shannon Sasseville, B.A., B.Ed.**  
Senior Community Engagement Consultant  
ESC-LHIN  
180 Riverview Drive, Chatham, ON  
N7M 5Z8  
P: 519.351.5677 Toll Free 1.866.231.5446  
Email: [Shannon.Sasseville@lhins.on.ca](mailto:Shannon.Sasseville@lhins.on.ca)

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# RURAL EMERGENT HEALTH CARE: SELECTED PERSPECTIVES FOR THE ERIE-ST. CLAIR LOCAL HEALTH INTEGRATION NETWORK

01/26/2010

Integrated Rural Priority Care (IRPC) Facilities

This study examines selected refereed literature from around the World, as well as a series of reports about alternatives in an ever-changing primary health care (PHC) system landscape, including those associated with small and very small hospital emergency departments (EDs) in three Ontario locations served by the Erie-St. Clair Local Health Integration Network (ESC-LHIN). System-wide health care attributes are considered in the context of the literature surveyed, selected demographics of the areas served, the social determinants of health, and selected health care data that were analyzed. Although recommendations vary with respect to changes in the PHC system; new models for consideration within the main attributes of a high-performing health system are possible. This study proposes the establishment of the Integrated Rural Priority Care (IRPC) facility. When appropriately supported and maintained, the IRPC is positioned to aid the provision of priority triage, treatment and professional transport of clients to support a more effective response to meet client needs. Measures of success as key benchmarks for evolution of the PHC system in rural areas, together with a client-centered education and an accountability framework, have the potential to better the future of rural emergent care within the ESC-LHIN.

## Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>5</b>
<b>LIST OF ACRONYMS.....</b>	<b>6</b>
<b>RECENT BACKGROUND AND PRIMARY FOCUS .....</b>	<b>9</b>
<b>LITERATURE REVIEW.....</b>	<b>12</b>
Health Care Delivery Model.....	13
Health Services Utilization – Emergency Departments.....	14
Rural Health Care.....	19
Rural Health Care Hospitals.....	20
Delivering Rural Health Services .....	23
Alternative Models for Health Care Delivery.....	23
Community Health Centres.....	24
Family Health Teams.....	24
Telehealth.....	25
Telemedicine.....	25
Case Management/Demand Management.....	26
Walk-In Clinics .....	27
Registered Nurse Practitioner .....	27
Urgent Care Centres – What are they? .....	28
Definition of Urgent Care .....	28
Defining Urgent Care Centres.....	29
Urgent Care Centres Certification and Accreditation .....	31
Urgent Care Centres Characteristics .....	33
Efficiency / Effectiveness of Alternative Models.....	34
Quality Metrics for Assessment and Design of Care Delivery.....	37
Quality of Care in Emergency Care.....	40
Literature Review Conclusion.....	42
Environment Factors:.....	42
Population (Individual) Factors:.....	43
Health Behaviour: .....	43
<b>CURRENT STATE .....</b>	<b>45</b>
Understanding the ESC-LHIN Community Population .....	45
Lambton County .....	46
Chatham-Kent County .....	50
Leamington and Surrounding Area .....	52
Current Emergency Care Delivery Model .....	55
Sarnia-Lambton.....	55
Chatham-Kent.....	56
Leamington District Memorial Hospital.....	57
CTAS Data .....	58
Overall CTAS Data Analysis .....	58
Sub-Analysis of CTAS Data .....	60
EMS Utilization .....	69

Assessment of the Current Emergency Care Delivery Model.....	71
Deficiencies and Gaps .....	77
Actual Gaps: Key Issues .....	77
Potential Gaps: Key Issues.....	78
<b>FUTURE STATE .....</b>	<b>79</b>
Alternative Delivery Models.....	79
Proposed Delivery Model.....	80
Integrated Triage System (ITT).....	80
Integrated Rural Emergent Care Facility (IRPC FACILITY) .....	81
Educational Support for Client Emergent Care Decisions.....	81
EMS (ambulance) Station(s) .....	82
Accountability Measures.....	83
Transformation of Current State.....	83
Change Management .....	83
Hypothetical Scenarios in Transformation of the Current State .....	84
Scenario 1 .....	84
Scenario 2.....	85
Scenario 3.....	85
<b>SUMMARY OF RECOMMENDATIONS .....</b>	<b>87</b>
<b>CONSTRAINTS AND LIMITATIONS .....</b>	<b>91</b>
<b>FUTURE WORK .....</b>	<b>92</b>
<b>REFERENCES .....</b>	<b>94</b>

## EXECUTIVE SUMMARY

Refereed literature in this report provides a foundation for examining some of the fundamental aspects of emergency care in the areas served by the ESC-LHIN in Ontario. The main purpose of this study is to examine a number of underlying factors related to delivering emergency health care in Essex County, Chatham-Kent and Sarnia-Lambton. Available data was synthesized to help better understand client needs, existing gaps and core issues, and to provide recommendations in association with selected decision-making attributes, with an overall goal of aiding the delivery of rural emergent health care.

While there are several previous reports that have examined one or more aspects of emergency care status, funding and services outcomes, there are few that have taken a more global perspective in examining the ongoing issue of continued support and development to meet client needs in areas with low population densities. The researchers of this study suggest that the refereed literature reviewed in this report, provides a rich overview for readers. In examining health care more globally, it is suggested that there will be an ever-growing need for more care providers and advanced infrastructure to support clients. Health care guidelines, practices, and patient care programs for the prevention, diagnosis, treatment and long-term care of clients in the future will only increase in demand as age-structure and population size change. This demand can be fulfilled by increases in human capital, as well as basic and advanced health care infrastructure; however the impact of these changes on the overall health care system remains difficult to determine.

There is little debate that PHC systems will need to change and adapt to support future client needs. Although this study is limited to emergency care, and in particular more detailed aspects at one small and two very small hospitals, there will be an ever growing need, and in many systems, for an increase in overall funding required to maintain and evolve emergency care in Ontario. Given that there are indeed limited funds available, there remains the admirable goal to use funding based on knowledgeable decision-making. Despite this realization, political pressures and lobbying also have influence. In the broader scope, these latter influences may be relatively short-lived in long term benefits. The reasons are simple; Given the need to support medium and large size hospitals with enhanced services that must be maintained, the resources to support the longer-term considerations and growth at other facilities becomes more difficult. The inability to maintain state-of-the-art environments, coupled with the constantly evolving services across all hospital sites predicts that at some point, there will not be enough resources at one or more levels to maintain continued best practices to meet the needs of the population.

This study suggests that with closer integration of health care, and continuing development of technological innovation, the Integrated Rural Priority Care (IRPC) facility provides a model of practice for rural emergent health care. This study also suggests that understanding and modifying client behaviours is a key consideration for enhancing client decision-making related to emergency care and primary health care. Further, an accountability framework will aid in monitoring and improving the outcomes of any changes in the delivery system. Together, these unique strategies will assist in the evolution of health care in rural areas served by the ESC-LHIN.

## LIST OF ACRONYMS

A&ED	Accidents & Emergency Department
AAUCM	American Academy of Urgent Care Medicine
ACC	Acute Care Centre
ACP	Advanced Care Paramedics
AED	Automated External Defibrillator
AHRQ	Agency for Health Care Research & Quality
AMI	Acute Myocardial Infarction
BAT	Breath Alcohol Testing
BCBSM	Blue Cross-Blue Shield of Michigan
BH	Bluewater Health
CCHS	Canadian Community Health Survey
CEEH	Charlotte Eleanor Englehart Hospital
CFPC	College of Family Physicians of Canada
CHC	Community Health Centre
CHF	Congestive Heart Failure
CIHI	Canadian Institute for Health Information
CKHA	Chatham-Kent Health Alliance
CLIA	Clinical Laboratory Improvement Amendments
CMA	Canadian Medical Association
CNA	Canadian Nursing Association
CNO	College of Nurses of Ontario
COPD	Chronic Obstructive Pulmonary Disorder
CPSO	College of Physicians and Surgeons of Ontario
CTAS	Canadian Emergency Department Triage & Acuity Scale
DEHA	Delaware Healthcare Association
DO	Doctor of Osteopathic Medicine
DOT exam	Department of Transportation medical exam

ECG	Electrocardiogram
ED	Hospital Emergency Department
EMS	Emergency Medical Service
ESC-LHIN	Erie-St. Clair Local Health Integration Network
ESP	Expended Scope of Practice
FHT	Family Health Team
FP	Family Physician
GINI Index	Measure of Inequality (in this report, applies to access to health care)
GP	General Practitioner
HQCA	Health Quality Council of Alberta
ICU	Intensive Care Unit
IM	Intramuscular
IOM	Institute of Medicine
IRPC	Integrated Rural Priority Care
ITT	Integrated Triage System
IV	Intravenous
JPPC	Joint Policy and Planning Committee
LDMH	Leamington District Memorial Hospital
LPN	Licensed Practical Nurse
MD	Doctor of Medicine
MIU	Minor Injury Units
MOHLTC	Ontario Ministry of Health and Long-Term Care
NACRS	National Ambulatory Care Reporting System
NAFAC	North American Association for Ambulatory Urgent Care
NP	Nurse Practitioner
OCFP	Ontario College of Family Physicians
OHQC	Ontario Health Quality Council
PCP	Primary Care Physician
PCWTP	Primary Care Wait Time Partnership
PHC	Primary Health Care



PMD	Primary Medical Doctor
PO	Per os (by mouth, orally)
QCC	Quality Care Commission
QI	Quality Indicators
RHOI	Rural Health Outreach Initiative
RN	Registered Nurse
UC	Urgent Care
UCAOA	Urgent Care Association of America
UCC	Urgent Care Centre
VA	Department of Veteran Affairs
WHO	World Health Organization

## RECENT BACKGROUND AND PRIMARY FOCUS

In March 1995, a report commissioned by the Ontario Ministry of Health, the Ontario Hospital Association and the Ontario Medical Association, was published by the Graham Scott, Q.C. as a fact finding report about the growing problems in maintaining and sustaining on-call coverage of emergency facilities by family physicians in small hospitals in rural Ontario (Scott, 1995). Small rural hospitals were defined as those with less than 25,000 patient visits to the ED per year. The report identified issues in the consistency of care in underserved areas, and attempted to address the concerns regarding physician recruitment and training. Now, almost 15 years later, we can ask ourselves: Has the situation improved? We are dealing with several key issues: (a) an aging population base in Ontario in urban and rural areas; (b) an ever-increasing health budget with limited funding for advancing major health care infrastructure and high-quality medical personnel resources; and (c) the ongoing challenge of the providing universal health care for all Ontarians.

In June 1997, the Ontario Ministry of Health provided the vision for the Rural and Northern Health Care Framework (Ministry of Health, 1997). The vision proposed was one of a “fully integrated and co-ordinated health care network that provides access to a range of programs and services which put the patient first, while using resources more effectively and efficiently – the right care, in the right place at the right time.” These are admirable goals expressed some 10 years ago, and many of them are still waiting to be fulfilled for rural health care in 2010 and beyond. The Ministry of Health 1997 report described small hospitals in rural and northern communities as “new opportunities to evolve in their role in health care, while rural and northern health care providers will be supported in addressing the needs of the communities in which they serve.” At the forefront of the vision was the identification that the “rural and northern health system will use new and emerging technology to support physicians and health care professionals in the provision of 24 hour access to care, and appropriate linkages to more specialized services when required.” Even though this vision is now also over 10 years old, it is one that the researchers involved in the current study propose as being one cornerstone to the provisioning of rural emergent health care.

In 2006, a report entitled “The Core Service Role of Small Hospitals in Ontario Phase One: An Exploration of the Current Services” was prepared by the Multi-site/Small Hospitals Advisory Group of the Joint Policy and Planning Committee (JPPC) of the Ontario Hospital Association and the Ministry of Health and Long-Term Care. The report further distinguished between small and very small hospitals in Ontario, and reviewed the challenges and opportunities for these hospitals in the continuum of the health care system (JPPC, 2006). This report made recommendations for core services for small and very small hospitals. The report highlighted that the definitional issues focus on factors such as isolation, geographic location, and urban versus rural catchment populations rather than strictly hospital size. This report also confirmed that much of the literature on rural health care and on the role of the small hospital focuses on access issues, sustainability and difficulties in recruiting and retaining health professionals. Further, this report also examined core services requirements of small hospitals, and reviewed the literature in reference to classifying and describing small hospitals in Ontario.

JPPC (2006) identified that there was variation in the characteristics of the communities across Ontario that form the context within which a hospital provides service; however, the report was unable to describe the relationship of the variation to the current minimal classification of small and very small hospitals. It remains unclear to the researchers involved in this current study whether the report was recommending an expansion to a hospital as a co-located host for community services, as part of the continuing care in rural emergent care, or whether the very nature of hospitals and how they are defined in Ontario would only need to be altered to accommodate the changing mandate of rural hospitals in Ontario. Whaley (2008) published a report entitled “Strategic Review of the Charlotte Eleanor Englehart Hospital (CEEH) of Bluewater Health (BH): Rural Health Findings and Recommendations”, and while the intent of that report appeared to build on the recommendations of the JPPC report, there was a requirement of more detailed studies to determine the appropriate services that should be provided by the CEEH.

The requirement for efficiencies in emergent health care services delivery all appear to reinforce a continuing need to support quality health care in rural Ontario, as they do in urban health care settings. Although quality is not easy to define objectively, it is important to note that quality measures, as described within the annual report of the Ontario Health Quality Council (OHQC, 2009), provide attributes that allow selected measures of these attributes to be applied to appropriate metrics for analysis. The analysis of quality metrics is discussed in this study in relationship to the attributes, but it is beyond the scope of this report to draw conclusions on the quality, or changes in quality as a result of any recommendations included herein.

In January 2009, the Hay Group (2009) completed a report entitled “Small Community Hospital Emergency Department Study.” The report included reviews of the operating context of three small hospital ED’s in the ESC-LHIN, including: Leamington District Memorial Hospital (LDMH), CEEH in Petrolia (a site of BH), and Sydenham campus in Wallaceburg, a site of the Chatham-Kent Health Alliance (CKHA). The purpose defined by the Hay Group was to identify options for addressing sustainability challenges (Hay Group, 2009). The report identified two main operating issues faced by all three Hospital sites and these were the recruitment and retention of emergency room physicians and connectivity to other services for more effective integration. Business issues included the use of operating dollars to pay service fees to MedEmerg for emergency physician placement assistance, cost-efficiency and cost-effectiveness of operating low-volume ED’s, challenges in maintaining viable low volume ED’s, when access to larger, better equipped 24 hour per day emergency facilities are available within a short distance. In reviews of the corporate status, Hospital visit volumes, physical plant, staffing, diagnostic and support services, quality assurance, and interpretations of immediate challenges, the Hay Group recommended several final considerations.

First, the Hay Group recommended that LDMH should continue to operate as a full-service ED for at least 5 years. CEEH in Petrolia was recommended to no longer operate as an ED, but instead, should develop a model which ensures the continuing provision of urgent care. CKHA Sydenham campus was also recommended to cease operations of its ED, and to continue to provide services under the auspices of an urgent care facility. The daily duration of urgent care centre operation was recommended to be 12 to 16 hours per day for up to 7 days per week. The timing of

change in these locales would, of course, be contingent on the ability of client care to be accommodated with a different type of care provision for clients with emergency care considerations. It was also deemed necessary that changes would require larger hospitals, with fully-functioning emergency departments in Sarnia and Chatham, to be adequately staffed and equipped to accommodate clients with emergency needs from the Petrolia and Wallaceburg areas currently served by CEEH and the Sydenham campus of CKHA.

In March 2009, Coulson and Associates was retained by BH to assist in the development of alternative options for the delivery of primary care to serve the residents of Petrolia and the surrounding communities. In April 2009, BH, the Petrolia family physicians and the ESC-LHIN signed a Charter agreement to work together to examine the future role of CEEH specifically. This is a proactive consideration of changes that would benefit clients who use the services of CEEH.

In October 2009, the terms of reference for the Rural and Northern Health Care Panel were published by the Ontario Ministry of Health and Long Term Care (MOHLTC). The government proposed a three-step approach, involving an expert panel comprised of 15 representatives from various health care settings, and that the panel will formulate recommendations, enact broader community consultations, and develop a provincial framework or plan for presentation to the Minister of Health. The timeframe proposed for the capacity planning framework was to be approximately 12-18 months in duration. The panel is to address programs that are intended to promote quality, safety, service, efficiency and sustainability of health care to residents of rural and northern Ontario. It is the intention of the researchers involved in this report to provide recommendations that will align with the Rural and Northern Health Care Panel, as least as far as the program mandate has been defined. The degree of alignment, however, will ultimately depend upon the recommendations provided by the Panel at some point in the future.

In Dec 2009, the Primary Care Wait Time Partnership (PCWTP), established in 2007 between the Ontario College of Family Physicians (OCFP) and the Canadian Medical Association (CMA), published a report entitled “The Wait Starts Here” (PCWTP, 2009). The goals of the partnership are admirable in planning for timely access to health care for all Canadians. PCWTP (2009) reported that the broad reaching comparisons provided in “The Wait Starts Here” did in fact, establish that “there was no conclusive evidence that any one particular model is better than all of the others in providing timely access to care.” Although interesting, this finding fails to provide any clear evidence to support the current decision-making issues faced by the ESC-LHIN.

In essence, the researchers involved in the current study, have worked to examine the literature base, as well as researched underlying factors related to delivering emergent health care in Essex County, Chatham-Kent and Sarnia-Lambton. Specifically, the research team synthesized available data to help better understand client needs, existing gaps and core issues. Service recommendations are provided in association with selected decision-making attributes, to aid the delivery of rural emergent health care in the ESC-LHIN.

## LITERATURE REVIEW

This section of the report presents current and past information from the global literature that examined issues of emergency department utilization, access to health care, and rural health delivery and models. This review is not intended to be exhaustive, but yet to provide evidence that can be used to explain and to help support decision-making within the ESC-LHIN.

In preparing this report, it became evident that the term, *rural*, needs to be defined for the reader. There are numerous technical and social definitions of rurality in the literature. These include, but are not limited to the following as provided by Statistics Canada, 2007a:

- Census rural - individuals living outside centres of 1,000 or more population
- Rural community - individuals in communities with less than 150 persons per square kilometre
- Rural population - all population living in the rural fringes of census metropolitan areas and census agglomerations, as well as the population living in rural areas outside census metropolitan areas and census agglomerations.
  - Census agglomeration: has an urban core population of at least 10,000
  - Census metropolitan area: has a total population of at least 100,000 of which 50,000 or more live in the urban core
- Rural and small town - individuals residing in towns or municipalities outside the commuting zone of larger urban centres
- Non-isolated community - communities with road access less than 90 kilometres to physician services
- Semi-isolated community - communities with road access greater than 90 kilometres to physician services
- Isolated community - communities with good telephone service, scheduled air transportation flights, but no roads
- Remote, isolated community - a community with no scheduled flights, minimal telephone or radio access and no roads.

(Statistics Canada, 2007a)

The Canadian General Practice Rurality Index (Leduc, 1997) and the Rurality Index of Ontario (Kralj, 2001) offer indices based on a point system. Weights are given to community characteristics, such as number of primary care practitioners, access to specialists, distance to nearest hospital, availability of emergency medical services (EMS). Although this definition appears to accommodate the unique features of a community, it is important to note that operationalization (e.g., reduction to practice) of these indices has not been demonstrated in the literature (Stamler & Yiu, 2008).

Given the demographics of the ESC-LHIN, this report will consider the Health Canada (2007) definitions of *rural population* as reflective of the communities being examined in this review.

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## Health Care Delivery Model

In order to address the considerations presented to these researchers by the ESC-LHIN, the need for a model or framework to organize the data and elements/factors that play a role in health care delivery became important. One of the most used and modified frameworks available in the field of health sociology is the Andersen and Newman (1973) Health Behaviour Model.

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This model has been extensively used by many researchers in urban and rural health areas, as well as for nation-wide studies of health care utilization (e.g., Baker & Liu 2006; Mercier & Shelly II, 1997; Padget & Brodsky, 1992). Over the years, the model has been modified for various purposes, such as: (a) measuring access to health services; (b) better addressing the realities of the health care system and its elements, as well as changes in regulations; c) including other components, due to the findings of empirical studies (Andersen, 1995; Aday & Awe, 1997).

The original Health Behaviour Model considered three major factors – predisposing characteristics, enabling resources, and need – as affecting the use of health services (Andersen & Newman, 1973). Later, these three major factors were combined under the name of individual determinants. Predisposing characteristics refer to the inherent predisposition that individuals have to seek and use health services. These include demographics, social structure, and health beliefs. Enabling resources are those that need to exist for the use of health services to take place. These are personal, family and community. Need or illness level is the factor that Andersen and Newman (1973) represented as the most immediate cause of health service use. This can be perceived or evaluated.

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Andersen and Newman (1973) expanded the model by including two additional factors— social determinants and health services system. These elements affect each other and the individual determinants. Social determinants include norms and technology. Norms are reflected through formal legislation, as well as growing consensus of beliefs and homogeneity of values which pervade society. Technology refers to the tools used in the health care system that affect the use of such system and the treatment provided by it. The health services system is composed of two

major dimensions - resources and organization – and determines the provision of health care services to the individual.

Examples of Population (Individual) Characteristics (Andersen & Newman, 1973; Andersen, 1995):

- Predisposing: (mutable and immutable)
  - Demographic: age, gender, marital status, past illnesses, genetic factors, psychological characteristics, cognitive impairment, autonomy
  - Social structure: education, race, occupation, family size, ethnicity, religion, residential mobility
  - Health Beliefs: values concerning health and illness, attitudes toward health services, knowledge about disease
- Enabling: (mutable and immutable)
  - Personal/Family: income, health insurance, regular source of care, travel and waiting times
  - Community: ratios of health personnel and facilities to population, price of health services, region of country, urban-rural character
- Need:
  - Perceived – disability, symptoms, diagnoses, general state
  - Evaluated – symptoms and diagnoses

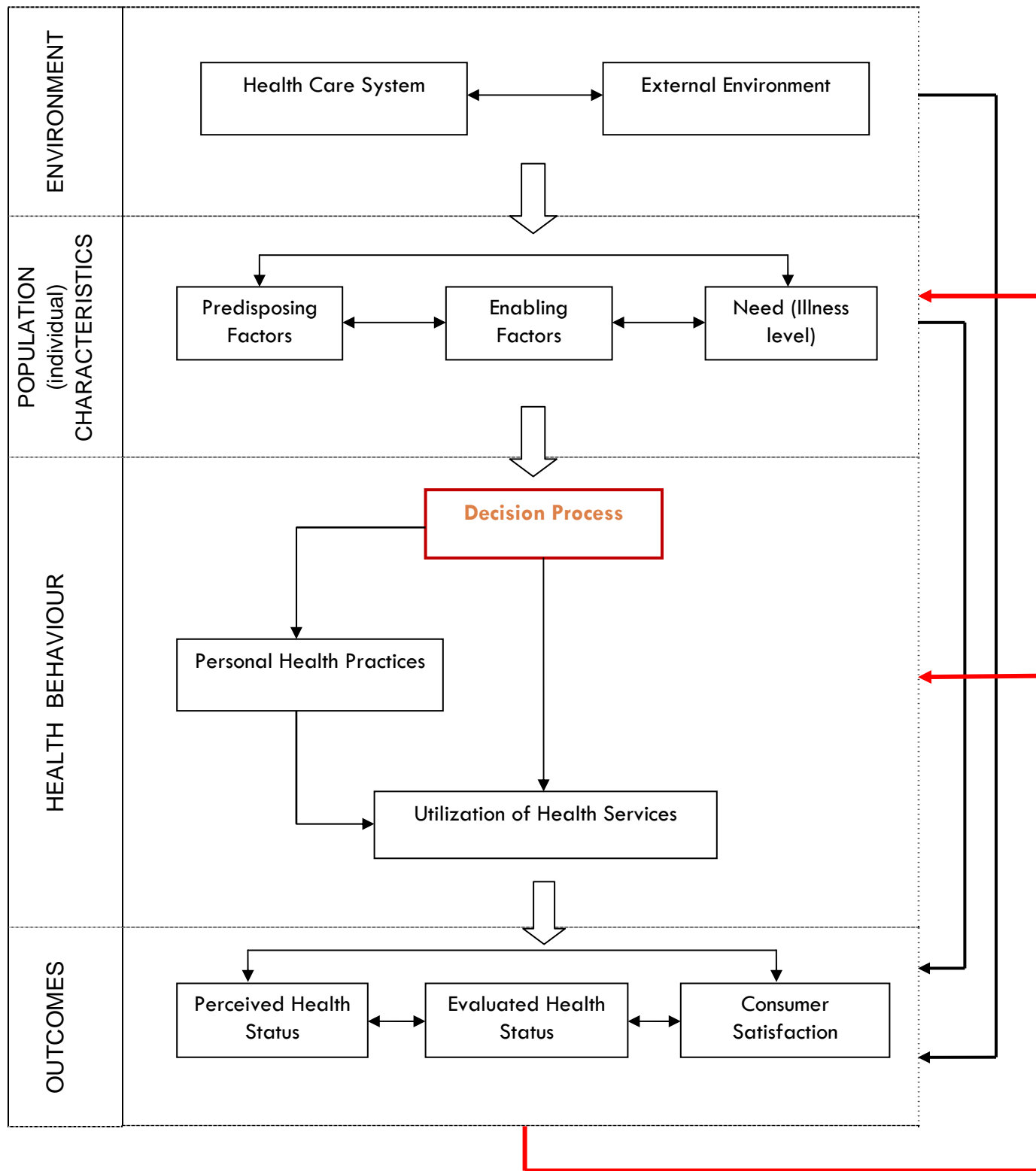
Use of health services is represented by type of service, purpose, and unit of analysis. Type of service refers to the type of facility and the professional that provides the service. Purpose refers to the type of care and what it is designed to accomplish (primary, secondary, tertiary, end of life care, and custodial). Unit of analysis defines how a service is being evaluated or studied.

The current model (Andersen, 1995) incorporates the external environment (physical, political, and economic components) and the health care system (policy, resources, organization) as macro-influencing variables, emphasizes the population and not the individual as unit of analysis, and includes the following outcomes: perceived health status, evaluated health status, and consumer satisfaction (convenience, availability, financing, provider characteristics, and quality). Figure 1.0 represents the current Andersen Model with the added decision-making process work of Padgett and Brodsky (1992).

## Health Services Utilization – Emergency Departments

The question of why the general population seeks fulfillment of health care needs at a hospital does present itself as an important one. The factors uncovered by research studies fit primarily in the category of population characteristics, although some are triggered by environment (health care system; external environment), for these refer to the lack or limited availability of resources in the system (e.g., Padgett & Brodsky, 1992; Parboosingh & Larsen, 1987; Richardson & Hwang, 2001; Steele, Anstett, & Milne, 2008).

Figure 1.0: Modified Health Behaviour Model





The utilization pattern of ED's by the general population has changed since the inception of such departments in the early 20<sup>th</sup> century. Originally planned as after-hours, urgent care facilities, ED's became 24/7/365 facilities, serving now both, urgent and non-urgent patients (Richardson & Hwang, 2001; Ruger, Richter, Spitznagel, & Lewis, 2004). The ED and its staff are seen as a safety-net for the population that cannot access other sources of health care. This lack of access to other sources is typically due to cost, availability, or other factors.

Richardson and Hwang (2001) in their review of the last 20 years of emergency medicine literature stated that "Because of the unique position of the ED within the health care system, the use of the ED is a function of:

- 1) The nature, acuity, and severity of the presenting complaint; and
- 2) The patient's experience with and access to other health care settings prior to the ED visit." (p. 1030).

*"Because of the unique position of the ED within the health care system, the use of the ED is a function of: (1) the nature, acuity, and severity of the presenting complaint; and (2) the patient's experience with and access to other health care settings prior to the ED visit." (Richardson & Hwang, 2001, p. 1030).*

Some of the major points that can be drawn from Richardson and Hwang's paper are:

- 1) Major ED issue is overcrowding for it leads to denied care – patients that leave without being seen;
- 2) Cost of ED utilization, when considering the marginal costs of seeing a patient (and not the fixed costs for the ED facility or physicians office), does not differ much from the cost of seeing a patient at another health care facility. In other words, if an ED infrastructure is in existence, its fixed cost is the same with or without patients being seen. The same is a valid reasoning for a physician's office. Therefore, not seeing a patient in the ED and sending the individual to another health care service – e.g., physician office – does not really save the health care system any extra money than seeing the patient at the ED;
- 3) A valid definition of what constitutes an 'appropriate ED visit' has yet to emerge from the literature;
- 4) Patients should be allowed to go to the ED and receive timely and appropriate care, especially those members of vulnerable and disenfranchised populations and those without primary care physicians or access to other health care facilities.

Below, the researchers of the current report present examples of what the literature covering ED use has demonstrated as important factors. The literature specifically cited below is not exhaustive of what is available, but represents the major studies and results obtained. The studies selected and presented below are examples of the evidence available in the literature.

Studies that have investigated why people go to EDs instead of utilizing other source of health care include:

- Padgett and Brodsky (1992) demonstrated that enabling factors such as income, insurance coverage, having an usual source of care, and geographic proximity affect use of the ED, both alone and in interaction with race (predisposing factor). The most common reason for non-urgent ED use was 'other care not available'. Non-urgent use of the ED is also linked to need factors arising from socioeconomic stress, psychiatric co-morbidities, and a lack of social support.

*The most common reason for non-urgent ED use was 'other care not available'. (Padgett & Brodsky, 1992).*

- Afilalo, Marinovich, Afilalo, Colacone, Lèger, Unger, and Giguère (2004) compared non-urgent with urgent and semi-urgent patients on their reasons for not seeking care with a primary care physician before coming to the ED. Results show that the reasons for non-urgent patients not to visit with their Primary Care Physicians (PCP) before coming to the ED are accessibility (PCP office was closed; unable to reach PCP; unable to secure an appointment) (32%), referral/follow-up (20%), familiarity with ED (11%), need (22%), trust (7%), and no specific reason given (7%).
- Lega and Mengoni (2008) investigated structural and psychological factors that led non-urgent patients to choose the Accidents & Emergency Department (A&ED) of a community in Italy rather than primary care services. They were able to show that patients have a preference for A&ED due to its diagnostic and therapeutic capacity. Also, patients' perception of need and socioeconomic conditions positively affect A&ED utilization.

*Lega and Mengoni (2008) were able to show that patients have a preference for A&ED due to its diagnostic and therapeutic capacity. Also, patients' perception of need and socioeconomic conditions positively affect A&ED utilization.*

- Steele, Anstett, and Milne (2008) investigated Canadian Emergency Department Triage & Acuity Scale (CTAS) IV and V visits to a low volume rural EDs. One hundred and twenty two patients (122), about 90%, reported having a family physician (FP) and 53 patients (39%) had already seen an FP before presenting to the ED. Just over one-half of all patients had their health problem for more than 48 hours, and 42 (31%) stated that they were referred to the ED for care. Fifty-three (39%) of the respondents felt they needed treatment as soon as possible. Many patients reported coming to the ED because: 1) their FP office was closed (22%); 2) they could not get a timely appointment (17%); or 3) the walk-in clinic was closed (25%). Only 6 patients (4%) specifically stated that they came to the ED because they had no FP. One-third of patients attended the ED because they believed it offered specialized services.

*Fifty-three (39%) of the respondents felt they needed treatment as soon as possible. Many patients reported coming to the ED because: 1) their FP office was closed (22%); 2) they could not get a timely appointment (17%); or 3) the walk-in clinic was closed (25%). (Steele, Anstett, & Milne, 2008)*

- The PCWTP (2009) report mentions the issue of utilization of EDs and other sources of care. Citing data from the 2007 Canadian Community Health Survey (CCHS) by Statistics Canada, 78% of the 4.1 million Canadians that identified themselves as not having a regular doctor have made use of other sources of care available. Walk-in clinics top the list as the most used source of care (64%) followed by emergency departments (12%), community health centres (10%), and “other” (14%).

Following, studies are presented that investigate the reasons and characteristics of individuals that seek health care in ED or other services in an attempt to find patterns of individual characteristics that could explain this use.

- Barsky, Wyshak, and Klerman (1986) investigated the relationships among psychiatric disorder (depression and hypochondriasis), somatic symptoms, medical morbidity, and the utilization of ambulatory medical services. Medical utilization is directly correlated with the number of somatic symptoms and depressive symptoms reported, as well as with the number of medical diagnoses in the medical record. Somatic symptoms were related to hypochondriacal attitudes and depression.
- Parboosingh and Larsen (1987) investigated predictors of the frequency and appropriateness of utilization of an emergency room by persons aged 65 years and older in a large city in Canada. Appropriateness in this study is defined as the efficient and effective use of health resources in achieving the best outcomes. Results demonstrate that attitude toward health care, prior experience with the hospital system and the number of available options of health care services, were important predictors of the frequency of presentation to the emergency department. Almost one half (47%) utilized the ED for appropriate reasons. About half of the patients, at the time of the emergency, have attempted to reach their PCP, with less than 1/3 of them succeeding in so doing.
- Connelly, Philbrick, Smith, Kaiser, and Wymer (1989) conducted a study to determine the influence of primary care patients' health perceptions on their utilization of health care services. Of 208 patients, 62 (30%) patients with health perceptions scores less than 50 had greater degrees of anxiety, depression, health-related worry, and felt less able to resist illness than patients with higher health perception scores. Patients with low health perceptions made more office visits, more telephone calls to the physician, and had more office charges than patients with higher scores.

*Patients with low health perceptions made more office visits, more telephone calls to the physician, and had more office charges than patients with higher scores (Connelly et al., 1989).*

- MacLean, Bayley, Cole, Bernardo, Lenaghan, and Manton (1999) study describes the population of individuals who seek health care at emergency departments. Children (15 years of age and younger) accounted for 23% of the users and younger adults (25 to 44 years of age) accounted for 31% of the users of non-urgent care. The most frequent reasons for visits were fever, chest pain, and abdominal pain, and the most common discharge diagnoses were middle ear infection, chest pain and acute upper respiratory infection. The majority (52%) of the patient visits were for non-urgent care, with 40% for

urgent care, and 8% for emergent care, with most visits occurring between 10 AM and 8 PM, peaking at 6 PM.

- Field and Briggs (2001) examined the extent to which the socio-demographic and factors related to geographic location (locational factors) affect people's utilization behaviour and perceptions of their access to a general practitioner (GP). Key identified themes were related to age, gender, social class, employment, ethnicity and proximity to the GP surgery. The young, elderly and females report higher rates of utilization, as do non-manual workers and those who are unemployed.

*The young, elderly and females report higher rates of utilization, as do non-manual workers and those who are unemployed (Field & Briggs, 2001).*

- Monzon, Friedman, Clarke, and Arenovich (2005) conducted a study to describe the socio-demographic characteristics and clinical outcomes of patients who leave the emergency department (ED) without being seen by a physician. Patients who leave the ED without being seen have different socio-demographic features, methods of accessing the health care system, affiliations and expectations than the general ED population. They are often socially disenfranchised, with limited access to traditional primary care. These patients are generally low acuity but at risk of important and avoidable adverse outcomes.

Another important factor that is affecting the health care system in general is that of wait time for treatment. This issue affects the delivery of primary and secondary health care and it is not easily solvable as the report from the PCWTP (2009) indicated. The report offers recommendations for action in addressing this problem for patients with and without a family physician. The report highlights the use of information systems and workflow improvements as a way to improve patient flow at the primary care physician offices and other PHC sites. The report also advocates the need for more family physicians in the province as the major key factor for addressing the wait time issue. Another ensuing recommendation is to advocate for, and support, collaborative work between different health care professionals. In essence, the foundation towards a more integrated health care system.

*There is a need to advocate for, and support, collaborative work between different types of health care professionals, leading to a more integrated health care system in Ontario (PCWTP, 2009)*

## Rural Health Care

Within the realm of utilization of health care and of providing health care to the general population, and applicable to the problem at hand, is the case of Rural Health Care delivery. From the definition of what Rural is to the intrinsic sociological and cultural characteristics of such populations, Rural Health Care delivery poses challenges to any health care system. Most common problems orbit around the issue of personal resources, distance, and knowing which services to offer (Graves, 2008).

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In the US, studies of Rural Populations and their health care needs have been conducted by many (e.g., Mercier & Shelley II, 1997; Glasser, Holt, Hall, Mueller, Norem, Pickering, Brown, & Peters, 2003; Oakley, Moore, Burford, Fahrenwald, & Woodward, 2005). The learning provided by these type of studies can be used as a source of evidence to the Canadian reality, as long as the main differences between both health care systems are taken into consideration. Nevertheless, Dunlop (2000) was able to demonstrate that even with controlling for the funded health system we have in Canada, predisposing and enabling factors do have an effect on the care received.

### **Rural Health Care Hospitals**

The facilities needed to be analyzed can be classified as small or very small rural hospitals as they provide services, in their majority, to patients that live in rural areas. Serving rural populations has been a major issue for health care systems in many countries and studies from Australia, the United States, and Canada revealed interesting challenges for the health care system in providing adequate and effective service (e.g., Nemet & Bailey, 2000; O'Meara, Burley, & Kelly, 2002; Arcury, Preisser, Gesler, & Powers, 2006; Baker & Liu, 2006; Wong & Reagan, 2009).

The importance of rural Hospitals for the communities which host them seems not to be fully understood. The review of the literature by the researchers involved in this report, did not provide many papers specific to the topic. One study that needs to be mentioned here is the one by Grafton, Troughton, and Rourke (2004). This study explored the relationship between community and health care from a historical and geographical perspective. Some important findings as stated by the authors were: (a) health care and related institutions are vital components in maintaining self-sufficient, sustainable communities (community is able to satisfy almost all relevant demands of its households); and, (b) in the development of both health care systems and rural communities, the important interplay and interdependency identified in this study must be incorporated into the planning and implementation development process. In reviewing data on hospital closures in rural Saskatchewan, the authors highlighted that 2 types of community depression were evident: economic and mental.

On the other hand, many research studies investigated geographical factors that affect the choice of utilizing health care services. The following are examples in the literature.

- Nemet and Bailey (2000) studied the relationship between distance and the utilization of health care by elderly residents in rural Vermont. The authors explored how other important activities such as grocery shopping, travel to work, home location relative to local services, access to private transportation, and living arrangements (also classified as activity space) are associated with the number of visits made to PHC providers. Results

showed that propensity to seek care, having a regular physician, and the presence of chronic illness related to more provider visits. Distance to provider affected visits negatively - distance decay. People who had to travel more than 10 miles to their physician tended to go to their physicians less frequently than those who had to travel shorter distances. The authors were able to demonstrate that physician location relative to activity space was positively associated with health service utilization.

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- Arcury, Gesler, Preisser, Sherman, Spencer, and Perin (2005) conducted a study to determine the importance of geography and spatial behaviour as predisposing and enabling factors in rural health care utilization. Results showed that having a driver's license and distance for regular care, as well as several predisposing (age, gender, ethnicity), enabling (household income), and need (physical and mental health measures, number of conditions) factors were related to regular check-up and chronic care visits. Acute care visits were found to reduce with age and to increase with every 10-unit increase in the SF-12 scale of physical health. Greater distance to the place where care was available was related to fewer regular health care visits. Distance was not significant for chronic and acute care visits frequency.
- Arcury, Preisser, Gesler, and Powers (2006) analyzed the association of transportation and health care utilization in a rural region. Findings are that those who had a driver's license had 2.3 times more health care visits for chronic care and 1.9 times more visits for regular check-up care than those who did not. Respondents who had family or friends who could provide transportation had 1.6 times more visits for chronic care than those who did not.
- Baker and Liu (2006) conducted a study in rural areas of Honduras to examine the factors that can be used to explain PHC utilization and to improve the understanding of patient utilization behaviour. Results indicate that estimated walking time, economic status, and home territory variables were found to be significant predictive factors explaining PHC utilization in the region. In contrast, variables for employment and education were not found to be significant. A strong "distance-decay" of utilization pattern based on estimated walking time to the clinics was found.
- Wong and Reagan (2009) examined how to deliver PHC services and increase their accessibility (regardless of geographic location) from the patient's perspective. The authors conducted seven focus groups with people living in rural communities in British Columbia, Canada. Participants described the challenges posed by geographical location in terms of additional out-of-pocket expenses associated with traveling to regional centers for health services, making tradeoffs between their safety of having to travel during times of poor road conditions and having their healthcare needs met. Timely access to a regular healthcare provider, continuity of information and management of people's chronic disease conditions, and linkages to specialist services and diagnostic tests pose major challenges for those living in rural communities.

*Timely access to a regular healthcare provider, continuity of information and management of people's chronic disease conditions, and linkages to specialist services and diagnostic tests pose major challenges for those living in rural communities (Baker & Liu, 2006).*

The JPPC (2006) report entitled “The Core Service Role of Small Hospitals in Ontario Phase One: An Exploration of the Current Services” provides evidence of the challenge of delivering health care services to rural communities and offer suggestions for managing the roles of rural health hospitals. Some of the highlights from the JPPC report (as published in the report) are as follows:

- For both Very Small (less than 1,500 weighted cases) and Small hospitals (between 1,500 and 4,000 inpatient weighted cases) current core services are:
  - General/Family practitioners;
  - An Emergency Department;
  - Emergency departments must be prepared to provide care (or stabilize and transfer) medical and mental health patients entering via the ED;
  - Laboratory, Physiotherapy, Ultrasound, and General Radiography; and
  - General and specialty ambulatory clinics tailored to the needs of the community.
- In addition to the above, for Small hospitals only, core services also include:
  - Physician specialty of General surgery (with anaesthesia support);
  - A General Surgery and day surgery program;
  - Obstetrics; and
  - The provision of special care units and the ability to accommodate ventilated patients;
- Our review of the available data is consistent with prior analysis suggesting that the activity of small hospitals is focused largely on medical services. This is particularly true for the smallest hospitals.
- From an ambulatory perspective, it was not possible with the available data to reach any conclusions about specific types of ambulatory clinic services that might be considered core services of small hospitals in Ontario. Although virtually all hospitals report ambulatory clinic activity, a wide variety of the types of clinics are reported. The specific ambulatory clinics available as a component of hospital services need to be considered in the context of community needs and the availability of community services.
- Throughout these challenges, rural hospitals are recognized as integral hubs of local health services and an essential part of the social and economic identity of rural communities. As such, they enjoy the benefits of tremendous support from the local community and are sincere in their attempts to meet the expectations and health needs of the populations they serve.
- The core services of small hospitals therefore must be considered in the context of their communities' expectations and the changing health care system. In the Ontario context, this emphasizes the importance of small hospital involvement in the LHIN planning process.
- These observations suggest that the new Ontario LHIN environment may well provide an appropriate planning forum to identify the necessary infrastructure, collaboration and innovative approaches to enhance access to surgical services in the Very Small Hospitals. Such planning should consider the necessity for local service balanced and informed by the available evidence associated with sustainable volumes and patient safety.
- The literature notes extensively that isolation of surgeons, anaesthetists, specialty trained nurses and other health professionals offers few, if any, of the checks and balances provided on a daily basis in larger centres through contact with colleagues. In this context, the critical

elements identified for successful rural practice have been noted as "... sufficient numbers to share the load, sufficiently differentiated GPs to cover multiple bases, sufficient back-up to support confidence, and sufficient money (and time off) to support stability" (Wootton, 2004).

## **Delivering Rural Health Services**

O'Meara, Burley, and Kelly (2002) conducted a study aimed at identifying the elements that constitute rural urgent care systems. The authors used focus groups in 5 rural communities of different sizes in Australia, and were able to identify twelve common elements of rural care systems and further classified those into 2 categories: infrastructure; and personnel. These are as follows:

1. Infrastructure:
  - a. Organizational Support
  - b. Community Support
  - c. Transport
  - d. Communication and Coordination
  - e. Facilities and Equipment
  - f. Community Knowledge and Information
2. Personnel:
  - a. Nurses
  - b. Doctors
  - c. Community Leaders
  - d. Health and Welfare Professionals
  - e. Emergency Service Workers
  - f. Ambulance Officers

The authors also stressed that "effective interdisciplinary partnerships between general practitioners, nurse practitioners, bush nurses, ambulance personnel, and other health professional are fundamental to the successful provision of urgent care in rural areas." (pg. 46)

In reviewing a decade of progress in rural health in Australia, Humphreys, Hegney, Lipscombe, Gregory, and Chater (2002) suggest the following 'mottos' for planning and delivering rural health care:

- Think health status;
- Think system;
- Think long term, act short term;
- Think community;
- Think whole-of-health;
- Think genuine partnership between governments, providers, and communities.

## **Alternative Models for Health Care Delivery**

The previous information was presented to help in clarifying the current health care delivery picture that is being experienced by hospitals in the ESC-LHIN area of responsibility. These researchers purport that the information aids in understanding what is transparent from the initial analysis of the Sydenham, Petrolia, and Leamington sites (discussion of what the data show for



these sites follows item 4). This section of the report opens with the discussion of alternative health care delivery models that have been used in Canada and in other countries, or that are becoming available through various government initiatives. It is then followed by the evidence from the literature on what has been accomplished in relationship to the utilization of some of the approaches.

### **Community Health Centres**

A Community Health Centre (CHC) is a non-profit organization, which provides PHC and health promotion programming to a community population (MOHLTC, 2009a). The overall goal of a CHC is to promote community health and wellness. The target population may include the individual, family and/or the community as a whole. Primary care is provided to those who have difficulty accessing such care. This may be due to language barriers, cultural differences, disability, poverty and/or geographical remoteness. The focus is on increasing individual coping and strengthening a community's capacity to assume responsibility for its own health. The inter-professional team of the CHC works collaboratively with the health and social service sector to assist clients to access the necessary resources which promote health and wellbeing.

Services may include:

- domestic violence prevention, treatment and counselling
- addictions counselling
- conflict resolution, anger management, stress management, self-esteem enhancement;
- parenting education
- parent-child resource rooms and drop-ins
- anti-racist initiatives and other programs to promote tolerance, cultural diversity and acceptance of minority groups
- teen and youth education including weight/body image issues, peer relationships, healthy sexuality
- healthy aging initiatives, including health promotion and illness/injury prevention
- chronic disease prevention & management
- homelessness strategies

CHC's do not provide emergency care, and the ability to provide an urgent level of care remains limited.

### **Family Health Teams**

A Family Health Team (FHT) consists of an inter-professional team of health care professionals who work collaboratively to provide direct health care services, chronic disease management, disease prevention, rehabilitation, palliative care and health promotion (MOHLTC, 2009b). The team consists of physicians and other health care professionals, which may include registered nurses, nurse practitioners, dietitians and pharmacists. The focus of an FHT is to provide accessible health care "virtually around the clock", thus reducing the burden on ED's for non-emergency care needs. Accessibility includes alternative contacts and mechanisms of obtaining information through electronic services, such as after-hours telephone support and referral.

## Services:

- Regular office hours are provided by each family physician and nurse practitioner
- Clients have access to other health care professionals within the FHT
- Clients have access to a FHT physician during extended evening and weekend hours for urgent health care problems.
- After-hours advice for urgent health concerns is provided by a registered nurse through the FHT Telephone Health Advisory Service.
- Continuity of care is enabled through documentation of such telephone calls and visits with other health care professionals within the FHT
- The integration of the electronic health record within FHT's supports organization and sharing of health information.

FHT's do not provide emergency care. The ability to provide an urgent level of care is based upon the nature of the health concern and the time of day when care is required. That is, urgent care required outside of extended evening and weekend hours would likely be met in the ED.

## Telehealth

Telehealth is a free, confidential telephone service whereby individuals can access health care advice or information from a Registered Nurse - RN (MOHLTC, 2009c). The service is available 24 hours a day. With a specific health care concern, a focused assessment is facilitated by the RN to determine the most appropriate level of care needed. The recommendation may include any, or a combination of the following health strategies:

- Applying self-care
- Accessing a community resource
- Booking an appointment with the PHC provider
- Accessing a walk-in clinic or urgent care centre
- Accessing the ED

Within the context of emergency care, telehealth provides a system of triage, whereby, a client receives professional health advice concerning the level of care required for his or her health concern. When experiencing an emergent health concern, the client would likely be directed to the ED. Conversely, an individual requiring a lower level of care would be advised to access non-emergency care. Although this system does not provide direct care for a health problem, theoretically, it can help to facilitate appropriate use of emergency care among the population.

## Telemedicine

Telemedicine is the use of information and communication technologies for the delivery of health care to a location different from where the health care practitioner is located. Telemedicine applications play an increasingly important role in health care and provide tools that are indispensable for home health care, remote patient monitoring, and disease management.

Telemedicine has been applied in surgery and diagnosis, in rural health and hard-to-access locations, such as battlefields. As early as 1993, Rinde, Nordrum, and Nymo discussed the application of telemedicine in rural Norway. Since then, and with the development of more advanced technology in the area of networks and telecommunications, more research and applications of telemedicine have been conducted and developed (e.g., Stanberry, 2000; Van Ast & Larson, 2007; Mair & Ferguson, 2008). The use of telemedicine in rural health care does provide future hope for the provision of services that are either not available or not regularly available in rural communities. There are a large number of published reports of the success of the use of telemedicine provided that the underlying infrastructure to support electronic service delivery needs, and its redundancy in the case of technology failure are met (Keane, 2009). In addition, successes in the areas of emergency telepsychiatry (Yellowlees, Burke, Marks, Hilty, & Shore, 2008), telecardiology consultations and transfer patterns (Huang, Moon-Grady, Traugott, & Marcin, 2008), collaborative mobile e-health (Ray, Parameswaran, Cahn, & Yu, (2008) and systems in use for remote consultation in cases of acute stroke (Kim, Yoo, Park, Choa, Bae, Kim, & Heo, 2009).

### **Case Management/Demand Management**

Vickeri (1996) suggests the utilization of demand management as an approach to increase overall health status. Demand management relies on information, but it recognizes that the decisions consumers make about their care are influenced by other factors such as their cognitive skills, social support, sense of self-efficacy, and cultural norms. The demand management model postulates that demand for medical services has four sources: morbidity, perceived need, patient preference, and non-health motives.

“Demand management uses self-care interventions to influence perceived need by directly improving an individual’s ability to assess and manage medical problems and that self care does not prevent illness; it changes the way an individual uses medical care and manage illness by changing his or her knowledge and perception of the need for professional medical care.” (Vickeri, 1996, pg. 17)

Vickeri (1996) stresses that perceived need – a person’s view of his or her illness and the health care services needed – was the most important factor influencing a person’s use of medical care. This was influenced by an individual’s knowledge of the risks and benefits of medical care; perceived efficacy of the treatment; ability to assess the problem; perceived severity of the problem; capability to self-manage the problem; and confidence in his or her ability to self-manage the problem. Demand Management used four basic services:

- Telephone-based decision support
- Communications that address self-care (self-care publications, for example)
- Group and individual education programs
- Traditional health promotion programs

### **Walk-In Clinics**

Also referred to as after-hours clinics, walk-in clinics provide care for non-complicated and non-emergency health concerns. Appointments are generally not required, and services are often provided during evening and weekend hours. Some walk-in clinics provide additional services, such as laboratory and x-ray. Walk-in clinics do not provide emergency care, and the ability to provide an urgent level of care may be limited, due to credentialing and expertise of the health care providers and supportive resourcing within the clinic (MOHLTC, 2009c).

### **Registered Nurse Practitioner**

A nurse practitioner (NP) is a registered nurse with advanced skill in the assessment and management of acute and chronic disease (Canadian Nursing Association [CNA], 2005). Practising within a holistic model of care, NP's also implement strategies among their clients which promote health promote and prevent illness.

Within Ontario, NP's are regulated by the College of Nurses of Ontario (CNO). Scope of practice is determined by factors such as, access to health care providers and other resources, as well as the experience and expertise of the NP. Across the province of Ontario, these advanced practice nurses work both independently and collaboratively in a variety of clinical settings, including the community, clinics, emergency departments, urgent care centres and hospitals. Depending upon the setting, the NP may work directly with a physician. If working independently, decision-making may be supported through medical directives developed by the institution or agency. The MOHLTC (2009d) recently announced the approval of eight NP-led clinics in the province of Ontario, with one of these clinics to be located in the town of Essex, Ontario.

Within the context of emergent care, the scope of the NP may include the following:

- Carry out advanced, comprehensive and focused health history and complete physical examination
- Identify health concerns, risks, normal and normal states of health
- Formulate differential diagnoses
- Order appropriate screening and diagnostic tests & interprets reports
- Diagnose diseases, disorders and conditions
- Communicate health findings and/or diagnoses
- Document assessments, findings, diagnoses, collaborations, communications and conclusions
- Determine treatments and prescribes them in writing
- Select and prescribe drug therapies
- Carry out counselling and advanced therapeutic interventions, such as minor surgical and invasive procedures essential for the clinical management of diseases, injuries and disorders
- Anticipate, recognize and intervene in stabilizing clients in rapidly changing urgent and emergent situations (CNA, 2005).

## Urgent Care Centres – What are they?

Urgent Care Centre (UCC) is a relatively new way of delivering health care. The original idea behind such a model appears to be rooted on the over-utilization of EDs and, consequently, the delays in providing needed care on a timely basis. UCCs have experienced a tremendous growth in the United States, but are appearing at a much lesser rate in Canada. In the US, UCCs are represented by the Urgent Care (UC) Association of America (UCAOA) which provides both accreditation and certification. The Joint Commission Accreditation together with the UCAOA created an accreditation program to ensure that UCCs meet the standards for quality and safety required by the Joint Commission. Another US institution that provides accreditation practice standards for UCCs is the North American Association for Ambulatory Urgent Care (NAFAC). There does not appear to be a Canadian institution or organization that represents UCCs or that regulate what UCCs need to provide in order to achieve minimum standards on terms of quality and safety. Some of the Canadian self-entitled UCCs do not substantially differentiate themselves from the Walk-In clinics.

*In Canada, there does not appear to be an institution or organization that represents UCCs or that regulate what UCCs need to provide in order to achieve minimum standards in terms of quality and safety. Some of the Canadian self-entitled UCCs do not substantially differentiate themselves from the Walk-In clinics.*

A web-based search for UCCs in Canada exemplifies the current situation lacking consistency between what services are offered, hours of operation, and what other laboratory and exam services need to be offered.

### Definition of Urgent Care

There are different but complimentary definitions of what represents UC. These researchers hereby present some definitions to clarify what is meant by the term “urgent care”. NAFAC (2009a) offers the following definition: “Urgent Care Medicine specializes in the treatment of any disease, illness, and injury, which is presented by otherwise healthy consumers.” NAFAC also states that “Urgent Care Medicine provides services to 85% of the population who do not suffer from a long-term chronic disease, or require the services of a hospital.”

*NAFAC reports that “Urgent Care Medicine provides services to 85% of the population who do not suffer from a long-term chronic disease, or require the services of a hospital” (NAFAC, 2009a).*

The American Academy of Urgent Care Medicine (AAUCM) offers the following definition for Urgent Care: “Urgent Care Medicine is defined as provision of immediate medical service (no appointment necessary) offering outpatient care for the treatment of acute and chronic illness and injury”. Urgent Care Medicine requires a broad, comprehensive fund of knowledge to provide such care, and concentrates on the evaluation and treatment of acutely arising

conditions in all age groups. Urgent care specialists often first diagnose chronic conditions, generally with referrals to primary care physicians (AAUCM, 2009).

*Urgent Care Medicine concentrates on the evaluation and treatment of acutely arising conditions in all age groups. Urgent care specialists often first diagnose chronic conditions, generally with referrals to primary care physicians (AAUCM, 2009).*

The Royal College of General Practitioners (Lakhani, Fernandes, & Archard, 2007) in England defines urgent care as “the range of responses that health and care services provide to people who require – or who perceive the need for – urgent advice, care, treatment or diagnosis. People using services and carers should expect 24/7 consistent and rigorous assessment of the urgency of their care need and an appropriate and prompt response to that need.”

*The Royal College of General Practitioners defines urgent care as “the range of responses that health and care services provide to people who require – or who perceive the need for – urgent advice, care, treatment or diagnosis (Lakhani, Fernandes, & Archard, 2007).*

### **Defining Urgent Care Centres**

The definition of an urgent care centre orbits around the definition of urgent care. For instance, the Urgent Care Association of America (UCAOA, 2008) defines urgent care [center] as “the delivery of ambulatory medical care outside of a hospital emergency department on a walk-in basis without a scheduled appointment.”

The Department of Veteran Affairs (VA, 2007) defines an urgent care clinic as a facility that “provides medical care for patients without a scheduled appointment who are in need of immediate attention for an acute medical or psychiatric illness, and/or minor injuries.” It further states that Urgent Care Clinics can exist in facilities with or without an ED.

The MOHLT (2009e) defines Urgent Care Centre as a facility that “provides services to patients without an appointment seeking treatment for non-life threatening conditions during the day, in the evening and on weekends. Urgent Care Centres are equipped to provide all types of treatment, with the exception of surgery. Provide immediate care for minor or uncomplicated conditions in less urgent situations such as eye injuries, sutures, casts, X-rays, and laboratory tests.”

Blue Cross-Blue Shield of Michigan (BCBSM, 2010) offers the following explanation for urgent care centers: “Urgent Care Centers offer walk-in care for patients with illnesses or injuries that do not require the intensity of care offered at an emergency room, but typically cannot wait for a scheduled appointment in a physician’s office.” BCBSM further states that UCC “provide medically necessary services for the treatment of illness and injuries that have the potential to develop into further disability or death if treatment is delayed longer than 24 hours.”

The Government of Minnesota (2010) defines UCC as “Programs, which may be available on a 24-hour basis, that provide walk-in treatment services for people who have minor illnesses or injuries. Urgent care centers serve as an alternative to hospital emergency departments for episodic care that cannot be delayed until an appointment at a physician's office is available; and are often equipped to provide services not generally available in primary care physician offices, e.g., have x-ray facilities that allow for treatment of minor fractures and foreign bodies such as nail gun injuries and/or minor care trauma rooms that facilitate the repair of minor and moderate to severe lacerations that can be treated in an urgent care center.”

Delaware Healthcare Association (DEHA, 2010) defines an UCC or Unit as “A medical facility where ambulatory patients can be treated without an appointment, and receive immediate, non-emergency care. The urgent care center may be opened 24 hours a day;”

The ESC-LHIN (2009a) offers the following clarification to the public about Urgent Care: “The main distinguishing feature of an UCC is that it is not designated as a ‘Receiving Centre’ for ambulance bound patients. Thus, any patients designated as CTAS level 1 or 2 being transported by ambulance will automatically be routed to an ED. However, it is recognized that UCC may be the destination chosen by patients suffering from what ultimately evolves into an immediate life or limb threatening clinical problem. Thus, UCCs must have the necessary skills and diagnostic equipment to assess and resuscitate patients presenting with a complete range of medical problems. Urgent Care Centres typically, although not necessarily, operate for a reduced number of hours (generally 12 to 16) per day. They may also provide service 7 days per week.”

*“The main distinguishing feature of an Urgent Care Centre is that it is not designated as a ‘Receiving Centre’ for ambulance bound patients. Thus, any patients designated as CTAS level 1 or 2 being transported by ambulance will automatically be routed to an ED.” (ESC-LHIN, 2009a)*

A current study on utilization of ED and UC is provided by Doupe, M., Kozyrskyj, A., Soodeen, R., Derksen, S., Burchill, C., and Huq, S. (2008). The authors provided initial exploration of ED and UC utilization in the Winnipeg area, focusing in particular on: (1) the appropriateness and quality of the data captured by ED/UC units and used for reporting their utilization; and (2) profiling the frequent users of ED/UC. The study also reported on observed general trends in ED/UC use, such as large (and growing) portion of ED visits being for a minor medical problems and almost 74% cases discharged home. It was also noted that patterns of use for EDs and UCs were different, given UCs focus on handling non-life threatening conditions. The study recorded number of challenges related to data characteristics and collection process, emphasizing data capturing inconsistencies among the sites and resulting loss of information.

## Urgent Care Centres Certification and Accreditation

As previously stated, UCCs are more defined and regulated in the United States than in Canada. The following items present more specific information on the requirements such centres need to fulfill in order to be certified or accredited in the USA.

### CERTIFICATION REQUIREMENTS (UCAOA, 2009a)

The UCAOA provides the following guidelines for certification of UC facilities. It is important to note that there are 2 levels of certification: Category 1 and Category 2. The staffing model is what defines in which of such categories the UC facility falls into:

- Category 1 = licensed physician (MD/DO) on site during all posted hours of operation
- Category 2 = licensed practitioner (MD/DO or NP, PA) on site during all posted hours of operation (mixed models).

UCAOA requires that all facilities, regardless of staffing model, meet or exceed all of the following criteria.

1. Facility must accept and advertise that walk-in patients of all ages are accepted for a broad spectrum of illness, injury and disease during all hours the facility is open to see patients.

- Paediatric specialty centers are exempt from above age requirement IF paediatric-only specialization is included in the name of the facility.

2. The following must be available during all posted hours of operation for the facility:

- X-ray on site
- Phlebotomy services on site
- Licensed provider on site with the appropriate state licenses and resources to:
  - obtain and read an EKG and x-ray on site
  - administer PO, IM & IV medication/fluids on site
  - perform minor procedures (ex. sutures, cyst removal, incision & drainage, splinting) on site.
- The following equipment, and staff trained in its use:
  - automated external defibrillator (AED)
  - oxygen, ambu-bag/oral airway
  - drug cart stocked appropriately for patient population (as determined by the facility)
  - working phone to dial 911
- At least two exam rooms, separate waiting area and restricted access patient restrooms.

3. Minimum hours of operation (must meet all three criteria)

- 7 days/week (not including national holidays)
- 4+ hours each day
- 3000 hours per year

NOTE: Alternatively, special circumstances will be considered for a facility if all of the following are met (see application):

- Facility is part of a multi-center system
- Facility is open 5+ days/week (not including national holidays)



- Another facility that is part of the same system meets standard minimum hours of operation criteria [Criteria 3] AND is less than or equal to five miles away.

4. Facility must have a licensed physician designated as Medical Director for the facility who is responsible for overall clinical quality.

#### CERTIFICATION REQUIREMENTS (NAFAC)

NAFAC does not have on its website a summary document as the one just presented from UCAOA. The Standards Guideline Document Table of Contents is presented on the website and covers the following contents (NAFAC, 2009b):

1. Service Standard
2. Administration Standard
3. Quality Care Standard
4. Event Records Standard
5. Laboratory Services Standard
6. Radiology Services Standard
7. Work Place Standard
8. Public Relations Standard
9. Communications Standard
10. Event Record Management Standard
11. Documentation Standard
12. Medication Dispensing Standard
13. Follow Up Systems Standard
14. Non-Physician Practice Standard
15. Patient Consent Standard
16. Emergency Protocol Standard
17. Work Environment Standard
18. Claim Handling Standard

#### ACCREDITATION REQUIREMENTS (UCAOA, 2009b)

The document entitled “Accreditation Handbook for Urgent Care Centers” published by the Joint Commission Accreditation – Ambulatory Care together with UCAOA serves as the guiding document for UCCs considering accreditation status. The document presents a standard follow by a rationale and the elements of performance that will be measured to evaluate compliance. The document covers the following topics:

1. Environment of Care
2. Emergency Management
3. Human Resources
4. Infection Prevention and Control
5. Information management
6. Leadership
7. Medication Management
8. National Patient Safety Goals
9. Provision of Care, Treatment, and Services
10. Performance Improvements

11. Record of Care, Treatment, and Services
12. Rights and Responsibilities of the Individual
13. Waived Testing.

### **Urgent Care Centres Characteristics**

A national survey conducted of UCC operations in the United States presents the following characteristics of the scope of services, staffing, and facility designs (NAFAC, 2009a):

#### **1. Scope of Services**

- 90% or more of all UCC's are episodic and acute. Minor laceration, fractures, bumps sore throats, ear infection, and other "just don't feel good" conditions
- 87% of all UCC's provide a wide range of Worker's Compensation, Pre-placement services, DOT exams, BAT testing, etc.
- 97% of all UCC's provide pre-packaged prescription services. (i.e., average of 28 frequently used drugs.) This may vary by State laws.
- 100% of all UCC's have X-ray departments for basic radiology covering fracture care chest exams, etc.
- 98% of all UCC's have a CLIA level II laboratory department for routine blood test and other diagnostic procedures. Federal laws regulated the delivery of these services.
- 100% of all UCC's have life support capabilities but do not advertise this service to the public. People who present to the ACC with life threatening situations are immediately transferred to the Emergency Departments or referred to the 911 EMS.
- 100% of all UCC's are licensed to practice medicine by the State in which the practice is located. No other certification or accreditation is required.
- 95% of all UCC's are open seven days each week, 13 hours on average and require no appointment.
- 95% of all UCC's physicians do not have and do not require hospital-admitting privileges. Patients requiring this care are referred to their own PMD or are referred to a local PMD for appropriate follow up and continued care.
- 95% of all UCC's will see managed care patients, traditional insurance, and private pay. These centers offer the customer discounts for cash payment when the service is not billed to a third party.
- 96% of all UCC's use a fee for service system of payment. This provides for a specific measurement of cost, benefit, and value in purchasing ACC services. Other forms of reimbursement vary by contract and from state to state.
- 68% of all UCC's provide acute on-site physical therapy. This is a very effective case management tool for Worker's compensation.
- 60% of all UCC's are privately owned by physicians and other owners. Hospitals account for the remaining ownership. Private ownership is increasing while hospital ownership is declining. Variations occur from year to year.
- Less than 5% of all UCC's do traditional primary care. Those centers that do are located in service areas, which have a limited number of providers.
- State licensing regulates the delivery of this service.

## 2. Staffing

- 97% of all UCC's are staffed by full time physicians and medical staff.
- 70% of all UCC physicians are board certified in Family Practice or Emergency Medicine. A state and federal license to practice medicine is required for practice in an UCC as in all private practices of medicine.
- Medical staff is comprised of RN's, LPN's, Medical Assistants, Lab Technologists, X-ray Technologists and other medical support personnel. The configuration of the staffing is in accordance with state laws and varies from state to state and within different community's standards of care.
- 100% of all UCC's have a physician available at all times. Some variation of this may be seen in very rural remote areas where Nurse Practitioners and Physician Assistants are present.

## 3. Facility Design for UCC

- 50% of all UCC's are freestanding clinic buildings. 50% are in retail shopping centers. The sites vary by state and group development preference. All are routinely convenient and easy to locate and utilize.
- UCC's differ from traditional Physicians office with procedure rooms for lacerations and fractures, Radiology department for x-ray services, laboratory for lab services and onsite physical therapy. While some traditional physician practices may have these facilities, it is more of an exception. It is the rule for UCC's to have these service spaces available.
- The average UCC's is between 3,600 square feet and 12,000 square feet. The variation is based on common practice and the extent of services offered.

## Efficiency / Effectiveness of Alternative Models

In this section, we will present the results of studies conducted to evaluate alternatives for health care delivery that have the potential to minimize the use of hospital resources and increase the efficiency of Rural Health Care services. Studies that investigated ways of reducing the use of hospital utilization by non-urgent patients are:

- Merritt, Naamon, and Morris (2000) examined the effect of a visit to an UCC on ED use by patients with non-emergent complaints. The ED and clinic usage 6 months before and 6 months after a UCC visit were examined. After the UCC visit for adults there was a 48% reduction in ED visits and 49% increase in clinic visits, while for children there was a 28% reduction in ED visits and 65% increase in clinic visits. There was no substantial change in patterns of hospitalization 6 months after the UCC visit which means that UCC usage decreased non-emergent ED use without adverse effects of increased patient hospitalization in this population.

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- Coleman, Eilertsen, Kramer, Magid, Beck, and Conner (2001) report on a study that investigated if providing primary care group visit would reduce the use of ED visits by older adults with chronic illness. These visits were designed to emphasize self-management of chronic illness, peer support, and regular contact with a primary care team. Results demonstrate that the group participating in such activities averaged fewer ED visits and were also less likely to have an ED visit in the future.

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- Bunn, Byrne, and Kendall (2009) assessed the effects of telephone consultation on safety, service usage, and patient satisfaction, and also to compare such services provided by different health professionals. Nine studies met the author's criteria for review. Results show that 3 out of 5 studies found a decrease in visits to a GP but also found an increase in return consultations. About 50% of the calls were successfully handled by telephone advice alone. The authors conclude that telephone consultation appears to reduce the number of surgery contacts and out of hours visits by general practitioners, but warn that further evaluation of safety, cost, and patient satisfaction should be conducted.

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- Michelen, Martinez, Lee, and Wheeler (2006) report on the results of an ED diversion program started by the Northern Manhattan Community Voices partners with the use of health priority specialists and community health workers. Seven-hundred eleven patients were assessed at 6 months. Results showed that providing health education, teaching patients how to use the health care system, and providing counselling on social/emotional issues significantly reduced the use of the ED.
- Mair and Ferguson (2008) conducted a retrospective review to estimate the number of patients sent to the main hospital ED who would have been suitable for treatment via telemedicine. Data comes from 3 of the 15 minor injury units (MIU) in community hospitals. Results show that the MIU with higher use of tele-consultation referred the lowest proportion of patients (2%) to the hospital ED, while the MIU with no tele-consultation and which X-rays were reviewed by a GP referred 85% of its patients to the hospital ED. Further analysis of these patients estimates that about 80% of those could have been managed by tele-consultation.

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- Schumway, Boccelari, O'Brien, and Okin (2008) report on a study to test if clinical case management is more cost-effective than usual care for frequent users of the ED. Results demonstrate that case management was associated with statistically significant reductions in psychosocial problems common among ED frequent users including homelessness, alcohol use, lack of health insurance and social security income, and financial need. Case management was also associated with statistically significant reductions in ED use and cost.

Studies that investigated ways of providing health care services or increasing the efficiency of those for rural populations are:

- Glasser, Holt, Hall, Mueller, Norem, Pickering, Brown, and Peters (2003) report on the organization and outcomes of a Rural Health Outreach Initiative (RHOI). Overall, the outcomes of student-led projects with the collaboration of medical preceptors and the community, as well as mini-grants program also with collaboration with the community proved to be successful in increasing the overall health of the rural population as well as helping in developing positive health behaviour. Results also show that the expanded scope of practice (ESP) by paramedics increased the interaction between ambulance services and rural communities with an overall benefit to health care through increasing community response capacity, linking communities more closely to ambulance services, and increasing health promotion and illness prevention work at the community level.
- Van Ast and Larson (2007) report on the use of videoconferencing as a tool to educate and support rural carers. Besides being well accepted by carers and trainers, it also improved learning and retaining of knowledge. The use of videoconferencing also provided psychosocial support to isolated cases with a cost reduction of up to 47% when compared to face-to-face sessions.

*The use of videoconferencing also provided psychosocial support to isolated cases with a cost reduction of up to 47% when compared to face-to-face sessions (Glasser et al., 2003).*

- Stirling, O'Meara, Pedler, Tourle, and Walker (2007) reported on a community engagement program by paramedics and its positive contributions to both PHC and overall improved emergency response capacity.
- Scott-Jones, Lawrenson, and Maxwell (2008) reported on an initiative in a rural New Zealand community to provide after hours care. First contact for patients was with a community nursing team operating from the local health centre and complemented by on-call advice from GPs. Results demonstrate that 114/204 patients were managed successfully by nurses or ambulance staff while 90/204 were managed by the GPs. Overall 87% of the contacts handled by the nurses and doctors were managed locally reducing the need for utilization of the base hospital.
- Ballance, Kornegay, and Evans (2009) reviewed the literature on factors that influence rural practice location decisions by physicians. They identified factors that fall into 5 general categories: (1) preparation for and recruitment by medical schools; (2) the medical school experience; (3) the residency experience; (4) recruitment of physicians to rural communities; and (5) retention of rural physicians. Evidence reported in the literature

favour a multidisciplinary or multi-faceted approach that results in more residents and physicians locating their practices in rural areas. While rural background is a common factor in many physicians who choose rural practices, programs that encourage and maintain rural affinity and intent to choose family medicine or primary care are also a necessary component in a rural physician's education and residency. Effective recruitment efforts that highlight the positive aspects of rural life and address work-life balance are also shown to attract providers and retain them in their rural practices.

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### Quality Metrics for Assessment and Design of Care Delivery

Quality is an important element in the delivery of health care. Without quality health care, the population would not improve its health status and more services would be needed. Quality, therefore, needs to be included in the decision making process. While there is an almost universal agreement that healthcare quality is extremely important, there is also a general lack of agreement what is the exact meaning of quality. It is common that definitions of quality differ among stakeholders.

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Historically, interest in defining and measuring quality in health care has been relatively recent. Much of the groundbreaking progress in measuring quality can be traced to pioneering work of Donabedian (Donabedian, 1966; Donabedian, 1980) who defined dimensions of quality. The knowledge of methods to measure and improve the quality of care is tied closely to models for approaching quality improvement in industries other than health care (Blumenthal, 1996). Over the past 30 years almost 100-fold increase in well-documented data collection efforts through medical studies and clinical trials have transformed health care into evidence-based enterprise and supported the need of quality standards. The public awareness of patient safety and quality increased with Institute of Medicine's (IOM's) seminal report *To Err Is Human: Building a Safer Health Care System* (Kohn, Corrigan, & Donaldson, 2000) and its follow up *Crossing the Quality Chasm: A New Health System for the 21st Century* (Institute of Medicine [IOM], 2001).

The ultimate measure of the quality of health is the health status of the community. Currently, reports pertaining to such assessment are routinely published (Agency for Healthcare Research and Quality [AHRQ], 2008). In Ontario such a report is produced by the Ontario Health Quality Council (OHQC, 2009); other Canadian provinces generating similar assessments. It has to be

emphasized, though, that while determination of quality of health of a population living in an area can be derived from indices summarized in these extensive reports, relationships of such measures of quality to the services provided by specific physicians or hospitals remains poorly defined.

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In assessing quality of care, measurement and availability of data are key concerns. Other issues such as data reliability and consistency, as well as non-direct observational data collection, are also important as they raise the issue of the extent to which the data reflect the actual care provided. Nevertheless, assuming the availability of accurate and appropriate data, quality assessment is typically carried out in three dimensions (Donabedian, 1980; Wolper, 2004):

- Structure of Care: reflects the environment in which the care is provided, and includes quality of inputs (labour, facilities, equipment, supplies, certifications, etc.)
- Process of Care: focuses on organization and methods to provide services, in particular when compared to standard procedures (clinical guidelines)
- Outcome of Care: reflects what happened to the patient and may include measures reflecting clinical outcomes, quality of life, patient satisfaction, among others. While these may be the most important indicators of quality, they are also difficult to measure. The determination of causal relationships between medical care and patient outcomes is continuing biggest challenge.

In essence, these three dimensions are connected with each other and constitute a quality management system, shown in Figure. 2. The evaluation (assessment) of the three areas when compared to the current state-of-the-art in healthcare delivery may initiate a need for corrective (improvement) actions, through which inputs and processes can be replaced, refined, or reconfigured. This is a *systems* view of quality.

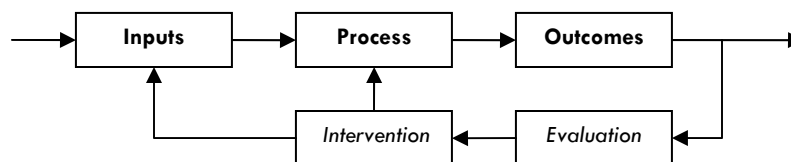


Figure 2 Quality Management System

To help define quality of care in terms of both technical standards and patients' expectations, the Healthcare and Workforce Improvement (2009) "Quality Assurance Project (QAP)" has defined nine dimensions of quality:

- Technical performance
- Access to services
- Effectiveness of care
- Efficiency of service delivery
- Interpersonal relations
- Continuity of services
- Safety
- Physical infrastructure and comfort
- Choice.

The AHRQ (2009) publishes four sets of specific Quality Indicators (QIs): Prevention QIs, Inpatient QIs, Patient Safety Indicators, and Paediatric QIs. This quality of care indicators can be readily derived from available treatment/insurance claims data. A total of 81 indicators are defined.

The OHQC annually collects, collates, and disseminates report on quality of health care on the province and its conformance to established benchmarks. It is worth noting, however, that structurally the information provided in the report is organized similarly to the QAP, and along the nine desired characteristics of health care delivery system defined as:

- Accessible: people should be able to get the right care at the right time in the right settings by the right healthcare provider;
- Effective: people should receive care that works and is based on the best available scientific information.
- Safe: people should not be harmed by an accident or mistakes when they receive care;
- Patient-centred: healthcare providers should offer services in a way that is sensitive to an individual's needs and preferences;
- Equitable: people should get the same quality of care regardless of who they are and where they live;
- Efficient : the health system should continually look for ways to reduce waste;
- Appropriately resourced: the health system should have enough qualified providers, funding , information, equipment, and supplies and facilities to look after people's health needs;
- Integrated: all parts of the health system should be organized, connected, and work with one another to provide high quality care;
- Focused on population health: the health system should work to prevent sickness and improve the health of the people of Ontario.

The fundamentals of quality-of-care definition and management are increasingly bearing resemblance those to quality as defined in business model, and therefore are not fully accepted in traditional medical environment. The main criticism being that they overlook the human component, namely people being the main subject of the quality considerations.



When it comes to evaluation of health care services in rural areas, it is known that care patterns differ from those in the urban areas primarily due to differences in population density, lifestyle and other characteristics of the population. Medical geography (Meade & Erickson, 2000) provides some guidance to the design and assessment of health care systems, in particular in defining locations that serve dispersed populations. While it has been acknowledged that rules for equitable distribution of resources are poorly defined, some measures do exist and may include, for example:

- Resource-to-population ratios
- Location quotients (measure of departure from regional or national averages)
- Gini index (measure of inequality).

In a country with a large rural population such as Canada, delivery of healthcare remains certainly a concern and it has been addressed in a recent Canadian Institute for Health Information (CIHI) report (2006) and in the *Four Principles of Family Medicine* published by the College of Family Physicians of Canada (CFPC, 2003).

The quality of care metrics discussed so far fall into tangible (measurable) category, meaning they can be derived through data collection and lead to quantifiable values. If a decision-making process requires only assessment of tangible effects, then the process is relatively straight forward and can be based on cost analysis, which is typically driven by financial analysis and responsibility.

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There seem to be, however, a need to define intangible effects, which may potentially affect involved communities. In other words, the existing services and their transformation carry additional social values. Such intangibles may include, for example, economic impact of the health care facilities on a community, its self-esteem and pride, or ability to attract young professionals. There may be a need to engage the communities in an active dialog, which could provide input on defining what those community-perceived benefits are, and in the long run will enable convergence to acceptable solutions.

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### **Quality of Care in Emergency Care**

The emergency care provided by EDs in the hospitals is a critical part of the national health care delivery systems. In recent years it has gained a lot of attention due to increased overcrowding and extensive wait times, which are perceived by the public and the media as signs of

deteriorating health care delivery (Clancy, 2004). On the other hand, growing potential for terrorist activities, pandemics or natural disasters, governments recognize critical role that EDs have to play in preparing communities for such events.

Similarly to metrics capturing the general quality of care in healthcare delivery, emergency medicine has developed metrics based on clinical outcomes. Graff, Stevens, Spaite, and Foody (2002) presents findings of a committee on measuring and improving quality in emergency medicine, which has developed a summary list of measures of quality that includes four categories: condition-specific diseases, diagnostic syndromes, tasks/procedures, and department efficiency/efficacy. The paper also acknowledges existing barriers to change that are required to implement use of the proposed metrics.

Similarly, Lindsay, Schull, Bronskill, and Anderson (2002) presented an expert panel process which has identified clinical conditions frequently treated in most EDs, and clinically relevant outcomes to evaluate these conditions. Based on this review, a set of condition–outcome pairs was defined that panellists felt were potentially related to quality of care, then define specific indicators for many of these condition–outcome pairs.

Jimenez, Murray, Beveridge, Pons, Cortés, Garrigós, and Ferré (2003) described the experience of adopting CTAS triage system outside of Canada and conclude that time-to-triage and fracture response rates can be used as indicators of triage quality.

*Jimenez et al. (2003) also advocate that CTAS is a valid instrument for predicting admission rates, hospital length of stay and diagnostic utilization.*

Many papers have acknowledged that the measurement of time intervals in the ED and the tracking of patients who leave before they are seen have become de facto markers for quality and efficiency in the literature (Liew & Kennedy, 2003; Lewandrowski, 2004; Plerhoples, Zwermer, & Bazarian, 2004), though no standardized definitions for these markers appear to have been put forth or accepted.

Another stream of quality assessment in emergency care has been developed over the recent 10 years, which is examining the level of satisfaction with care from the patient point of view. That such an approach is broadly used was confirmed by the analysis by Boudreaux and O’Hea (2004), based on a review of over 50 such studies carried out in the US. It was noted that based on the multivariate predictive studies, the most robust predictor of global satisfaction is the quality of interpersonal interactions with the ED provider. Similar conclusions were also reached by Guarisco and Bavin (2008).

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The methodologies involved in these surveys are based on multivariate statistical analysis of collected responses, accuracy of which depends on the sample sizes and the question set used for assessment. In the US most commonly used are questionnaires and analysis methodology developed by Press Ganey Associates (2009), indicating that the top issues concerning the patients are: up-to-date information, staff care, and pain control. In the UK and Canada ED surveys seem to be based on approach developed by Picker Europe. A comprehensive survey of emergency department has been conducted in 2008 for the British National Health Service, and is now managed by Quality Care Commission (QCC, 2008). The methodology has also been used in a recently published survey of Emergency Department Patient Experience Survey conducted by the Health Quality Council of Alberta (HQCA, 2009) While these surveys provide a thorough snapshot of patient satisfaction with emergency care treatments, they also indicated wealth of information and complexity. Nevertheless, they establish useful benchmarks which can be used in assessment and also any quality improvement initiatives.

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## Literature Review Conclusion

Analyzing the literature review within the framework proposed by the modified Andersen model (Figure 1), the studies do provide evidence that the utilization of health care services is indeed a multi-factorial issue and that any possible solution will need to take into consideration this knowledge. Factors intrinsic to the individual (e.g., psychological health, physical health, perceived health), to the health care system (e.g., access to primary health care, access to general health care), and geographic factors (e.g. proximity to ED) are key to addressing the phenomena. From the examples of the interventions studied in the literature review, we also see evidence for this multi-factorial characteristic and the need to create multi-factorial solutions.

### **Environment Factors:**

It is clear that health service policies are a key factor on the whole health services utilization issue, not only from the perspective of providing the services and facilities to the population but also from the educational perspective. A change to a more population-based approach in which health maintenance and health behaviour are targeted could, as the literature shows, reduce significantly the utilization of ED and UCC services.

The studies by Parboosingh and Larsen (1987), Padgett and Brodsky (1992), Afilalo et al. (2004), and Steele et al. (2008) highlight the fact that having timely access to a primary care physician is a factor of greater impact on ED use than having a primary care physician per se. This indicates that it is not sufficient to be able to offer a PHC option to the population if this

option is not accessible when need arises. Nevertheless, the lack of PHC services was also related to ED use (e.g., Parboosingh & Larsen, 1987; PCWTP, 2009).

Literature also demonstrates that the delivery of rural health care is challenging, especially because rural locations lack appropriate resources in terms of people and facilities, as well as a model specifically designed to address health care delivery (e.g., Humphries et al., 2002; O'Meara et al., 2002).

#### **Population (Individual) Factors:**

As the model explains, individual (population) characteristics can be mutable or immutable, and the mutable components of such characteristics provide an avenue to address many of the reasons why the population currently behaves towards the use of EDs. This is supported by the literature reviewed and data provided by ESC-LHIN.

#### **PREDISPOSING**

Studies have demonstrated that certain groups of individuals in the general population tend to access the ED for different symptomatic reasons and at different times of the day. The number of cases in these groups also varies with children and older adults being the highest users. Perception of services is also a factor for ED use. The availability of diagnosing facilities and the speed in getting results leads people to use the ED (e.g., MacLean et al., 1999; Monzon et al., 2005; Lega & Mengoni, 2008)

#### **ENABLING**

It is interesting to note that in rural populations the distance-decay effect is an important factor in seeking chronic and ambulatory care. One other factor that consistently showed as important is transportation – having the means to travel to and from the health service location. It is important to notice that chronic and emergency care seem not to be affected by these factors. Nevertheless, when able to choose where to go, a closer location is preferred by individuals in rural communities. (e.g., Nemet & Bailey, 2000; Field and Briggs, 2001; Arcury et al., 2005)

#### **NEED**

Studies demonstrate that how individuals perceive their overall state of health (physical & mental) does have an impact on the utilization of health services. If the individual perceives that he/she does not have or is not experiencing good health, he/she will access the health service network. If primary care services are not available or accessible, these individuals will end up attending the ED (e.g., Barsky et al., 1986; Connelly et al., 1989).

#### **Health Behaviour:**

Another point of action is influencing the decision making process that individuals go through in order to choose which health service they should use. Education and training can be used to influence this decision making process in order to guide individuals to the most appropriate service, if available. Literature indicates that developing good health practices and also being knowledgeable of one's health issues (chronic or not) leads to better decision making in terms of

utilization of services (e.g., Coleman et al., 2001; Michelen et al., 2006; Schumway et al., 2008; Scott-Jones et al., 2008).

In summary, the literature reviewed indicates that the delivery of rural health care service, either from Hospital facilities with or without EDs or from other primary care delivery models or urgent care delivery models, needs to be addressed from a system perspective, taking into account many inter-related factors that play important roles in this picture. And, above all, these factors are originated or are intrinsic to different players or parts of the health system – population, health care workers, and government (policies, facilities, and services).

## CURRENT STATE

In order to understand the factors related to delivery of health care within the ESC-LHIN, it is essential that an overall assessment of the current state is conducted. We have gathered a detailed assessment of several data sources that are key factors in understanding the issues and needs surrounding emergency care in the ESC-LHIN. The assessment includes a 'snapshot' of the communities under study, a summary of the current care delivery models, and an analysis and a summary of available data. It is important to note that many of these data are already known to the ESC-LHIN; however, analysis and synthesis of all relevant data is essential to support the recommendations made within this report. Our analysis, including gaps and inconsistencies, is presented in the final section.

### Understanding the ESC-LHIN Community Population

The ESC-LHIN oversees the delivery of health care for 649,000 residents over a large geographical area. This area totals 7,234 square kilometres and spans three counties: Windsor-Essex, Chatham-Kent and Sarnia-Lambton (ESC-LHIN, 2009b). In examining the health of any community, it is important to recognize that many factors directly impact its health (Stamler & Yiu, 2008). They are called 'social determinants of health' and include factors, such as, for example, education, employment status, income, biology and genetics, access to health services and personal health practices.

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When we apply these factors to the ESC-LHIN, a significant concern about this community's health is apparent.

First, the region is mostly rural. In general, rural areas have poorer health (Ontario College of Family Physicians [OCFP], 2009). Second, there is a significant aboriginal population across the ESC-LHIN. This population is known to have unique health care issues, such as high rates of chronic and infectious diseases, and shorter life expectancy.

As compared to other Canadians, the following health problems are of concern:

- Occurrence of Type 2 diabetes is 3 to 5 times higher
- Mortality from diabetes is 5 times higher
- Rates of diabetes complications, including amputation, blindness and kidney failure are higher.
- Heart disease is 1.5 times higher
- Fifteen per cent of new HIV and AIDS infections occur in aboriginal people.
- Tuberculosis infection rates are 8 to 10 times higher

(Health Canada, 2009; Stamler & Yiu, 2008)

And finally, residents in the ESC region overall (ESC-LHIN, 2009b):

- Are an aging population
- Have higher unemployment rates
- Have higher incidences of obesity
- Are more likely to have unhealthy lifestyle habits such as smoking, alcohol use, poor nutrition and physical inactivity
- Have higher rates of chronic health problems, such as asthma, diabetes, high blood pressure and heart disease
- Have higher rates of hospitalization due to diagnoses such as cancer, cardiovascular problems and injury.

Table 1.0 Population Trends for the ESC-LHIN

County	Population 65 years +		Total population	
	N	% population	N	% increase
Lambton				
2009	23,060	17%	132,230	-
2020	31,920	23%	136,720	3%
2036	43,610	30%	145,440	10%
Chatham-Kent				
2009	17,920	16%	111,330	-
2020	23,360	21%	113,080	2%
2036	32,240	28%	114,280	3%
Essex				
2009	56,130	14%	406,650	-
2020	77,700	18%	428,980	6%
2036	116,640	25%	473,590	17%

*Across the ESC-LHIN, the senior population is predicted to increase by up to 30% in the next 16 years (ESC-LHIN, 2009c)*

### Lambton County

Sarnia-Lambton is comprised of 10 townships with a total population of 132,230 (Statistics Canada, 2007b). The geographical area covers 3,001 kilometres (ESC-LHIN, 2009b). The most recently reported unemployment rate was 7.0 % as compared to 6.4% in Ontario (Statistics Canada, 2007b). It is important to note that this number is likely not reflective of the current economic climate. In fact, according to labour force survey trends (Sarnia-Lambton Workforce Development Board, 2009), median income in Sarnia-Lambton is \$68,703 (\$69,156 in Ontario). Seventy-nine percent of the population has attained a certificate, diploma or post-secondary degree. This is in line with the provincial percentage of 78%. Seventeen percent of the current population is 65 years and older. According to projections, this percentage will increase to 23%

by 2020 and 30% by 2036 (Statistics Canada, 2007b; ESC-LHIN, 2009c). The overall population within the region is expected to increase 10% by 2036 (Table 1.0)

According to Statistics Canada (2007b, c, d) data, the Aboriginal population numbers approximately 5795 individuals in Sarnia-Lambton. The Sarnia 45 reserve is located south of the City of Sarnia and has a population of 706. The Kettle Point Indian reserve has a population of 1020, and this population has increased by 24% since the 2001 census. These populations have lower levels of income and education, along with higher unemployment rates. For example, forty 40% of the Kettle Point Indian reserve population has not attained a post-secondary certificate, diploma or degree. The unemployment rate is 16%. Median household incomes are approximately 30% lower than Ontario.

A significant percentage of Canada's chemical industry is located in Sarnia-Lambton (Macdonald & Rang, 2007). The effects of chronic exposure to toxins and air pollution, associated with the agriculture and chemical industries, are concerning. Some of the compounds released in this area may be linked to chronic health conditions, such as respiratory problems and some cancers. Shorter term health effects include eye and skin irritations, headache, fatigue and nausea.

High humidity levels in this region may also be associated with increased respiratory symptoms of asthma and chronic obstructive pulmonary disease. Rates of diabetes are significantly higher in this region – 13% as compared to 5% in Canada. According to 2007/2008 CTAS data (ESC-LHIN, 2009c), these health conditions are represented as reasons for individuals seeking emergency care in the area.

The region is currently served by two acute care hospitals: BH: Norman and Mitton sites (285 beds) and BH: CEEH site in Petrolia (41 beds).

The Norman and Mitton sites provide the following health care services:

- Emergency Care (Hours of operation: 24 hours, 7 days a week)
- Cardiac Care
- Inpatient Psychiatry
- Continuing Care
- Palliative Care
- Rehabilitation
- Obstetrics
- Acute Care Medicine
- Surgery

The CEEH is located site provides:

- Emergency Care
- Acute Inpatient Care (23 beds)
- Ambulatory Care
- Continuing Care (18 beds)



There are 69 family practitioners in this region. Ten of these physicians have practices located in Petrolia. Nine of these physicians are accepting new patients. They practice mainly out of individual and group practices. Ten of the 69 family practitioners practice out of more than one location. With respect to Petrolia physicians, nine out of ten practice in the ED at CEEH (BH, 2008). According to Coulson and Associates (2009), two physicians will be leaving, or have already left the Petrolia area, three are 65 years and older, and not all work in a full-time capacity. Despite these statistics, 97% of visitors to the CEEH ED reported having a family physician (ESC-LHIN, 2009c). It is important to consider the validity of these data given the concerns regarding access to primary care in the region.

Family Health Teams:

- Rapids Family Health Team

Open Times	M	T	W	R	F
9:00 AM-4:30 PM	✓	✓		✓	
9:00 AM-1:00 PM			✓		
9:00 AM-3:00 PM					✓

Community Health Centres:

- North Lambton Community Health Centre, Forest, Ontario

Open Times	M	T	W	R	F
<b>Forest Site</b>					
8:00 AM-4:30 PM	✓		✓	✓	✓
8:00 AM-8:00 PM		✓			
<b>West Lambton Site</b>					
8:00 AM-4:30 PM	✓				✓
8:00 AM-8:00 PM		✓	✓	✓	
<b>Watford Site</b>					
8:00 AM-4:30 PM				✓	
8:30 AM-12:00 PM			✓		
2:00 PM-8:00 PM		✓			
<b>Kettle Point Site</b>					
8:30 AM-4:30 PM	✓				✓
2:00 PM-8:00 PM		✓			
8:30 AM-4:30 PM			✓		
8:30 AM-8:00 PM				✓	

- Grand Bend Area Community Health Centre, Grand Bend, Ontario

Open Times	M	T	W	R	F	S
8:30 AM-7:00 PM	✓	✓	✓	✓		
8:30 AM-4:00 PM					✓	
9:00 AM-3:00 PM					✓	
9:00 AM-12:00 PM						✓

Walk-in Clinics:

Open Times	M	T	W	R	F	S	S
<b>Bayshore Physicians Group</b>							
<b>Sarnia-Lambton Care Centre</b>							
9:00 AM-2:00 PM	✓	✓	✓	✓	✓		
<b>Sarnia Family Physicians Group</b>							
6:00 PM-9:00 PM	✓	✓	✓	✓	✓		
10:00 AM-2:00 PM						✓	✓

Emergency Medical Services (EMS) is coordinated through the County of Lambton. Nine stations are located across the county in Brigiden, Corunna, Forest, Grand Bend, Petrolia, Sarnia (2 stations), Thedford, and Watford. The staff consists of 150 paramedics, ten of whom are Advanced Care Paramedics (ACP's). In 2008, EMS responded to 16,000 calls. The median response time was just under 8 minutes, with 90 percent of calls being responded to in 11 minutes or less. These response times are well within the provincial standards.

Other Health Care Services:

- County of Lambton, Community Health Services
- Erie-St. Clair Community Care Access Centre
- Canadian Mental Health Association (Lambton County – Crisis Services)
- Kettle Point Health Services Building, Indian Lane Kettle and Stony Point
- Alzheimer Society of Sarnia-Lambton
- St. Joseph's Hospice Resource Centre
- Lambton County Elderly Outreach Program
- Kettle Point First Nations Health Centre
- Home Health Services: Victorian Order of Nurses, Bayshore Home Health Care.

**APPLYING THE DETERMINANTS OF HEALTH TO SARNIA-LAMBTON**

*Based upon the data, any population-based approach to health care delivery must consider the following:*

- *Income and social status*
- *Educational levels*
- *Working conditions (occupational health and safety)*
- *Physical environment (air quality)*
- *Culture (Aboriginal health)*
- *Early child development (prenatal through adolescence)*
- *Access to health primary health care*
- *Biology & genetics (aging in place)*

## **Chatham-Kent County**

The county of Chatham-Kent occupies 1 458 square kilometres and has a current population of 1 111,330 (Statistics Canada, 2007e). Sixteen percent of the current population is 65 years and older. According to projections, this percentage will increase to 21% by 2020 and 28% by 2036 (Statistics Canada 2007e; Ontario Ministry of Finance, 2009). A significant increase in population is not expected within the region (see Table 1.0).

Chatham-Kent includes the municipalities of Blenheim, Bothwell, Chatham, Dresden, Ridgeway, Thamesville, Tilbury, Wallaceburg and Wheatley. It is a mix of both rural and urban areas with manufacturing and agriculture being the main industries. Residents of this county are primarily employed in sales and service and trades (Statistics Canada, 2007e). Median family income in this area is \$63,218 as compared to the provincial average of \$69,156. The most recently published unemployment rate is 7.2%. Sixty-nine percent of the residents of this area have attained a post-secondary certificate, diploma or degree (78% in Ontario).

The aboriginal population of Walpole Island is a significant user of health care services in the Chatham-Kent area, particularly Sydenham hospital. This region includes 1,900 residents (Statistics Canada, 2007f), although this number fluctuates to a population of 3,500 during hunting season. The total aboriginal population in Chatham-Kent averages 2,715. Median income in 2006 was \$32,352; which is 53% less than median incomes in Ontario and 49% less than Chatham-Kent. Unemployment rates averaged 16.7% with post-secondary education being attained by 63% of the Walpole Island population.

CKHA is a 300-bed community hospital system (CKHA, 2008). The system partners three hospital corporations: Public General (Chatham), St. Joseph's and Sydenham District Hospital (Wallaceburg). The Sydenham campus is located 28 kilometres from the Public General site.

The following health care services are provided at the Chatham General site:

- Women's Health – OB/GYN Clinics
- Paediatrics
- Critical Care
- Mental Health & Addictions Programming
- Ambulatory Care
- Diabetes Education
- District Stroke Centre & Prevention Clinic
- General Medicine
- General Surgery
- Sexual Assault Treatment
- Emergency Care
- Ambulatory Care

The ED has 3 trauma resuscitation bays, 6 major acute patient care beds, 4 observation beds, 7 minor treatment beds, 2 private examination rooms and 4 chairs for low acuity cases. Located

within the ED are a sexual assault treatment centre and a mental health crisis service. The department is staffed with a variety of health care personnel including physicians, specialists, nurse practitioners, registered nurses, registered practical nurses, as well as support staff.

The Sydenham site provides the following services:

- Complex Continuing Care
- Emergency Care
- Ambulatory Care
- Rehabilitation
- Medicine
- Surgery
- Mental Health & Addictions

The ED at Sydenham has 2 major/resuscitation beds and 7 acute minor beds.

According to the College of Physicians and Surgeons of Ontario (CPSO, 2009), there are 64 family practitioners in this area. Twenty of these physicians operate in more than one location and seven are accepting new patients. According to National Ambulatory Care Reporting System (NACRS) data, 84% of total visits to the emergency department indicated having a family physician. The number was considerably higher for CTAS 1 and 2 patients (98%). Once again, the validity of these findings requires a closer study.

Family Health Teams:

- Chatham-Kent Family Health Team

Open Times	M	T	W	R	F	S	S
8:30 AM-4:30 PM	✓	✓	✓	✓	✓		
9:00 AM-12:00 PM						✓	

- Tilbury District Family Health Team
  - Hours of operation: access to PHC treatment advice, 24 hours a day, seven days a week, through a combination of regular and extended hours, and a nurse-staffed Telephone Health Advisory Service)

Community Health Centres:

Currently, there are no CHC's located in Chatham-Kent; however, 3 CHC's are scheduled to open in 2010 and 2011. The proposed sites are Walpole Island, Wallaceburg and Chatham.

Walk-in Clinics:

Open Times	M	T	W	R	F
<b>Chatham Clinic</b>					
9:00 AM-5:00 PM	✓	✓	✓	✓	✓
<b>Adelaide Place Clinic</b>					
8:30 AM-4:30 PM	✓	✓	✓	✓	✓

- Tilbury Family Practice Walk-in Clinic
  - Hours of operation: access to PHC treatment advice, 24 hours a day, seven days a week, through a combination of regular and extended hours, and a nurse-staffed Telephone Health Advisory Service

EMS is provided by Sun Parlour Emergency Medical Services. Stations are located across the county: Chatham, Tilbury, Wallaceburg, Thamesville, Ridgetown and Blenheim. EMS responded to 17,103 calls (Krauter, 2009). Ninety percent of these emergency calls were responded to in 13.5 minutes or less. In the case of CTAS level 1 calls, the average response time was just under 7 minutes.

#### Other Health Care Services

- Chatham-Kent Health Unit
- Erie-St. Clair Community Care Access Centre
- Canadian Mental Health Association – Chatham-Kent
- Regional Mental Health - Chatham-Kent ACT Team
- Moraviantown First Nations Health Centre
- Walpole Island First Nations Health Centre
- Home Health Services – VON, Bayshore, VHA, Comcare

### **APPLYING THE DETERMINANTS OF HEALTH TO CHATHAM-KENT**

*Based upon the data, any population-based approach to health care delivery must consider the following:*

- *Income and social status*
- *Educational levels*
- *Personal health practices (tobacco use, healthy eating and physical activity)*
- *Social support networks*
- *Culture (Aboriginal health)*
- *Healthy child development (prenatal through adolescence)*
- *Biology & genetics (aging in place)*
- *Access to primary health care*

#### **Leamington and Surrounding Area**

Leamington District Memorial Hospital (LDMH) is located within the municipality of Leamington and serves mainly the populations of Leamington Kingsville, Essex, Wheatley and Amherstburg. The combined population of this region is approximately 70,000 (Statistics Canada, 2007g, h), although the majority of ED visits originate from Leamington (50%) and Kingsville (17%). The median family income in Leamington is \$62,537, as compared to Kingsville (\$76,109) and the provincial average (\$69,156). Unemployment rates in the region were 6.6% in Leamington and

5.6% in Kingsville. Employment in both areas is primarily in manufacturing, agriculture, sales and health care. The agricultural industry is supported by up to 5,000 migrant farm workers who do have PHC providers, and rely upon emergency services as a provider for PHC (Hay Group, 2009).

Population trends are not available for Leamington and surrounding areas; however, statistics related to Essex County as a whole are summarized in Table 1.0.

The following health care services are provided at LDMH:

- Emergency care
- Acute care medicine
- Surgery
- Obstetrics and Gynaecology
- Complex Continuing Care
- Rehabilitation
- Palliative Care
- Intensive Care
- Ambulatory Care

According to the CPSO (2009), there are 30 general practitioners in this area. Fifteen of these physicians operate in more than one location and 22 have privileges at LDMH. A Family Health Team was recently formed in this community; however the area is still considered an underserved area, and therefore continues to recruit physicians. According to the NACRS data, 84% of visits reported having a family physician. This number was considerably higher for CTAS 1 and 2 patients (99%).

Family Health Teams:

<b>Open Times</b>	<b>M</b>	<b>T</b>	<b>W</b>	<b>R</b>	<b>F</b>
<b>Amherstburg*</b>					
9:00 AM-5:00 PM	✓	✓	✓	✓	✓
<b>Harrow Health Centre</b>					
8:00 AM-6:30 PM	✓				
8:00 AM-8:00 PM		✓	✓	✓	
8:00 AM-6:00 PM					✓
<b>Leamington* &amp; Area</b>					
9:00 AM-5:00 PM	✓	✓	✓	✓	✓

\* and after hours by appointment

- Tilbury District Family Health Team
  - Hours of operation: access to PHC treatment advice, 24 hours a day, seven days a week, through a combination of regular and extended hours, and a nurse-staffed Telephone Health Advisory Service)

Community Health Centres:

- None

Walk-in Clinics:

Open Times	M	T	W	R	F	S	S
<b>Amherstburg Clinic</b>							
9:00 AM-11:30 AM	✓	✓	✓	✓	✓	✓	
1:00 PM-3:00 PM	✓	✓	✓	✓			
1:00 AM-4:00 PM					✓		
<b>Dr. D. Coates</b>							
9:00 AM-11:30 AM	✓	✓	✓	✓	✓		
1:00 PM-3:00 PM	✓	✓	✓	✓			
1:00 AM-4:00 PM					✓		
9:00 AM-12:00 AM						✓	
<b>Dr. Chalhoub</b>							
8:30 AM-7:00 PM	✓	✓	✓	✓	✓		
8:30 AM-4:30 PM						✓	
<b>Essex Clinic</b>							
9:00 AM-4:30 PM	✓	✓	✓	✓	✓		
9:00 AM-1:00 PM						✓	✓

EMS services are provided throughout the County of Essex by Essex-Windsor EMS (County of Essex, 2009). There are 11 EMS stations located across Windsor-Essex. Three stations are located within the City of Windsor. The remaining stations are located in Amherstburg, Belle River, Harrow, Kingsville, LaSalle, Leamington, Tecumseh and Woodslee. Essex-Windsor EMS employs 38 ACP's and 177 PCP's. In 2008, they received 49,000 calls and have a 90<sup>th</sup> percentile response time of 9 minutes and 24 seconds.

Other Health Care Services:

- Windsor-Essex County Health Unit: Leamington and Essex offices
- Erie St. Clair Community Care Access Services (co-ordinated out of Windsor office)
- Home Health Services – Paramed Home Health, Comcare Health Services

**APPLYING THE DETERMINANTS OF HEALTH TO LEAMINGTON AND AREA**

*Based upon the data, any population-based approach to health care delivery must consider the following:*

- Income and social status
- Educational levels
- Employment and working conditions (occupational health & safety)
- Personal health practices (tobacco use, healthy eating and physical activity)
- Healthy child development (prenatal through adolescence)
- Biology & genetics (aging in place)
- Culture
- Access to primary health care

## Current Emergency Care Delivery Model

In the ESC-LHIN, emergency department care is provided by six hospitals: Hotel-Dieu Grace Hospital and Windsor Regional Hospital (Windsor), LDMH (Leamington), CKHA (Chatham General and Sydenham campuses) and BH (Norman and CEEH campuses). For the purpose of this report, these researchers focused on the delivery of emergency care in the counties of Chatham-Kent, Sarnia-Lambton and the Leamington only. The Hay Group (2009) report clearly summarized the current care delivery model from staffing and physical plant perspectives; therefore, these data will not be repeated in this report. However, we will offer enhancements where clarification was required, or where new data have become available.

### Sarnia-Lambton

For the most part, emergency care in Sarnia-Lambton is provided through the BH Hospital Corporation. In 2007/2008, BH had 80,597 emergency department visits; 16,413 of these visits were to the CEEH site. The patients who present at the CEEH site originate primarily from Petrolia, Wyoming and Oil Springs (ESC-LHIN, 2009c).

Both ED's provide emergency care 24 hours a day, seven days a week (BH, 2008). Emergency physicians are on-site at the Mitton site 24/7. In the case of CEEH, a Registered Nurse is present in the ED 24 hours a day, seven days a week with the ED physician on-call during the night, and capable of arriving to the ED within 15 minutes.

A significant construction project at the Mitton site will result in a larger, more efficient ED and an additional 52 beds (BH, 2008). The project is scheduled for completion in 2011. Critical care services are provided at the Mitton site. This unit is graded at a level three critical care unit; however, nursing staff report that unstable patients who require more aggressive treatment are generally stabilized and transferred (personal communication, July 2009). The average occupancy rate for the critical care unit is 79% with a range of 73% to 82% over the last five fiscal years. Occupancy of the acute care medical unit(s) averages 92% with a range 88% in 2006/2007 to 94% in 2004/2005. These findings are summarized in Table 2.0. (ESC-LHIN, 2009c)

*CEEH has an operating room; however, there are no designated critical care beds. Critically ill patients who are in need of Intensive Care require transfer to another facility with more appropriate capabilities. (BH, 2008; ESC-LHIN, 2009c)*

CEEH has 23 acute care beds (BH, 2008). The hospital does have an operating room; however, there are no designated critical care beds. Critically ill patients who are in need of intensive care require transfer to another facility with such capability. Occupancy rates at the Sarnia General site indicate that beds would be available in Sarnia; however, further analyses are suggested.



Table 2.0 Occupancy Rates for BH According to Unit

Fiscal Year	Site	Medicine	Surgery	Combined Med-Surg	Critical Care
2008/2009	Sarnia General CEEH	93%	77%	N/A 77%	77% N/A
2007/2008	Sarnia General CEEH	93%	77%	N/A 72%	78% 42.7%
2006/2007	Sarnia General CEEH	88%	75%	N/A 78%	79% 56.8%
2005/2006	Sarnia General CEEH	94%	77%	N/A 82%	79% 47.9%
2004/2005	Sarnia General CEEH	94%	80%	N/A 82%	82% 49%

### Chatham-Kent

CKHA provides 24-hour emergency care at both campuses. Recruitment and retention of emergency physicians remains problematic. In 2007/2008, CKHA had 67,895 emergency department visits: 45,842 at the Public General site and 22,053 at the Sydenham General Hospital site. ED cases to the Public General site originate primarily from Chatham; however, the catchment is dispersed throughout most of Chatham-Kent. In the case of the Sydenham site, the majority of visits originate from the town of Wallaceburg, but also include several other municipalities, including Chatham. Of the Sydenham visits, 1,101 (5%) were classified as CTAS level 1 or 2.

According to the CKHA website, the combined bed count between both campuses (Public General and Sydenham) is 300; however, anecdotal evidence reveals that downsizing of the number of beds at the Sydenham site has occurred. There are no acute care beds remaining at the Sydenham site; however, the ED has retained some observation beds, which allow for patients who require transfer to be monitored while awaiting transfer. It is suggested that this downsizing of acute care beds will directly impact CKHA's ability to recruit and retain physicians, and retain the present services at the Sydenham site. A 1992 survey of Ontario hospitals indicated that 30% of those with less than 100 acute care beds experienced shortages in general surgeons, with 61% of such these institution expecting a shortage within five years (Health Canada, 2004).

*A 1992 survey of Ontario hospitals indicated that 30% of those with less than 100 acute care beds experienced shortages in general surgeons, with 61% of such these institution expecting a shortage within five years (Health Canada, 2004).*

In 2007/2008, there were 564 admissions to the Sydenham site through the ED. It is essential that the system be analyzed to determine the impact of bed reductions at the Sydenham campus. Occupancy rates for the acute and critical care areas within the CKHA are displayed in Table 3.0 (ESC-LHIN, 2009c). The data suggest adequate bed availability for transfer; however, additional analyses are required, especially seasonal trending.

*The Public General site staffs a Level 3 Critical Care Unit, which means that this unit is well equipped to able to handle ventilated patients, and those who require intensive monitoring using invasive methods. There is no ability to handle the care of critically ill patients over an extended period of time at the Sydenham Hospital site; therefore, transfer of such patients would be required.*

Table 3.0 Occupancy Rates for CKHA According to Unit

<b>Fiscal Year</b>	<b>Site</b>	<b>Medicine</b>	<b>Surgery</b>	<b>Combined Med-Surg</b>	<b>Critical Care</b>
2008/2009	Public General Sydenham	77%	67%	81% 65%	68%
2007/2008	Public General Sydenham	81%	77%	81% 64%	72%
2006/2007	Public General Sydenham	85%	80%	83% 75%	75%
2005/2006	Public General Sydenham	93%	86%	81% 67%	71% 27%
2004/2005	Public General Sydenham	93%	77%	80% 56%	65% 56%

The Public General site staffs a Level 3 critical care unit, which means that this unit is well equipped to able to handle ventilated patients, and those who require intensive monitoring using invasive methods. There is no ability to handle the care of critically ill patients over an extended period of time at the Sydenham Hospital site; therefore transfer of such patients would be required.

#### **Leamington District Memorial Hospital**

In 2007/2008, the ED had 26,863 visits, 1,445 of which were classified as CTAS level 1 or 2 (5.4%). The catchment area for ED services is primarily Leamington and Kingsville (67% of all visits). Total hospital beds number 88, two of which are deemed level-2 critical care beds. Two beds were recently closed as a result of reduced occupancy rates, resulting in a reduced capacity to care for highly critical medical conditions. According to hospital administration, the unit is only able to support ventilated patients for a limited period of time. Traumas, severely unstable patients or those requiring ongoing intensive care are generally transferred to either Hotel-Dieu Grace Hospital or Windsor Regional Hospital, in Windsor, Ontario. Travel times between Leamington and these institutions are 48 and 43 minutes, respectively. The ability of the hospital to admit patients from the ED requires further analyses. Occupancy rates for these areas are provided in Table 4.0 (ESC-LHIN, 2009c).

Table 4.0 Occupancy Rates for LDMH According to Unit

Fiscal Year	Combined Med-Surg	Critical Care
2008/2009	73%	67%
2007/2008	76%	71%
2006/2007	82%	65%
2005/2006	82%	54%
2004/2005	82%	51%

LDMH is currently working with emergency and critical care specialists at Hotel-Dieu Grace Hospital to both improve the quality of care in its ICU and to enhance the transferring of patients who require specialized care that cannot be provided at LDMH.

According to the Leamington District Memorial Hospital website (2009), the institution is currently advertising for emergency physicians and family physicians. Based upon data collected by the NACRS, 84% of patients who visited the ED in 2007/2008 reported that they had a family physician. The number was slightly higher for CTAS 1 and 2 visits (90%).

### CTAS Data

#### Overall CTAS Data Analysis

These researchers conducted an overall analysis of the CTAS data, followed by sub-analysis by CTAS level and institution. The purpose of the analysis was to report an estimate of the CTAS 1 & 2 cases that are representative of the emergency care needs in relationship to less urgent care involving CTAS 3, 4 and 5 cases presented to the Hospitals. A summary of CTAS data across all ED's in Chatham-Kent, Sarnia-Lambton and the Leamington area is provided in Table 5.0 (ESC-LHIN, 2009c).

*If these data are reflective of an inability of CTAS 3, 4 & 5 cases to obtain access to PHC other than through the Hospital, then it can be assumed that access to PHC appears to be problematic across all sites. Therefore, any recommendation to health care delivery should be designed to help address this issue.*

The data suggest the following:

#### CEEH:

- ED visits to CEEH represent 26% of ED volume in the BH Corporation
- A very small percentage of patients triaged at the CTAS 1 or 2 level access the ED at CEEH
- The majority of visits to CEEH were triaged at the CTAS 3 and 4 levels
- CTAS 3 and 4 visits represent 80% of the ED volume at CEEH
- CTAS 3 and 4 visits at CEEH represent 18% of the total ED volume for the BH corporation

**Sydenham**

- ED visits to CEEH represent 32.5% of ED volume in the BH Corporation
- 5% of ED visits to the Sydenham campus were triaged at a CTAS 1 or 2 level
- The majority of visits to Sydenham were triaged at a CTAS level (70%)
- CTAS level 4 visits at Sydenham represent 23% of the total ED volume for the BH corporation

**LDMH**

- 5% of all ED visits to LDMH were triaged at a CTAS 1 or 2 level
- The majority of visits to the ED were triaged at a CTAS 4 level (55%)

**Table 5.0 ED Data by CTAS Level**

Institution	CTAS Level					Total visits
	1	2	3	4	5	
<b>Bluewater Health</b>	349					
<i>Mitton site</i>	0.5%					
Number of visits		6,439	21,433	30,147	5,809	64,178
% of Mitton visits		10.0%	33.4%	47.0%	9.1%	100%
	22					
<i>CEEH site</i>	0.1%					
Number of visits		205	2,798	11,810	1,533	16,413
% of CEEH visits		1.4%	17.1%	72.1%	9.3%	100%
<i>Total All Sites</i>		6,644	24,231	41,957	7,342	80,591
<i>CEEH as % of total BWH ED volume</i>	< .1%	.003%	3.5%	14.6%	1.9%	25.6%
<b>CKHA</b>						
<i>Public General site</i>						
Number of visits	193	4,725	15,262	23,117	2,544	45,842
% of visits	0.4%	10.3%	33.3%	50.4%	5.6%	100%
<i>Sydenham site</i>						
Number of visits	54	1,047	3,964	15,504	1,484	22,053
% of visits	0.2%	4.7%	18.0%	70.4%	6.7%	100%
<i>Total All sites</i>						
	247	5,772	19,226	38,621	4,028	67,895
<i>Sydenham as a % of CKHA total ED volume</i>	<1%	1.5%	5.9%	22.9%	2.2%	32.5%
<b>LDMH</b>						
Number of visits	112	1,333	5,949	14,857	4,612	26,863
% of visits	0.4%	5.0%	22.1%	55.3%	17.2%	100%

Table 6.0 Trends in ED Visit Volume

Institution	Year						% change
	2002	2003	2004	2005	2006	2007	
CEEH	11,708	10,875	12,843	13,518	15,038	16,413	40% increase
Sydenham	23,900	22,616	22,664	21,824	21,096	22,053	8.0% decrease
LDMH	33,762	31,323	29,878	28,708	27,350	26,863	20% decrease

- Leamington ED visits have declined by 20% over the past six years from 33,762 in 2002/2003 to 26,863 in 2007/2008 (see table 7.0)
- Sydenham ED visits have remained relatively stable over the same period.
- Petrolia ED visits have increased by 40% over the past three years from 11,708 in 2002/2003 to 16,413 in 2007/2008.

Table 7.0 ED Disposition: CEEH, Sydenham, LDMH

Disposition	CEEH	Sydenham	Leamington
Admit	3.1%	2.6%	7.1%
Death	0.1%	0.1%	0.2%
Left	2.9%	4.6%	6.6%
Transfer	2.1%	2.2%	1.5%
Went Back	91.6%	90.6%	84.6%

Across all three sites, the data suggest that:

- The vast majority of ED visits are treated and discharged home
- The percentage of ED visits resulting in admission to hospital at LDMH is significantly higher (7%) than Sydenham or CEEH (2.6% and 3.1%, respectively)
- A lower percentage of ED visits at LDMH (1.5%) result in transfer to another institution as compared to Sydenham (2.2%) and CEEH (2.1%)
- Very few visits across all sites result in death.

#### Sub-Analysis of CTAS Data

In addition to examining the CTAS data across all levels (Table 5.0), we grouped the data into two levels: (a) emergency (CTAS 1 and 2 data); and (b) non-emergency (CTAS 3, 4 and 5 data). According to CTAS definitions (Beveridge et al., 1998), CTAS 1 and 2 cases require rapid assessment and triage in the field, followed by transport and timely intervention in an emergency care setting. CTAS 3, 4 and 5 may not necessarily require treatment in an ED, but rather in an urgent care or primary care setting.

*According to CTAS definitions (Beveridge et al., 1998), CTAS 1 and 2 cases require rapid assessment and triage in the field, followed by transport and timely intervention in an emergency care setting. CTAS 3, 4 and 5 may not necessarily require treatment in an ED, but rather in an urgent care or primary care setting.*

A summary of the 2007/2008 NACRS (ESC-LHIN, 2009c) data by institution and CTAS level is summarized in Table 8.0.

Table 8.0 Summary of Data by Institution and CTAS Level

<b>Institution</b>	<b>All CTAS Data N (%)</b>	<b>CTAS 1 and 2 N (%)</b>	<b>CTAS 3,4 and 5 N (%)</b>
<b>CEEH</b>			
Total Visits	16,413 (100%)	227 (1%)	16,186 (99%)
Disposition:			
• Admits	503 (3%)	52 (23%)	451 (3%)
• Transfers	344 (2%)	49 (22%)	295 (2%)
• Deaths	13 (<1%)	11 (5%)	2 (<1%)
• Discharges/Left	15,553 (94%)	115 (51%)	15,438 (95%)
Used ambulance	411 (3%)	55 (24%)	356 (2%)
Has primary care physician	15,943 (97%)	226 (99%)	15,717 (97%)
<b>Sydenham</b>			
Total Visits	22,054 (100%)	1,101 (5%)	20,953 (95%)
Disposition:			
• Admits	564 (3%)	167 (15%)	397 (2%)
• Transfers	487 (2%)	232 (21%)	255 (1%)
• Deaths	17 (<1%)	17 (2%)	- (0%)
• Discharges/Left	20,986 (95%)	685 (62%)	20,301 (97%)
Used ambulance	1,035 (5%)	384 (35%)	651 (3%)
Has primary care physician	18,595 (84%)	1,087 (99%)	17,508 (84%)
<b>LDMH</b>			
Total Visits	26,864 (100%)	1,445 (5%)	25,419 (95%)
Disposition:			
• Admits	1915 (7%)	414 (29%)	1501 (6%)
• Transfers	397 (2%)	103 (7%)	294 (1%)
• Deaths	54 (<1%)	50 (4%)	4 (<1%)
• Discharges/Left	24,498 (91%)	878 (61%)	23,620 (93%)
Used ambulance	3,734 (14%)	488 (34%)	3,246 (13%)
Has primary care physician	22,822 (85%)	1,301 (90%)	21,521 (85%)

The data suggests that CTAS level 1 and 2 visits represent a small proportion of total visits to the ED at each of the three hospitals and that the disposition of CTAS level 1 and 2 patients varies significantly among the three hospitals.

- The vast majority of visits across all sites were triaged at the CTAS 3, 4 and 5 levels (95% for Sydenham and LDMH; 99% for CEEH)
- LDMH admitted the highest percentage of CTAS 1 and 2 level patients and transfers the lowest percentage of patients across all CTAS levels
- Sydenham admitted the lowest percentage of patients (15%).
- Sydenham and Leamington have higher rates of discharge as compared to CEEH
- The highest percentage of patients (5%) died at the CEEH site in 2007/2008 as compared to Sydenham (2%) and Leamington (4%)
- Utilization of EMS services is low across all sites
- LDMH has the highest percentage of overall EMS use (14%)
- The majority of patients across all sites indicated that they had a PHC physician.
- A higher percentage of CTAS 1 and 2 level patient visits indicated that they had a PHC provider (90% to 99%) as compared to CTAS 3, 4 and 5 level patient visits (84% to 97%)

*These data suggest that non-urgent use of the ED may be a complex issue that requires further exploration. It is likely related to a combination of: (a) behavioural factors; and (b) accessibility to primary care services. (see, for example, Field & Briggs, 2001; Steele et al., 2008)*

Trends in ED visits by CTAS level are reported in Table 9.0 (ESC-LHIN, 2009c). The major findings for each site are discussed below. Although trends have been suggested from the data, it is important to note that further analysis is recommended to detect any statistical significance associated with these findings.

Table 9.0: Trends in ED Visits by Year and CTAS Level

Institution	CTAS 1 and 2	CTAS 3, 4 and 5	Total visits
<b>CEEH</b>			
2002	89	11,619	11,708
2003	75	10,794	10,875
2004	74	12,758	12,843
2005	68	13,435	13,518
2006	52	14,970	15,038
2007	227	16,141	16,413
<b>Sydenham</b>			
2002	432	23,457	23,900
2003	500	22,083	22,616
2004	882	21,746	22,664
2005	1,123	20,676	21,824
2006	847	20,249	21,096
2007	1,101	20,952	22,053

Table 9.0 (cont.): Trends in ED Visits by Year and CTAS Level

Institution	CTAS 1 and 2	CTAS 3, 4 and 5	Total visits
LDMH			
2002	1,153	32,609	33,762
2003	988	30,335	31,323
2004	955	28,923	29,878
2005	1,100	27,608	28,708
2006	818	26,532	27,350
2007	1,445	25,417	26,863

- *CEEH*

There was a large increase in the number of CTAS 1 and 2 emergency visits, in 2007/2008. CEEH saw 227 CTAS 1 and 2 visits, a 70% increase from the previous year. The volume of CTAS 3, 4 and 5 visits also appears to be increasing, along with total ED visits.

- *Sydenham*

Trends in ED visits appear to be stable. There was an increase in CTAS 1 and 2 visits in 2005/2006 and 2007/2008. Statistical analysis of the dataset is recommended to detect any significance associated with these findings.

- *LDMH*

LDMH handled 26,863 ED visits in 2007/2008. Of these, 112 were CTAS 1 visits and 1,333 were triaged as CTAS 2 cases. There was a large increase in the number of CTAS 2 in 2007/2008, such that an additional 578 CTAS level 2 cases were seen in 2007/2008. Overall the volume of CTAS 1 and 2 patients appears to be increasing, whereas the numbers of CTAS 3, 4 and 5 visits and total volume are trending downwards. Although further statistical analysis is needed to support this finding, it may suggest that access to PHC is improving in this area.

Seasonal trending of CTAS 1 and 2 visits was conducted for the year 2007/2008. The pattern and volume of visits fluctuate greatly through the year across all institutions. It is important to note that these findings represent only one year of ED visit data. Further, generalizations cannot be inferred from CEEH data given the low total number of visits during 2007/2008.

The following findings emerged:

- Sydenham CTAS 1 & 2 visit volumes are highest in the winter months and lowest in June and July
- LDMH CTAS 1 & 2 visit volumes are highest in the summer months and lowest in the winter

These researchers conducted further analyses and exploration of the CTAS 1 and 2 dataset. One outcome from the research appears to be that there are numerous instances where patients either improved clinically prior to presentation at the ED, or were triaged inaccurately. Therefore,



further grouping of the CTAS 1 and 2 data were examined by diagnoses which carry an increased risk of mortality and/or morbidity, if not treated in a timely fashion.

The purpose was to (a) determine the total numbers of these high risk visits at each of the hospitals under study; (b) determine the admission and transfer needs of the system if these ED's were closed; and (c) formulate recommendations for delivery of emergency care based upon these high risk conditions.

Upon examination of these condensed CTAS 1 & 2 data, it appears that instances of cardiovascular aetiology represented the largest category of high risk diagnoses across all institutions. Ambulance utilization rates among high risk cases would be area of further analyses, as this factor has a direct impact on survival and morbidity (Uren, Lowell, & Silbergleit, 2009).

*Upon examination of these condensed data, instances of cardiovascular etiology represented the largest category of high risk diagnoses across all institutions. Ambulance utilization rates among high risk cases need to be improved, as this has a direct impact on survival and morbidity (Uren et al., 2009).*

These data (ESC-LHIN, 2009c) are summarized in the following tables (Tables 10, 11 and 12) according to institution.

Table 10.0: Diagnoses with Increased Risk of Mortality/Morbidity  
Bluewater Health: Petrolia Site

Category	N	Outcome (n)			
		Admit	Transfer	Death	Other
<b>Cardiovascular</b>					
AMI	4	1	2	1	-
Angina/Chest Pain	39	10	12	-	17
CHF	5	4	-	-	1
Dysrhythmia	9	1	3	-	5
Cardiac Arrest	6	-	1	5	-
<i>Total (n)</i>	62	16	18	6	22
<b>Neurological</b>					
Cerebrovascular	12	5	3	1	3
Coma	4	2	2	-	-
Convulsions	8	1	2	-	5
Head Injury	3	3	-	-	-
<i>Total (n)</i>	25	11	7	1	6

Table 10.0 (cont.): Diagnoses with Increased Risk of Mortality/Morbidity  
Bluewater Health: Petrolia Site

Category	N	Outcome (n)			
		Admit	Transfer	Death	Other
<b>Circulatory</b>					
Septicaemia	1	1	-	-	-
Total (n)	1	1	0	0	0
<b>Respiratory</b>					
Asthma	6	1	-	-	5
Pneumonia	8	7	-	-	1
Dyspnea (not specified)	17	6	2	-	9
Total (n)	31	14	2	0	15
<b>Gastrointestinal</b>					
GI Bleed	3	2	1	-	-
Total (n)	3	2	1	-	-
<b>Other</b>					
<b>Poisoning</b>	5	0	2	-	3
<b>Mental Health/Addiction</b>	5	1	2	-	-
<b>Diabetes with hypoglycaemia</b>	1	1	0	-	2
Total (n)	11	2	4	0	0
					5
<b>Totals</b>	133	46 (35%)	32 (24%)	7 (5%)	48 (36%)

Notes: (a) Total number of CTAS 1 and 2 visits = 227; (b) One hundred and thirty three (133) visits high morbidity/mortality (59% of all CTAS 1 and 2); (c) Cardiovascular (47%); (d) Used ambulance n = 55 (24.0%)

Table 11.0: Diagnoses with Increased Risk of Mortality/Morbidity  
Chatham Kent Health Alliance: Sydenham Hospital

Category	N	Outcome (n)			
		Admit	Transfer	Death	Other
<b>Cardiovascular</b>					
AMI	33	1	14	1	17
Angina/Ischemia	28	1	16	2	9
Chest pain	134	8	8	-	118
CHF	34	15	13	-	6
Dysrhythmia	26	6	6	-	14
Cardiogenic shock	1	-	1	-	-
Cardiac arrest	4	-	-	4	-
<i>Total (n)</i>	260	31	58	7	164
<b>Neurological</b>					
Coma (Unspecified)	5	2	3	-	-
Cerebrovascular	25	7	9	-	9
Head Injury	6	-	2	-	4
Epilepsy (seizure)	10	1	2	-	7
<i>Total (n)</i>	46	10	16	0	20
<b>Circulatory</b>					
Septicaemia	2	1	1	-	-
Embolism	4	-	4	-	-
<i>Total (n)</i>	6	1	5	0	0
<b>Respiratory</b>					
Arrest/Failure	4	-	4	-	-
COPD	34	17	6	-	11
Dyspnea (unspecified)	23	10	6	-	7
Asthma	12	2	-	-	10
Pneumonia	17	8	-	-	9
<i>Total (n)</i>	90	37	16	0	37
<b>Gastrointestinal</b>					
GI Bleed	17	6	10	-	-
GI obstruction	4	1	3	-	-
<i>Total (n)</i>	21	7	13	0	0

Table 11.0 (Cont.): Diagnoses with Increased Risk of Mortality/Morbidity  
Chatham Kent Health Alliance: Sydenham Hospital

Category	N	Outcome (n)			
		Admit	Transfer	Death	Other
<b>Other</b>					
Poisoning	13	4	3	-	6
Diabetes Mellitus with Hypoglycaemia	17	6	5	-	6
Diabetes Mellitus with Ketoacidosis	2	1	1	-	-
Anaphylaxis	2	-	1	-	1
Mental health	46	1	8	-	37
<i>Total (n)</i>	80	12	18	0	50
<b>Totals</b>	503	98 (19%)	126 (25%)	7 (1%)	271 (55%)

Notes: (a) Total number of CTAS 1 and 2 visits = 1101; (b) Five-hundred and three 503 visits high morbidity/mortality (45% of all CTAS 1 and 2); (c) Cardiovascular (52%); (d) Used ambulance n = 55 (24%)

Table 12.0: Diagnoses with Increased Risk of Mortality/Morbidity  
Leamington District Memorial Hospital

Category	N	Outcome (n)			
		Admit	Transfer	Death	Other
<b>Cardiovascular</b>					
AMI	43	-	6	6	31
Angina/Chest Pain	73	60	3	-	10
CHF	38	36	0	2	-
Dysrhythmia	55	33	3	1	18
Ischemic Heart Disease	11	6	-	5	-
Cardiac Arrest	17	5	1	8	3
Abdominal Aortic Aneurysm	1	-	-	1	-
<i>Total (n)</i>	238	140	13	23	62
<b>Neurological</b>					
Cerebrovascular	10	9	-	1	-
Coma	7	3	4	-	-
Seizure/Convulsions	15	11	-	-	4
Head Injury	5	-	5	-	-
<i>Total (n)</i>	37	23	9	1	4

Table 12.0 (Cont.): Diagnoses with Increased Risk of Mortality/Morbidity  
Leamington District Memorial Hospital

Category	N	Outcome (n)			
<b>Circulatory</b>					
Pulmonary embolism	2	2	-	-	-
Septicaemia	3	3	-	-	-
Amputation	2	2	-	-	-
Postpartum haemorrhage	1	-	-	-	1
<i>Total (n)</i>	8	7	0	0	1
<b>Respiratory</b>					
Pneumonia	33	24	7	2	-
ARDS	1	1	-	-	-
Pneumothorax	3	1	2	-	-
Dyspnea (not defined)	23	23	-	-	-
Asthma/Croup/Bronchiolitis	46	4	11	-	31
<i>Total (n)</i>	106	53	20	2	31
<b>Gastrointestinal</b>					
GI Bleed	12	11	1	-	-
Perforated Intestine	1	1	-	-	-
Obstruction	3	3	-	-	-
<i>Total</i>	16	15	1	0	0

Notes: (a) Total number of CTAS 1 and 2 visits = 1,445; (b) Four-hundred thirty two (432) visits high morbidity/mortality (30% of all CTAS 1 and 2); (c) Cardiovascular (55%); (d) Used ambulance n = 488 (34%)

### CEEH

When the diagnoses of cases in the CTAS 1 and 2 groups were examined, 133 of the 227 visits were classified as being of increased risk of morbidity and mortality. These patients would require a rapid response to transport, stabilization and intervention to mitigate these risks. Overall data suggests that CTAS 1 and 2 visits originated primarily from Petrolia, Wyoming, Oil Springs and Alvinston. Based upon geography, Petrolia would be most impacted in terms of travel distance, by any changes to emergency service provision at the CEEH site.

In 2007/2008, 344 patients were transferred from the CEEH site to another acute care institution. Of those with a high risk of mortality and/or morbidity, 46 (35%) were admitted and 32 (24% were transferred).

Forty-three of these patients were triaged at a CTAS 1 or 2 level and 88% of these patients were transferred to BH in Sarnia. In the event of changes in the ED services at CEEH, the viability of maintaining acute care beds at CEEH remains an important consideration. The system would need to not only handle the additional ED volume, but also the additional patients who would have been admitted to the CEEH site.

## Sydenham

In 2007/2008, the Sydenham campus of the CKHA had 22,053 ED visits. These cases make up 33% of the total volume of ED visits to both campuses. This is a significant percentage and the current system will need evaluation to determine if the Public General site would be able to accommodate the additional 35% of volume with the current model. Of the 22,052 visits, 1,101 were triaged at a CTAS 1 or 2 levels. These visits originated primarily from Wallaceburg, Walpole Island, Port Lambton and Tupperville. Of the 1,101 CTAS 1 and 2 visits, 503 can be considered at risk of increased morbidity and/or mortality. In terms of travel distances, changes to emergency care at the Sydenham site would most likely impact those visits which originate from Walpole Island and Wallaceburg.

According to 2007/2008 NACRS data, 481 patients were transferred from the Sydenham site, and of these patients, 231 were triaged at a CTAS level 1 or 2. Of the high risk patients, 19% (98 in total) were admitted and 25% (126 in total) were transferred to another acute care institution. In total, 95% of transfers were to the Public General site.

Given the downsizing of acute care beds at the Sydenham, the ability to accommodate these patients at other institutions should be examined.

## Leamington

NACRS data reveals that 397 patients were transferred to another acute care institution in 2007/2008. This represents 1.5% of all CTAS visits. Of these transfers, 103 were triaged at a CTAS 1 or 2. Almost all of these transfers were to one of the Windsor hospitals. As a ratio, LDMH's admission to transfer ratio is 5:1. This means that for every one visit, which is transferred to another institution, 5 are admitted to LDMH. Further, when we examine the high risk visits, 30% of the total CTAS 1 and 2 visits can be considered high risk. Of these, 60% were admitted to beds within LDMH and 11% were transferred. This suggests adequate resourcing at LDMH to meet the care needs of patients who present to the ED and require admission. An overall in-depth examination of the existing system should be conducted in order to determine the transfer and admission capability across all institutions. This would need to include access to critical care beds.

*An overall in-depth examination of the existing system must be conducted in order to determine the transfer and admission capability across all institutions. This must include access to critical care beds.*

## EMS Utilization

Emergency medical care is accepted as an essential element in the pre-hospital diagnosis and treatment of patients with acute, and often rapidly changing health conditions. Within Ontario, over 95% of the province is covered by 9-1-1 service (MOHLTC, 2006). This service is accessible from any telephone. Paramedics are trained to provide not only efficient and timely transport of patients to the emergency department, but also advanced skills, such as defibrillation, cardiac pacing, intubation and fluid resuscitation (Krauter, 2009).

Although response and transport times are considered quality indicators of emergency care (Ontario Health Quality Council, 2009), improved patient outcomes are also associated with early triage and treatment while en route to the emergency department. Furthermore, reductions in morbidity and mortality are associated with advanced EMS interventions, including pre-hospital 12-lead electrocardiography (Brown, Mahmud, Dunford & Ben-Yehuda, 2008; Millar-Craig, Joy, Adamowicz & Thomas, 1997), pre-hospital clot-busting drugs (Pedley et al., 2003) and administration of drugs, which are used reverse deadly arrhythmias (Dorian et al., 2002).

According to NACRS data, a large percentage of the 2007/2008 EMS transports to the Hospitals in the ESC-LHIN were for cardiovascular problems. Prompt response and transport are essential for such emergencies, particularly stroke (Lindsay et al., 2008) and ST-elevation heart attacks (Antman et al, 2004). In the ESC-LHIN, median response times range from 6 minutes and 59 seconds (Krauter, 2009) to seven minutes and 48 seconds (County of Lambton, 2009), both of which are well within the median provincial response time of 11 minutes and 20 seconds (MOHLTC, 2006).

Despite these quick response times and mass advertisement of 9-1-1, a significant percentage of individuals fail to access EMS for transport and treatment of their emergency health care problems. Particularly concerning are the CTAS 1 and 2 visits, which are primarily cardiovascular in origin, and are classified as visits which require emergent care and possible resuscitation. These results are summarized in Table 13.0 (ESC-LHIN, 2009c).

Table 13.0 EMS Utilization by Institution

Institution	All CTAS Data N (%)	CTAS 1 and 2 N (%)	CTAS 3,4 and 5 N (%)
Bluewater Health: Milton site CEEH site	411 (3%)	55 (24%)	356 (2%)
CKHA Public General site Sydenham site	1,035 (5%)	384 (35%)	651 (3%)
LDMH	3,734 (14%)	488 (34%)	3,246 (13%)

Across the three sites, 3% to 14% of visits accessed the ED by ambulance. LDMH had the highest percentage of ambulance use. These researchers are most concerned about EMS use by CTAS 1 and 2 visits. These percentages ranged from 24% to 35%. When we examined all visits, which were considered to have risks of increased morbidity and mortality, these findings were not improved. This is concerning given that timely assessment and treatment of these health conditions are essential.

## **Assessment of the Current Emergency Care Delivery Model**

The final element of this section of the report provides an assessment of the current state using the decision-making attributes adopted by the ESC-LHIN. Operational definitions have been suggested for all of the criteria; however, valid and reliable data were not readily available for several of these variables.

### **Attribute 1: Access:**

From a systems perspective, accessibility to emergency care can be assessed by the following four factors: (a) travel time and distance; (b) ambulance availability and wait times; (c) service availability; and (d) regular access to primary care. (e.g., Baker & Liu, 2006; Nemet & Bailey, 2000)

#### Travel time/distance

An analysis of travel distances and time was not feasible given the data available. The postal codes collected in the CIHI NACRS (2007/2008) database overlap a variety of geographic regions, preventing a more valid analysis of travel times. We have plotted the known municipalities of origin, where these data were captured within the NACRS dataset (Diagram 1.0 and Diagram 2.0). The location of EMS stations is also indicated. Given the low percentages of individuals who access EMS for transport to ED's, there remains some concern regarding the additional travel times that would be associated with changes to one or all of the ED's under study, without an alternative or augmented plan for emergency care in place.

The travel distances for EMS services to the ED at LDMH would increase greatly for clients that need to be transported to a base hospital in Windsor, more so for those located on the South shore of Essex County than those on the North shore. This observation comes from the basic realization that physical distances are greater within Essex County than some other regions of the ESC-LHIN. That is, the CKHA Public General campus is centrally located within the landmass, providing for more effective access from the South shore, with the North shore being predominantly covered by the BH (Mitton site) in Sarnia. The LDMH ED also has much higher volumes of clients than CEEH than Sydenham as reported by the Hay Group (2009). There was one other important consideration these researchers examined with regard to the LDMH ED. The hospital serves an important role for residents and tourists to Pelee Island, either through direct telemedicine connections from a clinic on the island, to the Hospital, which serves as a base hospital to support the clinic.



Diagram 1.0: EMS Station locations in Essex County and predominant CTAS 1 & 2 origins (2007-08)



### Ambulance availability and wait times

Based upon the EMS reports available for analysis, transport and response times across the ESC-LHIN are certainly within the acceptable provincial standards. Due to lack of available data, these researchers did not examine the response and transfer times among individual EMS stations, call locations and the emergency departments. This analysis would provide a more accurate and systematic assessment related to the appropriateness of the current locations of EMS stations.

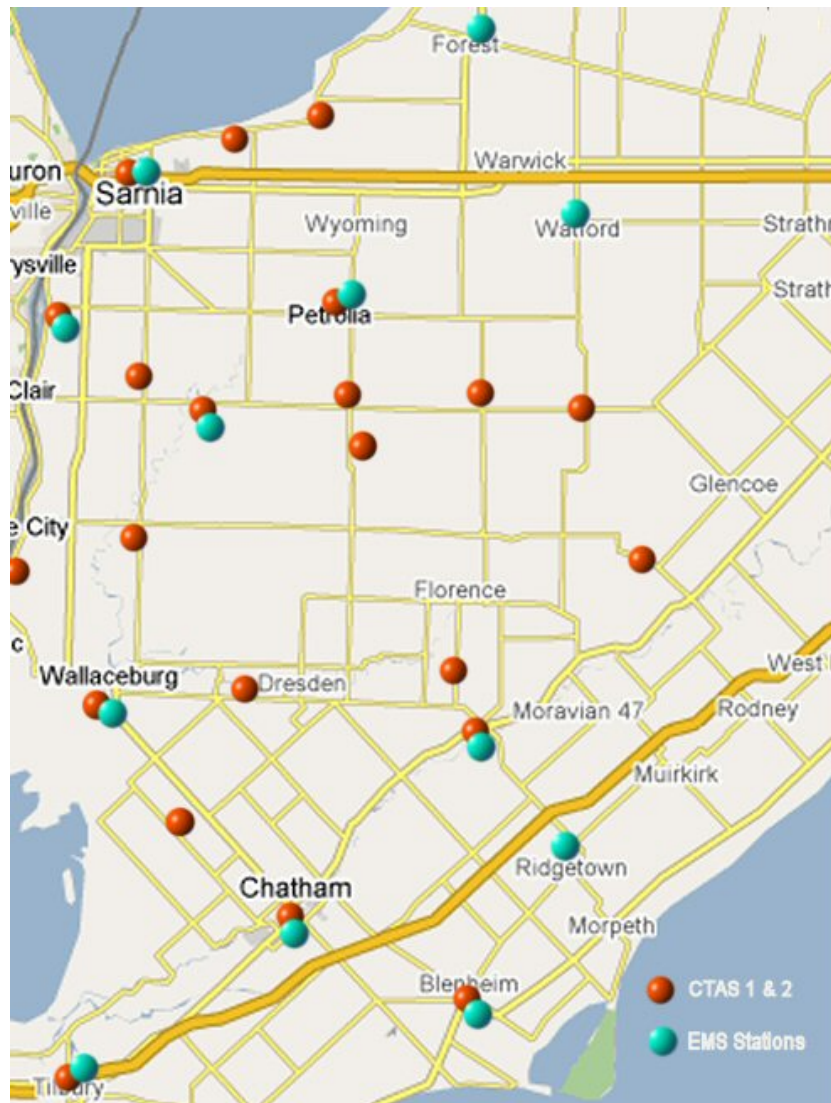
### Service availability

In the regions of Chatham-Kent, emergency care is available 24 hours a day at both the General and Sydenham sites. Provision of such care is challenged by recruitment and retention of emergency room physicians. As evidenced by CTAS data, both urgent and non-urgent care are provided by the two emergency departments. Within the area, there appears to be a significant gap in the service availability of non-emergency/urgent cases by clinics after hours and on weekends.

In Lambton County, BH provides emergency care 24 hours a day and seven days a week from both sites (Mitton and CEEH). Service may be delayed at the CEEH site due to the lack of on-site

emergency physician during the overnight hours. The current primary care delivery model lacks the capability to service non-emergency and/or urgent cases outside the emergency department after regular office and clinic hours.

Diagram 2 provides similar data for EMS stations in the Chatham-Kent and Sarnia-Lambton, and the CTAS 1 & 2 origins (2007-08).



### Regular access to primary care

Although the majority of patients indicated having a primary care physician (CIHI NACRS 2007/2008), anecdotal data reveals that accessing primary care is problematic. Retirements, recruitment and retention of physicians are contributing factors. Further, the trend of physicians to sub-specialize and to operate out of more than one location contributes to increased wait times for primary care. In this instance, individuals are more likely to seek care in an emergency department (Padgett & Brodsky, 1992).

## Attribute 2: Effectiveness

Effectiveness of the current system can be assessed through the examination of volume, mortality rates and admission/discharge/transfer rates for various CTAS levels.

### Volume

Annually, a significant volume of patients accesses the ED's of the three community hospitals under examination in this report. In total, over 65,000 ED visits were made to these hospitals in 2007 and 2008 (CIHI NACRS). The trends suggest an increase in volume at CEEH (40%) since 2002, while visits to the other sites remain stable.

### Mortality rates

Across the three institutions, mortality rates in the emergency department were low. At the CTAS 1 and 2 levels, mortality ranged from 1.5% at Sydenham to 4.8% at CEEH. This suggests effective treatment and management of patients who presented to the ED requiring resuscitation and/or other emergent care.

### Admission/discharge rates for various CTAS

The vast majority of ED volume was classified at the CTAS 3, 4 and 5 levels. Only 1.4 to 5% of this volume was classified at the CTAS 1 or 2 level. Over half of these critically triaged patients are discharged home. The remainder are either admitted or transferred, depending upon the treatment needs of the patient and resource availability within the institution. There are currently no mechanisms in place to systematically evaluate if the effectiveness of the flow of patients within and between institutions, from a cost and patient outcomes perspective.

## Attribute 3: Safety

Transport of patients between institutions is a key factor in assessing the patient safety within the current system. Safe transport can be related to a variety of human and physical factors, such as, driving skill, distractions, weather, and road conditions. Furthermore, the literature supports an increased risk for patient error during transfers in care (e.g., Kripalani, LeFevre, Phillips, Williams, Basaviah, & Baker, 2007). This is largely due to communication failures. Therefore, a safe system minimizes patient transfers, with the provision that best practices for care can be provided in the current institution.

Sydenham and CEEH transfer a higher percentage of patients than LDMH. This may have been related to lack of acute care beds and critical care units at the Sydenham and CEEH sites. The resourcing at LDMH appears better able to support direct admission of patients to the hospital. Considering the longer time to travel from Leamington to an alternative emergency care institution, the ability to manage the care of patients on-site promotes patient safety for the aforementioned reasons.

Other objective measures of patient safety may include: (a) the extent to which best practices for emergency care are utilized; (b) frequency of errors and near misses; and (c) tools and systems

for communication of patient information. Data were not currently available to assess the impact of these factors on the safety of the current system.

#### Attribute 4: Patient-centeredness

##### Patient-rated quality of care

This factor was not assessed, as valid and reliable data were not available. Nevertheless, qualitative responses to community engagement sessions conducted by the ESC-LHIN overwhelmingly indicated positive support for the current emergency care model. This feedback remains highly relevant to the planning and implementing of any changes to the current system.

#### Attribute 5: Focus on Population Health

The current emergency care delivery model does not address population health in a specific, integrated and systematic manner. Within the ESC-LHIN, emergency care appears to be influenced by: (a) an aging population; (b) high rates of circulatory and other chronic diseases; (c) farm and industrial injuries; and (d) the unique health care needs of the Aboriginal peoples.

#### Attribute 6: Equitability

Objective measures of equitability were currently unavailable. Nevertheless, the current system appears to support fair and reasonable access to emergency services by residents within the boundaries of the ESC-LHIN. That is, all individuals within the communities serviced by the ED's of interest can theoretically access emergency services within those hospitals. This inference was supported by qualitative data collected from community engagement sessions conducted by the ESC-LHIN. Changes in the one or more of the ED's could result in community perceptions of inequity related to distribution of health care services.

It is important to note that these inferences relate to perceived equitability, rather than actual equitability. Without objective measures of equitability, community perceptions are especially important in any decision-making.

#### Attribute 7: Appropriate Resourcing and Sustainability

Given the availability of data, it was difficult to offer a valid assessment of the resourcing and sustainability of the current emergency care delivery system. The following text summarizes an assessment of the available data.

##### Total expenditures/budget

Data were not available.

##### Number of ED visits that could be treated elsewhere

Based upon the assumption that cases triaged at CTAS levels 3, 4 and 5 can be treated in a non-emergency setting, in 2007/2008 across the ESC-LHIN, 95% of visits to the ED could have been treated elsewhere (CIHI NACRS). Of particular interest are those triaged at a CTAS level 3.

These are patients who would fit the criteria for urgent treatment. Data suggests that 17% (CEEH) to 22% (LDMH) of cases seen in 2007 and 2008 were triaged as requiring an urgent level of care. Based on the visits to the hospitals by these patients, the current system does not appear to adequately support the provision of urgent care outside of the ED.

#### Number of care options

As previously stated, the current model supports delivery of emergent care across three hospital corporations: BH, CKHA and LDMH. Utilization data suggests that the majority of ED visits are non-emergency in nature. Although primary care was available in the community, it may have been hampered by one or more factors that have been documented above. Walk-in clinics provide a third option for care; however, there are limited numbers of such clinics, and after hours services are limited.

#### Human resources

Expertise in the clinical practice of emergency medical care remains essential. This requires ongoing human resourcing of physicians, registered nurses, and other allied health care providers. Additional human resources include clerical, lab and diagnostic support staff. As previously stated, recruitment and retention of physicians remains a problem. The use of MedEmerg to staff the ED's has occurred in the ESC-LHIN, particularly at the Sydenham site and at LDMH.

#### Facilities and capacity (# beds)

Three hospital facilities provide emergency care to the communities of Petrolia, Wallaceburg and Leamington, along with their surrounding areas. Although each are able to provide a range of emergent care, only LDMH has capability to admit patients directly onto either an acute care unit, or a critical care bed. Patients who access emergent care at either CEEH or Sydenham, and who require ongoing medical care, are transferred.

Facilities at all sites include triage and treatment areas, x-ray, haematology and biochemistry laboratories. A larger hospital ED is currently under construction at the Mitton site of Bluewater Health.

#### Use IT (electronic records)

The electronic record continues to be slowly implemented. Currently, client records do not appear to be universally accessible among acute care institutions and between primary care practitioners. As identified in the literature, this remains one impediment to the development and support of an integrated health care model for use in emergent care (e.g., McDonald, 1997; Woods, 2001). The Hospital sites are all connected to Ontario's Smart System for Health Agency (SSHA) Network. Since the connections are fibre optic connections, the current and future capabilities are mainly limited only by the technology placed at the ends of the fibre cables, and the training and maintenance aspects of technology used in collaborative two-way high-speed voice, image and data exchanges.

## Attribute 8: Integrated

Valid objective data with which to clearly assess the extent of integration of emergency services across the ESC-LHIN are not available. Utilization of ambulance transport to the ED remains low, with only 3% to 14% (CEEH and LDMH, respectively) of CTAS level 1 and 2 visits to the ED arriving by ambulance.

### Deficiencies and Gaps

Based upon the assessment, several gaps exist within the current emergency care delivery system. These gaps were categorized as actual and potential, and relate the following attributes: (a) access; (b) effectiveness; (c) safety; (d) focus on population health; (e) resourcing and sustainability; and (f) integration. When interpreting the gaps within the system, it remains important to consider that the objective qualifiers identified for each of the attributes are not entirely independent, and therefore overlap in some circumstances. The impact of any overlap would require further study to determine synergistic effects of the qualifiers for each of the attributes.

#### Actual Gaps: Key Issues

##### Access:

- Lack of access to PHC across the ESC-LHIN
- Lack of after-hours health care services for non-emergency care needs
- Lack of service provision for urgent care needs outside the ED

##### Effectiveness

- Pervasive use of ED for non-emergency care across the ESC-LHIN
- Approximately 95% of ED visits could have been treated elsewhere
- On-call status of emergency physician at CEEH

##### Focus on Population Health

- Gaps in service provision for aging population, circulatory and chronic diseases, Aboriginal population
- Lifestyle factors – smoking, obesity, etc.

##### Resourcing and Sustainability

- Aging ED facilities and ongoing maintenance needs
- Lack of acute care beds/critical care beds within two of the small community hospitals (Sydenham and CEEH)
- Recruitment and retention of emergency physicians
- On-call status of emergency physician at CEEH

## Potential Gaps: Key Issues

### Effectiveness:

- Retirements of physicians & recruitment challenges
- ED visit volumes predicted to increase due to:
  - Increased population growth over the next 10 to 25 years
  - Aging population

### Safety:

- Increased risk for error related to transfer of patients between institutions
- Under-utilization of EMS for CTAS 1 and 2 visits
- Lack of acute care beds/critical care beds within two of the small community hospitals (Sydenham and CEEH)

### Integration:

- Slow integration of the electronic patient record
- Under-utilization of EMS
- Lack of systematic approach to monitoring and managing client flow from the field/community, through triage, treatment and transfer

Careful examination of the magnitude of actual and potential gaps as listed above is beyond the scope of this study. Nevertheless, a closer examination of the PCH system components indicates that there is the need for more access available at varied times within the communities. The literature reviewed identifies lack of access as a reason for the high number of CTAS 3, 4 and 5 clients presenting themselves to the ED's when they would likely be more appropriately addressed in an alternative primary care site (e.g., Steele et al., 2008).

The aging of the population and the specific health issues that these rural populations face require that a solution focused in providing targeted clinical support be put in place, either at the primary as well as secondary care. The focus on better population health must be maintained or enhanced to stay one step ahead of the potential detriment of negative population health over time (e.g., Barsky et al., 1986; Connelly et al., 1989).

The need for the maintenance and improvement of health care infrastructure puts incremental cost increases as somewhat mandatory for all sites. The issue with not repairing and updating infrastructure is the simple fact that as facilities deteriorate, there is a potential for the health care system supported by that infrastructure to also deteriorate. In order to provide adequate service and to cover the gaps, there is the need for investment in facilities and equipment that can address the needs of the specific populations whilst leveraging resources already in place at the current facilities and other area hospitals.

Any future developments need to put in place mechanisms to efficiently and effectively reduce the number and extent of gaps identified in this report.

## FUTURE STATE

The evaluation of the current delivery model at the hospitals and existent delivery models provided in the literature suggests that there may be a need for creative, systemic, integrative solutions to the current issues faced by the health care system. Some solutions are targeted to primary care while others are targeted to emergency care. In the case of rural populations a single solution may not be sufficient to address the systemic issues faced by such. These researchers believe that this is the case for the challenges faced by the ESC-LHIN on the Petrolia and Sydenham Hospital sites. We also believe that the proposed model has the potential to address the many gaps previously presented.

Our recommendations in regards to the delivery of emergency care at the Sydenham and Petrolia Hospitals call for the continuation of such services at both locations until a new delivery model can be fully implemented.

### Alternative Delivery Models

The alternative delivery models previously addressed in our literature review were shown to be usable and applicable to the delivery of health care services to the general population. The models allow for a better and more efficient delivery of primary care as well as education on health issues, management of chronic diseases, and access to health care providers not physically located in a certain geographical area. In the case of emergency services, the majority of these models do fall short in providing any extra support to the general population. Although these models have reduced the amount of use of emergency departments as PHC for non-emergent patients, such models cannot deliver emergency care. From these models, telemedicine seems to be the most promising in providing support for emergency care by allowing an intensivist or an emergency doctor to participate with a local team in defining the best course of action.

On the other hand, when considering the Health Behaviour Model (Figure 1), it is the combination of these delivery models together with the investment on a new way of delivering emergency care that perhaps may provide the best possible outcome. This opportunity for improvement requires an integrated approach to health care delivery. Looking at the Health Behaviour Model, the delivery models presented here do affect positively the delivery of health care at all levels of the model.

For example, in terms of options available to the general population (environment factor), the models previously discussed increase the availability of services and access to services at the PHC level. These models also help educate the population on their health needs and healthy practices, as well as on how and when to access care (directly affecting population characteristics and health behaviour). All these effects should, therefore, improve the outcomes of the health system. Nevertheless, at the emergency level, no direct improvement in the delivery of care may be expected or demonstrated. Indirectly, on the other hand, it can be speculated that these changes may reduce the load on EDs allowing for more efficient use of hospital resources.



Overall, it seems clear to these researchers that in order to better provide ED or UCC services to a specific rural population, selectively focusing only on ED/UCC will fall short of a permanent solution in the long run, no matter how well equipped and resourced such facility may become. Understanding community health needs and planning for long and short term results and investments will increase the likelihood of success. Following the model presented in Figure 1 should help in addressing the factors that are important in an orderly fashion, allowing for the elaboration of policies and procedures that will be systemic in nature and, therefore, more likely to succeed.

*Any rural health care solution would benefit from leveraging the use of existing health care facility(ies) in the community.*

### **Proposed Delivery Model**

Although this report was commissioned to look into CTAS 1 and 2 events and how to better address emergency care issues, consideration of other health care needs (chronic; ambulatory) and the current state of the health care system are also necessary to support some of the conclusions and to clarify the understanding of any misinterpretations. These researchers suggest that the proposed model and the subsequent recommendations in extending this model will provide the ESC-LHIN with an integrated solution which may help better support the health care needs of the individuals in these communities.

To address the current situation experienced by the rural communities we propose an integrative Emergent Care model composed of the following major elements:

- a) Integrated (smart) triage system for use in field activities (EMS) and at the Hospital sites by attending nurses;
- b) Establishment of an integrative care facility within the premises of the community hospitals to provide emergency services;
- c) Establishment of an EMS station within the premises of the community hospitals to provide transportation for patients that need to be treated at other locations;
- d) Establishment of accountability measures to monitor the efficiency and quality of care provided by the proposed system;
- e) Education of the users of the current system in order to better leverage and exploit health care resources.

### **Integrated Triage System (ITT)**

The purpose of this system is to help paramedics and nurses to initially triage the patients in order to identify the patients that can be treated either at the Sydenham or Petrolia sites, and therefore admitted into these sites, from patients that need to be treated at other hospital sites. In the field, this system must provide paramedics with the ability to decide to which facility to transport a patient to depending on the patient's symptomology. The underlying idea behind this would be to prevent a patient which is too sick to be treated at the Sydenham or Petrolia Hospitals and so should be transported elsewhere sooner than after an on-site assessment at the Sydenham or Petrolia Hospitals, if at all possible.

The second function of this triage system is to be used by nurses at the Sydenham or Petrolia Hospitals to identify patients that are brought to the hospitals by means other than ambulance service or that come to the hospital by their own means. The purpose was also to define which patients need to be transported to other Hospitals – using the ambulance service – from the patients that can be treated at the local integrated care facilities. This element of the ITT is needed since the vast majority of individuals do come to the hospital via other means than ambulance service.

### **Integrated Rural Emergent Care Facility (IRPC FACILITY)**

This facility would have the objective of providing emergent care to patients other than those classified as CTAS 1 or that have the potential to become a CTAS 1. This facility needs to be designed and equipped to provide CTAS level 2 services and to stabilize patients in the CTAS 1 category if those are brought to the facility. This may happen due to an inability of a chosen based hospital to accept a patient upon transport as defined in accountability agreements, or by the patient being brought by other (non-EMS) means to the IRPC facility. This facility can evolve from the current available infrastructure at the hospitals, and there may be value in doing so, if opportunities exist to utilize laboratory and x-ray facilities at the hospital site today in the requisition and provision of services using an “in-house” IRPC facility. Health care workers at this facility should also be trained accordingly to possess the level of skills necessary to provide triage and emergent care services. It is recommended that the available equipment and services on these facilities fulfill the requirements of the UCAOA, UAC, and NAFAC as previously presented in the literature review.

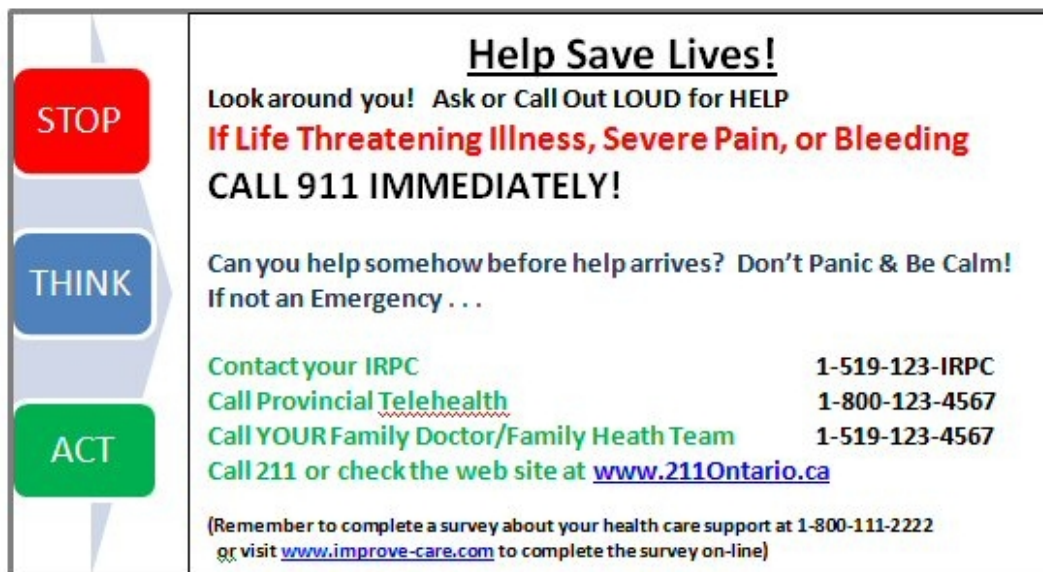
### **Educational Support for Client Emergent Care Decisions**

An added benefit that the IRPC facility may be able to provide to the population are services geared towards the **education needed** for making the most adequate decision in terms of which care to seek. We refer to this service as STA – Stop, Think, Act. The idea behind this education service is to provide the population that live in the area with adequate information about the services available to them at the hospital level and at the provincial level. With a simple educational program such as this, built from the elementary school analogy for “Stop, Drop, Roll,” or “Stop, Look, Listen” these researchers suggest that it is possible to reduce the number of visits to the IRPC facility that are not at the emergency level, and to also help re-direct clients to a more adequate health service provider for their medical condition.

Establishing a continuing educational campaign in the community to inform every resident potentially served by an IRPC facility, could use a series of newspaper and web-based advertisements, store front signage, fridge magnets, etc., and by encouraging school teachers in the region to educate their classes at least 2x per year for the first two years of the IRPC facility opening. These awareness and marketing efforts should provide a consistent message about the role of the IRPC facility in emergent care in these locales. It would be crucial that the promotion of care at the IRPC facility not precede its ability to provide service, or prior to being able to obtain feedback through one or more mechanisms of the accountability framework.

An example of the front face of a business card distributed in the community to enact “Stop, Think, Act” is presented in Figure 5. On the back of a card, with reference to the simple designations in this educational strategy would be information that helps teach clients in the community about what to do in an emergency.

Figure 5: Stop, Think, Act



**EMS (ambulance) Station(s)**

For each of the Hospitals, it is necessary to have an ambulance service on site in order for the proper emergency care to be provided. The main reason for an EMS station located at the hospital is to be able to immediately transport patients that either showed up at the IRPC facility and need to be transported to another facility and/or for patients being treated at the IRPC

facility that have their medical condition deteriorated to the point of needing the services available at other regional hospitals.

### **Accountability Measures**

The ESC-LHIN and the Hospitals, as well as providers of other medical-related services needed for the solution to be implemented, must establish an accountability agreement. The OHQC-JPPC White Paper (2008) could be used to draft such agreements. An accountability agreement would serve the health system in many positive ways as long as it was monitored and used for promoting needed change. In light of the complexity of health care delivery and urgent services in rural communities, it remains imperative that a set of measurement tools be created to monitor the fulfillment of the terms of any accountability agreement.

The nine attributes of a high-performing health system – accessible; effective; safe; patient-centred; equitable; efficient; appropriately resourced; integrated; and focused on population health – could be used as the constructs for the measurements needed. As this measuring tool is created and agreed upon between the parties, these researchers propose that patients be provided with access to a toll-free number in order to provide feedback on the service received or on issues encountered while trying to receive service. With the capability of the Internet, these researchers also advocate for the availability of a web-site based feedback service for those patients that have Internet access or that prefer to provide feedback through this means. Data collected through this accountability mechanism could then be used to evaluate the solution and its outcomes according to the nine criteria. This system will also allow for the fine tuning of the solutions implemented according to the feedback provided by the population.

*In light of the complexity of health care delivery and urgent services in rural communities, it remains imperative that a set of measurement tools be created to monitor the fulfillment of the terms of any accountability agreement.*

### **Transformation of Current State**

Any innovation may face resistance no matter what it is and what it intends to do. It appears to be a natural process to be attached to current conditions or status quo and to try to avoid change – either at a conscious or unconscious level. The innovation literature provides guidance in ways to address and break down resistance, as well as planning steps for the change to happen (Kemp & Low, 2008; Klein & Sorra, 1996; Saran, Serviere, & Kalliny, 2009). The following processes are presented to provide a few elements of the change process that have consistently shown to be important and that these researchers suggest the ESC-LHIN would benefit from considering them when implementing future solution(s).

### **Change Management**

Change management can be understood as a process during which changes to a system are implemented in an organized and planned manner. During a change management process, a ‘champion’ is usually chosen to be the focal person that knows more about the change and that is able to interact and convey ideas to all stakeholders. It is widely recognized as a needed step

in planning for and implementing any changes in organizations (Kemp & Low, 2008). In the case of ESC-LHIN, the 'organizations' receiving the change are the communities that utilize the hospitals in Sydenham and Petrolia. Therefore, it would be advisable that such a process be planned and executed. Some change management principles are to be clear about the reality of the health care issue at hand and understand the reasons why it needs to be changed, by presenting a clear picture of what the future state is intended to be. It is also necessary to set reasonable time for achieving the outcomes and set in place mechanisms to control and evaluate the change. Always communicate, enable, involve, and facilitate the participation of all stakeholders.

John Kotter (1995) describes a helpful model for understanding and managing change. This model has 8 steps as follows:

1. Increase urgency
2. Build the guiding team
3. Get the vision right
4. Communicate for buy-in
5. Empower action
6. Create short-term wins
7. Don't let up
8. Make change stick.

### Hypothetical Scenarios in Transformation of the Current State

A 63-year old farmer collapses out in the field on a 38 Celsius degree summer day. His health condition may or may not require emergent care. In the event that he requires emergent care, there are 3 possible scenarios:

Scenario 1: The farmer's wife calls 911;

Scenario 2: The farmer's wife calls the local IRPC Facility and asks for advice;

Scenario 3: The farmer's wife has no cellular coverage so seeks help from a neighbour and the farmer is driven by truck to the nearest hospital.

#### Scenario 1

The farmer's wife calls 911.

The ambulance is dispatched to the farm. The farmer now complains of chest pain and shortness of breath. The EMS paramedics assess the farmer based upon a standardized triage protocol, obtain an ECG and transmit all data into a "smart" triage system. The farmer is transported to the appropriate facility based upon the triage rating and the client care needs. Appropriate basic and advanced level care (airway, oxygen, anti-arrhythmic and thrombolytic drugs) are provided en route.

- If the patient is triaged at the CTAS 1 category, the patient is transported to either the base hospital Bluewater Health (Mitton site) or the secondary base hospital CKHA (Public

General site) depending on current load and acceptance policy identified in accountability agreements. The triage system electronically transfers the client information to the appropriate facility, as a base hospital of first choice. The EMS paramedics are in constant on-line access during the mobile transport, which includes voice and data transmission capability.

- If the patient is triaged at a CTAS level 2 and his treatment needs can be met at the IRPC facilities at the Sydenham or Petrolia sites, the triage system will direct the ambulance to the site which has the most available resources to treat the client (any of the four sites). The triage system electronically transfers the client information to the appropriate facility using a redirection protocol for electronic information exchange established between the base hospitals, according to policy and service level expectations also identified in the accountability agreements.

### **Scenario 2**

The farmer's wife calls a local IRPC facility and asks for advice

The triage nurse asks the farmer's wife specific questions according to the standardized triage protocol, enters the data into the triage system and activates the EMS. The ambulance is dispatched to the farm. The paramedics assess the farmer based upon a standardized protocol, obtain an ECG and transmit all data into the smart triage system. The farmer is transported to the appropriate facility based upon the triage rating and care needs. Appropriate basic advanced level care (anti-arrhythmics, thrombolytics) are provided *en route*.

- If the patient is triaged at the CTAS 1 category, the patient is transported to either the base hospital Bluewater Health (Mitton site) or the secondary base hospital CKHA (Public General site) depending on current load and acceptance policy identified in accountability agreements. The triage system electronically transfers the client information to the appropriate facility, as a base hospital of first choice. The EMS paramedics are in constant on-line access during the mobile transport, which includes voice and data transmission capability.
- If the patient is triaged at a CTAS level 2 and his treatment needs can be met at the IRPC facilities at the Sydenham or Petrolia sites, the triage system will direct the ambulance to the site which has the most available resources to treat the client (any of the four sites). The triage system electronically transfers the client information to the appropriate facility using a redirection protocol for electronic information exchange established between the base hospitals, according to policy also identified in the accountability agreements.

### **Scenario 3**

The farmer's wife has no cellular coverage so seeks help from a neighbour, and the client is driven by truck to the nearest hospital, whether it be a base hospital or an IRPC facility at Sydenham Hospital (the closest emergent health care site to the farm).

The farmer's wife runs into the IRPC facility at Sydenham Hospital, shouting that her husband is having chest pain and shortness of breath. Upon arrival, the client is assessed by the triage nurse using a standardized protocol. An ECG is obtained and appropriate care is provided. The triage nurse enters the client data into the smart triage system.

### **Outcome A**

The farmer's condition becomes unstable. The ECG suggests an ST-elevated acute myocardial infarction (heart attack). The farmer is transferred *en route* to either CKHA or Bluewater Health, depending upon which has the most available resources at that point in time. Emergent care is provided by the EMS paramedics in consultation with those at the receiving hospital, including any data transfer on the patient's condition that would assist in immediate treatment upon arrival.

### **Outcome B**

The farmer's condition remains stable. His pain and shortness of breath are relieved; however, his ECG suggests that he has experienced an acute myocardial infarction (heart attack). He is admitted to the IRPC and monitored until a bed is available at either the BH (Mitton site) or CKHA (Public General site). The triage system is updated on an ongoing basis with relevant clinical information. Eight hours later, the farmer is transferred to the cardiac care unit at CKHA for further investigation.

### **Outcome C**

The farmer's condition improves. His pain and shortness of breath are relieved. All diagnostic tests are negative. The farmer is discharged home with instructions to follow up with his family practitioner.

After having experienced any of the scenarios above, the client will have access to the accountability system to provide feedback about the care received. The information collected from the accountability framework would be used to support recommendations to improve efficiencies in the health system, at one or more levels. While there may be resistance to operationalizing an accountability framework, doing so may be one of the most successful and fundamental ways of involving and educating clients on the value of continued feedback in the prevention, assessment, diagnosis and treatment process. Since the community is engaged in an S.O.S. process with a 1-800 number for feedback on the status of the hospital, there may be the opportunity to have the system support a more integrated role as a feedback mechanism to support the enhancement of emergent care in the region.

## SUMMARY OF RECOMMENDATIONS

For the Leamington Hospital site, we agree with the recommendation brought forward by the Hay Group (2009). The LDMH site should continue to provide the ED service it does. Rationale for this decision includes numbers of hospital ED visits per year, the need for the hospital ED to serve clients in a unilateral relationship to geographic proximity to the Windsor Hospitals, and the unique requirements to address Pelee Island emergent care support.

As previously alluded to, it is necessary to expand the solution to encompass other elements of the health behavioural model (Figure 1), therefore generating a more systemic, integrated, and further-reaching solution. There are additional steps that the ESC-LHIN could take in order to improve PHC to the targeted rural populations which will, inevitably, reduce the load on the emergency and secondary care services.

The creation of the Integrated Rural Priority Care (IRPC) facility would be seen as the first step of this holistic solution. Within the Sydenham and Petrolia hospitals, either as a component of the IRPC or as a geographically separate site, these researchers recommend the creation of a primary community service that integrates telemedicine, community health centres, family health teams, and nurse practitioner led initiatives. This mixed-model of health care should be aimed at increasing the level of primary care available, helping the population to self-manage their chronic conditions, provide education and training on creating and maintaining healthy habits, general ambulatory care, and providing other services that the community identifies as important to them.

Regardless, any change to the existing system should be in keeping with PHC principles, as articulated in the Ottawa Charter for Health Promotion (World Health Organization [WHO], 1986).

Primary health care is defined as “essential health care based on practical, scientifically sound and acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination” (WHO, 1978, p.2)

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PHC considers the impact of any changes across the entire system, from the individual to the societal level. It recognizes an inter-sectoral partnership of key stakeholders, including, community members, health professionals and governmental and non-governmental organizations (Stamler & Yiu, 2008). Finally, any implementation of recommendations must consider the social determinants of health as factors which are linked to the health of the community's population.

We therefore recommend the following:

- Maintain existing emergency services at LDMH, with ongoing monitoring of quality indicators.
- The implementation of IRPC facilities at CEEH and Sydenham Hospital locations, in such a way that the existing infrastructure of the hospitals can be leveraged.
- Re-align existing community health services among health care institutions to promote integration and excellence in rural community health care
- All changes to existing health care delivery should be implemented with consideration of the social determinants of health, with priority given to the following:
  - Aboriginal health
  - Access to primary health care
  - Chronic disease management
  - Health promotion
  - Illness & injury prevention
  - Aging in place initiatives
  - Home health care services
- Develop infrastructure to provide telemedicine to both communities. This telemedicine capability should be located at the IRPC and be used to provide immediate care support and specialist support and consultations.
- Implement systems of care which promote primary health care:
  - Family Health Teams
  - Community Health Centres
  - Integration of Nurse Practitioners/NP led clinics
- Integrate strategies to recruit and retain health care providers in all communities (ED physicians, primary care practitioners)
- To enhance the recruitment, retention and expertise of rural health care providers, the ESC-LHIN is encouraged to promote the infrastructure for inter-professional training and education of allied health care providers in rural care
  - Physicians
  - RNs
  - Nurse Practitioners
  - Social Workers
  - Physiotherapists
  - Occupational Therapists

- Emergency Care
  - Continue to support advanced training of paramedics
  - Allocate advanced care paramedics to EMS stations > 30 minutes travel from institutions with emergency departments
  - Seamless assessment, transfer and treatment of patients
    - Teleconference capability between EMS and emergency physician during transport
    - Establish a real-time system which monitors patient flow and admitting capability across all emergent care centres in the ESC- LHIN
    - Prioritize the triage and treatment of all paediatric and elderly patients
  - Address best practices related to cardiovascular emergency care:
    - ECG's conducted in the field & transmitted to base hospital
    - Early recognition of stroke & ST-elevation AMI in the field
    - Advanced directives for initiation of thrombolytics in the field
  
- Community Empowerment: A Model for Improving Community Health (adapted from Stamler & Yiu, 2008)
  - Establish a PHC task force
    - Identify and engage community stakeholders: Who?
      - Residents of the communities: should be representative of the population
      - Health care providers from a variety of disciplines (physicians, NP's, RN's, PT's, OT's) and from a variety of delivery models (FHT's, CHC's etc.)
      - Educational institutions
      - Community health agencies (Public Health Units, CCAC, visiting nursing agencies, mental health etc)
      - Hospital representatives
      - Long-term care / retirement home representatives
      - EMS
      - ESC-LHIN
      - Policy makers
    - Establish terms of reference, mission & values
  - Conduct a strengths and needs assessment
    - Identify strengths and needs
    - Review and critically appraise previous assessments
    - Identify gaps and inconsistencies
    - Gather data to inform areas identified above

- Gain commitment & engagement among community members
  - Continue dialogue with community
  - Reaffirm values, beliefs and experiences
  - Identify and validate tensions and conflicts
  - Set mutual strategic goals
- Promote Community Action
  - Define roles & tasks
  - Allocate/reallocate resources
  - Promote community ownership for action and governance
  - Acknowledge and validate ongoing conflict
  - Affirm use of fair processes
- Ongoing Reflection on the Process
  - Evaluation of goal achievement
  - Deliberate mechanism to monitor process improvement
    - Establish benchmarks
    - Accountability measures for all stakeholders
    - Mechanism for community feedback
  - Transfer knowledge to the community

## CONSTRAINTS AND LIMITATIONS

Although we had access to current and historical data provided by the ESC-LHIN, we nevertheless encountered a few constraints and limitations while conducting this study due to the non-availability of specific data (e.g. EMS utilization patterns; patient charts and treatment follow-up; quality and utilization measures). These data were not available not for reasons related to the ESC-LHIN, but due to the fact that it has not been historically collected. In many cases, this lack of more specific data prevented a more robust analysis that may have achieved a broader understanding of the current health care delivery system in the region. Data limitations were the most pressing issue encountered by the research group.

The key issues with the existing data included: (1) limited reliability, (2) misalignment with desired system characteristics, and (3) static nature and significant time-delay of the dataset.

It has to be pointed out; however, that a larger issue with the data collection in general exists. Current process of data collection is an inherent part of a legacy system continuing from the past and it remains unclear whether a rationale to collect particular types of information can be considered valid. It is obvious, however, that to obtain necessary alignment across the health care delivery system in support of the 9 overarching desired system characteristics, the data collection system has to be reviewed and revised.

Another limitation appeared to be the scope of the task which required the researchers to concentrate on CTAS 1 and 2 at the three hospital sites (leaving out of consideration other CTAS patients, who consistently indicate unmet needs in terms of health services). Health care delivery remains a system, and as such, the focus on emergency services only (resulting in some drastic transformations) may have an impact on other elements in the system. In general, the issues expressing themselves most vividly in the Emergency Departments perhaps as a result that these areas of the hospital very often have roots elsewhere in the hospital systems. They are, however, most visible to the media and the public, therefore creating an undue impression that this may be the root source where the problems reside. Overall, many ED issues can be connected to the issues of capacity and flow in the parts of the hospital system outside of ED and there are no trivial solutions that can address them adequately (e.g., OCFP, 2008).

Fixing on one part of the system will not, necessarily, improve the system as a whole (that is usually for sure) or may create other problems. Thus, any urge to respond to cost-cutting measures may only be short term (e.g., because it provides short-term benefits by reducing the budget), it usually has long-term consequences that are either down played or not even considered at the time of a decision, such as overall well being of rural communities. One of the reasons why this happens may be the fact that all hospital processes have their own dynamics and it takes time for them to reach a steady state.

## FUTURE WORK

These researchers suggest that it is important to study these rural populations and their utilization of health care in more detail in order to validate the literature and to understand, in more depth, the intrinsic characteristics of these populations. The following future studies are, therefore, suggested:

- 1) Investigate the reasons why the utilization of EMS services is at the current levels. There is the need to understand the reasons behind the low level of utilization in order to make the use of such system a resource better utilized by the rural populations, mainly due to its critical aspect of emergency health care service.
- 2) Assessment of behavioural factors related to use of health care services
- 3) Follow-up on patients from intake to discharge (or transfer) over a certain period of time (longitudinal study), identifying general trends and other related information. This will help in analysing the appropriateness of treatment provided and where it was provided, as well as patient outcomes and effects on patient's general health status.
- 4) Assess the current level of resources available for the two rural hospitals sites in light of the needs of the rural populations and the availability of other centres. This is important to better streamline and control the flow of patients and data, and to leverage on complementary capabilities. Use the results of this analysis to appropriately equip health care facilities.
- 5) Assess and evaluate the needs of the population in those 2 regions in terms of primary, chronic, and acute conditions.
- 6) Develop an accountability mechanism to evaluate current health care delivery system and, based on these analyses, develop the mechanisms to check for accountability of future systems.
- 7) Create incentive programs to stimulate research interest by students of health care programs (physicians, nurses, social workers, ...). The idea is to bring those students into the community and have them work with them and collect data related to the research interests of students. This has the potential to create a bond between the students, professors, and the health care workers in the community and, more importantly, with the community itself.
- 8) Leverage on the fact that there is a lack of a model and policy for UCC in Canada of what these centres have to deliver. The ESC-LHIN could set up the guidelines and define this area of health care service, especially when considering the needs of rural and aboriginal populations in this work.

- 9) Comprehensive overhaul of the data collection, storage and analysis system to achieve alignment across the health care delivery with the 9 desired system characteristics. This is potentially a significant effort, but essential in the long term. These researchers suggest the following steps:
- a) Review and revision of the existing data collection protocols;
  - b) Development of data hierarchy and necessary aggregation (e.g., with demographic and geographic information) to create alignment with desired system characteristics;
  - c) Development of tools for thorough analysis (e.g., building models, trend analysis by data mining, etc.);
  - d) Establishment of a shared Data Center;
  - e) Develop training programs for both support staff and health care personnel; and
  - f) Provide for a continuous improvement and upgrade process.
- 10) Consider development of community-specific health care delivery practices. Rural health care specific to the setting (including geography and demographics, besides the medical procedures) play a significant role in population's health (Glasser et al., 2003; O'Meara et al., 2002). These researchers suggest that an alternative process of community engagement be developed (with participation of professionals across multiple disciplines, including social sciences), which:
- a) Involve and engage the communities affected;
  - b) Be continuous (and not a one-time, isolated event), to reflect varying and evolving situational characteristics and needs;
  - c) Be based on a direct community feedback, enabling community engagement, communication and education; and
  - d) Be incremental, allowing for adequate planning and thoughts on how to assess (measure) intended effects and gauge community response (satisfaction).

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## About the Researchers

The researchers involved in authoring this report wish to acknowledge the ongoing collaboration of the Erie-St. Clair Local Health Integration Network staff and administrators that were involved in the many reviews and discussions of the interpretations presented herein. In addition, personal communications with people in emergency services, the health care sector and in the communities provided insight that assisted in this literature review.

The authors represent a group of independent researchers, from within and external to the University of Windsor, with varied expertise that collectively authored this report. The authors' nature of research activities, in several areas directly and indirectly related to health care, provide novel synergies in the way the review was done and interpreted.

The principal authors of this study presented in alphabetical order, as opposed to contributory authorship, included:

**Francisco Moro, M.Eng., Ph.D.** with expertise in research involving human factors/ergonomics, information systems, and the utilization of information systems in health care.

**Zbigniew Pasek, M.S.E., Ph.D.** with expertise in research involving organizational design, risk analysis & management, manufacturing automation control in applications such as hospital wait time management and LEAN programs.

**Kathy Pfaff, B.Sc.N, R.N., M.Sc.** with clinical and research expertise in community health nursing, health promotion, illness/injury prevention, experiential learning, including nurse/physician collaboration and patient safety.

**Todd Sands, B.Sc., Ph.D.** with research expertise in population genetics, on-line identity management & security, advanced computer networking and innovative applications for community-based health care in chronic disease management.