IHE Report

Urgent care models to bridge emergency and primary care

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Urgent care models to bridge emergency and primary care

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Executive Summary

Background

Primary care services after hours in Alberta are limited, and, as a result, emergency departments have long wait times and overcrowding as they accommodate a greater number of low-acuity conditions. In recent decades, various urgent care models have been established to fill the gap between emergency and primary care, with the aim of providing unscheduled services for urgent but non-life- or limb-threatening conditions. The extant models have different mandates and services, and vary according to the degree of service availability, acuity of patients, continuity of care, hours of operation, location, and populations served. With the recent rapid increase of urgent care services, and lack of a common definition for and arrangement of the services, a summary of the research outlining available urgent care models and their effectiveness is warranted.

Objective

The objective of this report is to provide a synthesis of evidence regarding currently existing urgent care models and their effectiveness, with a focus on the following research questions:

- *Question 1*: What models of delivering urgent care exist in Canada and other select countries with similar health systems?
    - What are the mandates, composition, locations, and target populations of these models?
- *Question 2*: How safe, effective, and economical are these urgent care models, and what factors contribute to the safety and/or effectiveness?

Methods

This is a rapid review of recent literature that reported on urgent care models and their effectiveness. To address Question 1, information was gathered from several systematic reviews, health technology assessments, government documents, and other relevant articles identified through a comprehensive literature search. To address Question 2, information was obtained from systematic reviews, health technology assessments, and primary studies. Information about the urgent care models and their effectiveness was summarized narratively and presented in tables and figures.

Key Findings

Urgent Care Model Types

In general, *urgent care* is defined as unscheduled health care offered, as part of emergency department care or in ambulatory settings, for acute lower-acuity conditions. Urgent care services are provided by primary care providers such as general practitioners, nurse practitioners, physician assistants, or other professionals such as paramedics with advanced training. Urgent care services are predominately in high-density urban settings and in convenient locations, with extended hours in the evenings, during weekends, and on holidays. Ancillary technology and human resources used within urgent care vary greatly. Regulation and funding details are sparse, suggesting a lack of policies in place for managing urgent care strategies.

Within this report, we describe five urgent care model types, which are located on a spectrum of integration with emergency services, from highly integrated with emergency department services to less integrated services resembling primary care:

- *Emergency Department Integrated Services*: Urgent care services are embedded within the emergency department. Primary care providers may support the assessment and treatment of a full range of cases, apply "see-and-treat" management of low-acuity cases, and/or manage a low-acuity stream of patients independently.
- *Hospital Parallel Services*: Urgent care services are co-located, but physically separate from the emergency department. There is often shared responsibility in patient streaming and oversight. Patients triaged as low-acuity can be redirected from the emergency department to the adjacent clinic, patients can self-refer directly to urgent care, or the urgent care clinic can act as a gatekeeper to the emergency department, authorizing access to the emergency department only if necessary.
- *Community Advanced Services*: Stand-alone facilities that can assess, diagnose, and treat urgent, non-life- or limb-threatening illnesses. This model has on-site diagnostic evaluation services including radiology and laboratory, and offers an expanded scope of treatment services such as antibiotics, narcotics, intravenous fluids, and fracture and/or wound care.
- *Community Restricted Services*: Providing extended-hours (evenings and weekends) urgent services without a scheduled appointment, with facilities located in convenient locations such as retail stores. This model offers a limited menu of services, usually without advanced laboratory or diagnostic imaging resources.
- *Community Home Services*: Urgent care services are provided to low-acuity patients in their home or residency facilities by emergency care practitioners, often paramedics or nurses with advanced training.

Effectiveness of the Urgent Care Models for Service Utilization, Patient Safety and Satisfaction, and Cost Outcomes

A rapid synthesis of the evidence revealed the following:

- *Emergency Department Integrated Service* models showed favourable results in the use of fewer diagnostic resources, but weak evidence for improvements in emergency department wait/treatment times and cost savings, and no effect on patient or caregiver satisfaction.
- *Hospital Parallel Service* models showed heterogeneous results on emergency department utilization and no effect on patient outcomes or cost. Co-located urgent care was found to be favourable for service utilization in comparison to stand-alone services.
- *Community Advanced Service* models showed that hospital-based emergency department attendance decreased, but that demand for advanced services increased, often resulting in an unfavourable net effect on utilization and costs.
- *Community Restricted Service* models showed mixed results; studies from the United States showed favourable service utilization and cost outcomes, but studies from the United Kingdom had inconsistent results with respect to service utilization and no difference in cost.

- *Community Home Service* models showed favourable results for reducing transportation to the emergency department and safely diagnosing and treating low-acuity conditions at the scene, and showed that the model was cost-effective compared to usual care.

Based on the studies reviewed, overall, current urgent care services lack the ability to unequivocally reduce emergency department utilization (attendance, wait time, and length of stay). Patient safety was rarely addressed in the reviewed studies, and only included studies on the *Community Home Services* model reported favourable patient satisfaction. Cost-effectiveness was more frequently reported in the included studies for models closer to traditional primary/community care (the *Community Restricted Services* and *Community Home Services* models), with no cost reduction effect reported for services integrated with emergency care or those with advanced ancillary diagnostics (the *Emergency Department Integrated Services*, *Hospital Parallel Services*, and *Community Advanced Services* models).

Conclusion

There are several urgent care models that span the health system space between emergency and primary care and that focus on the treatment of low-acuity populations by primary care providers offering services supported by varying degrees of ancillary diagnostic resources. Most models were designed for urban and suburban settings, with some variation for rural locations. Tailoring to specialty populations or jurisdictional issues was not common. The majority of studies reported on urgent care services that are closely related to either emergency departments or primary care, but evidence is sparse on the *Community Advanced Services* model, particularly urgent care facilities led by specialists. Based largely on United States data, advanced urgent care services within the community may reduce emergency department visits, but there is no data regarding their impact on safety or patient/caregiver satisfaction, and research has shown that they may potentially increase overall system cost. Overall, the impact of urgent care models was mixed, likely owing to the variability of interventions and comparators, low-quality study designs, and challenges in comparing across studies due to the lack of common definitions for services and outcomes.

Reform of the urgent and emergency care system is currently on the political agenda in several high-income countries, and many jurisdictions continue to struggle to implement an optimal care model that will redirect low-acuity emergency department visits and guide patients to the most appropriate care. Several factors must be considered when introducing or developing novel urgent care strategies, including: (1) ensuring services have clear, consistent identities, with explicit indications on the populations they serve and treatments they provide; (2) understanding how patients view these services and how their health-seeking behaviour influences their use of such services; (3) ensuring good communication and shared information technology across all levels of the health system; and (4) acknowledging contextual factors and configuring strategies to better target underserved and vulnerable populations. Specific regulation (for example, minimum facility and staff criteria, consistent facility nomenclature) and reimbursement models for urgent care must be established in order to support and encourage these services. Future research will likely need to examine a broad set of strategies, but should employ rigorous methods of evaluation with longer-term follow up to appropriately assess the effectiveness of these novel urgent care models.

Abbreviations

All abbreviations that have been used in this report are listed here unless the abbreviation is well known, has been used only once, or has been used only in figures or tables, in which case the abbreviation is defined in the figure legend or in the notes at the end of the table.

CI	confidence interval
CTAS	Canadian Triage and Acuity Scale
ED	emergency department
GP	general practitioner
HTA	health technology assessment
NHS	National Health Service
NICE	National Institute for Health Care Excellence
NP	nurse practitioner
OECD	Organisation for Economic Co-operation and Development
PA	physician assistant
SR	systematic review

Glossary

The glossary terms listed below were obtained and adapted from the sources found at the end of the list.

Acuity – The level of severity of an illness. Generally, low-acuity conditions (also referred to as *family practice* or *ambulatory-sensitive conditions*) are semi- or non-urgent conditions that would benefit from intervention or reassurance within two hours, but may be delayed or referred to other services. Mid-acuity conditions are urgent conditions that could potentially progress to a serious problem and would benefit from intervention within 30 minutes. High-acuity conditions are emergencies that are an immediate potential threat to life, limb, and/or function and require rapid medical interventions.

Acute care – Health care that is delivered in a hospital-setting in order to provide care for serious illness or injury, or recovery from a treatment such as surgery.

Canadian Triage and Acuity Scale (CTAS) – A tool used to allow emergency departments prioritize patient care requirements. The CTAS has five levels:

- Level 1: Resuscitation – conditions that are threats to life or limb;
- Level 2: Emergent – conditions that are a potential threat to life, limb, or function;
- Level 3: Urgent – serious conditions that require emergency intervention;
- Level 4: Less urgent – conditions that relate to patient distress or potential complications that would benefit from intervention; and
- Level 5: Non-urgent – conditions that are non-urgent or that may be part of a chronic problem.

Community care – Health care and social services that are intended to support living independently in the community.

Emergency care – Treatment of individuals with acute life- or limb-threatening medical and potentially surgical needs.

Emergency department (ED) – A facility which provides health services for the public 24 hours a day, 365 days per year, regardless of a person's social or economic status and without requiring an appointment. Most often, these facilities are located within a hospital, but, in some countries, stand-alone emergency departments exist.

Emergency department (ED) overcrowding – A situation in which the demand for emergency services exceeds the ability of a department to provide quality care within acceptable time frames.

Gatekeeping – Primary care service based at the front of emergency departments to manage patient entry to emergency department services.

Medical home – Often a primary care practice, with the goal of having the patient's general practitioner be the most responsible provider of their medical care and work collaboratively with a team of healthcare professionals, to coordinate comprehensive care and ensure continuity.

Non-urgent care – Care for individuals who have low-acuity conditions that do not pose an immediate risk for poor outcome. This may include preventative services, chronic disease management, or care for acute conditions which may resolve without treatment.

Primary care – All community services a patient receives for basic, chronic, and everyday health needs.

Primary care provider – Physician or other health provider who is chosen or assigned to the management of a patient's primary care.

See-and-treat – A technique that involves seeing patients when they arrive, assessing their needs, and providing treatment. This does not exclude the possibility that a patient seen through this technique might need further tests, investigations, or consultations.

Triage – The immediate sorting of patient according to the seriousness of their condition. Several triage scales exist, and are used by trained staff to assess how quickly a patient needs to be treated and to identify the skill group that is most likely to meet the patient's needs.

Urgent care – Care for individuals who have unexpected but non-life-threatening health concerns that would benefit clinically from same-day or evening treatment.

Glossary Sources

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1. Background

1.1. Current Issues

The health system in Canada is currently being strained by increases in population growth, an aging population, and those with chronic disease. Primary care availability remains a concern for many; approximately 16% of Canadians report not having a regular family physician,[1] while 47% report that they chose to seek care in an emergency department (ED) because they could not get an appointment with a primary care provider.[2] Primary care services in evenings, on weekends, or on holidays are limited, and current physician case loads in primary care makes accommodation of same-day appointments difficult.

Increased ED wait times and overcrowding is becoming a global problem, and the trend of year-on-year increased demand for emergency care is consistent across developed countries.[3] Canadians visit EDs more often than people in 11 other Organisation for Economic Co-operation and Development (OECD) countries (41% versus the average of 27% indicated in the 2015–2016 Commonwealth Fund Survey), and Canada has the highest proportion of patients waiting four or more hours during an ED visit (29% versus the average of 11% indicated in the 2015–2016 Commonwealth Fund Survey).[6] In Alberta specifically, 46% of people surveyed as part of the 2015–2016 Commonwealth Fund Survey reported ED visits in the last two years,[6] and there were over 2 million visits to the ED in 2018.[5] Emergency care was designed for the treatment of individuals with acute life- or limb-threatening medical needs, yet more frequently people are arriving at EDs for urgent but non-life-threatening conditions. The percentage of patients going to EDs for non-emergent problems has been reported to be between 25.5 and 60% globally.[7] In Alberta, in 2016, 30% of patients used an ED for a condition that could have been treated by their usual physician, had they been available.[6] The cost of ED visits for low-acuity conditions in Canada exceeded $200 million in 2013/14, representing 13% of the cost for all non-admitted ED attendance.[2] Acute low-acuity conditions (also referred to as *family practice* or *ambulatory-sensitive conditions*) presenting in EDs provide an opportunity to explore novel ways of addressing urgent care, to provide more appropriate services that can lead to more efficient use of healthcare services, better outcomes, and higher patient and/or caregiver satisfaction.

1.2. Urgent Care

Urgent care emerged as a solution to various health system inadequacies. First, the reduction of out-of-hours service and home-calls by general practitioners (GPs) in the 1990s/2000s forced patients with urgent non-life-threatening conditions to EDs.[8, 9] Along with population increases, an aging population, and the complexity of managing chronic disease, EDs then began to feel the strain and issues of long wait times, and ED overcrowding emerged.[2] This brought about associated risks to care quality and increased system cost. Urgent care was therefore established to fill the gap between hospital-based emergency care and community-based primary care. The goal of establishing urgent care is to reduce ED utilization for lower acuity condition, ED overcrowding, wait time for outpatient appointments, and increase patient convenience and satisfaction.[8]

There has been a rapid increase in urgent care services, but currently there is no widely accepted definition for *urgent care*. A 2013 bulletin from the World Health Organization (WHO)[10] indicated the domains of acute care, of which urgent care was one. WHO defined *urgent care* as "ambulatory care in a facility delivering medical care outside a hospital emergency department, usually on an

unscheduled, walk-in basis."[10] Others consider urgent care as part of primary care service delivery and have defined these services as "designed to assess and manage unscheduled or unforeseen conditions that arise in the out-of-hours period, providing care for people with pressing healthcare needs which cannot wait until primary care services are available."[11]

Urgent care offers to bridge the ill-defined space between emergency and primary care by encompassing greater temporal availability and more diagnostic ancillary services than traditional physician offices, while avoiding the resource- and cost-intensity of EDs; however, the broad/various definitions of *urgent care* have created a wide breadth of models with varying labels, mandates, and services. The extant models have different emphases, and vary along a continuum according to the degree of service availability, acuity of patients, continuity of care, hours of operation, location, and populations served.[8]

Urgent care system details are often inadequately described in the available literature, and clear definitions or standardization of the delivery of urgent care services are lacking. Historically, urgent care services have been highly variable and often overlap with each other, as well as with emergency and/or primary care services, limiting the ability to unequivocally categorize and compare urgent care models. With the recent proliferation of urgent care services, and lack of a common conceptual anchor among the services, a structured summation of the research outlining available urgent care models and their effectiveness is warranted.

2. Objective

The present report was prepared in response to a request from the Health Standards, Quality and Performance Division of Alberta Health for information about current existing models of care that bridge the gap between in-hospital emergency care and community primary care, in Canada and other jurisdictions from OECD countries (United States, United Kingdom, Australia, New Zealand, and Israel). This evidence-based report will be used to inform policy development and provide guidance to Alberta Health in providing services to manage urgent but non-life-threatening conditions.

The following research questions will be addressed in this report:

- *Question 1*: What models of delivering urgent care exist in Canada and other select countries with similar health systems?
    - What are the mandates, composition, locations, and target populations of these models?
- *Question 2*: How safe, effective, and economical are these urgent care models, and what factors contribute to the safety and/or effectiveness?

3. Methods

This is a rapid review of systematic reviews (SRs) and health technology assessments (HTAs), government reports, primary studies, or other relevant articles published in the last 10 years that describe urgent care models and, if available, their safety and/or effectiveness.

3.1. Literature Search

To identify published academic literature on urgent care model types, an IHE information specialist (LT) conducted searches in the MEDLINE and Embase databases. To identify relevant grey

literature, the information specialist searched the HTA Database, websites of professional urgent care associations, websites of HTA agencies, Google Scholar, and Google. The MeSH terms and keywords searched included *urgent*, *minor injury*, *mobile health*, *immediate care*, *collaborative emergency*, *convenience*, *retail*, *freestanding*, *unscheduled*, *episodic*, *out-of-hours*, *after-hours*, *walk-in*, *extended hours*, *extended care*, and *advanced ambulatory*, as well as *models*, *structure*, *efficiency*, *organizational*, and *health services misuse*. Language was restricted to English, and dates were restricted to the last 10 years, from January 2009 onward. Studies from low- and middle-income countries were excluded, as information from countries with health systems similar to Canada (such as Australia, the United Kingdom, and the United States) would be more relevant and useful.[13] A detailed search strategy for the literature on urgent care model types is available in Appendix A, Table A.1.

To identify published academic literature (SRs, HTAs, and primary studies) on the effectiveness of the identified urgent care models in terms of service utilization, patient, and cost outcomes, the information specialist conducted additional searches in MEDLINE and Embase. To identify relevant grey literature, the information specialist searched ProQuest Theses and Dissertations, Google Scholar, Google, and relevant websites (of, for example, HTA agencies and professional associations). We also scanned reference lists of relevant studies and reports. The MeSH terms and keywords searched included *urgent*, *minor injury*, *mobile health*, *immediate care*, *collaborative emergency*, *convenience*, *retail*, *freestanding*, *unscheduled*, *episodic*, *out-of-hours*, *after-hours*, *walk-in*, *extended hours*, *extended care*, and *advanced ambulatory*, as well as an emergency searches hedge[14] in combination with the terms *primary health care*, *physician office*, or *family practice*. Language was restricted to English, and dates were restricted to the last 10 years, from January 2009 onward. Appropriate filters were applied to identify SRs,[15] randomized controlled trials,[16] other primary studies, and economic studies.[17] Studies from low- and middle-income countries were excluded.[13] A detailed search strategy for the literature on the safety and effectiveness of the identified urgent care models is available in Appendix A, Table A.2.

3.2. Study Selection

One reviewer (LW) screened the title and abstracts of all citations identified by the searches and assessed the full text of the potentially relevant papers for inclusion.

For the literature on urgent care model types, SRs and HTAs published within the last 10 years were included, along with relevant government reports and/or other articles (for example, general reviews, discussion papers, policy statements, theses, white papers) as needed. The population included consisted of patients seeking immediate medical attention for a range of urgent and non-urgent, non-life-threatening conditions. The urgent care models needed to provide unscheduled care with extended hours. Studies that reported on services provided in primary care physician offices or EDs without alteration for managing low-acuity conditions were excluded. Care providers were not restricted, nor was the presence/absence of ancillary diagnostic services.

For the literature on the effectiveness of the identified urgent care models, we included SRs and HTAs published in the last five years (as these SRs and HTAs included primary studies published at least 10 years ago) that met the Cochrane Collaboration's definition of an SR.[18] Primary studies from the last 10 years that were not already included in an SR were also included. Studies were included if they met all of the criteria specified in Table 1.

TABLE 1: Selection criteria for studies on the effectiveness of the urgent care models

Criterion	Description
Study design	Systematic reviews and health technology assessments; individual randomized controlled trials, observational studies, or pragmatic (effectiveness, implementation) studies
Population	Patients seeking immediate medical attention for a range of urgent and non-urgent, non-life-threatening conditions, including acute presentations of chronic conditions
Intervention	Care models that have non-appointment (unscheduled) care and extended hours/after-hours care, with or without on-site basic support services and related supplies not present in the majority of physician office settings (minimum of laboratory and diagnostic imaging services)
Comparator	Concurrent comparison with hospital-based emergency departments or primary care physician offices; before-after comparison

Outcomes of interest	Relevant outcomes may include any of the following:
	• Service utilization:
	  ○ Emergency department utilization
	  ○ Emergency department wait times
	  ○ Incidence of low-acuity presentations to emergency departments
	• Patient outcomes:
	  ○ Safety (adverse events, complications)
	  ○ Efficacy/effectiveness outcomes (mortality, morbidities)
	  ○ Patient and/or caregiver satisfaction
	  ○ Quality of life
	• Economic outcomes:
	  ○ Cost avoidance/cost saving
	  ○ Cost-effectiveness

3.3. Data Extraction and Synthesis

One reviewer (LW) extracted data from the included literature on urgent care model types into predeveloped and piloted data extraction forms. The descriptions of the model types and content were synthesized using a modified Template for Intervention Description and Replication, a checklist that specifies the content of the intervention, with each intervention being a unit of analysis.[19] A composite template was populated for each model type from details accumulated from the included literature, including: service description, why (rationale of the service), who (target population and service providers), what and how (the physical or informational resources, as well as the procedures, activities, or processes used in the delivery of the service and the mode of service delivery), where and when (service location and operation hours), sources of funding, and tailoring or modifications of services for specialty populations or issues.

The evidence on the effectiveness of the identified urgent care models from selected SRs, HTAs, or primary studies was summarized narratively and presented in tables, by model type. Details regarding study characteristics (author, year of publication, countries where studies were conducted, study design, data collection period) as well as target populations, intervention types, comparison groups, and outcomes (service utilization, patient outcomes, cost-saving/cost-effectiveness) were extracted by one reviewer (LW). A second reviewer (TM) cross-checked the data extraction tables for accuracy and consistency.

3.4. Quality Assessment

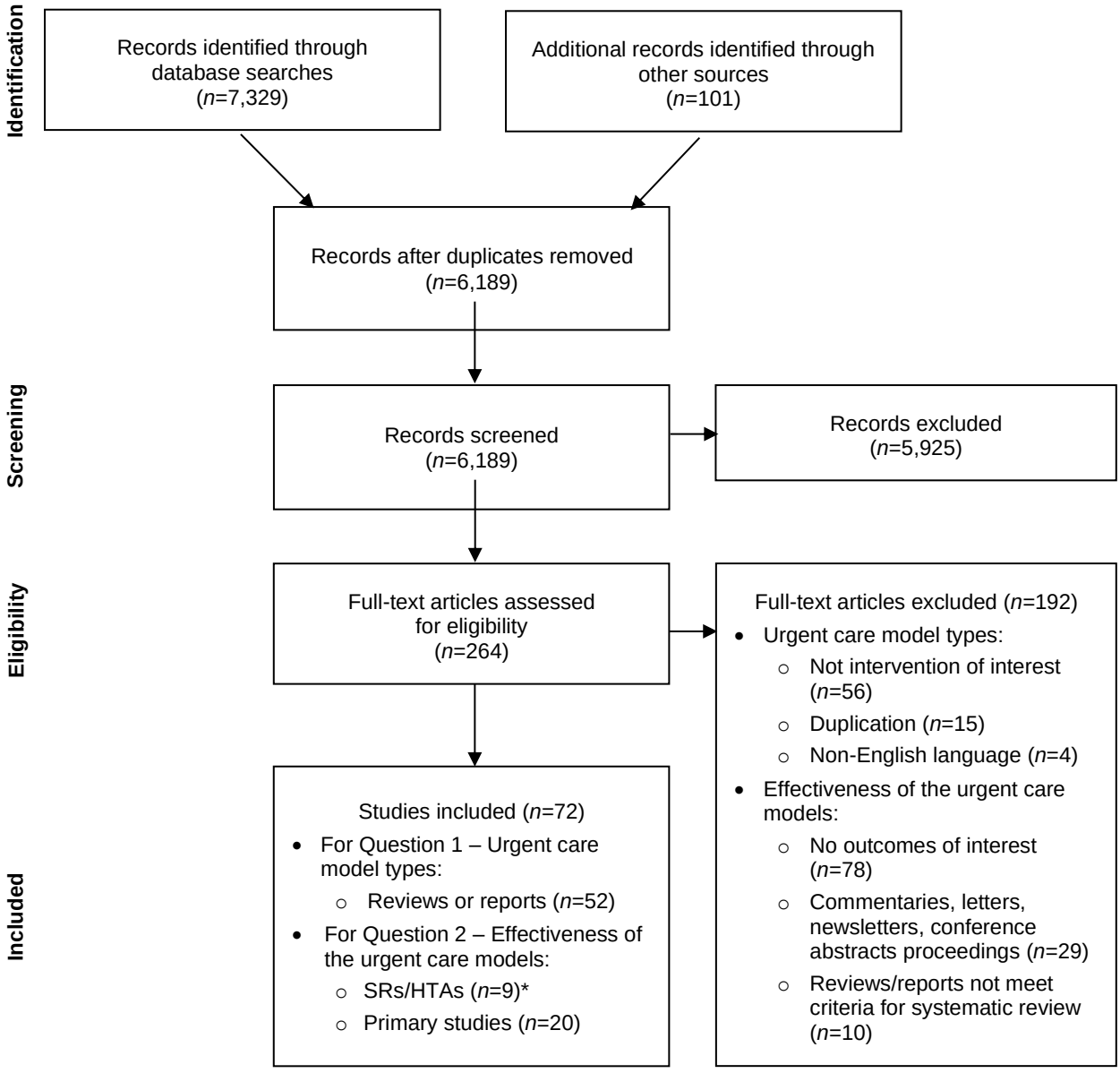
A formal critical appraisal of selected studies was not conducted due to time constraints. However, the main methodological issues were identified in the selected studies and are highlighted and discussed in the *Discussion* (section 5).

4. Results

4.1. Literature Search

A total of 7,430 citations (titles/abstracts) were identified, and 264 full-text articles were retrieved for assessing eligibility. A total of 72 articles were included in this review: 11 SRs,[20-30] six HTAs,[3, 31-35] four literature reviews,[36-39] 10 government reports,[2, 40-48] 21 other relevant articles,[8, 49-68] and 20 primary studies.[69-88] Forty-three articles were included on urgent care models types (Question 1) and 29 articles were included on the effectiveness of the identified urgent care models (Question 2). The study selection process is illustrated in Figure 1.

FIGURE 1: Study flow diagram



* The nine SRs/HTAs selected for Question 2 are also part of the literature included for Question 1.

SR: systematic review; HTA: health technology assessment

Generally, the literature described urgent care from the perspective of finding solutions for system issues such as ED overcrowding, inappropriate ED utilization, or primary care service resources being outstripped by demand. Frequently, the articles encompassed numerous solutions or services, some or all which were relevant to our research questions.

The excluded studies and the reasons for their exclusion are listed in Appendix B.

4.2. Urgent Care Model Types

This section presents information regarding the following research question:

- *Question 1*: What models of delivering urgent care exist in Canada and other select countries with similar health systems?
    - What are the mandates, composition, locations, and target populations of these models?

4.2.1. Overview

To overcome the inconsistent and often confusing terminology used to describe urgent care services, Cooper et al. (2019) recently established a taxonomy for primary care services in or alongside EDs.[12] First, they categorized models based on their proximity to an ED: access within the ED versus access separate from the ED. Next, they sub-divided the proximity categories into subcategories based on their theoretical spectrum of integration, from being close to an emergency service to usual primary care.

Following the structure established by Cooper et al. (2019)[12] and also taking into consideration other classifications from the literature, we have categorized the extant types of urgent care services into five models. We have labelled the models in terms of their location (*Emergency Department*, *Hospital*, or *Community*), along with a descriptor of how the urgent care services function in relation to their proximity to emergency or primary care as follows (see Table 2):

- *Integrated Services* that are provided within the ED;
- *Parallel Services* that are co-located within an ED with shared triage;
- *Advanced Services* that have more intensive human and technical resources (less than an ED but more than primary care);
- *Restricted Services*, which offer limited human and technical resources similar to those provided in primary care; and
- *Home Services*, which offer limited resources similar to ambulance care.

The models should be viewed as belonging on a spectrum of integration, from highly integrated with an ED to services resembling primary care, without clear distinction in current practice.

Our model taxonomy allows for the inclusion of non-primary care services (for example, specialist-led, advanced resources) and accommodates the considerable overlap between different models in terms of hours opened, healthcare providers, and services offered, despite relatively distinct locations. Our taxonomy reflects the current presentation of urgent care services that is primarily based on service location and resource components, which may be more informative and useful for urgent care planning, using existing services as templates.

TABLE 2: Summary of urgent care model types

Urgent care model type	Model characteristics					
	Description	Country	Setting and location	Care providers	Hours	Ancillary services access
Emergency Department Integrated Services[3, 21, 27, 32, 36, 44, 45, 50]	Urgent care services are embedded as part of the ED throughput	Canada United States United Kingdom Australia/New Zealand	Urban ED	GPs, NP; optometrist; dentist; other primary care provider	Extended (evenings and weekends); all ED hours; block shifts	Yes
Hospital Parallel Services[3, 24, 25, 31, 33, 38, 44-46, 48, 50, 51, 54]	Urgent care services are co-located with an ED, often with shared patient streaming and/or oversight	United Kingdom	Urban Hospital	GPs; NPs	Extended (08:00–20:00)	Sometimes
Community Advanced Services[2, 8, 31, 32, 35, 37, 39, 41-43, 46, 47, 49, 52, 53, 55, 57, 58, 60, 62-68]	Stand-alone urgent care services with intensive human and technical resources	Canada United States United Kingdom Australia/New Zealand Israel	Urban Community	GP; emergency care physician; NP; physician assistant; pediatrician; specialist	Extended (minimum 12 hours/day, 7 days/week)	Yes
Community Restricted Services[20, 22-26, 28, 35, 37, 38, 40, 54, 56, 59, 61]	Stand-alone urgent care services with limited human and technical resources	Canada United States United Kingdom Australia/New Zealand	Urban Community	GPs and/or NP	Extended (evenings and weekends)	No
Community Home Services[3, 29, 30, 34, 39, 45]	Mobile urgent care services	Canada United Kingdom Australia/New Zealand	Rural Patient's home	Paramedic, registered nurse, or NP with extended skills; physician	Extended; daytime only; evening only	No

ED: emergency department; GP: general practitioner; NP: nurse practitioner

4.2.2. *Emergency Department Integrated Services*

Two SRs,[21, 27] two HTAs,[3, 32] one literature review,[36] two government reports[44, 45] and one other article[50] discussed the *Emergency Department Integrated Services* model. Descriptions of the model are provided in Appendix C, Table C.1, with country-/geographical area-specific variations described in Appendix C, Table C.2.

The *Emergency Department Integrated Services* model provides urgent care within the ED, for those seeking care for low-acuity conditions (see Figure 2). This model reflects a trend toward providing more comprehensive services in the hospital-based ED, and was established as a solution to "inappropriate use" of the ED that contributes to ED overcrowding, increased health service cost, and treatment delays for true emergencies. The rationale behind these embedded services is that they allow for more efficient patient streaming by removing the onus otherwise on patients or other referring tools with regards to determining the most appropriate service for a patient's condition.

Within this model, it is often GPs, nurse practitioners (NPs), or other primary care providers who work within an ED to provide care jointly with ED staff, but sometimes specialists (for example, oncologists, cardiologists) may have sessional clinics within the ED to manage urgent problems for their specific population of interest. Primary care providers within this model often have responsibilities that go beyond those in traditional general practice, including:

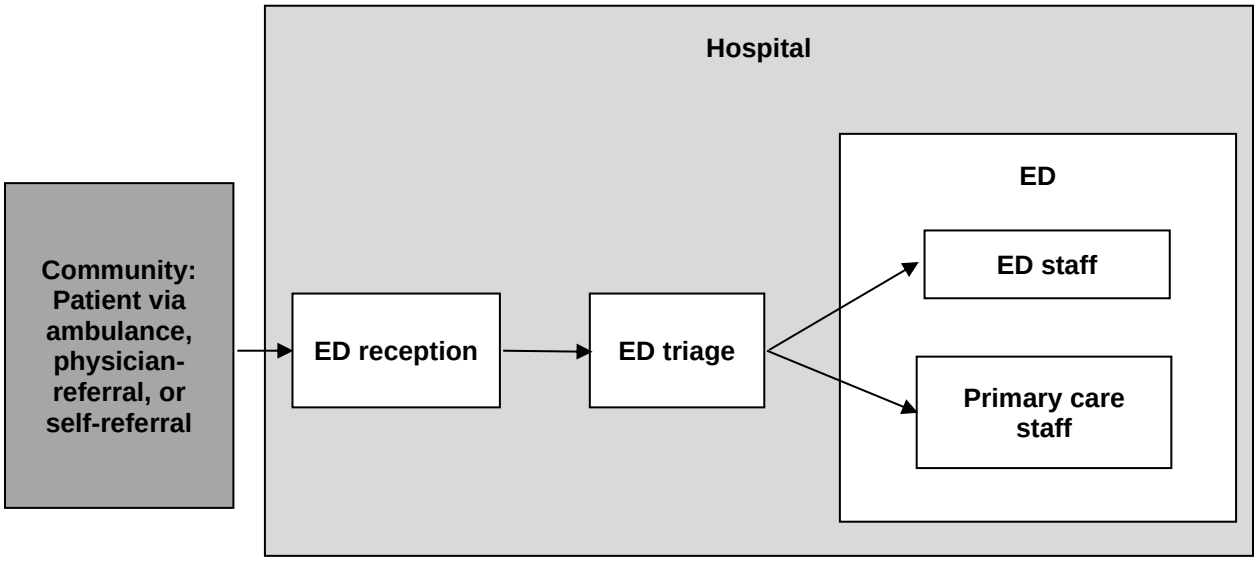
- supporting the assessment and treatment of the full range of ED cases;
- applying "see-and-treat" management for low-acuity cases, whereby patients with minor conditions are treated immediately after being triaged; and/or
- managing a low-acuity stream of cases within the ED independently.

The availability of primary care providers in the ED varies, often with extended hours (for example, 08:00 to 24:00) but rarely overnight. The model is frequently used within an urban or suburban setting.

This model allows provider flexibility, can respond to different patient needs, and is valuable to vulnerable populations (such as immigrants, the homeless, or those with mental illness/addictions) who are frequent users of the ED and tend to avoid primary care even when redirected.

Governance and funding usually fall within the responsibility of the attending hospital, streamlining the health system service management.

FIGURE 2: Patient flow through the *Emergency Department Integrated Services* model



Source: Adapted from Ablard et al. (2017)[50]

In Canada, integrated services are sometimes referred to as a *fast-track system*, whereby assessment, treatment, and discharge of low-acuity ED patients is completed by a dedicated professional, usually an NP, GP, or resident. In the United States, physician assistants (PAs) and NPs have various roles in the ED: see-and-treat, fast-tracking, and/or ED physician support. In the United Kingdom, GPs or NPs work in the front-line to support appropriate triage/apply a see-and-treat management or support ED physicians in treating a full range of acuity patients. In Australia, NPs or paramedics with advanced skills support the triage and treatment of patients in the ED independently, most often in rural and remote locations where GP and ED physician staffing is limited.

4.2.3. *Hospital Parallel Services*

Two SRs,[24, 25] three HTAs,[3, 31, 33] one literature review,[38] four government reports,[44-46, 48] and three other articles[50, 51, 54] discussed the *Hospital Parallel Services* model.

The *Hospital Parallel Services* model provides urgent care services alongside but separate from an ED, often with the adjacent urgent care services having a formal, coordinated relationship with the ED (see Figure 3). Again, this was created as a solution to counteract ED overcrowding, with the rationale that a single-site service point with a strong collaboration between ED and urgent care would create efficient patient streaming and limit "inappropriate use" of ED services.

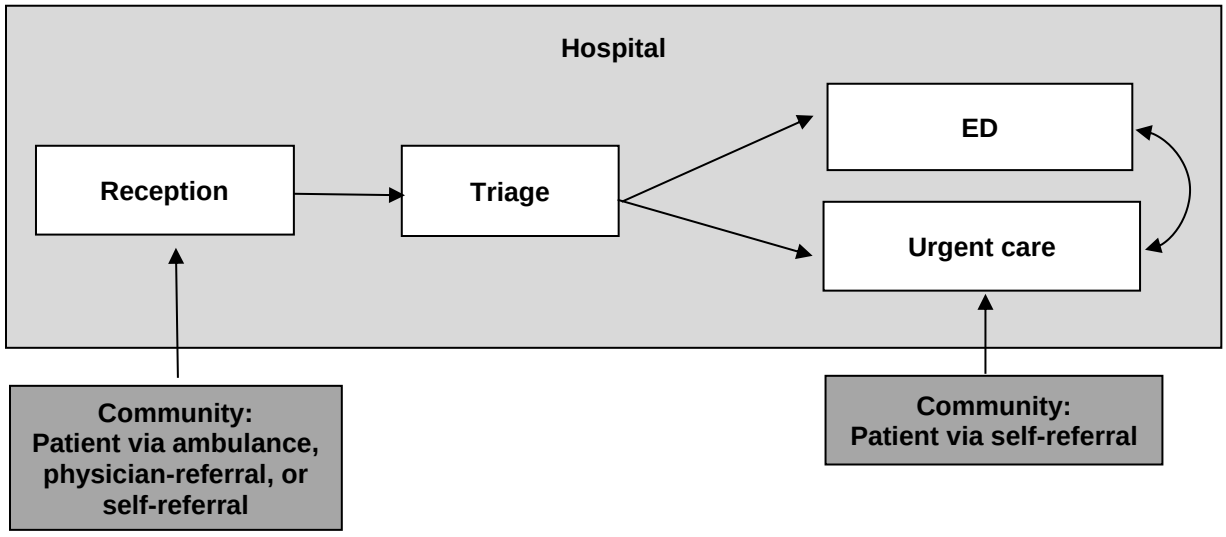
These parallel services are intended to have primary care practitioners support the ED by:

- allowing ED-triaged patients to be redirected to the adjacent urgent care clinic;
- allowing self-referred patients to choose care by the adjacent urgent care clinic directly; and/or
- having the adjacent urgent care clinic act as a "gatekeeper" for the ED, whereby all self-referred ED patients are first triaged by the GP-led services, and then are given access to the ED or other specialized care if necessary.

These parallel services are open extended hours (12 to 16 hours a day, seven days a week), with a limited availability of ancillary diagnostic services. This model is often established in urban and suburban settings.

This model allows for better coordination of care, since the urgent care services have access to and communication across the entire spectrum of health services. As with the *Emergency Department Integrated Services* model, having comprehensive service within a single site could be valuable for patients having difficulty navigating the health service provisions. Though still managed by the hospital,[48] compared with primary care providers within the ED, this model maintains patient and service management autonomy, keeping responsibilities and funding consistent with traditional divisions. That is, the ED manages/funds ED staff separate from the adjacent clinic (which has the GP manage/fund the clinic staff), and billing is done through established emergency or primary care streams.[44]

FIGURE 3: Patient flow through the *Hospital Parallel Services* model



Source: Adapted from Ablard et al. (2017)[50]

In the United Kingdom, the National Health Service (NHS) mandated that a front-door clinical streaming model be established in every ED by December 2019,[46] whereby an adjacent extended-hours urgent care GP centre only takes low-acuity referrals from the ED (no self-referrals, though this may vary by location). In the Netherlands and Belgium, GPs deliver out-of-hours care in large GP cooperatives (40 to 120 full-time GPs participating in each), which are often located within the hospital. This system uses gatekeeping, with the ED and GP cooperative having joint triage that is coordinated by the GPs; if a patient is deemed to be appropriate for urgent care, they are directed to be seen by the cooperative instead. In Australia, EDs have redirection protocols in place to refer patients to nearby urgent care centres, which are usually on the same property but are not affiliated with the ED.

A parallel relationship between urgent care and EDs is not frequently used in Canada or the United States, though community clinics are often located near EDs, with the expectation that self-referring patients would select a lower-acuity option if readily available.

4.2.4. *Community Advanced Services*

Three HTAs,[31, 32, 35] two literature reviews,[37, 39] six government reports,[2, 41-43, 46, 47] and 15 other articles[8, 49, 52, 53, 55, 57, 58, 60, 62-68] discussed the *Community Advanced Services* model.

The *Community Advanced Services* model uses a stand-alone facility for the examination, diagnosis, and treatment of non-life- or limb-threatening illnesses and injuries. This model is driven by volume (population density), as well as by the prevalence of mid-acuity conditions that tend to contribute to ED overcrowding. The needs of mid-level acuity patients are too urgent or acute to be managed within primary care but do not require the expertise nor services of an ED, and are therefore often poorly accommodated by traditional services. This model is most frequently used as a transitional step between the ED and primary care in urban settings, and less often as an ED-alternative in rural locations where comprehensive ED care may not be readily available.

In this model, patients typically self-refer and are accommodated on an unscheduled, walk-in basis. Facilities under this model are staffed by GPs, emergency medicine-trained physicians, and/or other licensed healthcare professionals such as PAs, NPs, pediatricians, or specialists (for example, oncologists). On-site evaluation services include radiology and laboratory, and offer an expanded scope of treatment services such as antibiotics, narcotics, intravenous fluids, and fracture and/or wound care; services may extend beyond urgent needs to include both routine primary care and/or occupational health. Facilities under this model are open extended hours, usually a minimum of 12 hours a day, seven days a week, 365 days a year. The availability of physician staff and ancillary services may differ, depending on the hour of service. Funding and management of these services vary (for example, facilities under this model can be owned and operated by government or healthcare institutions, or by private physicians). Most services accept both public and private insurance.

In Canada, this model is most frequently integrated with primary care service. British Columbia established *urgent and primary care centres* (previously called *urgent primary care centres*) starting in fall 2018 as part of their Primary Care Strategy.[62] These centres are predominately in large urban areas where people more frequently cannot find or access a regular primary care provider, and are mandated to provide urgent care for patients with non-life-threatening injuries and illnesses that should be addressed within 12 to 24 hours (Canadian Triage and Acuity Scale [CTAS] levels 4 and 5), with extended hours in the evening as well as weekends. These centres utilize at least one physician or NP, a social worker or other allied health professional, and a registered nurse. These centres are described as "full service," with on-site or close proximity access to diagnostic and laboratory resources that maintain the same hours. As of October 2019, the first five centres have had more than 700,000 patient visits in their first year open, with 65% of the patients unattached to a regular primary care provider.[63]

Collaborative emergency centres were first established in Nova Scotia in 2011[32] and in Saskatchewan in 2013,[64] with a primary care team (GPs, NPs, and allied health professionals) available during the day, and GPs or NPs and paramedics in consultation with a GP providing care coordination or immediate care to low-acuity patients overnight. These provinces have used this model primarily in small or rural communities. Prince Edward Island established a collaborative emergency centre in 2013, but it is attached to a hospital and running as an ED during the day with emergency nurses and paramedics with advanced training running the centre overnight, in consultation with an on-call physician.[66]

Alberta and Ontario have *urgent care centres* in both rural and urban locations to provide extended hour access for unexpected but non-life-threatening health concerns that require same-day or evening treatment.[47, 65, 68] The care team consists of nurses, NPs, and physicians, with varying services. In Manitoba, Winnipeg's healthcare facilities were restructured in 2017, and currently there are two urgent care centres established within local hospitals in the city, running in replacement of EDs.[67] These urgent care centres are open 24 hours a day, seven days a week, and are able to provide services not available in many primary care offices, but are not equivalent to EDs.

In the United States, privately owned, free-standing emergency centres were first established as stand-alone EDs with a slightly narrower service delivery mandate than hospital-based EDs. Established in urban settings, these centres were to provide affordable and accessible emergency care in communities, to reduce inequalities in healthcare distribution, and to support the efficiency of hospital-based EDs. Recently, the term *urgent care centre* has been used for such facilities, which have a greater focus on treating lower-acuity conditions, though each facility varies widely in terms of the type of staff (GP, emergency care physicians, internists, PAs, NPs, and/or pediatricians) and available diagnostic and radiological services. Though there are over 9,000 urgent care centres in the United States as of November 2019, there are currently no criteria that a facility is required to meet in order to be considered an urgent care centre (the Urgent Care Association of America does, however, have guidelines for services and supplies they recommend, and physicians may now become board-certified in urgent care medicine).[57] An urgent care centre's affiliation affects their reimbursement and patient population served, where hospital-affiliated centres can get reimbursed for public insurance claims, while privately-owned facilities sometimes cannot take public insurance and therefore are limited in providing care only to those with private insurance.

In the United Kingdom, in 2017 the NHS identified that their urgent care services were fragmented and variably named/delivered, creating confusion for patients seeking care. By the fall of 2020, previously termed *urgent care centres*, *walk-in centres*, and *minor injury units* will be redesigned as *urgent treatment centres*, which will have GP-led enhanced services that are open at least 12 hours a day, every day of the week.[89] In Australia, a number of urgent care centres have opened with consistent use of NPs and paramedics with advanced skills, some in replacement of EDs and others to accommodate overnight urgent services in remote areas. In Israel, urgent care centres have predominately been established by insurance providers as a lower-cost option to ED care, and appear to be structured similar to urgent care centres in the United States.

4.2.5. *Community Restricted Services*

Seven SRs,[20, 22-26, 28] one HTA,[35] two literature reviews,[37, 38] one government report,[40] and four other articles[54, 56, 59, 61] discussed the *Community Restricted Services* model.

The *Community Restricted Services* model provides urgent care services without requiring a scheduled appointment. As GP recruitment and retention is outstripped by demand, and access to same-day appointments within a patient's medical home becomes less available, this model provides an opportunity for convenient, unscheduled access to relatively simple medical services.

This model utilizes NPs to a greater extent, but facilities may also be GP-led. Facilities under this model offer a limited menu of services, usually without advanced laboratory or diagnostic imaging resources. This model focuses on convenience, with hours in the evenings and weekends, as well as locations in the community such as retail stores, pharmacies, and grocery stores. Funding and management of this model vary greatly; facilities under this model are typically run by private entities

(for example, big-box stores or physicians), but are sometimes owned and operated by healthcare institutions or government.

In Canada, this model is predominately in urban settings as an extension of GP offices, with the key feature being that no appointment is required; facilities under this model are often located near (but not affiliated with) pharmacies and laboratory and diagnostic imaging services. In the United States, these facilities are commonly referred to as *retail clinics*, as they are frequently owned and operated out of big-box stores, grocery chains, and pharmacies. The Convenient Care Association was established in 2006 as the national trade organization for companies and health systems that provide care in retail-based locations; while it is not the governing body of retail clinics (this varies by state), it aims to share best practices and establish operating standards. In the United Kingdom, facilities under this model are known as *walk-in clinics* and *minor injury units*, and are mostly nurse-led with the support of clinical assessment software. As mentioned above, the NHS is currently restructuring their urgent care services, which will result in increased availability of weekend and evening GP appointments (bookable through the NHS 111 tele-service) and more enhanced urgent treatment centres.[90] In Australia, this model is predominately nurse-led, providing extended hours and unscheduled primary care.

4.2.6. *Community Home Services*

Two SRs,[29, 30] two HTAs,[3, 34] one literature review,[39] and one government report[45] discussed the *Community Home Services* model.

In the *Community Home Services* model, urgent care services are delivered to the patient. Replacing the traditional transportation role of emergency medical services, this model adopts a "treat-and-release" mandate, whereby low-acuity patients are treated by emergency care practitioners in their homes and discharged back into the community without ever leaving it. This rationale for developing this model was to reduce the number of unnecessary trips to EDs by integrating ambulance service into a wider network of emergency and primary care. Sometimes this model will act as a surrogate for routine primary care by providing education, post-discharge care, and chronic disease management in a non-urgent capacity. This model can be especially useful to frail and/or elderly patients who have difficulty commuting to care, as well as to rural or remote areas with limited access to both ED and primary care services.

"Emergency care practitioners" are paramedics or NPs with extended training and skills; beyond a treat-and-release mandate, they may also provide self-management advice or, where available and appropriate, refer patients to other health services. Emergency care practitioners typically work only specific hours/shifts. Available ambulance equipment is used to diagnose and treat minor conditions, and emergency care practitioners may have direct communication with a GP or an emergency physician for their support in the diagnosis and creation of treatment plans.

Funding for programs under this model was rarely discussed in the literature, and, if it was, these programs were labelled as pilot projects with funding coming from grants or time-limited institutional support.

In Canada, the community paramedicine model predominately uses paramedics with advanced skills to provide mobile, integrated primary care services in partnership with other health professionals, in rural/remote populations with a lack of available primary care (for example, the physician-paramedics-nurse model in Nova Scotia) and in urban settings to prevent care problems from becoming emergencies. Urgent services are also available for some specialty populations (such as

those requiring palliative care) to deliver treatment alongside their overall care plan, as well as treat-and-release protocols to reduce transfers to an ED.

The United States continues to use paramedics for the transportation of urgent patients to specialized care, though pilot projects are underway to have paramedics transport patients to other facilities (for example, mental health clinics, urgent care centres, physician offices, sobriety centres) and coordinate non-urgent care for frequent ED users. In the United Kingdom, "primary care paramedics" have been widely implemented, and treat-and-release is used to care for patients in the community, utilizing both paramedics and NPs with direct support from GPs or specialists. To meet the needs of rural and remote communities, Australia and New Zealand use paramedicine integrated with primary care to operate clinics and EDs in areas of isolation where other medical professionals are unavailable and/or to act as the coordinator of care.

4.3. Effectiveness of the Urgent Care Models for Service Utilization, Patient Safety and Satisfaction, and Cost Outcomes

This section presents information regarding the following research question:

- *Question 2*: How safe, effective, and economical are these urgent care models, and what factors contribute to the safety and/or effectiveness?

Given the variability of urgent care service delivery, we have described the results of this research question separately for each model of urgent care described above.

4.3.1. Overview

Seven SRs,[20-22, 24, 27-29] two HTAs,[3, 34] and 20 primary studies[69-88] were included for assessing the effectiveness of the urgent care models identified in section 3.

The characteristics of the nine SRs/HTAs are described in Appendix D, Table D.1. The majority of the studies included in the SRs/HTAs were non-randomized and of low quality. In both the SRs/HTAs and the primary studies, there was a focus on service outcomes such as ED attendance, length of stay, and resource utilization. Evidence for patient outcomes such as morbidity and mortality was sparse, as was evidence comparing costs. Patient and/or caregiver satisfaction was sometimes reported, but rarely quality of life. Other than acuity, the characteristics of the patient populations were rarely described, nor was the triage scale or method used to determine acuity. Factors associated with effectiveness were rarely discussed within the included articles. An overview of the results is presented in Table 3, with effectiveness outcomes separated by urgent care model type.

TABLE 3: Summary of the effectiveness of the urgent care models

Urgent care model type	Studies	Effectiveness outcomes			
		Favourable[a]	Heterogeneous[b]	No effect[c]	Not reported[d]
Emergency Department Integrated Services	3 SRs/HTAs;[3, 21, 27] 2 primary studies[69, 70]	Diagnostic test use	ED LOS	Patient satisfaction; cost	Morality; adverse events; quality of life
Hospital Parallel Services	3 SRs/HTAs[3, 24, 28] 8 primary studies[71-78]		ED attendance	ED LOS; patient satisfaction; adverse events; mortality; cost	Quality of care; quality of life
Community Advanced Services	0 SRs/HTAs 7 primary studies[79-85]		ED attendance	Cost	Adverse events; mortality; quality of care; patient satisfaction; quality of life
Community Restricted Services	3 SRs/HTAs[20, 24, 28] 2 primary studies[86, 87]	Diagnosis accuracy; cost	ED attendance		Adverse events; mortality; patient satisfaction; quality of life
Community Home Services	3 SRs/HTAs[3, 29, 34] 1 primary study[88]	Transport to the ED; patient satisfaction; cost		Mortality	Adverse events; quality of life

[a] The urgent care service was superior to its comparator in the majority of included studies.

[b] There were mixed results when comparing the urgent care service to its comparator across all included studies.

[c] The urgent care service was equivalent or inferior to its comparator in the majority of included studies.

[d] These outcomes were not assessed by the included studies.

ED: emergency department; HTA: health technology assessment; LOS: length of stay; SR: systematic review

4.3.2. *Emergency Department Integrated Services*

Evidence from SRs and HTAs

Three reviews[3, 21, 27] on the effectiveness of the *Emergency Department Integrated Services* model were included, two[3, 27] of which focused on United Kingdom studies only (for details, see Appendix D, Table D.2).

An evidence synthesis consisting of five separate reviews of SRs and primary studies was completed by Turner et al. (2015)[3] in response to the increasing patient demand for urgent care and the NHS's 2013 strategy to redesign their emergency and urgent care system in order to be more responsive to patient needs, improve outcomes, and deliver high-quality, safe care. In one of the five reviews, which examined the evidence for primary care services associated with EDs, the authors found that these integrated services could potentially reduce ED attendance and process/treatment times, save resources by ordering less diagnostic tests and creating less referrals, increase patient satisfaction, and reduce cost of care; however, the authors also found that the evidence supporting this model of care was weak and based on poor-quality, uncontrolled before-and-after studies.[3]

A Cochrane review on primary care providers providing non-urgent care in EDs was updated in 2018 and included one recent randomized controlled trial and three older (published 20 years ago) non-randomized studies.[21] The randomized trial assessed an urban, single-site, NP-led service in Australia for patients who presented to the ED for pain but without life-threatening conditions, compared with standard ED care. There was no difference in ED wait time (mean difference: 2.1 minutes; 95% confidence interval [CI] [−4.9, 9.2]) or total length of stay (mean difference: −3.2 minutes; 95% CI [−20.2, 13.8]). The non-randomized studies assessed the impact of GPs within urban or suburban EDs and had heterogeneous results for all outcomes. The authors concluded they could not be certain whether primary care providers within EDs would make a difference to ED wait times, ED length of stay, the number of hospital admissions, diagnostic tests ordered, consultations, or referrals, treatments given, or costs. The authors noted that these studies were of very low quality, and the results reported were inconsistent.

In 2018, the National Institute for Health Care Excellence (NICE) published guidelines for the delivery of emergency and acute care in the community and/or hospital for people aged over 16 years. As part of the evidence for these guidelines, a systematic review regarding GPs working within EDs was conducted.[27] From three studies, the authors found evidence suggesting that GPs working within an urban ED may provide a benefit in terms of a reduced number of diagnostic tests ordered; however, the evidence suggested there was no effect on patient and/or caregiver satisfaction with assessment, treatment, or the physician's bedside manner. The review noted that standard practice has changed since these articles were published, limiting their relevance, and the authors decided not to make a recommendation.

No evidence for mortality, avoidable adverse events, or quality of life was available for any of the three reviews described above.

Evidence from primary studies

Two primary studies[69, 70] on the effectiveness of the *Emergency Department Integrated Services* model were included (for details, see Appendix D, Table D.3).

Uthman et al. (2017)[69] used a propensity score-matched cohort study to assess the impact of GPs in urban or suburban EDs within two United Kingdom NHS organizational units or trusts (that is, one

trust with GPs in EDs versus another trust without GPs in EDs). The authors found that GPs in EDs tended to manage self-referred minor cases with fewer resources than standard care and without an increase in patient re-attendance rates. Sharma et al. (2013)[70] examined a "Discharge Facilitation Team" at an urban academic medical centre ED, consisting of a PA performing rapid assessments, treatment procedures, education, and disposition planning for those patients identified as non-urgent, with the support of a registered nurse and oversight and treatment plan finalizing by the administrative attending physician of the ED. The authors found a significant reduction in length of stay for low-acuity patients when the Discharge Facilitation Team was active, and suggested that the utilization of this team in other ED services could improve ED throughput. They suggested that the team's efficiency may be explained by the queuing theory:[91] those who are treated by the Discharge Facilitation Team avoid numerous waiting opportunities such as waiting for space in the fast-track area, waiting to be seen by another nurse–physician team, potentially waiting for diagnostics and procedures/treatment, and waiting to be discharged.

4.3.3. *Hospital Parallel Services*

Evidence from SRs and HTAs

Three reviews[3, 24, 28] on the effectiveness of the *Hospital Parallel Services* model were included (for details, see Appendix D, Table D.4). All primary studies included in these reviews were of uncontrolled designs and conducted in European countries (United Kingdom, the Netherlands, Switzerland) except for one, which was conducted in Australia.

Turner et al. (2015)[3] found that ED attendance was reduced in some (but not all) EDs where a GP clinic was co-located with an ED. There was no evidence that co-located GP clinics had any impact on reducing the number of re-consultations, improving patient outcomes, or reducing costs.

Crawford et al. (2017) examined the effectiveness of GP cooperatives and walk-in clinics, and found strong evidence that GP services co-located with an ED were effective in reducing ED utilization, but little evidence was available on quality of care or other patient outcomes.[24]

The NICE evidence review[28] on minor injury units, urgent care centres, and walk-in clinics found evidence for improved ED patient throughput with co-located walk-in centres, but not for co-located minor injury units. There was no effect on avoidable adverse events, mortality, or cost. There was no evidence for quality of life, or patient and/or caregiver satisfaction. The evidence available was of low or very low quality, and, given the lack of quality evidence in general or presence of heterogeneous evidence, no recommendation was made in terms of the role of co-located urgent care.

Evidence from primary studies

Eight primary studies[71-78] on the effectiveness of the *Hospital Parallel Services* model were included (for details, see Appendix D, Table D.5). The majority of studies reported on a mix of urban- and rural-located services, without sub-analysis (that is, result reporting was not separate for urban versus rural settings).

These studies compared European integrated, gatekeeping GP cooperatives to either non-integrated EDs/GPs or the pre-intervention period, and found that the integrated cooperatives were effective in reducing ED attendance but not length of stay or wait times (that is, they did not enhance patient flow). Three studies[71, 76, 78] reported that 4.6% to 18.1% of GP cooperative-triaged patients had to subsequently be referred to the ED, and another study[74] reported that GP cooperative-triaged

patients subsequently referred to the ED had the longest overall (combined cooperative and ED) length of stay. One study[77] found that a co-located but non-gatekeeping GP cooperative was ineffective in improving system utilization. Only one study[75] reported on cost, and found that the integrated GP cooperatives did not result in lower costs to society. Thijssen et al. (2016)[72] noted that a shorter ED length of stay was observed in those patients who underwent ancillary testing prior to ED presentation; the authors argued that after-hours laboratory access and the ability of the adjacent GP cooperative to refer patients to the radiology department directly impacted ED referral and ED wait times, and more consistent availability of these services/process would further reduce service utilization. Three of these studies[72-74] found the average ED length of stay to be shorter in the Netherlands than those reported in the United States and Canada, and commented that a "strong" primary care system in the United Kingdom and the Netherlands (that is, 89% after-hours coverage in the United Kingdom versus 29% in the United States and 43% in Canada, in 2009)[92] and a higher ratio of inpatient beds (4.7 beds per 1,000 inhabitants in the Netherlands versus 3.0 per 1,000 in the United States and 3.2 per 1,000 in Canada, in 2014)[72] indirectly contributes to the shorter ED length of stay. That is, the ED–GP integration is likely just fine-tuning an already well-functioning health system in Europe.

4.3.4. *Community Advanced Services*

Evidence from SRs and HTAs

No SRs or HTAs on the effectiveness of the *Community Advanced Services* model were found.

Evidence from primary studies

Seven primary studies[79-85] on the effectiveness of the *Community Advanced Services* model were included, with two conducted in Canada[84, 85] and five in the United States[79-83] (for details, see Appendix D, Table D.6).

In Nova Scotia, Canada, *collaborative emergency centres* were established in 2011 in rural communities; these centres encompass both primary care and access to emergency care in an integrated team approach.[85] An audit of their impact was completed in 2014, which found that primary care was strengthened and ED closures (due to lack of available staff) were reduced by 90 to 100% across several sites. The audit noted that the actual use of the nurse- and paramedic-led overnight urgent services was very low (a three-month average of one patient per night), and recommended that alternatives to the current established overnight shifts should be examined given the low utilization rate. In Manitoba, Canada, a reconfiguration of Winnipeg's urgent and emergency care services was implemented in October 2017, and was evaluated three months after implementation.[84] The reconfiguration consolidated clinical services by converting one ED to an urgent care centre, closing another urgent care centre, and adding additional treatment spaces within another ED. Overall, critical and non-critical safety events remained unchanged, wait times in the ED and urgent care centres decreased, and the majority of surveyed patients who received treatment were satisfied with their care and wait time.

Two of the United States studies[79, 82] found that urban, free-standing EDs, which were expected to accept higher-acuity cases (all except ambulance-transported trauma, myocardial infarctions, or strokes), increased the overall utilization of emergency care, essentially creating unnecessary demand with associated increased costs. Three United States studies on urban or suburban urgent care centres,[80, 81, 83] all published in 2019, found that ED utilization for low-acuity conditions decreased as these centres proliferated. All five United States studies were population-level comparisons, focusing

on the number of urgent care services available within a region and/or their proximity to hospital-based EDs. Carlson et al. (2019)[80] suggested that urgent care centre impact may change with time as populations become familiar with the service and the surrounding catchment area becomes more dense. The authors cautioned that urgent care centres likely have a complex indirect impact on ED visits caused by shifting referral patterns, altering care-seeking behaviour, and potentially inducing demand, and noted that further research is necessary to understand the net effect and contextual factors.

4.3.5. *Community Restricted Services*

Evidence from SRs and HTAs

Three reviews[20, 24, 28] on the effectiveness of the *Community Restricted Services* model were included, with all studies included in these reviews conducted in the United States or the United Kingdom (for details, see Appendix D, Table D.7).

An SR that examined patient and cost outcomes of retail clinics in the United States found that these clinics were favourable as a low-cost setting compared with similar services (GP, urgent care, ED) and equivalent to other services for diagnosis and treatment accuracy for conditions such as pharyngitis and respiratory or urinary tract infections.[20] Only one study within this SR examined patient satisfaction and found that patient satisfaction was high, but without comparison to another site. Both the SR by Crawford et al. (2017)[24] on GP cooperatives and walk-in clinics and the NICE evidence review[28]on minor injury units, urgent care centres, and walk-in clinics reported on the same four United Kingdom studies; both found mixed results on the effectiveness of stand-alone, walk-in clinics on non-urgent presentations to the ED, with evidence lacking in volume and quality. The NICE evidence review also noted no difference in cost when comparing stand-alone clinics to ED co-located clinics, and did not make a recommendation.

Evidence from primary studies

Two primary studies[86, 87] on the effectiveness of the *Community Restricted Services* model were included, both conducted in the United States (for details, see Appendix D, Table D.8).

A retrospective records review of an urban, after-hours pediatric clinic with on-site diagnostic capabilities found a reduction in the number of patients admitted to hospital, laboratory and x-ray tests ordered, and adjusted median per patient charge, when compared with pediatric patients attending the ED.[86] In another retrospective records review, Patwardhan et al. (2012) assessed the answers of patients who received care from a convenience clinic network (that is, all clinics managed by one corporation) to the registration question "Where would you have gone for care if you did not come to the clinic?" (possible responses: *emergency room*, *urgent care centre*, *primary care physician*, or *would seek no treatment*).[87] It was found that 90% of these patients would have sought care elsewhere, and, when subtracting the convenience clinics' benchmark average visit costs from the benchmark average visit costs for the site the patient would have gone to (ED, urgent care, or primary care), they estimated that convenience clinics had saved the health system US$135 million over two years.

4.3.6. *Community Home Services*

Evidence from SRs and HTAs

Three reviews[3, 29, 34] on the effectiveness of the *Community Home Services* model were included, with the primary studies included in these reviews conducted in a variety of locations (for details, see Appendix D, Table D.9).

Turner et al. (2015)[3] conducted a review of SRs and primary studies to look at the management of patients with urgent care problems by ambulance clinicians. The authors found that paramedics with extended roles are able to make safe decisions about the need for transport and to deliver acceptable care, resulting in a reduction in the number of transports to the ED and the potential to be cost-effective. The strength of this conclusion was based on a small number of high-quality studies, implemented in various health systems in urban or rural settings.

Guo et al. (2017)[34] found that community paramedicine programs have the potential to reduce emergency calls and ED visits, are well-received by the community, and are appropriate for underserved populations. The evidence was limited by only having one cluster randomized controlled trial included, and safety outcomes were not reported in the majority of studies. The cost analysis showed that community paramedicine programs are cost-effective and would be recommended in the community.

The NICE evidence review[29] assessed the impact of paramedics in urban or suburban settings with enhanced competencies, and found that enhanced competencies of paramedics may provide benefit in terms of reducing the number of hospital admissions and ED attendance as well as improving patient and/or caregiver satisfaction, and did not increase mortality. Given this, the committee decided to make a strong recommendation for paramedic practitioners with enhanced competencies, as there was positive, low- to moderate-quality evidence across several outcomes in four studies.

Evidence from primary studies

One primary study[88] on the effectiveness of the *Community Home Services* model was included (for details, see Appendix D, Table D.10).

An urban advanced illness management program in the United States had paramedics act as urgent care physician extenders for elderly individuals who were homebound and had multiple chronic illnesses. The authors found that the majority of patients could be immediately managed at home, attendance to an ED within 24 hours was low, and patient and/or caregiver satisfaction was high.

5. Discussion

5.1. Summary of Main Findings

5.1.1. Urgent Care Model Types

Our review identified five extant models of urgent care. The *Emergency Department Integrated Services* model is where urgent care services are integrated within an ED. The *Hospital Parallel Services* model is where urgent care services are adjacent to the ED, often with a formal agreement on the triage and shared care of incoming patients. The *Community* models work independently from the ED, using stand-alone facilities and provide services along the entire spectrum of urgent care. The spectrum of services includes: *Advanced Services* with extensive human and technical resources allowing for care of a large range of conditions; *Restricted Services* that offer care resembling more traditional primary care; and *Home Services*, where urgent care is administered to the patient within their home.

Urgent care has been targeted to patients seeking care for low-acuity conditions and, for the most part, services are provided by primary care providers such as GPs, NPs, PAs, or paramedics with advanced training. Convenience is the predominate concept with urgent care, both in service hours and location. Urgent care services have been primarily designed for and extensively used in urban or

suburban settings, but all models have been adapted to meet needs in rural or remote communities (particularly in Australia). Tailoring to specialty populations or jurisdictional issues was not common. Information regarding the regulation and funding schemes for the urgent care models are sparse, with a lack of policies in place for the operation and reimbursement of novel urgent care services.

5.1.2. Effectiveness of the Urgent Care Models

The majority of included studies on the effectiveness of the identified urgent care models were non-randomized and focused on service utilization outcomes. The *Emergency Department Integrated Services* model showed favourable results in the use of fewer diagnostic resources, weak evidence for improvements in ED wait/treatment times and cost savings, and no effects on patient or caregiver satisfaction. There was no evidence available for outcomes of mortality, adverse events, or quality of life. SRs and HTAs evaluating the *Hospital Parallel Services* model found heterogeneous results on ED utilization; however, the included non-randomized primary studies showed that integrated GP cooperatives were effective in reducing ED length of stay. There was no effect on patient outcomes or cost. Both reviews and primary studies on this model noted that co-located urgent care was favourable in comparison to stand-alone services. No SRs or HTAs reported on the *Community Advanced Services* model. Included primary studies found hospital-based ED attendance decreased, but that demand for free-standing EDs and urgent care centres increased, often resulting in an unfavourable net effect on utilization and costs. Patient safety and satisfaction were not assessed in the studies on this model. The results regarding the effectiveness of the *Community Restricted Services* model were mixed; the United States studies showed favourable service utilization and cost outcomes for retail clinics when compared with GPs, urgent care, and/or EDs, but the United Kingdom studies found inconsistent results in service utilization and no difference in cost when comparing stand-alone, walk-in clinics to ED co-located services. The *Community Home Services* model was found to be favourable for reducing ED transportation and safely diagnosing and treating low-acuity conditions at the scene, and showed cost-effectiveness compared to usual care. The outcomes for this model were assessed in various health systems and settings, and this model was the only one to analyze and show favourable service utilization, patient safety and satisfaction, and cost outcomes in rural populations.

Based on the studies reviewed, overall, current urgent care services lack the ability to unequivocally reduce ED utilization (attendance, wait time, and length of stay). Patient safety was rarely addressed in the reviewed studies, and only included studies on the *Community Home Services* model reported favourable patient satisfaction. Cost-effectiveness was more frequently reported in the included studies for models closer to traditional primary/community care (the *Community Restricted Services* and *Community Home Services* models), with no cost reduction effect reported for services integrated with emergency care or those with advanced ancillary diagnostics (the *Emergency Department Integrated Services*, *Hospital Parallel Services*, and *Community Advanced Services* models).

5.2. Issues Related to Implementation, Sustainability, and Effectiveness

5.2.1. Defining *Urgent Care* and *Inappropriate Use*

Central to the issue of urgent care development and implementation is the historically inconsistent use of a common definition of *urgent care* and the need for "a common language to encourage discussion and help focus system development efforts."[10] A service describing itself as delivering urgent care may make sense to policy-makers, planners, and providers, but the term may not be

understood by patients.[44] The combined effect of the vast nomenclature of urgent care services, the diversity and variation of services provided, and a lack of publicly available information regarding what these models encompass makes it difficult for patients to navigate to the right service. The addition of new/novel urgent care services adds complexity to the health system as a whole and can result in widespread confusion about service selection, which in turn can frustrate patients and inadvertently encourage them to access higher-acuity services. EDs are generally seen by patients as a trusted and well-understood service for urgent needs, and therefore provide a definitive point of care when a patient is ill and scared.[3, 33, 45] New urgent care services need to have clear, consistent identities, with explicit indication of the populations they each treat and services they provide, to avoid both patient and clinician uncertainty on service appropriateness. Public education on new urgent care services should be part of the implementation strategy.[85]

Similarly, the term *inappropriate use* with regards to EDs is used inconsistently. Often what is considered "inappropriate" is dependent on the triage system employed by the service assessing patients, and variation exists in what is deemed to be "ambulatory-sensitive" and suitable for alternate urgent care services. In conjunction, these triaging scales are being employed in non-traditional facilities by primary care providers outside the ED, and have historically shown a poor ability to safely divert low-acuity patients away from the ED. For example, Vertesi et al. (2004)[93] found that those labelled *non-urgent* by the CTAS only used a small fraction of ED resources and consisted of 7% of all ED cases admitted, suggesting that diversion of these patient would not improve ED access and could potentially be unsafe. There is, therefore, a risk in focusing novel urgent care efforts on "inappropriate" ED users, and a better understanding of how patients view the services provided in relation to their reason for attendance is required. There are numerous societal and cultural factors that influence health-seeking behaviour, and it is understood that patients act in good faith when contacting emergency care – that is, patients believe their current condition requires the level of service they have selected.[94] Post hoc assessments of inappropriate use of EDs are of little relevance to patients seeking care, and interventions should not focus on matching health-seeking behaviour to services but rather on enhancing adequacy of care.[3, 95]

5.2.2. Regulation and Funding

There are inherent difficulties in establishing a new model of care that crosses traditional boundaries, and urgent care has previously been treated as an "add on" to other services rather than as a separate system. Specific urgent care model regulation and funding is limited, creating challenges for the integration of urgent care models with the wider health system and associated professional groups.[3] ED-integrated urgent care models have previously been opposed by GPs, because GPs perceived the integration as a shift to "hospital-centrism" (that is, a focus on hospital-based care with associated skill change), which would result in a loss of their autonomy and a compromised relationship between primary care provider and patient.[51] Urgent care has developed new professional roles that have not been well-defined, articulated, or evaluated, and lack supporting career development and training.[33] The emergency care practitioner role of paramedics is variably implemented, with fear of litigation and difficulties in changing the perception of ambulance services beyond transportation.[3] Better engagement with early-career professionals and trainees to promote urgent care value would ensure an engaged and competent workforce for new initiatives.[27, 33] Additionally, the development of emergency care networks, formally linking the community and hospital components of the urgent and emergency care system, would enhance stakeholder engagement and patient continuity of care.[45, 61] There has been a lack of mandated criteria for urgent

care facilities, especially for community models, and there is benefit for higher levels of regulation to ensure consistent services across like-named facilities.[3, 83, 96-98]

Reimbursement initiatives need to acknowledge and account for collaborative urgent care schemes.[44] Facility fees in hospital-based or free-standing EDs being applied to lower-cost GP-seen cases discourages integrated services, yet low reimbursement for primary care-like community models discourages their establishment.[44, 79, 88] Policies need to account for patient acuity in EDs to promote urgent care integration, and to enhance reimbursement in community care in order to incentivize the proliferation of services outside the hospital.[79, 86]

5.2.3. Communication among service providers and continuity of care

Good communication and shared information technology across service providers is essential.[33, 85] For the *Emergency Department/Hospital* models, early clinical engagement and collaboration by both primary and emergency care providers is necessary for devising feasible approaches and ensuring a sufficient number of cases to justify the collaboration, as well as having the flexibility to balance the workload. Carson et al. (2010)[44] encouraged working groups be established to ensure dialogue between groups and to break down barriers/promote joint-working. A dedicated primary care team (as opposed to rotating, sessional GPs) can build confidence and could produce more coherent and higher-quality decision-making.[44]

For the *Community* models, fragmentation of care is a concern.[42, 51] Policies for safe care transitions (such as identifying primary care providers, sending summaries to the appropriate professional after discharge or referral, and providing patient education) would ensure continuity of care.[42] Co-location and integration with primary care, along with shared electronic medical records, would make access to urgent community care a seamless part of primary care.[85]

5.2.4. Contextual Factors

Contextual factors must be acknowledged and addressed, both in the populations being served as well as the availability of sufficiently trained care providers to take on the work of the new models of care.[33] First, remote and rural areas have different patient needs, and workforce capacity to respond, compared with urban areas. Rurality will effect demand, service dynamics, clinical roles of different professional groups, population complexity, organization/operation, and relationships with other parts of the health service.[3] As more sophisticated and complex diagnostic services tend to be costly and emergency practitioners' availability may be limited, some models may only be justifiable in high-density areas.[79] Technology (for example, video linking, clinical decision software) could be deployed to support practitioners in rural and remote locations where emergency professionals and services are lacking.[41, 45, 61]

Second, people from vulnerable groups (for example, socioeconomic deprivation, minorities, migrants, the homeless, people with substance misuse issues) generally have worse health for diverse and complex reasons and are more frequent users of urgent and emergent care.[31] Multiple provisions for accessing services may maximize the chances that vulnerable populations have access to care, but at the same time add complexity to health system navigation, an already identified issue within this group. How initiatives are set up may differently address certain vulnerabilities, and tailoring will be necessary to ensure the inclusion of populations who are difficult to access and engage.[31]

Finally, high users of emergency care such as patients with chronic disease (for example, diabetes, cardiovascular disease, mental health disorder) and pediatric or oncology populations may benefit from specialist-led urgent care. The American Academy of Pediatrics has published a policy

statement for ambulatory acute care for children outside their medical home, in order to avoid potential risks or unsafe situations such as treatment inconsistent with pediatric best practice and lack of continuity of care.[52] Their suggestions include ensuring staff have pediatric training and establishing evidence-based protocols for transition of care back to primary care or for emergency situations outside the scope of the service. Handley et al. (2018)[36] suggest that development of urgent cancer care could prevent unplanned hospitalizations, but that evaluation of such services is limited. Information on patients with acute presentations of chronic diseases and tailored, specialist-led facilities (for example, cardiology facilities) is sparse. Trybou et al. (2014)[99] conducted a systematic review of physician-owned specialized facilities (specialized hospitals or ambulatory surgery centres) to assess their safety and effectiveness, and found that, when lower-acuity cases were considered, specialized facilities were favourable for performance (safety and volume load) over full-service hospitals, but not for higher-acuity cases. There was limited evidence for care or cost effectiveness. They concluded that there was no added value of physician-owned specialized facilities, and that the impact on full-service hospitals remains unclear. While this review did not include urgent care facilities, given that low-acuity patients saw the greatest benefit from specialized facilities, further research is warranted on the potential impact that targeted urgent care services may have on patients with chronic disease and the health system.

5.3. Methodological Issues and Implications for Future Research

There are some significant challenges encountered in reviewing the evidence on extant urgent care models. Urgent care encompasses a broad set of health service provision issues, as well as heterogeneous populations and service delivery methods. Both the diversity of services and lack of details in the literature regarding their components makes it extremely difficult to categorize them with certainty. Readers of this report should keep in mind that there is significant overlap among the urgent care models described within the literature. Furthermore, we are likely to have omitted other similar interventions given the rapid review methodology that was used.

Studies included in this review were highly variable, almost exclusively non-randomized designs, with insufficient study period lengths to adequately assess intervention impact. Often studies were completed at single sites, limiting generalizability, and direct comparison between interventions are complicated by inconsistencies in the outcome measures used. Since the majority of studies aim to address issues such as ED overcrowding, service utilization dominated the outcomes reported, and there is a lack of reporting on patient safety and satisfaction. Reporting of cost outcomes is rare, owing to the fact that an appropriate comparator is not always identifiable and difficulties in quantifying net effects when shifts in demand are poorly understood. Urgent care services are rapidly evolving, and these interventions must be evaluated with knowledge of the health system context for which they were originally assessed. Overall, the heterogeneous nature of the current evidence limits our ability to draw a firm conclusion about the effectiveness of urgent care models. There is a need for more well-designed and well-conducted research. Given the broad scope of urgent care, it is not likely that a single approach will be sufficient to appropriately assess the impact of these models, but studies with a control group and a longer follow-up period may help further quantify the magnitude of the effects of urgent care services. Formal population needs assessment, using patient data to direct service planning, will be necessary to assess whole-system benefits/costs. The use of common definitions for service components and outcomes will enhance comparability of services, and contextual processes need to be identified to support adoption across multiple settings.

It should be noted that, despite several decades of urgent care services and evaluation, urgent care reform in all selected OECD countries continues. For example, the NHS revised their contract with the British Medical Association in 2004, which allowed GPs to opt out of out-of-hours service (which most of them did).[100] With this emerged a new landscape where "Primary Care Trusts" and GP cooperatives were to commission and provide new out-of-hours services. This reorganization introduced new access points, but also increased complexity in an already difficult-to-navigate system. In 2014, the NHS put forth a "Five Year Forward View" as a complete health system upgrade that would span the entire spectrum of services.[9] For urgent care specifically, the plan emphasized the need to position patient needs at the centre of care and to help people access urgent care at the right time and in the right place.[9, 100] The implementation of these changes is expected to continue into the fall of 2020. As these changes to the health system approach sustainment, we expect a wealth of new literature regarding their impact to become available and updates this and other similar reviews will be necessary.

5.4. Implications for Alberta

When establishing urgent care strategies in Alberta and examining the models described in this report, it will be important to consider the Alberta context; this is especially important given that the existing research has largely focused on health systems within Europe and the United States. Stakeholders will need to identify a clear rationale for service development, backed by a population needs assessment and clearly identified and measurable outcomes. Urgent care services will need to have a defined scope, and care must be taken not to overlap with existing programs or add complexity to the system without value. Novel regulation and reimbursement strategies are likely necessary to accommodate the unique health system space urgent care fills, and to optimize coordination with both acute and primary care. Furthermore, novel urgent care initiatives will need rigorous, ongoing evaluation to ensure there is positive impact not only on service utilization, but also on patient/caregiver satisfaction and cost-effectiveness. As the urgent care landscape continues to evolve, Alberta has the opportunity to become leaders in urgent care provisions, establishing novel strategies with rigorous and continual evalutions of the services embedded.

6. Conclusion

There are several urgent care models that span the health system space between emergency and primary care and that focus on the treatment of low-acuity populations by primary care providers offering services supported by varying degrees of ancillary diagnostic resources and integration with acute and/or primary care. The majority of studies reported on urgent care services that are closely related to either emergency departments or primary care, and evidence is sparse on models that provide urgent care in the community via stand-alone facilities that are not integrated with emergency services (that is, what we label the *Community Advanced Services* model in this report), particularly urgent care facilities led by specialists. Based largely on United States data, advanced urgent care services within the community may reduce ED visits, but there is no data regarding their impact on safety or patient/caregiver satisfaction, and research has shown that they may potentially increase overall system cost. Overall, the impact of urgent care models was found to be mixed, likely owing to the variability of interventions and comparators, low-quality study designs, and challenges in comparing across studies due to the lack of common definitions for services and outcomes.

Reform of the urgent and emergency care system is currently on the political agenda in several high-income countries, and many jurisdictions continue to struggle to implement an optimal care model

that will redirect low-acuity ED visits and guide patients to the most appropriate care.[40] Several factors must be considered when introducing or developing novel urgent care strategies, including: (1) ensuring services have clear, consistent identities, with explicit indications on the populations they serve and treatments they provide; (2) understanding how patients view these services and how their health-seeking behaviour influences their use of such services; (3) ensuring good communication and shared information technology across all levels of the health system; and (4) acknowledging contextual factors and configuring strategies to better target underserved and vulnerable populations. Regulation and reimbursement models for urgent care must be established in order to support and encourage these services. Future research will likely need to examine a broad set of strategies, but should employ rigorous methods of evaluation with longer-term follow up to appropriately assess the effectiveness of these novel urgent care models.

Appendix A: Search Strategy

TABLE A.1: Search strategy for literature on urgent care model types

Source	Date searched and results	Search terms††
Core databases		
Ovid MEDLINE(R) ALL 1946 to 27 Jan 2020	28 Jan 2020 178 results	1. (urgent adj2 (care or clinic or clinics or centre* or center* or healthcare* or treatment)).ti,ab,kf. 2. (immediate adj2 (care or attention)).ti,ab,kf. 3. ((minor injury or mobile health) adj2 (unit or units or center* or centre* or clinic or clinics)).ti,ab,kf. 4. (emergicenter* or emergicentr*).ti,ab,kf. 5. (("collaborative emergency" or convenience or retail or free-standing) adj2 (center* or centr* or clinic or clinics)).ti,ab,kf 6. (unschedule* adj2 (care or utli?ation)).ti,ab,kf. 7. ((episodic or out-of-hours or after-hours or walk-in or extended hours) adj4 (care or service* or clinic or clinics or centre* or center* or facilit*)).ti,ab,kf. 8. "advanced ambulatory care".mp. 9. or/1-8 [free text terms] 10. Mobile Health Units/ 11. exp Ambulatory Care/ae, ec, mt, og, st, sn 12. ambulatory care facilities/ or pain clinics/ or surgicenters/ 13. After-Hours Care/ 14. or/10-13 [MeSH terms] 15. (urgent or "minor injury" or "mobile health" or "immediate care" or "collaborative emergency" or convenience or retail or free-standing or freestanding or unschedule* or episodic or out-of-hours or after hours or after?hours or walk?in or walk in or "extended hours" or "extended care" or "advanced ambulatory").ti,kf. 16. (center* or centre* or clinic or clinics or service practice or staff or staffing or care or service* or organization* or treatment* or "primary care" or emergency or integrated).ti,kf. 17. and/15-16 18. or 14 or 17 [INTERVENTION] 19. exp *Models, Organizational/ 20. *"Efficiency, Organizational"/ 21. ((models or structure) adj3 (practice or staff or staffing or care or service* or organization* or treatment*)).ti,kf. 22. (model or models).ti. 23. (9 or 14) and (19 or 21) 24. 17 and (19 or 20 or 22) 25. 23 or 24 26. Developing Countries.sh,kf. 27. (Africa or Asia or West Indies or South America or Central America).hw,kf,ti,ab,cp. 28. (Caribbean or Latin* America*).hw,kf,ti,cp.

Source	Date searched and results	Search terms††
		29. (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,kf,ti,ab,cp. 30. ((developing or less* developed or under developed or underdeveloped or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab. 31. (middle income adj (countr* or nation? or population? or world)).ti.

Source	Date searched and results	Search terms††
		32. (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab. 33. (low adj3 middle adj3 countr*).ti. 34. (lmic or lmics or third world or lami countr*).ti,ab. 35. transitional countr*.ti,ab. 36. or/26-35 [LMIC filter[13]] 37. 25 not 36 38. limit 37 to (english language and yr="2009 -Current")
Embase 1974 to 28 Jan 2020	29 Jan 2020 584 results	1. (urgent adj2 (care or clinic or clinics or centre* or center* or healthcare* or treatment)).ti,ab,kw. 2. (immediate adj2 (care or attention)).ti,ab,kw. 3. ((minor injury or mobile health) adj2 (unit or units or center* or centre* or clinic or clinics)).ti,ab,kw. 4. (emergicenter* or emergicentr*).ti,ab,kw. 5. (("collaborative emergency" or convenience or retail or free-standing) adj2 (center* or centr* or clinic or clinics)).ti,ab,kw. 6. (unschedule* adj2 (care or utli?ation)).ti,ab,kw. 7. ((episodic or out-of-hours or after-hours or walk-in or extended hours) adj4 (care or service* or clinic or clinics or centre* or center* or facilit*)).ti,ab,kw. 8. "advanced ambulatory care".mp. 9. or/1-8 [free text terms] 10. exp *Ambulatory Care/ 11. pain clinic/ 12. out-of-hours care/ 13. or/10-12 [EMTREE terms] 14. (urgent or "minor injury" or "mobile health" or "immediate care" or "collaborative emergency" or convenience or retail or free-standing or freestanding or unschedule* or episodic or out-of-hours or after hours or after?hours or walk?in or walk in or "extended hours" or "extended care" or "advanced ambulatory").ti,kw. 15. (center* or centre* or clinic or clinics or service practice or staff or staffing or care or service* or organization* or treatment* or "primary care" or emergency or integrated).ti,kw. 16. and/14-15 17. exp *Health Services Misuse/pc 18. (casualty department* or emergent or ((emergenc* or ED) adj1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment* or visit*)) or (triage or critical care or (trauma adj1 (cent* or care)))).ti,ab,kw. 19. *emergency treatment/ or *emergency medicine/ or exp *emergency health service/ or *evidence based emergency medicine/ or *emergency nursing/ or exp *emergency care/ or *emergency ward/ or *emergency/)[14] 20. 17 and (18 or 19) [INTERVENTION 2 for SRS] 21. exp *"organization and management"/ or exp *health care organization/ 22. ((model or models or structure) adj3 (practice or staff or staffing or care or service* or organization* or treatment*)).ti,kw. 23. (model or models).ti.

Source	Date searched and results	Search terms††
		24. or/21-23 25. 16 and 24 26. (9 or 12 or 20) and 24 27. 25 or 26 28. developing country/ or low income country/ or middle income country/ 29. (Africa or Asia or West Indies or South America or Central America).hw,ti,ab,kw,cp. 30. (Caribbean or Latin* America*).hw,kw,ti,cp. 31. (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union

Source	Date searched and results	Search terms††
		of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,ti,ab,kw,cp. 32. ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab,kw. 33. (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab. 34. (low adj3 middle adj3 countr*).ti,ab,kw. 35. (lmic or lmics or third world or lami countr*).ti,ab. 36. transitional countr*.ti,ab. 37. or/28-36 [LMIC filter[13]] 38. 27 not 37 39. limit 38 to (english language and embase and yr="2009 -Current") 40. limit 39 to letter 41. limit 39 to editorial 42. 39 not (40 or 41)
Professional associations (*Note*: These results were also used for *Effectiveness studies of urgent care models*)		
Urgent Care Foundation *www.ucaoa.org/*	10 Jan 2020 1 result	Browsed site
American Academy of Urgent Care Medicine *aaucm.org/*	10 Jan 2020 1 result	Browsed Urgent Care Resources
American Board of Urgent Care Medicine (certifying body) *abucm.org/*	Jan 10 2020 1 result	Browsed site
Royal New Zealand College of Urgent Care *rnzcuc.org.nz/about/what-is-uc/*	10 Jan 2020 2 results	Browsed Urgent Care Research
HTA agencies (*Note*: These results were also used for *Effectiveness studies of urgent care models*)		
HTA Database *database.inahta.org/*	10 Jan 2020 5 results	"urgent care" OR "episodic care" OR "walk in clinic" OR "convenience clinic" OR "extended hours" OR "unscheduled care" OR "retail clinic" OR "collaborative emergency centre*" OR "walk-in connected care" Limited: 2009-2020
Canada		
CADTH *www.cadth.ca/*	21 Jan 2020 2 results	“urgent care”, walk-in, advanced ambulatory care, collaborative emergency care”, mobile injury, episodic care

Source	Date searched and results	Search terms††
Health Quality Ontario *www.hqontario.ca/*	21 Jan 2020 5 results	Browsed Health Technology Assessments Browsed Journal: Ontario Health Technology Assessment Series
Institute of Health Economics *www.ihe.ca*	10 Jan 2020 0 results	Urgent care, urgent treatment, episodic care
INESSS *www.inesss.qc.ca/accueil.html*	10 Jan 2020 0 results	Browsed Publications
Canadian Foundation for Healthcare Improvement *www.cfhi-fcass.ca/PublicationsAndResources/ResearchReports.aspxment*	10 Jan 2020 0 results	Browsed Reports
Contextualized Health Research Synthesis Program *www.nlcahr.mun.ca/CHRSP/*	10 Jan 2020 0 results	Browsed Evidence in Context Reports
ICES *www.ices.on.ca/*	10 Jan 2020 (results in next column)	Restricted to Atlases and Reports and Journal Articles, last ten years "After hours" (7 results) "walk in" (0 results) "urgent care" (3 results) "Collaborative emergency" (0 results) "episodic care" (2 results)
Technology Assessment Unit of the McGill University Health Centre *www.mcgill.ca/tau/publications/*	10 Jan 2020 0 results	Browsed site
Toronto Health Economics and Technology Assessment Collaborative *theta.utoronto.ca/*	10 Jan 2020 0 results	Browsed Reports

Source	Date searched and results	Search terms††
University of British Columbia Centre for Health Services and Policy Research *chspr.ubc.ca/publications/*	10 Jan 2020 0 results	Browsed Reports
Australia/New Zealand		
Adelaide Health Technology Assessment *www.adelaide.edu.au/ahta/*	10 Jan 2020 0 results	Browsed Publications
Australian Efficacy Register of New Interventional Procedures – Surgical *www.surgeons.org/research-audit/research-evaluation-inc-asernips/publications*	10 Jan 2020 0 results	Browsed Publications
Health Technology Reference Group *www.coaghealthcouncil.gov.au/AHMAC/Health-Technology-Reference-Group*	10 Jan 2020 0 results	Browsed Health Technologies Evaluated - Reports and Briefs
United States		
AHRQ *www.ahrq.gov/*	21 Jan 2020 154 results	"urgent care"
Institute for Clinical and Economic Review *icer-review.org/*	21 Jan 2020 4 results (1 selected)	"urgent care"
Monash Health - Centre for Clinical Effectiveness *www.monashhealth.org/page/CCE*	21 Jan 2020 1 result	Browsed site
HSTAT *www.ncbi.nlm.nih.gov/books/NBK16710/*	21 Jan 2020 0 results	"urgent care" AND hstatcollect [filter] Filters activated: published in the last 10 years, Report, Field: Title

Source	Date searched and results	Search terms††
Washington State Health Care Authority – Heath Technology Assessment Program *www.hca.wa.gov/about-hca/health-technology-assessment*	21 Jan 2020 0 results	Browsed health Technology Reviews
United Kingdom and Europe		
EUnetHTA *www.eunethta.eu/outputs*	21 Jan 2020 0 results	Browsed site
Health Evidence Network *www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/health-evidence-network-hen*	21 Jan 2020 0 results	Browsed publications
Health Technology Wales *www.healthtechnology.wales/*	22 Jan 2020 0 results	Browsed All Reports
Healthcare Improvement Scotland *www.healthcareimprovementscotland.org*	23 Jan 2020 4 results	Urgent care, urgent treatment Browsed SHTG publications
National Institutes for Health Research Journals Library *www.journalslibrary.nihr.ac.uk/#/*	23 Jan 2020 19 results	“urgent care”, “minor injury unit”
Other searches		
Google Scholar *scholar.google.ca*	28 Jan 2020 (results in next column)	allintitle: urgent care OR “after-hours” practice OR structure OR treatment OR model OR models OR staff OR staffing OR organizational OR service OR services OR system Date 2009-2020 (195 results – 2 screened) allintitle: "collaborative emergency" practice OR structure OR treatment OR model OR models OR staff OR staffing OR organizational OR service OR services OR system (11 results)

Source	Date searched and results	Search terms††
		allintitle: "super clinic" OR “super clinics” practice OR structure OR treatment OR model OR models OR staff OR staffing OR organizational OR service OR services OR system (5 results)
Google *www.google.ca*	28 Jan 2020 (results in next column)	urgent care models practice OR treatment OR organization OR staff OR staffing OR organizational OR service Date 2009-2020 (Browsed first 100 results - 8 screened) allintitle: structure OR model OR models OR staff OR staffing "after hours" “urgent care” site:.ca (35 results) allintitle: "super clinic" +model OR models (13 results)

†† “*”, “# “, and “?” are truncation characters that retrieve all possible suffix variations of the root word, e.g., surg* retrieves surgery, surgical, surgeon, etc. Searches separated by commas have been entered separately into the search interface.

TABLE A.2: Search strategy for literature on the effectiveness of the urgent care models

Source	Date searched and results	Search terms††
Core databases		
Ovid MEDLINE(R) ALL 1946 to 17 Dec 2019	18 Dec 2019 SRS: 531 results Primary studies: 3,112 results Economic studies: 338 results	1. (urgent adj2 (care or clinic or clinics or centre* or center* or healthcare* or treatment)).ti,ab,kf. 2. (immediate adj2 (care or attention)).ti,ab,kf. 3. ((minor injury or mobile health) adj2 (unit or units or center* or centre* or clinic or clinics)).ti,ab,kf. 4. (emergicenter* or emergicentr*).ti,ab,kf. 5. (("collaborative emergency" or convenience or retail or free-standing) adj2 (center* or centr* or clinic or clinics)).ti,ab,kf. 6. (unschedule* adj2 (care or utli?ation)).ti,ab,kf. 7. ((episodic or out-of-hours or after-hours or walk-in or extended hours) adj4 (care or service* or clinic or clinics or centre* or center* or facilit*)).ti,ab,kf. 8. "advanced ambulatory care".mp. 9. or/1-8 [free text terms] 10. Mobile Health Units/ 11. exp Ambulatory Care/ae, ec, mt, og, st, sn 12. ambulatory care facilities/ or pain clinics/ or surgicenters/ 13. After-Hours Care/ 14. or/10-13 [MeSH terms] 15. or 14 [INTERVENTION] 16. exp *Health Services Misuse/pc [Prevention & Control] 17. (casualty department* or ((emergenc* or ED) adj1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment*or visit*)) or (triage or critical care or (trauma adj1 (cent* or care)))).ti,ab,kf. 18. exp emergency medical services/ or emergency service, hospital/ or trauma centers/ or triage/ or exp Evidence-Based Emergency Medicine/ or exp Emergency Nursing/ or Emergencies/ 19. 16 and (17 or 18)[14] 20. exp Primary Health Care/ 21. exp Physicians' Offices/ 22. exp Family Practice/ec, mt, og, sn, sd, td 23. or/18,20-22 [MeSH terms COMPARATORS] 24. (family adj2 (clinic or clinics)).ti,ab,kf. 25. (family adj (physician* or doctor* or practitioner*) adj (office or offices)).ti,ab,kf. 26. non-urgent.ti,ab. 27. (primary adj2 care).ti,ab,kf. 28. ("family practice sensitive conditions" or FPSC?).ti,ab. 29. or/17,24-28 [free text COMPARATORS] 30. and 29 [Freetext Intervention AND Comparators] 31. 14 and 23 [MeSH terms Intervention and Comparators] 32. (9 or 14) and (23 or 29) [INTERVENTION AND COMPARATORS] 33. meta-analysis.pt.

Source	Date searched and results	Search terms††
		34. (meta-anal$ or metaanal$).mp. 35. ((quantitativ$ adj3 review$1) or (quantitativ$ adj3 overview$)).mp. 36. ((systematic$ adj3 review$) or (systematic adj3 overview$)).mp. 37. ((methodologic adj3 review$1) or (methodologic adj3 overview$)).mp. 38. (integrat$ adj5 research).mp. 39. (quantitativ$ adj3 synthes$).mp. 40. or/33-39 41. review.pt. or (review$ or overview$).mp. 42. (medline or medlars or pubmed or index medicus or embase or cochrane).mp. 43. (scisearch or web of science or psycinfo or psychinfo or cinahl or cinhal).mp. 44. (excerpta medica or psychlit or psyclit or current contents or science citation index or sciences citation index or scopus).mp. 45. (hand search$ or manual search$).mp. 46. ((electronic adj3 database$) or (bibliographic adj3 database$) or periodical index$).mp. 47. (pooling or pooled or mantel haenszel).mp. 48. (peto or der simonian or dersimonian or fixed effect$).mp. 49. ((combine$ or combining) adj5 (data or trial or trials or studies or study or result or results)).mp. 50. or/42-49 51. 41 and 50 52. 40 or 51 53. (hta$ or health technology assessment$ or biomedical technology assessment$).mp. 54. technology assessment, biomedical/ or biomedical technology assessment/ 55. 53 or 54 56. 52 or 55 [SR filter[15]] 57. randomized controlled trial.pt. 58. clinical trial.pt. 59. randomi?ed.ti,ab. 60. placebo.ti,ab. 61. dt.fs. 62. randomly.ti,ab. 63. trial.ti,ab. 64. groups.ti,ab. 65. or/57-64 66. animals/ 67. humans/ 68. 66 not (66 and 67) 69. 65 not 68 [RCT filter[16]] 70. Epidemiologic Methods/ or exp Epidemiologic Studies/ or Observational Studies as Topic/ or Clinical Studies as Topic/ or organizational case studies/

Source	Date searched and results	Search terms††
		71. (Observational Study or Validation Studies or Clinical Study or case reports).pt. 72. (observational adj3 (study or studies or design or analysis or analyses)).ti,ab,kf. 73. (cohort* or case series).ti,ab,kf. 74. (prospective adj7 (study or studies or design or analysis or analyses)).ti,ab,kf. 75. ((follow up or followup) adj7 (study or studies or design or analysis or analyses)).ti,ab,kf. 76. ((longitudinal or longterm or (long adj term)) adj7 (study or studies or design or analysis or analyses or data)).ti,ab,kf. 77. (retrospective adj7 (study or studies or design or analysis or analyses or data or review)).ti,ab,kf. 78. ((case adj control) or (case adj comparison) or (case adj controlled)).ti,ab,kf. 79. (case-referent adj3 (study or studies or design or analysis or analyses)).ti,ab,kf. 80. (population adj3 (study or studies or analysis or analyses)).ti,ab,kf. 81. (descriptive adj3 (study or studies or design or analysis or analyses)).ti,ab,kf. 82. ((multidimensional or (multi adj dimensional)) adj3 (study or studies or design or analysis or analyses)).ti,ab,kf. 83. (cross adj sectional adj7 (study or studies or design or research or analysis or analyses or survey or findings)).ti,ab,kf. 84. ((natural adj experiment) or (natural adj experiments)).ti,ab,kf. 85. (quasi adj (experiment or experiments or experimental)).ti,ab,kf. 86. ((non experiment or nonexperiment or non experimental or nonexperimental) adj3 (study or studies or design or analysis or analyses)).ti,ab,kf. 87. (prevalence adj3 (study or studies or analysis or analyses)).ti,ab,kf. 88. (case adj3 (report or reports or study or studies or histories)).ti,ab,kf. 89. or/70-88 [CADTH Observational Studies Filter] 90. Developing Countries.sh,kf. 91. (Africa or Asia or West Indies or South America or Central America).hw,kf,ti,ab,cp. 92. (Caribbean or Latin* America*).hw,kf,ti,cp. 93. (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican

Source	Date searched and results	Search terms††
		Republic or East Timor or East Timur or Timor Leste or Ecuador or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,kf,ti,ab,cp. 94. ((developing or less* developed or under developed or underdeveloped or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab. 95. (middle income adj (countr* or nation? or population? or world)).ti. 96. (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab. 97. (low adj3 middle adj3 countr*).ti. 98. (lmic or lmics or third world or lami countr*).ti,ab. 99. transitional countr*.ti,ab. 100. or/90-99[13] 101. Economics/ 102. exp "Costs and Cost Analysis"/ 103. Economics, Nursing/ 104. Economics, Medical/ 105. Economics, Pharmaceutical/ 106. exp Economics, Hospital/

Source	Date searched and results	Search terms††
		107. Economics, Dental/ 108. exp "Fees and Charges"/ 109. exp Budgets/ 110. budget*.ti,ab,kf. 111. (economic* or cost or costs or costly or costing or price or prices or pricing or pharmacoeconomic* or pharmaco-economic* or expenditure or expenditures or expense or expenses or financial or finance or finances or financed).ti,kf. 112. (economic* or cost or costs or costly or costing or price or prices or pricing or pharmacoeconomic* or pharmaco-economic* or expenditure or expenditures or expense or expenses or financial or finance or finances or financed).ab. /freq=2 113. (cost* adj2 (effective* or utilit* or benefit* or minimi* or analy* or outcome or outcomes)).ab,kf. 114. (value adj2 (money or monetary)).ti,ab,kf. 115. exp models, economic/ 116. economic model*.ab,kf. 117. markov chains/ 118. markov.ti,ab,kf. 119. monte carlo method/ 120. monte carlo.ti,ab,kf. 121. exp Decision Theory/ 122. (decision* adj2 (tree* or analy* or model*)).ti,ab,kf. 123. or/101-122[17] 124. 32 and (69 or 89) [primary] 125. (15 or 19) and 56 [SRS] 126. 32 and 123 [economic] 127. 124 not 100 128. 125 not 100 129. 126 not 100 130. limit 127 to (english language and yr="2009 -Current") 131. limit 128 to (english language and yr="2009 -Current") [SRS] 132. limit 129 to (english language and yr="2009 -Current") 133. 130 not 131 [PRIMARY STUDIES] 134. 132 not (130 or 131) [ECONOMIC STUDIES]
Embase 1974 to 17 Dec 2019	18 Dec 2019 SRs: 241 results Primary studies: 2,122 results Economic studies: 102 results	1. (urgent adj2 (care or clinic or clinics or centre* or center* or healthcare* or treatment)).ti,ab,kw. 2. (immediate adj2 (care or attention)).ti,ab,kw. 3. ((minor injury or mobile health) adj2 (unit or units or center* or centre* or clinic or clinics)).ti,ab,kw. 4. (emergicenter* or emergicentr*).ti,ab,kw. 5. (("collaborative emergency" or convenience or retail or free-standing) adj2 (center* or centr* or clinic or clinics)).ti,ab,kw. 6. (unschedule* adj2 (care or utli?ation)).ti,ab,kw. 7. ((episodic or out-of-hours or after-hours or walk-in or extended hours) adj4 (care or service* or clinic or clinics or centre* or center* or facilit*)).ti,ab,kw.

Source	Date searched and results	Search terms††
		8. "advanced ambulatory care".mp. 9. or/1-8 [free text terms] 10. exp *Ambulatory Care/ 11. pain clinic/ 12. out-of-hours care/ 13. or/10-12 [EMTREE terms] 14. or 13 [INTERVENTION] 15. exp *Health Services Misuse/pc 16. (casualty department* or emergent or ((emergenc* or ED) adj1 (room* or accident or ward or wards or unit or units or department* or physician* or doctor* or nurs* or treatment* or visit*)) or (triage or critical care or (trauma adj1 (cent* or care)))).ti,ab,kw. 17. *emergency treatment/ or *emergency medicine/ or exp *emergency health service/ or *evidence based emergency medicine/ or *emergency nursing/ or exp *emergency care/ or *emergency ward/ or *emergency/[14] 18. 15 and (16 or 17) [INTERVENTION 2 for SRS] 19. exp Primary Health Care/ 20. exp Physicians' Offices/ 21. or/17,19-20 [EMTREE terms Comparators] 22. (family adj2 (clinic or clinics)).ti,ab,kw. 23. (family adj (physician* or doctor* or practitioner*) adj (office or offices)).ti,ab,kw. 24. non-urgent.ti,ab. 25. (primary adj2 care).ti,ab,kw. 26. ("family practice sensitive conditions" or FPSC?).ti,ab. 27. or/16,22-26 [free text COMPARATORS] 28. and 27 [free text INTERVENTION and COMPARATORS] 29. 14 and 21 [MeSH Interventions and Comparators] 30. developing country/ or low income country/ or middle income country/ 31. (Africa or Asia or West Indies or South America or Central America).hw,ti,ab,kw,cp. 32. (Caribbean or Latin* America*).hw,kw,ti,cp. 33. (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia

Source	Date searched and results	Search terms††
		or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadjikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,ti,ab,kw,cp. 34. ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab,kw. 35. (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab. 36. (low adj3 middle adj3 countr*).ti,ab,kw. 37. (lmic or lmics or third world or lami countr*).ti,ab. 38. transitional countr*.ti,ab. 39. or/30-38 [LMIC filter[13]] 40. (28 or 29) not 39 [FINAL set before other limits] 41. (14 or 18) not 39 [SR Set before limits] 42. meta-analysis.pt. 43. (meta-anal$ or metaanal$).mp. 44. ((quantitativ$ adj3 review$1) or (quantitativ$ adj3 overview$)).mp. 45. ((systematic$ adj3 review$) or (systematic adj3 overview$)).mp. 46. ((methodologic adj3 review$1) or (methodologic adj3 overview$)).mp. 47. (integrat$ adj5 research).mp.

Source	Date searched and results	Search terms††
		48. (quantitativ$ adj3 synthes$).mp. 49. or/42-48 50. review.pt. or (review$ or overview$).mp. 51. (medline or medlars or pubmed or index medicus or embase or cochrane).mp. 52. (scisearch or web of science or psycinfo or psychinfo or cinahl or cinhal).mp. 53. (excerpta medica or psychlit or psyclit or current contents or science citation index or sciences citation index or scopus).mp. 54. (hand search$ or manual search$).mp. 55. ((electronic adj3 database$) or (bibliographic adj3 database$) or periodical index$).mp. 56. (pooling or pooled or mantel haenszel).mp. 57. (peto or der simonian or dersimonian or fixed effect$).mp. 58. ((combine$ or combining) adj5 (data or trial or trials or studies or study or result or results)).mp. 59. or/51-58 60. 50 and 59 61. 49 or 60 62. (hta$ or health technology assessment$ or biomedical technology assessment$).mp. 63. technology assessment, biomedical/ or biomedical technology assessment/ 64. 62 or 63 65. 61 or 64[15] 66. exp clinical trial/ 67. randomi?ed.ti,ab. 68. placebo.ti,ab. 69. dt.fs. 70. randomly.ti,ab. 71. trial.ti,ab. 72. groups.ti,ab. 73. or/66-72[16] 74. (clin$ adj25 (trial$ or study or studies or design)).mp. 75. exp Placebo/ 76. (placebo$ or random$).mp. 77. (ae or co or ct or do or th).fs. 78. exp Methodology/ 79. exp Comparative Study/ 80. exp Evaluation/ 81. exp Follow Up/ 82. exp Prospective Study/ 83. clinical study/ 84. exp case control study/ 85. family study/ 86. exp longitudinal study/

Source	Date searched and results	Search terms††
		87. retrospective study/ 88. exp cohort analysis/ 89. exp Risk/ 90. ((allocat$ or compar$ or assign$ or treatment or control$ or interven$ or experiment$) and (group or groups)).mp. 91. (group or groups).ti,ab. 92. ((control$ or prospectiv$ or retrospectiv$ or volunteer$ or participant$ or compar$) and (trial$ or study or studies or design)).ti,ab,sh. 93. cohort$.mp. 94. (case$ and control$).tw. 95. "Cross sectional".ti,ab. 96. (before adj2 after).ti,ab. 97. (observational adj5 (study or studies or design)).ti,ab. 98. Longitudinal.mp. 99. Retrospective.ti,ab. 100. "Relative risk".ti,ab. 101. "Odds ratio".ti,ab. 102. (Follow up adj5 (study or studies or design)).ti,ab. 103. (case adj (comparison or referent)).ti,ab. 104. (Causation or causal$).ti,ab. 105. (Analytic adj (study or studies)).ti,ab. 106. (epidemiologic$ adj (study or studies)).ti,ab. 107. single subject$.mp. or SSRD.ti,ab. 108. "n-of-1".ti,ab. 109. or/74-108 110. 73 or 109 111. animal/ 112. human/ 113. 111 not (111 and 112) 114. 110 not 113 115. Economics/ 116. Cost/ 117. exp Health Economics/ 118. Budget/ 119. budget*.ti,ab,kw. 120. (economic* or cost or costs or costly or costing or price or prices or pricing or pharmacoeconomic* or pharmaco-economic* or expenditure or expenditures or expense or expenses or financial or finance or finances or financed).ti,kw. 121. (economic* or cost or costs or costly or costing or price or prices or pricing or pharmacoeconomic* or pharmaco-economic* or expenditure or expenditures or expense or expenses or financial or finance or finances or financed).ab. /freq=2 122. (cost* adj2 (effective* or utilit* or benefit* or minimi* or analy* or outcome or outcomes)).ab,kw. 123. (value adj2 (money or monetary)).ti,ab,kw.

Source	Date searched and results	Search terms††
		124. Statistical Model/ 125. economic model*.ab,kw. 126. Probability/ 127. markov.ti,ab,kw. 128. monte carlo method/ 129. monte carlo.ti,ab,kw. 130. Decision Theory/ 131. Decision Tree/ 132. (decision* adj2 (tree* or analy* or model*)).ti,ab,kw. 133. or/115-132[17] 134. 40 and 114 135. 41 and 65 136. 40 and 133 137. limit 134 to (english language and embase and yr="2009 -Current") 138. limit 135 to (english language and embase and yr="2009 -Current") [SYSTEMATIC REVIEWS] 139. limit 136 to (english language and embase and yr="2009 -Current") 140. 137 not 138 [PRIMARY STUDIES] 141. 139 not (137 or 138) [ECONOMIC STUDIES]
Theses		
ProQuest Dissertations and Theses Global 1861–2020	20 Jan 2020 116 results	(((ti(urgent OR episodic OR out-of-hours OR "out of hours" OR after-hours OR walk-in OR extended hours OR unscheduled OR immediate) AND ti(care OR healthcare OR clinic OR treatment OR centre* OR center* OR service OR facility OR facilities)) OR (ti(minor injury OR mobile health) AND ti(unit OR units OR center* OR centre* OR clinic OR clinics)) OR (ti("collaborative emergency" OR convenience OR retail OR free-standing) AND TI(care OR center* OR centr* OR clinic OR clinics)) OR ti(emergicenter* OR emergicentr*)) AND (la.exact("ENG") AND subt.exact("nursing" OR "health care management" OR "public health" OR "medicine" OR "health sciences" OR "health education" OR "information technology" OR "biostatistics") AND pd(20090101-20200131))) OR (((su(urgent OR episodic OR out-of-hours OR "out of hours" OR after-hours OR walk-in OR extended hours OR unscheduled OR immediate) AND su(care OR healthcare OR clinic OR treatment OR centre* OR center* OR service OR facility OR facilities)) OR (su(minor injury OR mobile health) AND su(unit OR units OR center* OR centre* OR clinic OR clinics)) OR (su("collaborative emergency" OR convenience OR retail OR free-standing) AND su(care OR center* OR centr* OR clinic OR clinics)) OR su(emergicenter* OR emergicentr*)) AND (la.exact("ENG") AND subt.exact("nursing" OR "health care management" OR "public health" OR "medicine" OR "health sciences" OR "health education" OR "information technology" OR "biostatistics") AND pd(20090101-20200131)))
Professional associations (*Note*: These results were also used for *Urgent care models*)		
Urgent Care Foundation *www.ucaoa.org/*	10 Jan 2020 1 result	Browsed site

Source	Date searched and results	Search terms††
American Academy of Urgent Care Medicine *aaucm.org/*	10 Jan 2020 1 result	Browsed Urgent Care Resources
American Board of Urgent Care Medicine (certifying body) *abucm.org/*	10 Jan 2020 1 result	Browsed site
Royal New Zealand College of Urgent Care *rnzcuc.org.nz/about/what-is-uc/*	10 Jan 2020 2 results	Browsed Urgent Care Research
HTA agencies (*Note*: These results were also used for *Urgent care models*)		
HTA Database *database.inahta.org/*	10 Jan 2020 5 results	"urgent care" OR "episodic care" OR "walk in clinic" OR "convenience clinic" OR "extended hours" OR "unscheduled care" OR "retail clinic" OR "collaborative emergency centre*" OR "walk-in connected care" Limited: 2009-2020
Canada		
CADTH *www.cadth.ca/*	21 Jan 2020 2 results	“urgent care”, walk-in, advanced ambulatory care, collaborative emergency care”, mobile injury, episodic care
Health Quality Ontario *www.hqontario.ca/*	21 Jan 2020 5 results	Browsed Health Technology Assessments Browsed Journal: Ontario Health Technology Assessment Series
Institute of Health Economics *www.ihe.ca*	10 Jan 2020 0 results	Urgent care, urgent treatment, episodic care
INESSS *www.inesss.qc.ca/accueil.html*	10 Jan 2020 0 results	Browsed Publications
Canadian Foundation for Healthcare Improvement *www.cfhi-fcass.ca/PublicationsAndResources/ResearchReports.aspxment*	10 Jan 2020 0 results	Browsed Reports
Contextualized Health Research Synthesis Program *www.nlcahr.mun.ca/CHRSP/*	10 Jan 2020 0 results	Browsed Evidence in Context Reports

Source	Date searched and results	Search terms††
ICES *www.ices.on.ca/*	10 Jan 2020 0 results	Restricted to Atlases and Reports, and Journal Articles, last 10 years "After hours" (7 results) "walk in" (0 results) "urgent care" (3 results) "Collaborative emergency" (0 results) "episodic care" (2 results)
Technology Assessment Unit of the McGill University Health Centre *www.mcgill.ca/tau/publications/*	10 Jan 2020 0 results	Browsed site
Toronto Health Economics and Technology Assessment Collaborative *theta.utoronto.ca/*	10 Jan 2020 0 results	Browsed Reports
University of British Columbia Centre for Health Services and Policy Research *chspr.ubc.ca/publications/*	10 Jan 2020 0 results	Browsed Reports
Australia/New Zealand		
Adelaide Health Technology Assessment *www.adelaide.edu.au/ahta/*	10 Jan 2020 0 results	Browsed Publications
Australian Efficacy Register of New Interventional Procedures – Surgical *www.surgeons.org/research-audit/research-evaluation-inc-asernips/publications*	10 Jan 2020 0 results	Browsed Publications

Source	Date searched and results	Search terms††
Health Technology Reference Group *www.coaghealthcouncil.gov.au/AHMAC/Health-Technology-Reference-Group*	10 Jan 2020 0 results	Browsed Health Technologies Evaluated - Reports and Briefs
United States		
AHRQ *www.ahrq.gov/*	21 Jan 2020 154 results	"urgent care"
Institute for Clinical and Economic Review *icer-review.org/*	21 Jan 2020 4 results (1 selected)	"urgent care"
Monash Health - Centre for Clinical Effectiveness *www.monashhealth.org/page/CCE*	21 Jan 2020 1 result	Browsed site
HSTAT *www.ncbi.nlm.nih.gov/books/NBK16710/*	21 Jan 2020 0 results	"urgent care" AND hstatcollect [filter] Filters activated: published in the last 10 years, Report, Field: Title
Washington State Health Care Authority – Heath Technology Assessment Program *www.hca.wa.gov/about-hca/health-technology-assessment*	21 Jan 2020 0 results	Browsed health Technology Reviews
United Kingdom and Europe		
EUnetHTA *www.eunethta.eu/outputs*	21 Jan 2020 0 results	Browsed site
Health Evidence Network *www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/health-evidence-network-hen*	21 Jan 2020 0 results	Browsed publications

Source	Date searched and results	Search terms††
Health Technology Wales *www.healthtechnology.wales/*	21 Jan 2020 0 results	Browsed All Reports
Healthcare Improvement Scotland *www.healthcareimprovementscotland.org*	23 Jan 2020 4 results	Urgent care, urgent treatment" Browsed SHTG publications
National Institutes for Health Research Journals Library *www.journalslibrary.nihr.ac.uk/#/*	23 Jan 2020 19 results	"urgent care", "minor injury unit"
Clinical practice guidelines		
TOP Guidelines *www.topalbertadoctors.org/cpgs/*	23 Jan 2020 0 results	Urgent care
CMA InfoBase *www.cma.ca/En/Pages/clinical-practice-guidelines.aspx*	23 Jan 2020 0 results	Urgent care
SIGN guidelines *sign.ac.uk*	21 Jan 2020 0 results	Urgent Care
Guidelines International Network *www.g-i-n.net/library/international-guidelines-library*	23 Jan 2020 0 results	Urgent care
NICE Evidence Search *evidence.nhs.uk*	23 Jan 2020 (results in next column)	"urgent care" Limited to HTAs (8 results) Cochrane reviews (6 results) EPPI Centre reports (3 results) Rand Europe (1 result) "minor injury units" (5 results)

Source	Date searched and results	Search terms††
Other searches		
Google Scholar *scholar.google.ca*	9 Jan 2020 (results in next column)	"Urgent care" "systematic review" browsed 1st 100 results Forward searched: A preliminary study of Emergency and Urgent Care Networks 2009-2020 (4 results) Forward searched: Pulling together: transforming urgent care for the people of Scotland (2 results) Forward searched: Navigating and making sense of urgent and emergency care processes and provision (4 results) Forward searched: What evidence is there on the effectiveness of different models of delivering urgent care?... 2009-2020 (34 results) Forward searched: Community-based urgent care in Israel and worldwide (7 results)
Google *www.google.ca*	8–23 Jan 2020 (results in next column)	Jan 8 allintext: role OR impact OR effectiveness OR contribution "urgent care" -jobs –indeed (244 results) Jan 9 review primary OR emergency OR systematic "urgent care" -yelp -indeed -facebook -jobs (browsed first 150 results) Jan 10 "collaborative emergency centres" saskatchewan OR nova scotia "systematic review" (26 results – 4 screened) saskatchewan "collaborative emergency centres" study (49 results - 10 screened) "Walk in connected care" "systematic review" (0 results) "Walk-In Connected Care" "rapid review" (102 results – 2 screened) allintitle: urgent care review primary OR emergency site:.uk filetype:pdf (27 results – 13 screened) Jan 23 allintitle: "review" "episodic care" OR "walk in clinic" OR "convenience clinic" OR "extended hours" OR "unscheduled care" OR "retail clinic" OR "collaborative emergency centre *" OR "walk in connected care" OR "primary care" OR emergency OR "urgent care" site:gov.uk Date 2009-2020 (39 results – 0 screened) allintitle: "evidence" "episodic care" OR "walk in clinic" OR "convenience clinic" OR "extended hours" OR "unscheduled care" OR "retail clinic" OR "collaborative emergency centre *" OR "walk in connected care" OR "primary care" OR emergency OR "urgent care" site:gov.uk (20 results) allintitle: "evidence" "urgent care" site:gov.uk (3 results) allintitle: "analysis" "urgent care" site:gov.uk (4 results) allintitle: "assessment" "urgent care" site:gov.uk (5 results) allintitle: "impact" "urgent care" site:gov.uk (2 results) allintitle: "appraisal" "urgent care" site:gov.uk (0 results)

Source	Date searched and results	Search terms††
		allintitle: "episodic care" | "convenience clinic" | "extended hours" | "unscheduled care" | "retail clinic" | "collaborative emergency centre *" | "walk in connected care" | "urgent care" "primary care" OR emergency site:gov.au (11 results) allintitle: "episodic care" | "convenience clinic" | "extended hours" | "unscheduled care" | "retail clinic" | "collaborative emergency centre *" | "walk in connected care" | "urgent care" site:govt.nz Date 2009-2020 (9 results)

†† "*", "# ", and "?" are truncation characters that retrieve all possible suffix variations of the root word, e.g., surg* retrieves surgery, surgical, surgeon, etc. Searches separated by commas have been entered separately into the search interface.

Appendix B: Excluded Studies

BOX B.1: Excluded studies and reasons for exclusion

Excluded studies on urgent care model types

Not intervention of interest (*n*=56)

Anderson TJ, Althausen PL. The role of dedicated musculoskeletal urgent care centers in reducing cost and improving access to orthopaedic care. *J Orthop Trauma* 2016;30 Suppl 5:S3-6.

Bailey R. A 'future-proof' urgent care facility. *Health Estate* 2016;70(8):39-44.

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Iezzoni LI, Wint AJ, Cluett WS, et al. Early experiences with the acute community care program in eastern Massachusetts. *Am J Manag Care* 2018;24(9):e270-7.

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Jayakumar KL, Samimi SS, Vittorio CC, et al. Expediting patient appointments with dermatology rapid access clinics. *Dermatol Online J* 2018;24(6):2.

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No outcomes of interest (*n*=78)

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Appendix C: Summaries of Urgent Care Model Types

TABLE C.1: Summaries of urgent care model types

Model taxonomy	Description and rationale	Target population and care providers	Setting and services	Funding	Model variations for specific needs
Emergency Department Integrated Services[3, 21, 27, 32, 36, 44, 45, 50]	*Description*: Access to urgent care, within the ED; a primary care provider works alongside emergency physicians to assess and treat incoming patients *Rationale*: A single "front door" may reduce confusion and allow for efficient patient streaming	*Target population*: General population seeking ED care for low-acuity conditions *Care providers*: GPs; NP; optometrist; dentist; other primary care provider; or specialist	*Where*: ED *When*: All ED hours; partial hours (daytime only, evening only, extended hours or block shifts) *Support services*: Full access to diagnostic and imaging services	Full public funding in some countries, private or publicly funded insurance accepted in countries where not completely publicly funded	Specialty cancer EDs or oncologist working within the ED have been used as a model to specifically treat cancer patients with non-life-threatening complications[36]
Hospital Parallel Services[3, 24, 25, 31, 33, 38, 44-46, 48, 50, 51, 54]	*Description*: There is a separate urgent care service co-located with the ED; low-acuity presenters at the ED can be triaged to the urgent care services, or patients can self-refer straight to adjacent urgent care *Rationale*: A central site enables patients to get to the service that best meets their needs, especially for those who have difficulty navigating health systems	*Target population*: General population seeking ED care for low-acuity conditions *Care providers*: GPs and/or NPs	*Where*: Adjacent to or near the ED *When*: Extended hours (e.g., 08:00–20:00) *Support services*: Variable; may have access to ED diagnostics, but frequently have limited or no access to ancillary services	Full central funding in some countries, private or publicly funded insurance accepted in countries where not completely centrally funded	The majority of Dutch GP cooperatives require contact by phone before attending and act as the gatekeeper for the ED[25]
Community Advanced Services[2, 8, 31, 32, 35, 37, 39, 41-43, 46, 47, 49, 52, 53, 55, 57, 58, 60, 62-68]	*Description*: Service that treats, on an unscheduled basis, non-life- or limb-threatening illnesses that may require resources more intensive than are available in typical primary care *Rationale*: ED avoidance; growing demand for convenient and easily accessible substitute	*Target population*: General population seeking immediate care for non-life- or limb-threatening issues *Care providers*: GP; emergency care physician; NP; PA; pediatrician; and/or specialist; care provider	*Where*: Within the community; sometimes located near an ED; sometimes co-located with primary care services *When*: Variable; most often open 7 days a week, 12 hours a day *Support services*: Variable; most often on-site	Owned by a larger entity or healthcare institution, or may be physician-owned; most often fee-for-service payment model; full public funding in some countries, private or publicly funded insurance accepted in	None described

Model taxonomy	Description and rationale	Target population and care providers	Setting and services	Funding	Model variations for specific needs
	healthcare that serves needs beyond the capabilities of family physicians' offices, but without the wait and cost of EDs	availability may vary during the day (e.g., physician only during daytime hours)	availability of diagnostic services, including radiology and laboratory, and minor ailment or injury treatments (e.g., antibiotics, narcotics, intravenous fluids, fracture and wound care)	countries where not completely publicly funded	
Community Restricted Services[20, 22-26, 28, 35, 37, 38, 40, 54, 56, 59, 61]	*Description*: An extended hours service providing unscheduled basic medical care, without the expectation of follow up *Rationale*: Primary care unavailability; timely access to primary care services needed as GP need is outstripped by demand, and same-day appointment with one's primary care provider are frequently unavailable	*Target population*: General population seeking immediate care for low-acuity conditions *Care providers*: GPs and/or NP	*Where*: Within the community; sometimes located near the ED; sometimes located near commuter hubs; within or close to retail stores, pharmacies, grocery stores, or big-box stores *When*: Extended hours, including evenings and weekends *Support services*: Limited or no diagnostics	May be operated by hospitals, health systems, pharmacies, or retail chains; full public funding in some countries, private or publicly funded insurance accepted in countries where not completely publicly funded; infrequent cash-only clinics	None described
Community Home Services[3, 29, 30, 34, 39, 45]	*Description*: Utilizing an emergency care practitioner to treat patients who call for ambulance services for minor conditions in the field, or to refer them to non-ED health resources *Rationale*: Management of the patient on-scene will avoid unnecessary journeys to the hospital	*Target population*: Patients who call for ambulance services for low-acuity conditions *Care providers*: Paramedic with extended skills; registered nurse or NP with extended skills; or physician	*Where*: Patient's home *When*: All hours; partial hours (daytime, evening only) *Support services*: Ambulance service equipment; sometimes supported by a GP or specialist (direct access via phone)	Not described	Emergency care practitioners may also provide routine primary care, (patient education, post-discharge care, and chronic disease management) for underserved or vulnerable populations, including elderly patients with limited mobility, rural/remote areas, and deprived areas that lack access to primary care[30, 34]

ED: emergency department; GP: general practitioner; NP: nurse practitioner; PA: physician assistant

TABLE C.2: Urgent care model variations, by country/geographical area

Country/ geographical area	Urgent care model				
	Emergency Department Integrated Services	***Hospital Parallel Services***	***Community Advanced Services***	***Community Restricted Services***	***Community Home Services***
Canada					
Nomenclature	ED Fast Track	NA	Urgent care clinic; collaborative emergency centre; urgent and primary care centres	Walk-in clinic	Community paramedicine
Description	ED attendees with low-acuity conditions are treated by a specifically allocated GP, NP, or emergency care physician	NA	GPs and/or NPs, along with ancillary diagnostic services, are available to assess and treat unscheduled, urgent, non-life-threatening conditions and are integrated with co-located primary care services	GP-led primary care services offered with extended hours, unscheduled availability, and in convenient locations within the community	Paramedics with advanced skills assess and treat patients on-site, then refer them to other health services if necessary; often these paramedics are also integrated in and support primary care services in underserved or remote populations
United Kingdom and Western Europe					
Nomenclature	Primary care provider within the ED	Co-located urgent GP centre; Luton and Dunstable model; front-door clinical streaming; GP cooperative	Urgent treatment centre	Minor injury unit; walk-in centre	Emergency care practitioner
Description	GPs or NPs support triage of patients, and apply "see-and-treat" protocols for ED attenders with low-acuity conditions; GPs or NPs may also be integrated into ED care, working with emergency care physicians to care for a full range of ED patients	Taking referrals from the ED only, a co-located GP-led clinic assesses and treats low-acuity patients; with GP cooperatives in the Netherlands, these GP- and nurse-led clinics are the first point of contact and act as the gatekeepers to the ED	GP-led service for urgent non-life-threatening ailments, open at least 12 hours a day, 7 days a week	Most often nurse-led, these clinics provide unscheduled, out-of-hours primary care or basic medical services for a limited number of low-acuity ailments and injuries (*Note*: Urgent care services are being redesigned/ renamed by fall 2020 to create more consistent care and terminology)	Paramedics or NPs with extended skills, and with direct support from GPs or specialists, treat patients with low-acuity conditions who have called for an ambulance on-site

Country/ geographical area	Urgent care model				
	Emergency Department Integrated Services	***Hospital Parallel Services***	***Community Advanced Services***	***Community Restricted Services***	***Community Home Services***
United States					
Nomenclature	Primary care provider within the ED	NA	Free-standing ED/centre; urgent care centre	Walk-in clinic; retail clinic; convenience clinic	NA
Description	PAs or NPs support triage of patients, and treat ED attendees with low-acuity conditions; PAs or NPs may also be integrated into ED care, working with emergency care physicians to care for a full range of ED patients	NA	GPs, emergency care physicians, and other licensed healthcare professionals treat urgent but non-life-threatening conditions, with support of on-site diagnostics (radiology and laboratory)	Located within big-box stores, pharmacies, or grocery chains, these extended hour clinics provided a limited amount of primary care services from GPs or NPs without the support of ancillary diagnostic services	NA
Australia and New Zealand					
Nomenclature	Primary care provider within the ED	See urgent care clinics (*Community Advanced Services*)	Urgent care clinics	Walk-in centre	Extended care paramedic
Description	NPs assess and treat low-acuity ED attendees independently, and may also support the triage process		GPs, NPs, or urgent care physicians provided unscheduled care for urgent, non-life-threatening conditions, with access to laboratory and radiology on-site; EDs have policies to re-direct low-acuity attendees to nearby urgent care clinics	Nurse- or, less frequently, GP-led clinics provide unscheduled, extended hours services for primary care type conditions	Provide integrated health and extend access to health services delivery in rural and remote communities; may provide relief work in rural EDs when there are physician shortages

ED: emergency department; GP: general practitioner; NA: not applicable; NP: nurse practitioner

Appendix D: Summaries of the Effectiveness of the Urgent Care Models

TABLE D.1: Characteristics of included SRs or HTAs

Author, year	Objective	Eligible studies	Population	Intervention(s) and comparator(s)	Outcome(s) of interest	Search strategy	Quality assessment
Crawford et al. (2017)[24] SR	To identify the impact on ED presentations from diverting less urgent patients away from EDs	Peer-reviewed primary research articles	Adult presenting to the ED	*Interventions*: Co-located GP cooperatives; co-located walk-in clinics *Comparators*: Stand-alone GP cooperatives; stand-alone walk-in clinics	*Service utilization*: ED attendance	*Publication period*: 2000–2014 *Databases/sources searched*: MEDLINE, Ovid, PubMed, Google Scholar, snowball sampling from relevant sources	CASP critical appraisal
Gonçalves-Bradley et al. (2018)[21] SR	To assess the effects of locating primary care providers in hospital EDs	RCTs; non-RCTs; controlled before-after studies; interrupted time series	Patients who present to hospital EDs with primary care conditions; primary care providers working in EDs; emergency medicine physicians	*Intervention*: EDs with primary care providers *Comparator*: Standard ED care	*Service utilization*: ED wait time; ED LOS; admission to hospital; diagnostic tests; treatments; consultations or referrals; ED re-attendance *Patient outcomes*: Mortality; self-reported health status; adverse events *Economic outcome*: Cost-effectiveness	*Publication period*: Inception–2014 *Databases/sources searched*: Cochrane Library, MEDLINE, Embase, CINAHL, PsycINFO, Web of Knowledge, NHS Economic Evaluation Database, King's Fund Library Database, WHO ICTRP, ClinicalTrials.gov, reference lists	Cochrane Risk of Bias, EPOC Risk of Bias Criteria
Guo et al. (2017)[34] HTA	To provide a summary regarding currently existing community paramedicine programs and their effectiveness	SRs; HTAs; government documents; general reviews; primary studies (if others are limited)	Any	*Intervention*: Community paramedicine programs *Comparator*: Standard care	*Service utilization*: ED attendance; hospital admission *Patient outcomes*: Morbidity; mortality; appropriateness of decision; patient satisfaction; health-related quality of life	*Publication period*: 2000–2016 *Databases/sources searched*: MEDLINE, EBM Reviews, Embase, CINAHL, PubMed Health, Web of Science, Scopus, Google Scholar, grey literature, reference lists	Checklist developed by Downs, and Black (1998)[101]

Author, year	Objective	Eligible studies	Population	Intervention(s) and comparator(s)	Outcome(s) of interest	Search strategy	Quality assessment
					Economic outcomes: Cost analysis; budget impact analysis		
Hoff and Prout (2019)[20] SR	To review the literature on US retail clinics on outcomes of quality, cost, and patient satisfaction	Empirical articles	NA	*Interventions*: Retail clinic; walk-in clinic; convenience clinic *Comparator*: NA	*Service utilization*: Healthcare quality *Patient outcome*: Patient satisfaction *Economic outcome*: Cost of care	*Publication period*: up to 2018 *Databases searched*: PubMed, Cochrane Library, Business Source Complete, CINAHL	NA
Morely et al. (2018)[22] SR	To explore the causes or consequences of and solutions to ED overcrowding	Published, peer-reviewed: quantitative, qualitative, mixed-methods	NA	*Intervention*: Intervention aimed at reducing ED *Comparator*: All EDs except specialized	*Service utilization*: ED LOS; ED wait time; ambulance diversion	*Publication period*: 2000–2018 *Databases searched*: MEDLINE, Embase, CINAHL, Web of Science	SIGN critical appraisal
NICE (2018)[27, 28, 29] SR (to support CPG)	To develop guidance on the organization and delivery of services for people with acute or emergency medical conditions	SRs of RCTs; RCTs; observational studies (if others not identified)	Adults and young people (aged ≥16 years) who seek emergency NHS care for a suspected or confirmed acute medical emergency	*Interventions*: Co-located GP-led unit; GPs working within the ED; minor injury unit; urgent care centre; walk-in centre; paramedics with enhanced competencies *Comparators*: Stand-alone GP unit; standard ED care; minor injury unit; urgent care centre; walk-in centre; standard paramedic care	*Service utilization*: ED LOS; ED re-attendance; ambulance conveyance rates; hospital admissions; treatment; demand *Patient outcomes*: Mortality; adverse events; quality of life; patient and/or caregiver satisfaction *Economic outcome*: Cost-effectiveness	*Publication period*: Inception–2016 *Databases searched*: MEDLINE, Embase, Cochrane Library, NHS EED, HTA database, HEED	GRADE

Author, year	Objective	Eligible studies	Population	Intervention(s) and comparator(s)	Outcome(s) of interest	Search strategy	Quality assessment
Turner et al. (2015)[3] Review of SRs	To examine the evidence on how efficient, effective, and safe urgent and emergency care services can be delivered	Published, peer-reviewed quantitative and qualitative empirical evidence	Users of services within the NHS emergency and urgent care system	*Interventions*: Ambulance; organization of EDs; networks *Comparator*: NA	*Service utilization*: ED attendances; emergency admissions; ambulance calls, dispatches, or transports; demand; appropriateness of level of care *Patient outcomes*: Adverse events; patient experience and satisfaction *Economic outcomes*: Cost consequence analysis; cost-effectiveness	*Publication period*: 1995–2014 *Databases/sources searched*: MEDLINE, Embase, Cochrane Library, Web of Science, CINAHL, reference lists, ScHARR archives, NHS archives, topic experts	Informal (no quality assessment tool used), narrative commentary on quality

CASP: Critical Appraisal Skills Program; CINAHL: Cumulative Index to Nursing and Allied Health Literature; CPG: clinical practice guidelines; ED: emergency department; EED: Economic Evaluations Database; EPOC: Effective Practice and Organization of Care; GP: general practitioner; GRADE: Grading of Recommendation, Assessment, Development and Evaluation; HEED: Health Economic Evaluation Database; HTA: health technology assessment; LOS: length of stay; NA: not available; NHS: National Health Service; NICE: National Institute for Health and Care Excellence; RCT: randomized controlled trial; ScHARR: Sheffield School of Health Related Research; SIGN: Scottish Intercollegiate Guidelines Network; SR: systematic review; US: United States; WHO ICTRP: World Health Organization International Clinical Trials Registry Platform

TABLE D.2: *Emergency Department Integrated Services* – effectiveness outcomes from SRs and HTAs

Author, year Number of relevant articles	Intervention and comparator	Outcomes		
		Service utilization	Patient outcomes	Economic outcomes
Gonçalves-Bradley et al. (2018)[21] *N*=4 (4 primary studies)	*Intervention*: EDs with primary care providers *Comparator*: Standard ED care	ED LOS unchanged (1 study): mean difference −3.2 min (95% CI [−20.2, 13.8])[Ŧ] Hospitalization rated variable (3 studies): RR=0.33–1.11 Resource use was variable (3 studies): • Lab: RR=0.35–0.96 • Imaging: RR=0.47–1.07 • Consultation/referrals: RR=0.5–1.21 • Prescriptions: RR=0.95–1.45	NA	Cost reduction: • 1 study: total cost saved during the 48-week intervention period was British £60,876 (admission costs excluded) • 1 study: total resource costs saved during the 15-month intervention period was Irish £95,125
NICE (2018)[27] *N*=4 (4 primary studies)	*Intervention*: GP working within an ED *Comparator*: Standard ED	Diagnostic investigations reduced (2 studies): RR=0.45 (95% CI [0.41, 0.5])*	Patient and/or caregiver satisfaction was unchanged: • Satisfaction with assessment (1 study): RR=0.99 (95% CI [0.9, 1.09])[Ŧ] • Satisfaction with treatment (1 study): RR=0.97 (95% CI [0.88, 1.07])[Ŧ] • Satisfaction with physician's manner (1 study): RR=1.03 (95% CI [0.97, 1.1])	NA
Turner et al. (2015)[3] *N*=4 (2 reviews, 2 primary studies)	*Intervention*: GP services within an ED to manage primary care problems *Comparator*: Standard ED	ED LOS was reduced (1 study): 93 min before vs. 69 min after** ED re-attendance results were mixed Fewer referrals for admission, and to specialists Fewer diagnostic tests Prescribing rates results were mixed	Assessment of safety results varied No difference in the number of correct diagnoses after GP introduced	Marginal cost savings (1 study): total costs/patient mean before-after difference −£71 (95% CI [−121, −23])*

* $p<0.05$

** $p<0.001$

[Ŧ] Non-significant, intervention vs. comparator

CI: confidence interval; ED: emergency department; GP: general practitioner; LOS: length of stay; min: minutes; NA: not available; NICE: National Institute for Health and Care Excellence; RR: relative risk

TABLE D.3: *Emergency Department Integrated Services* – effectiveness outcomes from primary studies

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Uthman et al. (2017)[69] United Kingdom Propensity score-matched cohort study	Non-urgent attendance visits to the ED *N*=16,278 (5,426 intervention, 10,852 comparator)	*Intervention*: Patients identified at triage as suitable for treatment by GPs working in the ED; this service operated 7 days/week, 12 hours/day at peak hours *Comparator*: Emergency physicians standard care in the ED *Period for comparison:* Individual-level acute care activity data May 2015–Mar 2016	*Service utilization*: • GPs working in the ED admitted fewer patients: 5.5% vs. EP 20.1% (RR=0.28; 95% CI [0.25, 0.31])* • GPs working in the ED referred fewer patients to other specialists: 1.3% vs. EP 4.3% (RR=0.31; 95% CI [0.24, 0.40])* • GPs working in the ED ordered fewer radiological investigations: 7.2% vs. EP 18.9% (RR=0.38; 95% CI [0.34, 0.42])* • GPs working in the ED ordered fewer blood tests: 12.1% vs. EP 21.5% (RR=0.57; 95% CI [0.52, 0.61])* • GPs working in the ED ordered fewer investigations: 45.9% vs. EP 49.3% (RR 0.93; 95% CI [0.90, 0.96])* • GPs working in the ED intervened more: 35.6% vs. EP 27.5% (RR=1.29; 95% CI [1.23, 1.35])* • GPs working in the ED offered more primary care: 28.5% vs. EP 16% (RR=1.78; 95% CI [1.67, 1.89])* • GPs working in the ED referred more to outpatient or ED clinics: 18.5% vs. EP 8.1% (RR=2.29; 95% CI [2.10, 2.49])* • Patients treated by a GP in the ED were less likely to spend ≥4 hours in the ED: 1.9% vs. EP 5.3% (RR=0.37; 95% CI [0.30, 0.45])* • Patients treated by a GP in the ED were less likely to leave without being seen: 2.2% vs. EP 3.9% (RR=0.57; 95% CI [0.46, 0.69])* *Patient outcomes*: • No difference in 7-day re-attendance between patients treated by a GP in the ED: 5.5% vs. EP 5.7% (RR=0.96; 95% CI [0.84, 1.09])* *Conclusion*: GPs working in the ED managed self-reporting minor cases with fewer resources than standard care by EPs in the ED, without increasing reattendance rates

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Sharma et al. (2013)[70] United States Retrospective review of data	All adults (aged ≥21 years) who self-referred to ED triage with a low-acuity complaint *N*=9,245 (1,055 intervention, 8,190 comparator)	*Intervention*: DFT consisting of an EP, PA, and RN – the PA assessed, treated, and discharged patients under the guidance of the EP and support of RN; this service was available weekdays 10:00–20:00 *Comparators*: Historical cases, prior to the implementation of the DFT and cases seen when the DFT was not on service *Period for comparison*: Retrospective review through data from low-acuity treated and released patients Jun–Oct 2009 and Jun–Oct 2010	*Service utilization*: • ED LOS for low-acuity conditions reduced by 28 min (15%) when DFT was active compared with times when it was not active (95% CI [22, 33])* • ED LOS for all acuity, treated and released patients was unchanged (1 min; 95% CI [−9, 7])[Ŧ] *Conclusion*: The establishment of the DFT was associated with a significant reduction in LOS for all low-acuity patients

* $p<0.05$

** $p<0.001$

[Ŧ] Non-significant, intervention vs. comparator

CI: confidence interval; ED: emergency department; EP: emergency physician; DFT: Discharge Facilitation Team; GP: general practitioner; LOS: length of stay; min: minute(s); PA: physician assistant; RN: registered nurse; RR: relative risk

TABLE D.4: *Hospital Parallel Services* – effectiveness outcomes from SRs and HTAs

Author, year Number of relevant articles	Intervention(s) and comparator(s)	Outcomes		
		Service utilization	Patient outcomes	Economic outcomes
Crawford et al. (2017)[24] *N*=8 (8 primary studies)	*Intervention*: Co-located GP cooperatives or walk-in clinics *Comparator:* Stand-alone GP cooperatives or walk-in clinics	ED attendance reduced: • Total (2 studies): 9–53% • Low-acuity patients (1 study): R^2=0.5* • Self-referrals: 36% • 3.6% (95% CI [2.5, 4.7])** shift from patients using ED to primary care ED wait times modelled to be shortened by 19% if non-urgent patients diverted to GP (1 study) GP clinic LOS 60 min shorter compared with ED care (120 min, 1 study) GP consultations increased (2 studies): 10–26% 1 study found no change in ED attendance or other measures	NA	NA
NICE (2018)[28] *N*=3 (3 primary studies)	*Intervention*: Minor injury units or walk-in centres co-located within an ED *Comparators*: Stand-alone minor injury units or walk-in centres; absence of minor injury units or walk-in centres	Mean monthly ED avoidance rates varied: • 1 study: 349 lower (95% CI [692 lower, 2 lower])* vs. absence • 1 study: 542 higher (95% CI [347 lower, 1,431 higher])[Ŧ] vs. absence Little impact on the number of cases complying with the ED 4-hour waiting target (2 studies): RR=1.08–1.09 (95% CI [0.98, 1.11]) vs. absence	Re-consultations: no change (2 studies): RR=0.92–0.96 (95% CI [0.77, 1.2]) vs. absence[Ŧ] No effect on mortality (1 study): 1.8 times higher (95% CI [1.6, 2]) vs. absence*	1 study reported a modest cost saving of co-located clinics (mean cost per patient: £3; 95% CI [−£16.50, £10.39])[Ŧ] vs. stand-alone services

Author, year Number of relevant articles	Intervention(s) and comparator(s)	Outcomes		
		Service utilization	Patient outcomes	Economic outcomes
Turner et al. (2015)[3] *N*=5 (1 review, 4 primary studies)	*Interventions*: Co-located GP clinic; GP cooperative *Comparator*: Standard ED	ED attendance (1 study): • Total, 13% decrease • Self-referral, 99.5% decrease (OR=0.003; 95% CI [0.002, 0.004])* • Referrals from GPs, 213.4% increase • ED admissions increased 20.2% GP-cooperative consultations increased 26.0% Planned outpatient follow up increased 5.8% (OR=1.968; 95% CI [1.870, 2.071])* ED LOS decreased (1 study): 60 min (IQR: 40–90 min) vs. 120 min in the ED (IQR: 80–165 min)** Diagnostic test use increased (adjusted OR=1.86; 95% CI [1.06, 3.27])*	NA	NA

* $p<0.05$

** $p<0.001$

Ŧ Non-significant, intervention vs. comparator

CI: confidence interval; ED: emergency department; GP: general practitioner; IQR: interquartile range; LOS: length of stay; min: minutes; NA: not available; NICE: National Institute for Health and Care Excellence; OR: odds ratio; RR: relative risk

TABLE D.5: *Hospital Parallel Services* – effectiveness outcomes from primary studies

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Broekman et al. (2017)[75] Netherlands Cross-sectional observational cost analysis	Patients of all ages who attended a GP and/or an ED for out-of-hours care. *N*=122,061 (58,620 intervention, 63,441 comparator)	*Intervention*: Patients attending a UCC are triaged to either a GP or an ED and assigned a level of urgency *Comparator*: Patients who attended a GP and/or an ED in the usual care setting in which both parties work separately, but are located relatively close to each other (within 5 km) *Period of comparison*: Mar–Apr 2011 and Oct–Nov 2011, 17:00–08:00 weekdays and throughout the day on weekends and holidays	*Economic outcomes*: • Mean costs per episode were higher in UCC, €480 vs. usual care €392 • Mean diagnosis and treatment costs were almost twice as high in UCC, €2,701 vs. usual care €1,369 • Incremental costs for patient satisfaction (*n*=773) were +€145.37 (95% CI [−127.81, 399.94]) • Incremental LOS (*n*=53,289) was −9.92 min (95% CI [−16.99, −2.21]),* indicates a longer LOS in UCC compared with usual care • Bootstrap cost–effect pairs indicate UCC is not dominate on cost-effectiveness *Conclusion*: Self-referring patients from EDs to GP services does not result in lower costs, a shorter LOS or a higher level of patient satisfaction
Chmiel et al. (2016)[76] Switzerland Prospective observational study	Adult patients attending an ED with an HGP *N*=104,469 (50,965 intervention, 57,920 comparator)	*Intervention*: Patients were consecutively triaged by a trained emergency nurse using the emergency severity index scoring, low-acuity patients were routed to the new HGP *Comparator*: Patients treated prior to the creation of the HGP *Period of comparison*: Aug 2007 (pre-intervention: 40 days) to Jun 2011 (3 post-interventions, 2009, 2010, and 2011: 38–45 days); each study period focused on different aspects – feasibility, patient/staff satisfaction, use of diagnostic tests, and costs; HGP hours: 09:00–22:30 weekdays, 10:00–22:30 weekends	*Service utilization*: • ED self-referral attendance reduced, 54.03% to 48.05%* • The HGP reduced burden of increasing patient numbers at the ED by up to 36.35% (2011) • The rate of incorrect triage, referral back to the ED was 3.9% in 2009 and 4.75% in 2011 (4.57% overall) *Conclusion*: The HGP reduced the burden of inappropriate ED use and the majority of low-acuity self-referred patients were conclusively treated at the HGP

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Colliers et al. (2017)[77] Belgium Controlled before-after study	Patients of all ages who attended a GP or an ED on the weekend *N*=11,259 (4,739 intervention, 6,520 control)	*Intervention*: GPC located adjacent to the ED; this cooperative does not have a gatekeeping role with the ED *Comparator*: GPC was located away from hospitals *Period of comparison*: Intervention regions collected data Mar–April 2012 and GPCs offered 24-hour services during the weekends and holidays; the control region collected data Mar–Apr 2011	*Service utilization*: • ED caseload no significant change after implementation of GPC (OR=0.96; 95% CI [0.87, 1.06])[Ŧ] • GP caseload increased significantly after implementation of GPC (OR=1.38; 95% CI [1.23, 1.55])* • Self-referrals to ED decreased after implementation of GPC: 83–80% (intervention) vs. 81–85% (control) *Conclusion*: Implementing a GPC increased the out-of-hours caseload of the GPs and stabilized the caseload of the EDs
Thijssen et al. (2016)[72] Netherlands Observational multicentre records review	First 1,000 patients, of all ages, treated by 7 EDs (small urban and large inner city) *N*=7,000	*Intervention*: ECAPs (an ED and GPC working together, with 1 triage desk); non-urgent self-referrals were redirected to the cooperative, and the cooperative acting as the ED gatekeeper *Comparator:* Non-ECAP hospitals *Period of comparison:* First 1,000 patients attending 7 different facilities, Feb 2013 (9–17 days to reach target)	*Service utilization*: • Median ED LOS: 129 min (intervention) vs. 118 min (control) *Conclusion*: Integration of EDs with out-of-hours primary care was not related to LOS, but the strong primary care system probably contributed to the overall short LOS of ED patients

van der Straten et al. (2012)[71]
Netherlands
Prospective observational study
	Low urgent or urgent self-referred patients of all ages
	N=3,356 (3,129 low urgent, 227 urgent)
		Intervention: Triaged during after hours and allocated to a GCP who assessed for safety and efficiency
		Comparator: NA
		Period of comparison: Sep 2009−Oct 2010 weekdays 17:00−08:00 and all weekends
			Service utilization:
			• 82.1% non-urgent patients were triaged to GP
			  ○ 6.5% (*n*=202) patients were referred by GP to ED
			  ○ 1.2% (*n*=36) were hospitalized after GP referred them to ED (17.8% the GP referred)
			• 24.9% urgent patients were triaged to GP
			  ○ 18.1% (*n*=41) patients were referred by GP to ED
			  ○ 4.0% (*n*=9) were hospitalized after GP referred them to ED (22.0% the GP referred)
			Patient outcomes:
			• Non-urgent patients:
			  ○ In random sample of patients, *n*=222 discharged by the GP, 8 (3.6%) returned to the ED (5 correctly discharged by GP, 2 incorrectly discharged by GP, 1 ambiguous)
			• Urgent patients:
			  ○ Of those discharged by the GP (*n*=111), 5 (4.5%) returned to the ED (3 correctly discharged by GP, 2 ambiguous)
			Conclusion: Self-referred non-urgent and urgent patients are treated effectively and safely by a GP

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
van Gils-van Rooij et al. (2015)[73] Netherlands Observational records review	Patients of all ages who attended a GP and/or an ED for out-of-hours care *N*=122,061 (58,620 intervention, 63,441 comparator)	*Intervention*: Patients attending UCC are triaged to either a GP or an ED and assigned a level of urgency *Comparator*: Patients who attended a GP and/or an ED in the usual care setting in which both parties work separately, but are located relatively close to each other (within 5 km) *Period of comparison*: Mar–Apr 2011 and Oct−Nov 2011, 17:00−08:00 weekdays and throughout the day on weekends and holidays	*Service utilization*: • Patients attended the ED less frequently: 21.6% (intervention) vs. usual care 27.6% (comparator)* • Controlling for patient and health problem characteristics, patients attended the ED for treatment less often than their usual care (OR=0.691 (95% CI [0.662, 0.721])* *Conclusion:* UCC significantly substitutes ED attendance, and is effective in intercepting patients who attend the ED
van Gils-van Rooij et al. (2016)[74] Netherlands Observational records review	All patients with asthma/COPD or sprained ankle who attended a GP and/or an ED during out-of-hours *N*=108,885 (50,965 intervention, 57,920 comparator)	*Intervention*: 3 UCCs, in which a GP cooperative and an ED each have their own department, while sharing an entrance/triage *Comparator*: *3* GPs usual care service located relatively close (within 5 km), but separate from the ED *Period of comparison*: Electronic medical records were obtained Mar–Apr and Oct–Nov 2011, 17:00–08:00 weekdays and weekends	*Service utilization*: • Overall UCCs LOS were 4:52 min longer than usual care wait times** • Overall UCCs wait times were 4:43 min longer than usual care wait times** • LOS and wait time were shorter in cases where patients were treated only by the GP** • LOS was longest for patients who were treated in the ED after consultation from the GP in the UCC,** but no change in overall wait time[Ŧ] *Conclusion*: UCCs do not enhance the efficiency of patient flow; the median LOS and wait times were significantly longer in UCCs and more handovers occur in UCCs compared with usual care

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
van Veelen et al. (2016)[78] Netherlands Uncontrolled before-after study	All patients who attended an ED *N*=16,247 (8,311 intervention, 7,936 control)	*Intervention*: Records assessed after the implementation of a co-located GPC in an inner-city level one trauma centre *Comparator*: Records were assessed before the implementation of a co-located GPC *Period of comparison*: Data was retrieved from the hospital's electronic patient database: control Oct–Nov 2012 and intervention Oct–Nov 2013	*Service utilization*: • Number treated in ED declined 20.3% (7,936 patients in the control period vs. 6,322 in intervention period) ○ Self referrals declined (52.6% from 62.7%)** ○ Referred patients increased (51.6% from 37.3%)** • Median LOS increased (125 min in the intervention group vs. 89 min in the control group)** • Total ED LOS increased 270 hours** even though treating fewer patients (14,962 hours in intervention vs. 14,682 hours in the control) *Patient outcomes*: • 1,989 self-referrals (45.5%) were directed to the GPC; of these, 169 (8.5% of redirected, 3.6% of total) required specialist care and were transferred back to the ED *Conclusion*: GPC led to redirection of self-referrals but, despite a 20% decrease in the total number of patients, LOS of remaining patients at the ED increased, which may be due to a change in patient population

* $p<0.05$

** $p<0.001$

ŦNon-significant, intervention vs. comparator

CI: confidence interval; COPD: chronic obstructive pulmonary disease; ECAP: emergency care access points; ED: emergency department; GP: general practitioner; GPC: general practitioner cooperative; HGP: hospital-integrated general practice; LOS: length of stay; min: minutes; NA: not available; OR: odds ratio; RR: relative risk; UCC: urgent care collaboration

TABLE D.6: *Community Advanced Services* – effectiveness outcomes from primary studies

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Allen et al. (2019)[83] United States Retrospective records review	All non-emergent patients seen at an ED that did not result in an admission	*Intervention*: Urgent care centre *Comparator*: Times when urgent care centres are not available *Period of comparison*: Data on urgent care centres came from an online database and ED visit data came from the Healthcare Cost and Utilization project State Emergency Department database; 2012	*Service utilization*: • ED attendance: ○ No impact on non-emergent ED visits in the morning when 1 urgent care centre in a ZIP code opens (−0.46%), or when more than 1 urgent care centre in a ZIP code opens (0.91%)[Ŧ] ○ Statistically significant increase in non-emergent ED visits among privately insured individuals in ZIP codes with multiple urgent care centres after the last urgent care centre closes for the evening (1.01%, 1.43% relative increase)* ○ No significant increase in non-emergent ED visits among privately insured individuals in ZIP codes with a single urgent care centre when it closes in the evening (0.58%, 0.81% relative increase)[Ŧ] *Conclusion*: Urgent care centres are a successful substitution for EDs in the treatment of non-emergent conditions
Carlson et al. (2019)[80] United States Retrospective cohort geospatial analysis	All adult patients (aged ≥20 years) with a known address seen by the ED at 2 urban tertiary care academic medical centres *N*=202,606	*Intervention*: Living within 1 mile of an open urgent care centre *Comparator*: Not living within close proximity to an urgent care centre *Period of comparison*: Electronic medical record data from ED visits occurring Apr 2016–Mar 2018	*Service utilization*: • ED utilization: ○ The odds of visiting the ED for low-acuity conditions relative to all other visits at Medical Centre 1 was not significant (OR=0.98; 95% CI [0.88, 1.10])[Ŧ] ○ Proximity to an affiliated urgent care centre was associated with a relative decrease in the likelihood of visiting the ED for low-acuity conditions at Medical Centre 2 (OR=0.87; 95% CI [0.77, 0.98])* *Conclusion*: Urgent care centre development may be an effective strategy for health systems hoping to decrease ED utilization for low-acuity conditions at academic medical centres
Johnson et al. (2018)[84] Canada Uncontrolled before-after evaluation	Non-emergent patients seen at EDs and/or urgent care	*Intervention*: Clinical consolidation, including conversion of an ED to an urgent care centre, closure of another urgent care centre, and additional treatment space added at another ED *Comparator*: Pre-intervention period *Period of comparison*: The first phase of major changes	*Service utilization*: • Overall (all EDs and urgent care): ○ Wait time decreased 19% (21 min) ○ LOS decreased 6% (14 min) ○ Monthly trends show that improvements began before implementation ○ Regional 30-day readmission rates remained within expected range *Patient outcomes*: • Patient satisfaction (825/26,331 responses ED and urgent care visits): ○ 94% of patients rated their care positively ○ 74% of patients rated their wait time positively ○ Number of complaints remained within the expected range

Study	Participants	Intervention and comparator(s) Period of comparison	Findings

		to clinical services took place 3 Oct 2017 and the first 3 months were evaluated and compared with 2016/17 ED visits	• Safety:
			  ○ Critical incidents reported remained in the expected range, and none were related to the consolidation
			  ○ Non-critical safety events spiked briefly, due to technical errors in reporting
			Conclusion: Consolidation of services and strengthening how services are coordinated regionally are likely factors for the improvements seen so far.

Llovera et al. (2018)[81] United States Retrospective review of billing data	All patients seen by the ED *N*=677,995	*Intervention*: Urgent care centres located within a 5-mile radius of an ED; these centres cannot accept Medicaid insurance *Comparators*: Pre-expansion period (1 centre in 2009, 4 in 2016), acuity status, insurance status *Period of comparison*: Computerized billing data of all ED patients Jan 2009–Dec 2016	*Service utilization*: • Overall ED attendance rose (80,478 in 2009 to 85,278 in 2016) • In pharyngitis patients, ED attendance decreased (1% to 0.6%)** • In bronchitis patients, ED attendance deceased (0.5% to 0.13%)** • More Medicaid patients presented with pharyngitis to the ED, with an increasing trend from 2009 to 2016 (OR=2.33)** *Conclusion*: With the introduction of 4 new urgent care centres within 5 miles of the hospital, ED diagnoses of pharyngitis and bronchitis decreased significantly; significantly more Medicaid discharged patients presented to the ED with pharyngitis than in the non-Medicaid discharged group

Patidar et al. (2017)[79]
United States
Cross-sectional observational cost analysis
	Hospitals and FSEDs who responded to the national survey of FSEDs	*Intervention*: FSEDs open 156 hours/week or urgent care centres open 24 hours, 7 days/week
		Comparator: NA
		Period of comparison: Phone surveys of both hospitals and FSEDs conducted 2003–2009; FSED data was merged with county-level data from secondary datasets; the Dartmouth Atlas was used to calculate Medicare expenditure by county
			Economic outcomes:
			• Average Medicare expenditure per person:
			  ○ $55 higher for every additional FSED in a county*
			  ○ 0.7% increases per beneficiary relative to the average during the study period ($8,360 during the study period)
			Conclusion: FSEDs may increase access to emergency care and may result in higher overall Medicare expenditures

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Simon et al. (2012)[82] United States Retrospective records review	All patients seen at either of 2 FSEDs or the main ED	*Intervention*: ED volume after 2 FSEDs were operational *Comparator*: ED patient volume prior to either FSED opening *Period of comparison*: A retrospective analysis of hospitals databases at a main ED and 2 FSEDs Jan 2007–Jun 2007 (control); Jul 2007–Jul 2009 (1 FSED opened) and Aug 2009–Jun 2010 (both FSEDs were open)	*Service utilization*: • Decrease in main ED attendance: ○ 4,675 patients/month during control period vs. 4,326 patients/month during period when 2 FSEDs were operational (p=0.022)* (7.5% decrease over the 3 years studied) ○ Volume for all facilities increased over time (4,632/month control period, 5,642/month when 1 FSED in operation, and 6,808/month when 2 FSEDs in operation)** (increase of 45%) *Conclusion*: Opening 2 FSEDs decreased the volume and admission rates for the main ED and increased the overall ED volume for the health system
Sylus Consulting (2014)[85] Canada Uncontrolled before-after evaluation	Patients seen at the CEC or ED	*Intervention*: CEC, which includes primary care and urgent care capacity out-of-hours *Comparator*: Pre-intervention period (first centre opened 27 Jul 2011) *Period of comparison*: Utilization data was collected from sources made available by the provincial CEC office Apr 2011–Mar 2014	*Service utilization:* • Local ED unplanned overnight closures reduced 90–100% • Based on a 3-month average, only 1 patient per night visits the CEC, with often no patient seeking care *Conclusion*: The CEC model has been successful in providing predictable access to urgent and emergency care services; utilization of CEC services during the overnight shift has been very low

* p<0.05

** p<0.001

ŦNon-significant, intervention vs. comparator

CEC; collaborative emergency centre; CI: confidence interval; ED: emergency department; FSED: free-standing emergency department; GP: general practitioner; LOS: length of stay; min: minutes; OR: odds ratio; RR: relative risk

TABLE D.7: *Community Restricted Services* – effectiveness outcomes from SRs and HTAs

Author, year Number of relevant articles	Intervention(s) and comparator(s)	Outcomes		
		Service utilization	Patient outcomes	Economic outcomes
Crawford et al. (2017)[24] *N*=4 (4 primary studies)	*Intervention*: Stand-alone GP cooperatives or walk-in clinics *Comparator*: Co-located GP cooperatives or walk-in clinics	ED attendance: • 1 study: 8% reduction in daytime non-urgent presentations* • 1 study: ED attendance reduced 175 patients/month[Ŧ] • 1 study: no impact • 1 study: statistical outcomes were too complex for publishing authors to interpret, workloads were not greatly altered	NA	NA
Hoff and Prout (2019)[20] *N*=15 (15 primary studies)	*Interventions*: Retail clinics; convenience clinics; walk-in clinics *Comparator*: Any comparator	NA	Diagnosis and treatment of pharyngitis and respiratory or urinary infections similar or better than other sites (GP, urgent care, or ED; 4 studies) 1 study found reduced continuity of care compared with seeing a primary care provider	In 9 studies, 11/16 individual cost findings supported retail clinics as a low-cost care selling then other site (GP, urgent care, ED), with 8/16 being statistically significant
NICE (2018)[28] *N*=4 (4 primary studies)	*Intervention*: Stand-alone minor injury units or walk-in centres *Comparators*: Minor injury units or walk-in centres co-located within an ED; absence of minor injury units or walk-in centres	ED attendance: • 2 studies: monthly attendance rates absolute risk difference 194.83 lower (95% CI [−322, −67.66]) vs. absence* • 1 study: annual non-ambulance attendance rates RR=1.17 (95% CI [1.03, 1.33]) vs. absence[Ŧ]	NA	1 study reported a modest cost saving of co-located clinics (mean cost per patient £3; 95% CI [−16.50, 10.39])[Ŧ] compared with stand-alone services

* $p<0.05$

** $p<0.001$

[Ŧ] Non-significant, intervention vs. comparator

CI: confidence interval; ED: emergency department; GP: general practitioner; NA: not available; NICE: National Institute for Health and Care Excellence; RR: relative risk

TABLE D.8: *Community Restricted Services* – effectiveness outcomes from primary studies

Study	Participants	Intervention and comparator(s) Period of comparison	Findings
Goodrich et al. (2015)[86] United States Retrospective records review	Children (aged <15 years) receiving care 17:00–22:00 weekdays or weekends *N*=400 (200 intervention, 200 comparator)	*Intervention*: After-hours pediatric clinic that is open to all children in the region, staffed by pediatricians and on-site laboratory and radiology *Comparator*: ED, staffed by emergency medicine physicians *Period of comparison*: Medical records of children attending either an ED or after-hours clinic (17:00–22:00 weekdays or weekends) were reviewed Jan–Jul 2012	*Service utilization*: • 51% (*n*=95) of children in the ED group received x-ray or laboratory tests vs. 23% (*n*=44) in the after-hours group* • 17 patients in the ED group vs. 6 in the after-hours group were admitted to the hospital* (these patients were excluded from further analysis) *Economic outcomes*: • Median charges for 6 diagnoses were lower in the after-hours group: $140 (IQR: $140–$140) vs. the ED group $457 (IQR: $320–$608)* • Median charges for 6 diagnoses were $305 (95% CI [−348, −261]) more for the ED group compared with the after-hours group** after adjustment for age, sex, insurance status, and diagnosis *Conclusion*: Charges for pediatric health care delivered in an after-hours clinic were less than those in an ED
Patwardhan et al. (2012)[87] United States Retrospective records review	Patients seen in the clinic who identified where they would have gone if they had not come to the clinic *N*=2,675,303	*Intervention*: CCC *Comparator*: NA *Period of comparison*: Electronic medical records were obtained from 1 Jan 2007–31 Dec 2009	*Service utilization:* • Responses to the question “Where would you have gone for care if you did not come to the clinic?”: ○ ED: 4.5% weekend, 3.15% weekday ○ Urgent care centre: 29.39% weekend, 27.34% weekday ○ GP: 56.05% weekend, 58.39% weekday ○ No treatment: 10.06% weekend, 11.12% weekday *Economic outcomes*: • Using benchmark average visits costs (CCC, $110; ED, $570; urgent care centre, $156; primary care physician, $166) ○ Potential cost saving due to avoidance of a visit to the ED, urgent care centre, or primary care physician is estimated at $135.53 million saved or $51 per patient encounter saved *Conclusion*: CCCs can be ideal alternative venues for non-urgent care especially outside of regular physician hours, and may result in cost savings for the health system

* $p<0.05$

** $p<0.001$

ŦNon-significant, intervention vs. comparator

CCC: convenience care clinic; CI: confidence interval; ED: emergency department; GP: general practitioner; IQR: interquartile range; LOS: length of stay

TABLE D.9: *Community Home Services* – effectiveness outcomes from SRs and HTAs

Author, year Number of relevant articles	Intervention(s) and comparator(s)	Outcomes		
		Service utilization	Patient outcomes	Economic outcomes
Guo et al. (2017)[34] *N*=20 (3 reviews, 17 primary studies)	*Intervention*: ECPs *Comparators*: Traditional paramedics; walk-in clinics; urgent care; GPs; EDs	ED attendance: • 6–58% transported to the ED by ECPs vs. 60–80% by paramedics at same time period* • 54–90% treated on-site by ECPs* Re-attendance or relapse: • 6–13% seen by emergency medical services or ED within 7–28 days of initial contact Care processes (diagnosis, investigations instigated, and treatment initiated) equivalent or better than traditional roles: • 1 study: adjusted OR=5.04 (95% CI [1.87, 13.60])* vs. GP and adjusted OR=5.15 (95% CI [2.90, 9.12])* vs. paramedic	Patient satisfaction was high: • Overall, 1 study: RR=1.16 (95% CI [0.09, 1.23])* • Thoroughness, 1 study: OR=1.4 (95% CI [1.0, 1.9])* • Explaining what happens next, 1 study: OR=1.5 (95% CI [1.1, 2.1])*	Mean cost per ECP patient £24 vs. ED contact: £55 (1 study)
NICE (2018)[29] *N*=4 (4 primary studies)	*Intervention*: ECPs *Comparator*: Traditional paramedics	ED attendance: • 1 study: Within 28 days of ECP contact was reduced (RR=0.72; 95% CI [0.69, 0.75])* • 1 study: Unplanned attendance was unaffected (RR=1.25; 95% CI [0.97, 1.62])[Ŧ] Hospitalization: • Hospital admissions (0–28 days) are reduced (1 study: RR=0.87; 95% CI [0.8, 0.94]), as were patients referred to hospital (ED or direct admission to a hospital ward; 1 study: RR=0.46; 95% CI [0.41, 0.5])	Unchanged mortality (1 study: RR=0.87; 95% CI [0.63, 1.20])[Ŧ] Patient and/or caregiver satisfaction increased (1 study: RR=1.8; 95% CI [1.08, 1.29])*	The probability of ECPs being cost-effective is at a threshold of £20,000 per QALY gained with >95% confidence
Turner et al. (2015)[3] *N*=6 (5 reviews, 1 primary study)	*Interventions*: ECPs; treat and refer; treat and leave *Comparator*: Traditional paramedics	All reviews found that ECPs reduced the number of patients being transported to the ED 1 review: Pooled OR=0.09 (95% CI [0.04, 0.18])* for transport to ED and 10.5 (95% CI [5.8, 19])* for discharge at the scene	Advice was clearer from ECPs than traditional staff ECPS decision-making was safe and appropriate Higher satisfaction for those treated by ECPs compared with usual care	4 studies showed lower costs with ECPs

* $p<0.05$

** $p<0.001$

ǂ Non-significant, intervention vs. comparator

CI: confidence interval; ECP: emergency care practitioner; ED: emergency department; GP: general practitioner; NICE: National Institute for Health and Care Excellence; OR: odds ratio; QALY: quality-adjusted life year; RR: relative risk

TABLE D.10: *Community Home Services* – effectiveness outcomes from primary studies

Study	Participants	Intervention and comparator Period of comparison	Findings

Abrashkin et al. (2016)[88]
United States
Retrospective records review
	Patients enrolled in the advanced illness management (AIM) program
	N=773
	(404 intervention, 369 comparator)
		Intervention: Patients evaluated at least once by CP (paramedics acting as physician extenders to provide urgent in-home health care with telemedicine-enhanced GP guidance)
		Comparator: Patients evaluated only by traditional emergency medical services
		Period of comparison: Electronic health records, post visit feedback via a survey and Center for Emergency services records were examined 1 Jan 2014–30 Apr 2015
			Service utilization:
			• 664/1,755 events (37.8% were CP responses)
			• 78% of CP responses patients were evaluated, treated, and remained at home; 22% resulted in ED transport
			• Hospitalization rate was significantly higher for individuals transported after a CP response (82.2%) than after a traditional EMS transport (68.9%)**
			• There was no difference in LOS between individuals admitted to the hospital after transport by CP (5.9 days) vs. traditional EMS (5.2 days)
			• Of individuals who were treated at home by CP, 1.7% (9/518) attended the ED within 24 hours
			Patient outcomes:
			• Patient/caregiver satisfaction (*n*=116) 35% response rate:
			  ○ 100% agreed or strongly agreed that CP care was high quality
			  ○ 97% would use the CP service in the future
			  ○ 91.4% would have gone to the ED if CP service had not been available
			Conclusion: This model could enhance current treatment of homebound individuals with advanced illness; CP can safely assess and treat medically complex individuals at home and can identify individuals who require inpatient treatment

* $p<0.05$

** $p<0.001$

ŦNon-significant, intervention vs. comparator

CP: community paramedicine; ED: emergency department; GP: general practitioner

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Author Contributions

Lindsey Warkentin designed, conducted, and wrote the evidence synthesis review.

Lisa Tjosvold conducted the literature searches for the review.

Bing Guo oversaw the design and conduct of the review, and reviewed the draft report.

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