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Walk-in clinics versus physician offices and emergency rooms for urgent care and chronic disease management (Review)

Chen CE, Chen CT, Hu J, Mehrotra A

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[Intervention Review]

Walk-in clinics versus physician offices and emergency rooms for urgent care and chronic disease management

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ABSTRACT

Background

Walk-in clinics are growing in popularity around the world as a substitute for traditional medical care delivered in physician offices and emergency rooms, but their clinical efficacy is unclear.

Objectives

To assess the quality of care and patient satisfaction of walk-in clinics compared to that of traditional physician offices and emergency rooms for people who present with basic medical complaints for either acute or chronic issues.

Search methods

We searched CENTRAL, MEDLINE, Embase, six other databases, and two trials registers on 22 March 2016 together with reference checking, citation searching, and contact with study authors to identify additional studies. We applied no restrictions on language, publication type, or publication year.

Selection criteria

Study design: randomized trials, non-randomized trials, and controlled before-after studies. Population: standalone physical clinics not requiring advance appointments or registration, that provided basic medical care without expectation of follow-up. Comparisons: traditional primary care practices or emergency rooms.

Data collection and analysis

We used standard methodological procedures expected by Cochrane and the Cochrane Effective Practice and Organisation of Care (EPOC) Group.

Main results

The literature search identified 6587 citations, of which we considered 65 to be potentially relevant. We reviewed the abstracts of all 65 potentially relevant studies and retrieved the full texts of 12 articles thought to fit our study criteria. However, following independent author assessment of the full texts, we excluded all 12 articles.

Authors' conclusions

Controlled trial evidence about the mortality, morbidity, quality of care, and patient satisfaction of walk-in clinics is currently not available.

PLAIN LANGUAGE SUMMARY

Comparing walk-in clinics to physician offices and emergency rooms

What is the aim of this review?

This review sought to compare the quality of care and patient satisfaction between walk-in clinics and other medical practice settings.

Key messages

Walk-in clinics are growing in popularity around the world, but it is unclear if the medical care provided by walk-in clinics is comparable to that of physicians' offices or emergency rooms.

What was studied in the review?

Frequently offering extended hours, shorter wait times, and lower prices, retail clinics have become popular alternatives to traditional physician offices and emergency rooms for people with low acuity illnesses. Despite their growing popularity, walk-in clinics have been controversial. Surveys have shown that some doctors in the UK, Canada, and Australia are concerned that walk-in clinics may provide lower quality care than physician offices. In the US, prominent physician groups have voiced similar concerns. A systematic review of the research literature on the quality and patient satisfaction of walk-in clinics as compared to physician offices and emergency rooms would give patients, practitioners, and health policymakers an objective understanding of this increasingly important but controversial healthcare resource.

What are the main results of the review?

An extensive search found no studies addressing this question that fit our study criteria.

How up-to-date is this review?

The review authors searched for studies that had been published up to March 2016.

BACKGROUND

Description of the condition

While the health systems of different countries vary significantly with regard to reimbursement schemes (e.g. universal coverage versus private insurance markets) and care delivery structures (e.g. publicly funded hospital systems versus free markets of for-profit and non-profit hospitals), many are confronting a shortage in healthcare workers in the face of aging populations and growing chronic disease burden (WHO 2013; Laurant 2009).

In an effort to better utilize existing workers, reduce healthcare costs, and improve access to care, a number of countries have begun shifting medical duties traditionally performed by physicians in high-intensity care settings (e.g. emergency rooms) into lower-intensity settings (e.g. outpatient clinics) (Bell 1992; Jenkins-Clarke 1998; Whitecross 1999; Szafran 2000). In this context, walk-in clinics have risen in popularity as health systems attempt to provide lower cost, more accessible care for the diagnosis, and treatment of low acuity conditions (Enright 2014).

Description of the intervention

For the purposes of this study, walk-in clinics will be defined as standalone physical clinics not requiring advance appointments or registration, that provide basic medical care without expectation of follow-up, and are not traditional primary care practices or emergency rooms. Basic medical care means conditions that do not require advanced laboratory or imaging for diagnosis or complex procedures for treatment (Mehrotra 2009). Lack of follow-up means that walk-in clinics provide medical care primarily for acute conditions or occasionally one-off issues in people with chronic disease but not ongoing, comprehensive management of chronic issues via a longitudinal patient-provider relationship as a primary care office would (Cassel 2012).

Like all medical service units, walk-in clinics vary from country to country in design but do have several key characteristics, as described above, that make these clinics unique from other practice settings such as traditional physician offices and emergency rooms (Cassel 2012; Stroke Unit Trialists' Collaboration 2013).

Traditional primary care physician offices are led by doctors with ancillary support staff including nurses and medical assistants. These offices are equipped to handle both acute and chronic medical conditions, and typically have limited hours and require advance appointment booking. Physicians in these practices typically take responsibility and are a stable source of care for a large group of people over a long-term period, building a longitudinal relationship with each person over repeated office visits. Emergency rooms are medical units designed to diagnose and treat acute medical conditions that require immediate medical attention.

Similar to physician offices, emergency rooms are typically led by doctors with ancillary support staff. Most often attached to tertiary care facilities, emergency rooms are able to handle higher levels of medical acuity with ready access to in-house laboratories, imaging facilities, and specialty consults. Explicitly designed to stabilize and triage people to the level of care they require, emergency rooms do not offer longitudinal care services. Once people are deemed clinically stable, they are transferred elsewhere for ongoing or follow-up care.

By contrast, walk-in clinics are outpatient medical units designed to provide acute treatment for low-risk conditions such as common coughs and colds. Walk-in clinics can also augment chronic disease management as an accessible setting for one-off issues but are generally not suited for ongoing monitoring or prevention of long-term complications. Compared to traditional physician offices and emergency rooms, walk-in clinics typically offer a more convenient experience in terms of location (typically a retail or community setting, not associated with a hospital), service (e.g. no appointments required; transparent pricing), and hours (open after hours on evenings and weekends) (Ahmed 2010; Weinick 2010).

Many countries have developed walk-in centers as a lower-cost and more accessible alternative to traditional sources of care. In Canada, walk-in clinics were first established in Ontario in 1984 as an inexpensive way to reduce long waiting times for physician appointments (Hutchison 2003). In the UK, nurse-run walk-in centers began in 2001 and now see about seven million visits a year (Salisbury 2002; NHS 2013). Australia adopted its first nurse-run walk-in clinics in 2010 (Desborough 2013). In the US, walk-in clinics were introduced in 1973 and have experienced enormous growth since the mid-2000s (Jones 2000). From 2007 to 2009, visits to US retail clinics, one type of walk-in clinic, increased from 1.48 million to 5.97 million annually (Mehrotra 2012). With the Affordable Care Act expected to extend coverage to 25 million new Americans over the next 10 years, without a corresponding increase in the supply of physicians, walk-in clinics seem to be poised for even greater volume in the US (CBO 2014). While these visits still represent a small share overall of outpatient visits around the world, walk-in clinics are growing in importance around the globe (WHO 2013).

How the intervention might work

The proliferation of walk-in clinics could divert people with uncomplicated illnesses away from traditional physician offices and emergency rooms (Ashwood 2011). By doing so, they have the potential to reduce healthcare costs, improve access to care, and reduce medical workforce pressures (Cassel 2012). However, there is concern that they could provide lower-quality care.

Why it is important to do this review

Despite their growing popularity, walk-in clinics have been controversial. One survey of UK general practitioners revealed concern that walk-in centers may provide lower-quality care than traditional physician offices due to less-trained personnel and lack of continuity of care (Pope 2005). In Canada, surveys show physicians view walk-in clinics as inferior sources of care compared to emergency rooms or family physician offices (Hutchison 2003). Surveys of Australian doctors show similar concerns (Parker 2012). In the US, prominent physician groups such as the American Medical Association, American Academy of Family Physicians, and the American Academy of Pediatrics have raised concerns that the quality of care delivered by walk-in clinics may be lacking, and that walk-in clinics may disrupt physician-patient relationships and continuity of care (AAFP 2013). A systematic review of the research literature on the care quality and patient satisfaction of walk-in clinics as compared to physician offices and emergency rooms would give patients, practitioners, and health policymakers

an objective understanding of this increasingly important but controversial healthcare resource.

OBJECTIVES

To assess the quality of care and patient satisfaction of walk-in clinics compared to that of traditional physician offices and emergency rooms for people who present with basic medical complaints for either acute or chronic issues.

METHODS

Criteria for considering studies for this review

Types of studies

Because there are few randomized trials available for walk-in clinics, we planned to also include non-randomized trials and controlled before-after studies.

- Randomized trials: random or quasi-random allocation of participants to walk-in clinics or a control (i.e. physician offices or emergency rooms), in which participants in each group differed only in their exposure to a different source of medical care. Factors that might affect the outcomes of interest were equally distributed between the two groups.
- Non-randomized trials: participants who were treated by walk-in clinics and prospectively compared to participants treated in physician offices or emergency rooms.
- Controlled before-after studies: participants seen in a walk-in clinic compared with participants seen in a doctor's office or emergency room, but the participants were not randomized to each intervention site. Clinical outcomes before and after participants sought medical attention were compared (e.g. participants rate their symptoms on a standardized scale before and after their healthcare visit, and the difference between sites was compared).

All studies were to meet the inclusion criteria for studies outlined by the Cochrane Effective Practice and Organisation of Care (EPOC) Group (EPOC 2013a). We planned to include both individually and cluster-randomized trials. To be included, controlled before-after studies had to include at least two intervention groups and two comparable control groups. We also planned to exclude randomized studies with only one intervention or control site.

Types of participants

People who presented to a walk-in clinic with a medical complaint were eligible for inclusion in the intervention group. People who presented to a physician office or emergency room with a medical complaint was eligible for inclusion in the control group.

Types of interventions

Our focus was on comparing the outcomes achieved in walk-in clinics (the intervention group) compared to traditional physician offices or emergency rooms (control groups) in treating both acute and chronic conditions. Acute conditions referred to diseases with symptoms that arose over days to weeks and, with appropriate medical intervention, were expected to fully resolve within days to weeks. Typically, a single care episode was all the medical attention required. Examples of common acute conditions included upper respiratory infections, sinusitis, bronchitis, otitis media, pharyngitis, conjunctivitis, and urinary tract infections. Chronic conditions referred to diseases with symptoms that typically arose over months and for which there was typically no curative medical therapy that could achieve total disease resolution. For such conditions, long-term medical management was often required. Common chronic conditions included asthma, diabetes mellitus, hypertension, and chronic obstructive pulmonary disease.

Studies with a definition of walk-in clinics meeting all four criteria described above were eligible for the review (see Description of the intervention. For each included study, we planned to complete a data extraction form documenting that the definition of walk-in clinic met the inclusion criteria (see Data extraction and management). We planned to include these tables in an appendix. We also planned to do a sensitivity analysis that excluded studies which met partial but not full criteria to evaluate the impact on the results (see Sensitivity analysis).

Types of outcome measures

Primary outcomes

- Mortality.
- Morbidity.
- Quality of care (specifically adverse events and adherence to practice guidelines).

We planned to report in our findings of how the primary outcome for each study were selected. Primary outcomes were only to include objective measures.

Secondary outcomes

- Participant satisfaction scores
- Participant preference for return to walk-in clinics.

Secondary outcomes were only to include objective measures.

Search methods for identification of studies

Electronic searches

The EPOC Information Specialist in consultation with the authors developed a sensitive search strategy designed to retrieve trials studies from electronic bibliographic databases. We searched the Cochrane Database of Systematic Reviews (CDSR) and the Database of Abstracts of Reviews of Effects (DARE) for related systematic reviews and the following databases from inception to 22 March 2016:

- Cochrane Central Register of Controlled Trials (CENTRAL; 2016, Issue 2);
- MEDLINE via Ovid (from 1946);
- Embase via Ovid (from 1974);
- CINAHL via EBSCO (from 1981);
- PubMed (www.ncbi.nlm.nih.gov/pubmed/);
- PubMed Central (www.ncbi.nlm.nih.gov/pmc/);
- Health Technology Assessment Database (HTA; 2016 Issue 1);
- NHS Economic Evaluation Database (NHSEED; 2015, Issue 2).

The search terms combined MeSH and free-text words as shown in the MEDLINE strategy in Appendix 1. The MEDLINE strategy was translated using appropriate syntax and vocabulary for other databases. Results were limited by two methodological filters: the Cochrane Highly Sensitive and Precision Maximising filter

for MEDLINE and Embase to identify randomized trials (Lefebvre 2011), and an EPOC methodology filter (version 2.6) to identify non-randomized designs. We applied no restrictions on language, publication type, or publication year.

Searching other resources

Grey Literature

We conducted a grey literature search on 22 March 2016 to identify studies not indexed in the databases listed above. Sources were:

- Joanna Briggs Institute (www.joannabriggs.edu.au/Search.aspx);
- World Health Organization (WHO) International Clinical Trials Registry Platform (apps.who.int/trialsearch/); and
- ClinicalTrials.gov (www.clinicaltrials.gov).

If we identified any additional grey literature sources, we planned to report them in the review. We reviewed the reference lists of all papers and relevant reviews identified by the electronic database searches. We contacted authors and field experts for any additional published or unpublished data. We planned to contact authors of active or completed trials for provisional results if they had not yet been published.

Data collection and analysis

Selection of studies

Two review authors (CTC and CEC) independently reviewed the title and abstract of all potential citations, and excluded any that did not meet inclusion criteria using the screening questions outlined in Appendix 2. Two review authors (CTC and CEC) read the remaining studies in full and independently assessed them to determine whether they met the eligibility criteria. We resolved differences between the review authors by consensus and discussion with third review author (JH). We documented full-text papers that were excluded, along with the reasons for exclusion (see Characteristics of excluded studies table). We planned to extract studies that generated more than one manuscript as one, and for manuscripts that reported more than one study, to extract each study separately.

Data extraction and management

Two review authors (CEC and CTC) independently extracted data from each study using a modified EPOC data collection form (Appendix 3). The data extraction form included the walk-in clinic definition, study design, demographics, and outcome measures. We planned to resolve discrepancies by consensus and discussion with third review author (JH).

Assessment of risk of bias in included studies

We planned to use the Cochrane 'Risk of bias' tool (Higgins 2011), and the EPOC-specific criteria (EPOC 2013b) to assess the risk of bias in the included studies. For randomized trials, non-randomized trials, and controlled before-after studies, these nine criteria included: sequence generation, concealment, outcome measurement, baseline characteristics, incomplete outcome data, blinding, contamination protection, selective outcome reporting, and other bias.

Based on these Cochrane and EPOC-specific criteria, two review authors planned to independently determine whether each study had a low, high or unclear risk of bias for each domain. If the two review authors disagreed, a third review author was to review the study and resolve the discrepancy through discussion. For studies that met inclusion criteria, we planned to describe the risk of bias for each domain with a descriptive summary justifying our decision. We also intended to measure risk of bias across studies for each primary and secondary outcome, considering the magnitude and direction of basis, as well as likelihood of whether bias was affecting the findings.

Measures of treatment effect

We planned to measure treatment effect based on the prespecified outcome variables and follow the framework as outlined by the Cochrane EPOC Group (EPOC 2013c). For all effect estimates, we intended to calculate the corresponding 95% confidence interval (CI). For dichotomous outcomes (e.g. mortality), we planned to use logit regression to calculate the adjusted odds ratio (OR) as the difference in outcome for patients treated by walk-in clinics (intervention group) versus patients treated by physician offices or emergency rooms (control group). An OR greater than one would indicate a higher likelihood of mortality among participants seen by walk-in clinics compared to the control sites; an OR of less than one would indicate a lower likelihood of mortality among participants seen by walk-in clinics compared to traditional medical sources of care. For continuous outcomes (e.g. participant satisfaction scores), we planned to use standardized mean differences between the intervention and control groups, which would provide a 'scale-free' effect estimate of each study which could be pooled across studies regardless of the original scale of measurement used (Laird 1990). If a study used both dichotomous and continuous measures to measure the same outcome, we planned to report both outcomes. If studies did not provide full information (e.g. standard error was not reported), we planned to contact the study's original author. If this was unsuccessful, then we planned to clearly documented the events and exclude the study from measurement of treatment effect analysis of that outcome.

Unit of analysis issues

To avoid unit of analysis errors, we planned to perform analyses at the same level as the allocation to treatment or control group. For clustered designs, we planned to perform an analysis adjusting for clustering, and reanalyze extracted results that did not adjust for clustering using an estimate of the intracluster correlation coefficient. If a study reported unit of analysis errors and there was insufficient information to reanalyze results, we planned to contact the original study authors to obtain necessary data. If these data were not available, we planned to not report CIs or P values and annotate them as a 'unit of analysis' error.

Dealing with missing data

We planned to seek missing information from the corresponding author of each paper. If we were unable to obtain missing data from a published study, we planned to report this on the data collection form and explicitly state any assumptions made about the missing data. For example, some data might be missing at random whereas other missing data might be associated with a particular outcome. We planned to conduct sensitivity analysis to assess how sensitive the results were to reasonable changes in any assumptions made, and discuss the potential impact of any missing data in the 'Discussion' section.

Assessment of heterogeneity

We planned to investigate heterogeneity by visual examination of forest plots and the Chi^2 test. If these tests were suggestive of differences that were likely to be greater than those due to chance alone, we planned to assess the magnitude of heterogeneity using the I^2 statistic. If the I^2 statistic showed no substantial heterogeneity, we planned to perform meta-analysis as appropriate. If there was substantial heterogeneity, we planned to explore potential explanations using subgroup and sensitivity analyses (see Subgroup analysis and investigation of heterogeneity).

Assessment of reporting biases

To reduce possible publication bias, we attempted to include relevant unpublished studies by searching the grey literature and prospective trial registries. If there were fewer than 10 studies available for a particular outcome, we planned to report that we were unable to assess publication bias. If there were greater than 10 studies available for a particular outcome, we planned to construct funnel plots to make a visual assessment of whether reporting bias might be present and use statistical tests to evaluate funnel plot asymmetry. If there was funnel plot asymmetry, we planned to investigate potential causes, including possible reporting biases, poor methodological quality, outlier data, and true statistical heterogeneity.

Data synthesis

We planned to pool data for meta-analysis when studies were reasonably similar in terms of populations, interventions, characteristics, and outcomes. We intended to perform meta-analyses for outcomes for which there were data from at least three randomized trials, since meta-analysis of fewer than three randomized trials is unlikely to add value beyond a semi-quantitative analysis. We planned to analyze outcomes with data from fewer than three randomized trials using semi-quantitative analysis. We planned to perform meta-analyses using a random-effects model, because there may be natural heterogeneity between studies due to different study settings (e.g. walk-in clinics in urban versus rural areas or in different countries). We planned to perform meta-analysis of dichotomous outcomes using the Mantel-Haenszel method and of continuous outcomes using the inverse variance method. We planned to prepare a table for studies of each type of intervention, which was to include study identification, outcome results including standard errors and ranges of effects, and key explanatory factors (see Appendix 3). Where multiple primary outcomes were reported for a single study, we planned to determine the primary outcome for the study by ranking the intervention effect estimates of the outcomes and selecting the outcome with the median estimate (Brennan 2009).

When summarizing the findings of the review, we intended to assess the certainty of the evidence using the GRADE criteria. We planned to judge the certainty of the evidence for each outcome as high, moderate, low, or very low based on the five GRADE considerations (study limitations, consistency of effect, imprecision, indirectness, and publication bias) and present our assessment in a 'Summary of findings' table (MECIR 2013).

Subgroup analysis and investigation of heterogeneity

We planned to perform subgroup analysis comparing:

- walk-in clinics that had physicians versus walk-in clinics with non-physician medical staff;
- walk-in clinics that offer care for acute conditions versus walk-in clinics that offer care for chronic conditions; and
- walk-in clinics that were managed by traditional healthcare delivery systems versus walk-in clinics that were managed by other organizations.

The rationale for the first subgroup analysis was to determine whether differing levels of training among staff affects quality of care. Some research has suggested that in primary care, nurses can provide as high quality care as physicians along with high levels of patient satisfaction (Laurant 2009). However, these studies have typically compared nurses in walk-in clinics to physicians in traditional offices. Because walk-in clinics are designed for greater patient convenience, it is unclear whether the higher satisfaction scores are due to the clinical setting or the clinical provider. By comparing nurses and physicians in the same clinical setting, we may be able to make a more valid comparison.

The rationale behind the second subgroup analysis was that the episodic, non-continuous care offered by walk-in clinics may be more conducive to caring for acute conditions than chronic conditions. Chronic conditions require multiple visits and medical interventions over time, and are thought to be best managed via longitudinal relationships with primary physicians (AAFP 2013). Thus, the quality of care at walk-in clinics may differ between acute and chronic conditions.

The rationale behind the third subgroup analysis was that walk-in clinics are operated by different entities. In the US, walk-in clinics are primarily operated by independent organizations such as retail organizations, whereas in other countries they may be supported by traditional healthcare entities (e.g. the National Health Service in the UK) (NHS 2013). Walk-in clinics operated by traditional healthcare entities may offer either better quality care (i.e. by drawing on organizational expertise) or worse care (i.e. due to diversion of resources away from walk-in clinics to traditional hospitals and clinics).

Sensitivity analysis

We planned to perform sensitivity analysis to assess the effect of imputing missing data with replacement values. We intended to repeat meta-analyses to assess how sensitive results were to reasonable changes in the assumptions that were made. We planned to perform sensitivity analysis to investigate the impact of excluding studies that meet a partial but not full definition of walk-in clinics. We also planned to conduct sensitivity analyses to assess the impact of excluding studies with a high risk of bias. Finally, if there were one or more very large studies, we planned to do a sensitivity analysis excluding those studies to determine if these studies dominated the results.

RESULTS

Description of studies

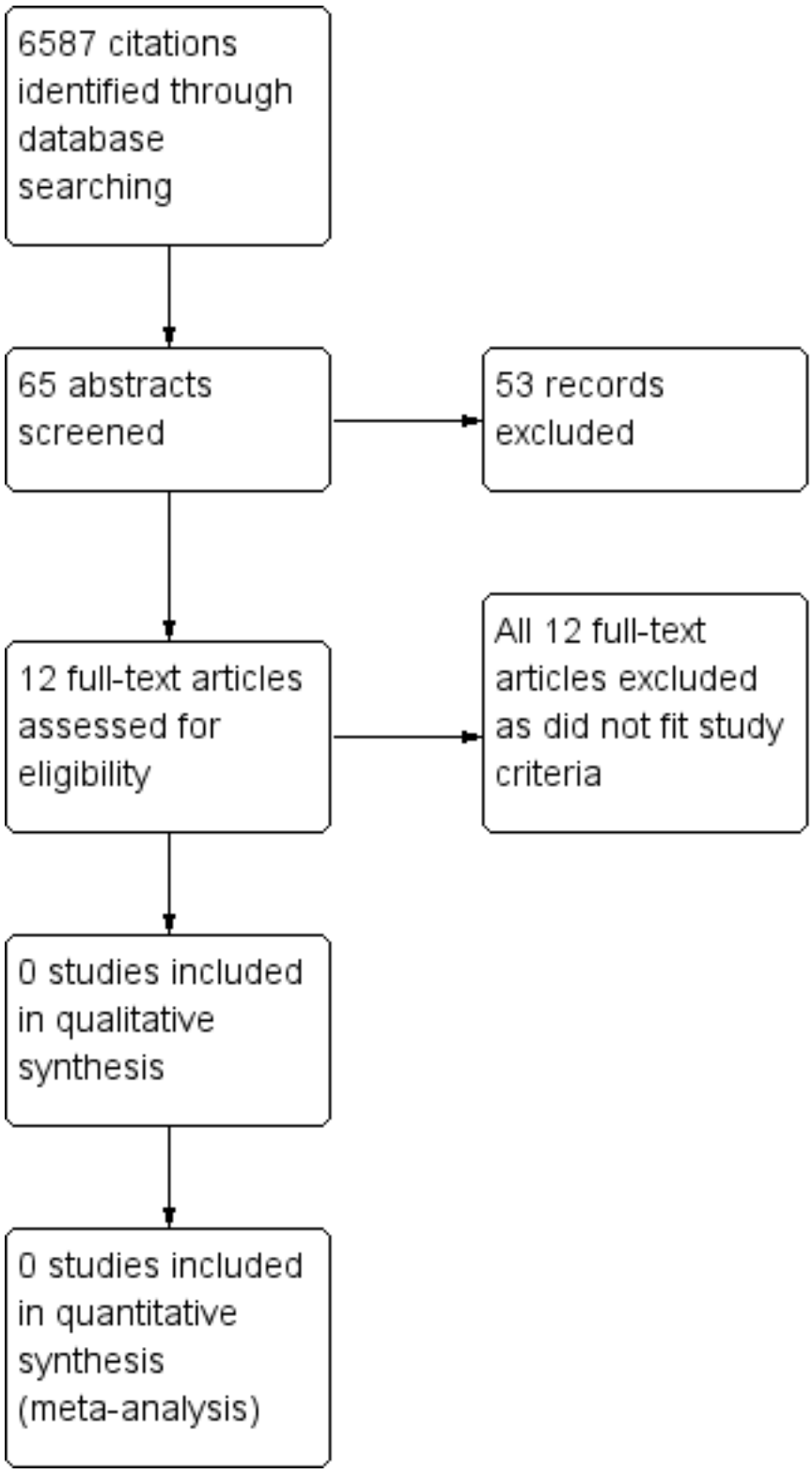
We found no studies.

Results of the search

The initial searches identified 6587 citations; we considered 65 citations potentially relevant. We independently reviewed the

abstracts and retrieved the full texts of 12 studies. We excluded all 12 after independent author assessment. The 12 studies did not meet one or both of two key criteria: they were either nurse-led clinics but not walk-in clinics, as defined by our criteria, or did not meet study type criteria (Figure 1).

Figure 1.



In the grey literature, we identified no ongoing or recruiting studies that met our inclusion criteria.

Because we did not have any papers that met study criteria, we did not conduct sensitivity analysis of studies that met the partial but not full definition of walk-in clinics.

Included studies

We found no studies.

Excluded studies

We excluded 12 potentially relevant studies (see Characteristics of excluded studies table).

Risk of bias in included studies

We found no studies.

Allocation

We found no studies.

Blinding

We found no studies.

Incomplete outcome data

We found no studies.

Selective reporting

We found no studies.

Other potential sources of bias

We found no studies.

Effects of interventions

We found no studies.

DISCUSSION

Walk-in clinics are a widely discussed topic, as demonstrated by the large number of potentially relevant articles in our literature search. However, we identified no articles that met our inclusion criteria.

Summary of main results

We found no studies.

Overall completeness and applicability of evidence

The review is complete.

Quality of the evidence

We found no studies.

Potential biases in the review process

We do not believe our review process was biased. The Cochrane EPOC Information Specialist conducted the search, and there were no deviations from the review protocol.

Agreements and disagreements with other studies or reviews

Given the lack of included studies, we cannot compare our conclusions to that of other studies or reviews.

AUTHORS' CONCLUSIONS

Implications for practice

Various stakeholders have made a variety of claims about the relative clinical efficacy of walk-in clinics as policymakers and providers debate their proper role within healthcare delivery systems. Our review suggests that many of these claims, on both sides of the debate, may not be based on controlled trial evidence.

Implications for research

Despite the increasing popularity of walk-in clinics, there is currently no controlled trial evidence for their quality of care or patient satisfaction with regards to either urgent care or chronic disease management. While we are unable to draw conclusions based on the lack of evidence base, we hope that our review draws attention to the growing importance of walk-in clinics to healthcare delivery around the world and need for research into this area.

The research to date on walk-in clinics has focused on database and registry studies. This is likely due to the technical and ethical complexity of conducting a real-world randomized trial, non-randomized trial, or controlled before-after study.

The ideal of a randomized study design is likely to be challenging in the setting of walk-in clinics. Future research in this field should therefore consider non-randomized studies of walk-in clinics compared with traditional primary care and emergency room settings. If these controlled studies are powered adequately in terms of size and population, they should provide important data on mortality, morbidity, quality of care, and patient satisfaction.

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REFERENCES

References to studies excluded from this review

Ahmed 2010 *{published data only}*

Ahmed A, Fincham J. Physician office vs retail clinic: patient preferences in care seeking for minor illnesses. *Annals of Family Medicine* 2010;**8**(2):117-23.

Arain 2013 *{published data only}*

Arain M, Nicholl J, Campbell M. GP-led walk-in centre in the UK: another way for urgent healthcare provision. *Critical Care* 2013;**17**(Suppl 2):P259.

Arain 2015 *{published data only}*

Arain M, Campbell M, Nicholl J. Impact of a GP-led walk-in centre on NHS emergency departments. *Emergency Medicine Journal* 2015;**32**(4):295-300.

Charlton 2004 *{published data only}*

Charlton J, Mackay L, McKnight J. A pilot study comparing a type 1 nurse-led diabetes clinic with a conventional doctor-led diabetes clinic. *European Diabetes Nursing* 2004;**1**(1):18-21.

Choi 2015 *{published data only}*

Choi E, Ching W, Lam C, Wan EY, Chan AK, Chan KH. Evaluation of the effectiveness of nurse-led continence care treatments for Chinese primary care patients with lower urinary tract symptoms. *PLoS One* 2015;**10**(6):e0129875.

Cleland 2007 *{published data only}*

Cleland J, Hall S, Price D, Lee A. An exploratory, pragmatic, cluster randomised trial of practice nurse training in the use of asthma action plans. *Primary Care Respiratory Journal* 2007;**16**(5):311-8.

Denver 2003 *{published data only}*

Denver E, Barnard M, Woolfson R, Earle K. Management of uncontrolled hypertension in a nurse-led clinic compared with conventional care for patients with type 2 diabetes. *Diabetes Care* 2003;**26**(8):2256-60.

Grant 2002 *{published data only}*

Grant C, Nicholas R, Moore L, Salisbury C. An observational study comparing quality of care in walk-in centres with general practice and NHS Direct using standardised patients. *BMJ* 2002;**324**(7353):1556.

Griffiths 2004 *{published data only}*

Griffiths C, Foster G, Barnes N, Eldridge S, Tate H, Begum S, et al. Specialist nurse intervention to reduce unscheduled asthma care in a deprived multiethnic area: the east London randomised controlled trial for high risk asthma (ELECTRA). *BMJ* 2004;**328**(7432):144.

Hutchison 2003 *{published data only}*

Hutchison B, Ostbyte T, Barnsley J, Stewart M, Mathews M, Campbell MK, et al. Patient satisfaction and quality of care in walk-in clinics, family practices and emergency departments: the Ontario Walk-In Clinic Study. *Canadian Medical Association Journal* 2003;**168**(8):977-83.

Johnson 2014 *{published data only}*

Johnson J, Sayah F, Wozniak L, Rees S, Soprovich A, Qiu W, et al. Collaborative care versus screening and follow-up for patients with diabetes and depressive symptoms: results of a primary care-based comparative effectiveness trial. *Diabetes Care* 2014;**37**(12):3220-6.

Kernick 2002 *{published data only}*

Kernick D, Powell R, Reinhold D. A pragmatic randomised controlled trial of an asthma nurse in general practice. *Primary Care Respiratory Journal* 2002;**11**(1):6-8.

Additional references

AAFP 2013

American Academy of Family Physicians. Retail clinics. www.aafp.org/about/policies/all/retail-clinics.html (accessed 29 November 2013).

Ashwood 2011

Ashwood J, Reid R, Setodji C, Weber E, Gaynor M, Mehrotra A. Trends in retail clinic use among the commercially insured. *American Journal of Managed Care* 2011;**17**(11):e443-8.

Bell 1992

Bell N, Szafran O. Use of walk-in clinics by family practice patients. *Canadian Family Physician* 1992;**38**:507-13.

Brennan 2009

Brennan S, McKenzie J, Whitty P, Buchan H, Green S. Continuous quality improvement: effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews* 2009, Issue 4. [DOI: 10.1002/14651858.CD003319.pub2]

Cassel 2012

Cassel C. Retail clinics and drugstore medicine. *JAMA* 2012;**307**(20):2151-2.

CBO 2014

Congressional Budget Office. The budget and economic outlook: 2014 to 2024. www.cbo.gov/sites/default/files/45010-Outlook2014_Feb_0.pdf (accessed 15 June 2015).

Desborough 2013

Desborough J, Parker R, Forrest L. Development and implementation of a nurse-led walk-in centre: evidence lost in translation?. *Journal of Health Services Research & Policy* 2013;**18**(3):174-8.

Enright 2014

Enright P, Nevin W. Point: should storefront clinics provide case finding and chronic care for COPD? Yes. *Chest* 2014;**145**(6):1191-3.

EPOC 2013a

Cochrane Effective Practice and Organisation of Care (EPOC) Group. What study designs should be included in an EPOC

review and what should they be called?. epoc.cochrane.org/epoc-specific-resources-review-authors (accessed 27 January 2017).

EPOC 2013b

Cochrane Effective Practice and Organisation of Care (EPOC) Group. EPOC 'risk of bias' guideline. epoc.cochrane.org/epoc-specific-resources-review-authors (accessed 27 January 2017).

EPOC 2013c

Cochrane Effective Practice and Organisation of Care (EPOC) Group. Analysis in EPOC reviews. epoc.cochrane.org/epoc-specific-resources-review-authors (accessed 27 January 2017).

Higgins 2011

Higgins J, Green S, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Jenkins-Clarke 1998

Jenkins-Clarke S, Carr-Hill R, Dixon P. Teams and Seams: skill mix in primary care. *Journal of Advanced Nursing* 1998;**28**:1120-6.

Jones 2000

Jones M. Walk-in primary medical care centres: lessons from Canada. *BMJ* 2000;**321**:928.

Laird 1990

Laird N, Mosteller F. Some statistical methods for combining experimental results. *International Journal of Technology Assessment in Health Care* 1990;**6**(1):5-30.

Laurant 2009

Laurant M, Reeves D, Hermens R, Braspenning J, Grol R, Sibbald B. Substitution of doctors by nurses in primary care. *Cochrane Database of Systematic Reviews* 2009, Issue 1. [DOI: 10.1002/14651858.CD001271.pub2]

Lefebvre 2011

Lefebvre C, Manheimer E, Glanville J. Chapter 6: Searching for studies. In: Higgins JP, Green S, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

MECIR 2013

Chandler J, Churchill R, Higgins J, Lasseron T, Tovey D. Methodological Expectations of Cochrane Intervention Reviews (MECIR). Methodological standards for the conduct of Cochrane Intervention Reviews Version 2.3. The Cochrane Collaboration, 2013. editorial-unit.cochrane.org/mecir (accessed 27 January 2017).

Mehrotra 2009

Mehrotra A, Liu H, Adams J, Wang M, Lave J, Thygeson M, et al. Comparing costs and quality of care at retail clinics with that of other medical settings for 3 common illnesses. *Annals of Internal Medicine* 2009;**151**(5):321-8.

Mehrotra 2012

Mehrotra A, Lave J. Visits to retail clinics grew fourfold from 2007 to 2009, although their share of overall outpatient visits remains low. *Health Affairs (Project Hope)* 2012;**31**(9):2123-9.

NHS 2013

National Health Service. NHS walk-in centres. www.nhs.uk/NHSEngland/AboutNHSservices/Emergencyandurgentcareservices/Pages/Walk-incentresSummary.aspx (accessed 15 October 2013).

Parker 2012

Parker R, Desborough J, Forrest L. Stakeholder perceptions of a nurse led walk-in centre. *BMC Health Services Research* 2012;**12**:382.

Pope 2005

Pope C, Chalder M, Moore L, Salisbury C. What do other local providers think of NHS walk-in centres? Results of a postal survey. *Public Health* 2005;**119**(1):39-44.

Salisbury 2002

Salisbury C, Chalder M, Scott T, Pope C, Moore L. What is the role of walk-in centres in the NHS?. *BMJ* 2002;**324**(7334):399-402.

Stroke Unit Trialists' Collaboration 2013

Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. *Cochrane Database of Systematic Reviews* 2013, Issue 9. [DOI: 10.1002/14651858.CD000197.pub3]

Szafran 2000

Szafran O, Bell N. Use of walk-in clinics by rural and urban patients. *Canadian Family Physician* 2000;**46**:114-9.

Weinick 2010

Weinick R, Burns R, Mehrotra A. Many emergency department visits could be managed at urgent care centers and retail clinics. *Health Affairs (Project Hope)* 2010;**29**(9):1630-6.

Whitecross 1999

Whitecross L. Collaboration between GPs and nurse practitioners: the overseas experience and lessons for Australia. *Australian Family Physician* 1999;**28**:349-53.

WHO 2013

World Health Organization. Global health workforce shortage to reach 12.9 million in coming decades. News release 11 November 2013. www.who.int/mediacentre/news/releases/2013/health-workforce-shortage/en/ (accessed 27 January 2017).

CHARACTERISTICS OF STUDIES

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Ahmed 2010	No actual intervention was offered, study was a randomized telephone survey of participants' theoretical preferences.
Arain 2013	Non-randomized trial, study was a survey to assess satisfaction among people who presented to a single walk-in clinic.
Arain 2015	Non-randomized trial, study was a survey to assess satisfaction among people who presented to a single walk-in clinic.
Charlton 2004	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.
Choi 2015	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.
Cleland 2007	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.
Denver 2003	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.
Grant 2002	Cross-over study of 15 standardized participants (did not enroll actual participants, instead were simulated encounters).
Griffiths 2004	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.
Hutchison 2003	Non-randomized trial, non-controlled, study was a survey of participant satisfaction and evaluation of clinical outcomes of walk-in clinic compared to family practices and emergency rooms.
Johnson 2014	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.
Kernick 2002	Study intervention did not meet definition of walk-in clinic, because study intervention involved coordinated follow-up.

APPENDICES

Appendix 1. Search strategies

MEDLINE (Ovid)

Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to 22 March 2016

No.	Search terms	Results
1	(walk-in or walk-ins).ti.	470

(Continued)

2	(walk-in adj3 (appointment? or clinic? or center? or centre or centres or care or facility or facilities or healthcare or primary care or nurse led or (led adj2 physician? assistant?) or visit?)).ab.	490
3	(drop-in adj3 (appointment? or clinic? or center or centers or centre or centres or care or healthcare or nurse led or (led adj2 physician? assistant?))).ti,ab.	340
4	((as needed or unscheduled or patient scheduled or (self-schedul* adj6 patient?)) adj2 (appointment? or visit?)).ti,ab.	631
5	((weekend? or after-hours or out of hours or week-end? or evening) adj2 (care or health care or clinic? or consultation? or appointment?)).ti,ab.	686
6	((patient? or primary) adj2 (care or healthcare) adj10 (walk-in? or unschedul*)).ti,ab.	105
7	(mobile health clinic? or mobile health* centre? or mobile health* center?).ti,ab. and (urgent or out of hours or after hours or scheduling or appointment? or unscheduled or emergency or emergencies).ti,ab,hw.	4
8	Mobile Health Units/ and (urgent or out of hours or after hours or scheduling or appointment? or unscheduled or emergency or emergencies).ti,ab,hw.	571
9	((flexible adj2 (appointment? or care or healthcare or schedul*)) and (patient? or (primary adj2 (care or health care or healthcare)))).ti,ab.	206
10	minor injur* unit?.ti,ab.	106
11	(urgent care centre? or urgent care center?).ti,ab.	222
12	(walk-in adj3 service?).ab.	70
13	(nurse-led adj2 (clinic? or care or centre or centres or center or centers or healthcare or patient care)).ti,ab.	564
14	(nurse? adj2 managed adj3 (clinic? or center or centers or centre or centres or care or healthcare)).ti,ab.	382
15	((nurse or nurses) adj2 run adj3 (clinic? or care or centre or centres or center or centers or healthcare or patient care)).ti,ab.	90
16	((physician? assistant? or feldsher? or nonphysician? or non-physician? or allied health or doctor? assistant?) adj3 (clinic or clinics or care or centre or centres or center or centers or healthcare or health care or patient care)).ti,ab.	960
17	(((care adj2 (centre or center? or centres)) or clinic?) adj4 (without adj3 (physician? or doctor?))).ti,ab.	18
18	(((care adj2 (centre or center? or centres)) or clinic?) adj4 non-physician?).ti,ab.	12
19	free standing clinic?.ti,ab.	39
20	((clinic? or healthcare or (health adj2 care) or (primary adj2 care)) adj10 (mall or malls or retail or shopping centre? or shopping or department store or department stores)).ti,ab.	394
21	(retail adj5 (health* adj2 (facility or facilities))).ti,ab.	9

(Continued)

22	((quick or quickly or convenient*) adj2 (care or health care or healthcare or clinic?)).ti,ab.	293
23	(appointment? adj2 (no or none or last minute)).ti,ab.	204
24	(curaquick or healthstop or smartcare or takecare or quickcare).ti,ab.	29
25	(medicentre? or medicenter?).ti,ab.	6
26	((walmart or walgreens) adj3 clinic?).ti,ab.	0
27	((drug store? or pharmacy or ((community or neighbo?rhood) adj2 pharmacies)) adj4 (clinic? or care center? or care centre or care centres or healthcare centre? or healthcare center?)).ti,ab.	337
28	or/1-27	6824
29	randomized controlled trial.pt.	409,862
30	controlled clinical trial.pt.	90,286
31	multicenter study.pt.	196,335
32	pragmatic clinical trial.pt.	269
33	(randomis* or randomiz* or randomly).ti,ab.	640,964
34	groups.ab.	1,528,474
35	(trial or multicenter or multi center or multicentre or multi centre).ti.	173,361
36	(intervention? or effect? or impact? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or time series or time point? or repeated measur*).ti,ab.	7,242,472
37	non-randomized controlled trials as topic/	45
38	interrupted time series analysis/	122
39	controlled before-after studies/	110
40	or/29-39	8,102,807
41	exp animals/	19,943,765
42	humans/	15,740,211
43	41 not (41 and 42)	4,203,554
44	review.pt.	2,079,608
45	meta analysis.pt.	62,641
46	news.pt.	174,946

(Continued)

47	comment.pt.	655,439
48	editorial.pt.	396,546
49	cochrane database of systematic reviews.jn.	11949
50	comment on.cm.	655,439
51	(systematic review or literature review).ti.	71,074
52	or/43-51	7,212,549
53	40 not 52	5,574,675
54	28 and 53	2973

Embase (Ovid)

Embase 1974 to 21 March 2016

No.	Search terms	Results
1	(walk-in or walk-ins).ti.	541
2	(walk-in adj3 (appointment? or clinic? or center? or centre or centres or care or facility or facilities or healthcare or primary care or nurse led or (led adj2 physician? assistant?) or visit?)).ab.	666
3	(drop-in adj3 (appointment? or clinic? or center or centers or centre or centres or care or healthcare or nurse led or (led adj2 physician? assistant?))).ti,ab.	455
4	((as needed or unscheduled or patient scheduled or (self-schedul* adj6 patient?)) adj2 (appointment? or visit?)).ti,ab.	1049
5	((weekend? or after-hours or out of hours or week-end? or evening) adj2 (care or health care or clinic? or consultation? or appointment?)).ti,ab.	852
6	((patient? or primary) adj2 (care or healthcare) adj10 (walk-in? or unschedul*)).ti,ab.	140
7	(mobile health clinic? or mobile health* centre? or mobile health* center?).ti,ab. and (urgent or out of hours or after hours or scheduling or appointment? or unscheduled or emergency or emergencies).ti,ab,hw.	4
8	((flexible adj2 (appointment? or care or healthcare or schedul*)) and (patient? or (primary adj2 (care or health care or healthcare)))).ti,ab.	320
9	minor injur* unit?.ti,ab.	110
10	(urgent care centre? or urgent care center?).ti,ab.	317
11	(walk-in adj3 service?).ab.	114

(Continued)

12	(nurse-led adj2 (clinic? or care or centre or centres or center or centers or healthcare or patient care)).ti,ab.	1034
13	(nurse? adj2 managed adj3 (clinic? or center or centers or centre or centres or care or healthcare)).ti,ab.	393
14	((nurse or nurses) adj2 run adj3 (clinic? or care or centre or centres or center or centers or healthcare or patient care)).ti,ab.	122
15	((physician? assistant? or feldsher? or nonphysician? or non-physician? or allied health or doctor? assistant?) adj3 (clinic or clinics or care or centre or centres or center or centers or healthcare or health care or patient care)).ti,ab.	1206
16	(((care adj2 (centre or center? or centres)) or clinic?) adj4 (without adj3 (physician? or doctor?))).ti,ab.	24
17	(((care adj2 (centre or center? or centres)) or clinic?) adj4 non-physician?).ti,ab.	16
18	free standing clinic?.ti,ab.	44
19	((clinic? or healthcare or (health adj2 care) or (primary adj2 care)) adj10 (mall or malls or retail or shopping centre? or shopping or department store or department stores)).ti,ab.	458
20	(retail adj5 (health* adj2 (facility or facilities))).ti,ab.	13
21	((quick or quickly or convenient*) adj2 (care or health care or healthcare or clinic?)).ti,ab.	353
22	(appointment? adj2 (no or none or last minute)).ti,ab.	331
23	(curaquick or healthstop or smartcare or takecare or quickcare).ti,ab.	51
24	(medicentre? or medicenter?).ti,ab.	8
25	((walmart or walgreens) adj3 clinic?).ti,ab.	3
26	((drug store? or pharmacy or ((community or neighbo?rhood) adj2 pharmacies)) adj4 (clinic? or care center? or care centre or care centres or healthcare centre? or healthcare center?)).ti,ab.	610
27	or/1-26	8722
28	randomized controlled trial/	397,653
29	controlled clinical trial/	392,529
30	quasi experimental study/	2811
31	pretest posttest control group design/	253
32	time series analysis/	16,687
33	experimental design/	12,220
34	multicenter study/	133,639

(Continued)

35	(randomis* or randomiz* or randomly).ti,ab.	866,722
36	groups.ab.	2,035,364
37	(trial or multicentre or multicenter or multi centre or multi center).ti.	239,290
38	(intervention? or effect? or impact? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or time series or time point? or repeated measur*).ti,ab.	9,188,776
39	or/28-38	10,259,816
40	(systematic review or literature review).ti.	86,795
41	"cochrane database of systematic reviews".jn.	3771
42	exp animals/ or exp invertebrate/ or animal experiment/ or animal model/ or animal tissue/ or animal cell/ or nonhuman/	22,801,580
43	human/ or normal human/ or human cell/	16,986,271
44	42 not (42 and 43)	5,862,073
45	40 or 41 or 44	5,951,836
46	39 not 45	7,746,246
47	27 and 46	4644

The Cochrane Library (Wiley)

No.	Search terms	Results
#1	("walk-in" or "walk-ins"):ti,ab	142
#2	("drop-in" near/3 (appointment* or clinic* or center or centers or centre or centres or care or healthcare or "nurse led" or (led near/2 physician* assistant*))):ti,ab	38
#3	(("as needed" or unscheduled or "patient scheduled" or (self-schedul* near/6 patient*)) near/2 (appointment* or visit*)):ti,ab	191
#4	((weekend* or after-hours or "out of hours" or week-end* or evening) near/2 (care or health care or clinic* or consultation* or appointment*)):ti,ab	55
#5	((patient* or primary) near/2 (care or healthcare) near/10 (unschedul*)):ti,ab	11
#6	("mobile health" next (clinic* or centre* or center*)):ti,ab and (urgent or "out of hours" or "after hours" or scheduling or appointment* or unscheduled or emergency or emergencies):ti,ab,kw	0

(Continued)

#7	[mh "mobile health units"] and (urgent or out of hours or after hours or scheduling or appointment* or unscheduled or emergency or emergencies):ti,ab,kw	18
#8	((flexible near/2 (appointment* or care or healthcare or schedul*)) and (patient* or (primary near/2 (care or health care or healthcare)))):ti,ab	53
#9	minor next injur* next unit*:ti,ab	5
#10	("urgent care" next (centre* or center*)):ti,ab	9
#11	(nurse-led near/2 (clinic* or care or centre or centres or center or centers or healthcare or patient care)):ti,ab	171
#12	(nurse* near/2 managed near/3 (clinic* or center or centers or centre or centres or care or healthcare)):ti,ab	20
#13	((nurse or nurses) near/2 run near/3 (clinic* or care or centre or centres or center or centers or healthcare or patient care)):ti,ab	17
#14	((physician* assistant* or feldsher* or nonphysician* or non-physician* or allied health or doctor* assistant*) near/3 (clinic or clinics or care or centre or centres or center or centers or healthcare or health care or patient care)):ti,ab	42
#15	(((care near/2 (centre or center* or centres)) or clinic*) near/4 (without near/3 (physician* or doctor*))):ti,ab	4
#16	(((care near/2 (centre or center* or centres)) or clinic*) near/4 non-physician*):ti,ab	9
#17	free standing clinic*:ti,ab	370
#18	((clinic* or healthcare or (health near/2 care) or (primary near/2 care)) near/10 (mall or malls or retail or shopping centre* or shopping or "department store" or "department stores")):ti,ab	9
#19	(retail near/5 (health* near/2 (facility or facilities))):ti,ab	0
#20	((quick or quickly or convenient*) near/2 (care or health care or healthcare or clinic*)):ti,ab	47
#21	(appointment* near/2 (no or none or last minute)):ti,ab	31
#22	(curaquick or healthstop or smartcare or takecare or quickcare):ti,ab	20
#23	(medicentre* or medicenter*):ti,ab	0
#24	((walmart or walgreens) near/3 clinic*):ti,ab	0
#25	((drug store* or pharmacy or ((community or neighbo*) near/2 pharmacies)) near/4 (clinic* or care center* or care centre or care centres or healthcare centre* or healthcare center*)):ti,ab	145
#26	{or #1-#25}	1386

CINAHL (EBSCO)

No.	Search terms	Results
S1	TI walk-in or walk-ins	1914
S2	AB (walk-in N3 (appointment? or clinic? or center? or centre or centres or care or facility or facilities or healthcare or primary care or nurse led or (led N2 physician? assistant?) or visit?))	180
S3	TI (drop-in N3 (appointment? or clinic? or center or centers or centre or centres or care or healthcare or nurse led or (led N2 physician? assistant?))) OR AB (drop-in N3 (appointment? or clinic? or center or centers or centre or centres or care or healthcare or nurse led or (led N2 physician? assistant?)))	207
S4	TI (((as needed or unscheduled or patient scheduled or (self-schedul* N6 patient?)) N2 (appointment? or visit?))) OR AB (((as needed or unscheduled or patient scheduled or (self-schedul* N6 patient?)) N2 (appointment? or visit?)))	317
S5	TI ((weekend? or after-hours or out of hours or week-end? or evening) N2 (care or health care or clinic? or consultation? or appointment?)) OR AB ((weekend? or after-hours or out of hours or week-end? or evening) N2 (care or health care or clinic? or consultation? or appointment?))	284
S6	TI ((patient? or primary) N2 (care or healthcare) N10 (walk-in? or unschedul*)) OR AB ((patient? or primary) N2 (care or healthcare) N10 (walk-in? or unschedul*))	18
S7	urgent or out of hours or after hours or scheduling or appointment? or unscheduled or emergency or emergencies	137,659
S8	(MH "Mobile Health Units")	1185
S9	TI (mobile health clinic? or mobile health* centre? or mobile health* center?) OR AB (mobile health clinic? or mobile health* centre? or mobile health* center?)	24
S10	S8 OR S9	1195
S11	S7 AND S10	204
S12	TI (((flexible N2 (appointment? or care or healthcare or schedul*)) and (patient? or (primary N2 (care or health care or healthcare))))) OR AB (((flexible N2 (appointment? or care or healthcare or schedul*)) and (patient? or (primary N2 (care or health care or healthcare)))))	64
S13	TI minor injur* unit? OR AB minor injur* unit?	54
S14	TI (urgent care centre? or urgent care center?) OR AB (urgent care centre? or urgent care center?)	63
S15	AB walk-in N3 service?	13
S16	TI (nurse-led N2 (clinic? or care or centre or centres or center or centers or healthcare or patient care)) OR AB (nurse-led N2 (clinic? or care or centre or centres or center or centers or healthcare or patient care))	499

(Continued)

S17	TI (nurse? N2 managed N3 (clinic? or center or centers or centre or centres or care or healthcare)) OR AB (nurse? N2 managed N3 (clinic? or center or centers or centre or centres or care or healthcare))	47
S18	TI ((nurse or nurses) N2 run N3 (clinic? or care or centre or centres or center or centers or healthcare or patient care)) OR AB ((nurse or nurses) N2 run N3 (clinic? or care or centre or centres or center or centers or healthcare or patient care))	74
S19	TI ((physician? assistant? or feldsher? or nonphysician? or non-physician? or allied health or doctor? assistant?) N3 (clinic or clinics or care or centre or centres or center or centers or healthcare or health care or patient care)) OR AB ((physician? assistant? or feldsher? or nonphysician? or non-physician? or allied health or doctor? assistant?) N3 (clinic or clinics or care or centre or centres or center or centers or healthcare or health care or patient care))	363
S20	TI ((((care N2 (centre or center? or centres)) or clinic?) N4 (without N3 (physician? or doctor?)))) OR AB ((((care N2 (centre or center? or centres)) or clinic?) N4 (without N3 (physician? or doctor?))))	0
S21	TI ((((care N2 (centre or center? or centres)) or clinic?) N4 non-physician?)) OR AB ((((care N2 (centre or center? or centres)) or clinic?) N4 non-physician?))	0
S22	TI free standing clinic? OR AB free standing clinic?	9
S23	TI (((clinic? or healthcare or (health N2 care) or (primary N2 care)) N10 (mall or malls or retail or shopping centre? or shopping or department store or department stores))) OR AB (((clinic? or healthcare or (health N2 care) or (primary N2 care)) N10 (mall or malls or retail or shopping centre? or shopping or department store or department stores)))	237
S24	TI ((retail N5 (health* N2 (facility or facilities)))) OR AB ((retail N5 (health* N2 (facility or facilities))))	0
S25	TI (((quick or quickly or convenient*) N2 (care or health care or healthcare or clinic?))) OR AB (((quick or quickly or convenient*) N2 (care or health care or healthcare or clinic?)))	220
S26	TI ((appointment? N2 (no or none or last minute))) OR AB ((appointment? N2 (no or none or last minute)))	30
S27	TI (curaquick or healthstop or smartcare or takecare or quickcare) OR AB (curaquick or healthstop or smartcare or takecare or quickcare)	6
S28	TI (medicentre? or medicenter?) OR AB (medicentre? or medicenter?)	1
S29	TI (((walmart or walgreens) N3 clinic?)) OR AB (((walmart or walgreens) N3 clinic?))	2
S30	TI (((drug store? or pharmacy or ((community or neighbo?rhood) N2 pharmacies)) N4 (clinic? or care center? or care centre or care centres or healthcare centre? or healthcare center?))) OR AB (((drug store? or pharmacy or ((community or neighbo?rhood) N2 pharmacies)) N4 (clinic? or care center? or care centre or care centres or healthcare centre? or healthcare center?)))	57
S31	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30	4707

(Continued)

S32	S31 Limiters - Exclude MEDLINE records	2125
S33	PT randomized controlled trial	30,405
S34	PT clinical trial	52,721
S35	PT research	987,546
S36	(MH "Randomized Controlled Trials")	25,829
S37	(MH "Clinical Trials")	84,167
S38	(MH "Intervention Trials")	5972
S39	(MH "Nonrandomized Trials")	168
S40	(MH "Experimental Studies")	14,765
S41	(MH "Pretest-Posttest Design+")	26,667
S42	(MH "Quasi-Experimental Studies+")	8408
S43	(MH "Multicenter Studies")	11,128
S44	(MH "Health Services Research")	7348
S45	TI (randomis* or randomiz* or randomly) OR AB (randomis* or randomiz* or randomly)	110,347
S46	TI (trial or effect* or impact* or intervention* or before N5 after or pre N5 post or ((pretest or "pre test") and (posttest or "post test")) or quasiexperiment* or quasi W0 experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or "time series" or time W0 point* or repeated W0 measur*) OR AB (trial or effect* or impact* or intervention* or before N5 after or pre N5 post or ((pretest or "pre test") and (posttest or "post test")) or quasiexperiment* or quasi W0 experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or "time series" or time W0 point* or repeated W0 measur*)	757,832
S47	S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46	1,292,403
S48	S32 AND S47	584

PubMed

Search terms	Results
(walk-in[Title] OR "urgent care"[Title] OR minor injury[Title] OR minor injuries[Title]) AND (appointment*[Title] OR clinic[Title] OR clinics[Title] OR center[Title] OR centers[Title] OR centre[Title] OR centres[Title] OR care[Title] OR unit[Title] OR units[Title] OR service[Title] OR services[Title] OR facility[Title] OR facilities[Title] OR healthcare[Title] OR "primary care"[Title] OR "nurse led"[Title] OR "physician* assistant*"[Title] OR visit[Title] OR visits[Title])	619

PubMed Central

Search terms	Results
(walk-in[Title] OR "urgent care"[Title] OR minor injury[Title] OR minor injuries[Title]) AND (appointment*[Title] OR clinic[Title] OR clinics[Title] OR center[Title] OR centers[Title] OR centre[Title] OR centres[Title] OR care[Title] OR unit[Title] OR units[Title] OR service[Title] OR services[Title] OR facility[Title] OR facilities[Title] OR healthcare[Title] OR "primary care"[Title] OR "nurse led"[Title] OR "physician* assistant*"[Title] OR visit[Title] OR visits[Title])	132

ClinicalTrials.gov

Search terms	Results
walk in OR "urgent care" OR "minor injury" OR "minor injuries" [intervention field]	44

WHO International Clinical Trials Registry Platform (ICTRP)

Search terms	Results
urgent care OR minor injury OR minor injuries OR walk in*	109

Appendix 2. Screening algorithm for titles and abstracts

- Did the study compare walk-in clinics versus either traditional physician offices or emergency rooms, or both?
- Did the study meet design criteria for a randomized trial, a non-randomized trials, or a controlled before-after study?
- Did the study address either a primary outcome or a secondary outcome?
  - Primary outcomes: mortality, morbidity, or quality of care.
  - Secondary outcomes: participant satisfaction, participant preference for return to walk-in clinics versus traditional source of care, cost-effectiveness, and ease of access.

If the answer to all 3 questions was 'yes' or was ambiguous, we extracted the entire text of the paper.

Appendix 3. Data collection form

Review title or ID

Study ID *(surname of first author and year first full report of study was published e.g. Smith 2001)*

(Continued)

Report IDs of other reports of this study *(e.g. duplicate publications, follow-up studies)*

Notes:

1. General information

1. Date form completed *(dd/mm/yyyy)*
2. Name/ID of person extracting data
3. Report title *(title of paper/ abstract/ report that data are extracted from)*
4. Report ID *(if there are multiple reports of this study)*
5. Reference details
6. Report author contact details
7. Publication type *(e.g. full report, abstract, letter)*
8. Study funding source *(including role of funders)*
Possible conflicts of interest *(for study authors)*
9. Notes:

2. Eligibility

Study characteristics	Review inclusion criteria *(Insert inclusion criteria for each characteristic as defined in the Protocol)*	Yes/No/Unclear	Location in text *(pg & ¶/fig/table)*
10a. Type of study	Randomized trial		
	Non-randomized trial		
	Controlled before-after study • Contemporaneous data collection • At least 2 intervention and 2 control clusters		
	Other design (specify):		
10b. Definition of walk-in clinics:	Does the paper define walk-in clinics as: • a standalone clinic? • without advance appointments or registration? • as providing basic medical care without expectation of follow-up? • as not a traditional primary care practice or emergency room?		
11. Participants			
12. Types of intervention			
13. Types of outcome measures			
14. Decision:			
15. Reason for exclusion			
16. Notes:			

DO NOT PROCEED IF STUDY EXCLUDED FROM REVIEW

3. Population and setting

	Description *Include comparative information for each group (i.e. intervention and controls) if available*	Location in text *(pg & ¶/fig/table)*
17. Population description *(from which study participants are drawn)*		
18. Setting		

(Continued)

(including location and social context)
19. Inclusion criteria
20. Exclusion criteria
21. Method/s of recruitment of participants
22. Notes:

4. Methods

	Descriptions as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
23. Aim of study		
24. Design *(e.g. parallel, cross-over, non-RCT)*		
25. Unit of allocation *(by individuals, cluster/ groups or body parts)*		
26. Start date		
27. End date		
28. Duration of participation *(from recruitment to last follow-up)*		
29. Notes:		

5. Risk of bias assessment

See Chapter 8 of the Cochrane Handbook for Systematic Reviews of Interventions*. Additional domains may be required for non-randomized studies.*

Domain	**Risk of bias** *Low/ High/Unclear*	**Support for judgement**	**Location in text** *(pg & ¶/fig/table)*
30. Random sequence generation *(selection bias)*			
31. Allocation concealment			

(Continued)

(selection bias)	
32. Blinding of participants and personnel *(performance bias)*	**Outcome group:** **All/**
(if required)	**Outcome group:**
33. Blinding of outcome assessment *(detection bias)*	**Outcome group:** **All/**
(if required)	**Outcome group:**
34. Incomplete outcome data *(attrition bias)*	
35. Selective outcome reporting? *(reporting bias)*	
36. Other bias	
37. Notes:	

6. Participants

Provide overall data and, if available, comparative data for each intervention or comparison group.

	Description as stated in report/paper	**Location in text** (pg & ¶/fig/table)
38. Total no. randomized *(or total pop. at start of study for NRCTs)*		
39. Clusters *(if applicable, no., type, no. people per cluster)*		
40. Baseline imbalances		
41. Withdrawals and exclusions *(if not provided below by outcome)*		
42. Age		
43. Sex		
44. Race/Ethnicity		
45. Severity of illness		

(Continued)

46. Comorbidities
47. Other treatment received *(additional to study intervention)*
48. Other relevant sociodemographics
49. Subgroups measured
50. Subgroups reported
51. Notes:

NRCT: non-ranomized trial.

7. Intervention groups

Copy and paste table for each intervention and comparison group

Intervention group 1

	Description as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
52. Group name		
53. No. randomized to group *(specify whether no. people or clusters)*		
54. Description *(include sufficient detail for replication, e.g. content, dose, components; if it is a natural experiment, describe the preintervention)*		
55. Duration of treatment period		
56. Timing *(e.g. frequency, duration of each episode)*		
57. Delivery *(e.g. mechanism, medium, intensity, fidelity)*		
58. Providers *(e.g. no., profession, training, ethnicity etc. if relevant)*		
59. Cointerventions		
60. Economic variables *(i.e. intervention cost, changes in other costs as result of intervention)*		

(Continued)

61. Resource requirements to replicate intervention *(e.g. staff numbers, cold chain, equipment)*
62. Notes:

8. Outcomes

Copy and paste table for each outcome.

Outcome 1

	Description as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
63. Outcome name		
64. Time points measured *(specify whether from start or end of intervention)*		
65. Time points reported		
66. Outcome definition *(with diagnostic criteria if relevant and note whether the outcome is desirable or undesirable if this is not obvious)*		
67. Person measuring/ reporting		
68. Unit of measurement *(if relevant)*		
69. Scales: upper and lower limits *(indicate whether high or low score is good)*		
70. Is outcome/tool validated?	*Yes/No/Unclear*	
71. Imputation of missing data *(e.g. assumptions made for intention-to-treat analysis)*		
72. Assumed risk estimate *(e.g. baseline or population risk noted in Background)*		
73. Notes:		

9. Results

Copy and paste the appropriate table for each outcome, including additional tables for each time point and subgroup as required.

For randomized or non-randomized trial - dichotomous outcome

	Description as stated in report/paper				Location in text (pg & ¶/fig/table)
74. Comparison					
75. Outcome					
76. Subgroup					
77. Time point *(specify whether from start or end of intervention)*					
78. Results *Note whether:* *postintervention OR* *change from baseline* *and whether* *adjusted OR* *unadjusted*	**Intervention**		**Comparison**		
	No. events	No. participants	No. events	No. participants	
79. Baseline data	**Intervention**		**Comparison**		
	No. events	No. participants	No. events	No. participants	
80. No. missing participants and reasons					
81. No. participants moved from other group and reasons					
82. Any other results reported					
83. Unit of analysis					

(Continued)

(e.g. by individuals, health professional, practice, hospital, community)	
84. Statistical methods used and appropriateness of these methods *(e.g. adjustment for correlation)*	
85. Reanalysis required? *(if yes, specify why, e.g. correlation adjustment)*	*Yes/No/Unclear*
86. Reanalysis possible?	*Yes/No/Unclear*
87. Reanalyzed results	
88. Notes:	

For randomized or non-randomized trial - continuous outcome

	Description as stated in report/paper						Location in text (pg & ¶/ fig/table)
89. Comparison							
90. Outcome							
91. Subgroup							
92. Time point *(specify whether from start or end of intervention)*							
93. Postintervention or change from baseline?							
94. Results *Note whether:* *postintervention OR* *change from baseline* *And whether* *Adjusted OR* *Unadjusted*	**Intervention**			**Comparison**			
	Mean	SD (or other variance)	No. participants	Mean	SD (or other variance)	No. participants	
95. Baseline data	**Intervention**			**Comparison**			
	Mean	SD (or other variance)	No. participants	Mean	SD (or other variance)	No. participants	
96. No. missing participants and reasons							

(Continued)

97. No. participants moved from other group and reasons	
98. Any other results reported	
99. Unit of analysis *(e.g. by individuals, health professional, practice, hospital, community)*	
100. Statistical methods used and appropriateness of these methods *(e.g. adjustment for correlation)*	
101. Reanalysis required? *(if yes, specify why)*	*Yes/No/Unclear*
102. Reanalysis possible?	*Yes/No/Unclear*
103. Reanalyzed results	
104. Notes:	

SD: standard deviation.

For randomized or non-randomized trial - other outcome

	Description as stated in report/paper				Location in text (pg & ¶/fig/table)
105. Comparison					
106. Outcome					
107. Subgroup					
108. Time point (specify whether from start or end of intervention)					
109. Type of outcome					
110. Results	Intervention result	SD (or other variance)	Control result	SD (or other variance)	
	Overall results		SE (or other variance)		
111. No. participant	Intervention		Control		
112. No. missing participants and reasons					
113. No. participants moved from other group and reasons					
114. Any other results reported					
115. Unit of analysis (e.g. by individuals, health professional, practice, hospital, community)					

(Continued)

116. Statistical methods used and appropriateness of these methods
117. Reanalysis required? *(if yes, specify why)*
118. Reanalysis possible?
119. Reanalyzed results
120. Notes:

For controlled before-after study

	Description as stated in report/paper				Location in text (pg & ¶/fig/table)
121. Comparison					
122. Outcome					
123. Subgroup					
124. Time point *(specify whether from start or end of intervention)*					
125. Postintervention or change from baseline?					
126. Results	Intervention result	SD (or other variance)	Control result	SD (or other variance)	
	Overall results		SE (or other variance)		
127. No. participants	Intervention		Control		
128. No. missing participants and reasons					
129. No. participants moved from other group and reasons					
130. Any other results reported					
131. Unit of analysis *(individuals, cluster/ groups or body parts)*					
132. Statistical methods used and appropriateness of these methods					

(Continued)

133. Reanalysis required? *(specify)*	*Yes/No/Unclear*
134. Reanalysis possible?	*Yes/No/Unclear*
135. Reanalyzed results	
136. Notes:	

10. Applicability

137. Have important populations been excluded from the study? *(consider disadvantaged populations, and possible differences in the intervention effect)*	*Yes/No/Unclear*
138. Is the intervention likely to be aimed at disadvantaged groups? *(e.g. lower socioeconomic groups)*	*Yes/No/Unclear*
139. Does the study directly address the review question? *(any issues of partial or indirect applicability)*	*Yes/No/Unclear*
140. Notes:	

11. Other information

	Description as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
141. Key conclusions of study authors		
142. References to other relevant studies		
143. Correspondence required for further study information *(what and from whom)*		
144. Further study information requested *(from whom, what, and when)*		
145. Correspondence received *(from whom, what, and when)*		
146. Notes:		

CONTRIBUTIONS OF AUTHORS

All authors devised the study question.

All authors prepared the protocol.

CTC and CEC conducted the searches; prepared the review; and planned to obtain, extract, and synthesize data. They will update the review.

Michelle Fiander, EPOC Trials Search Co-ordinator, wrote the search protocol.

DECLARATIONS OF INTEREST

CEC has no relevant interests to declare.

CTC is on the physician staff of Partners HealthCare, a health system based in Boston, Massachusetts that is planning to open several walk-in clinics.

JH has no relevant interests to declare.

AM has received prior grant support for research on walk-in clinics from the National Institutes of Health, Robert Wood Johnson Foundation, and the California Health Care Foundation.

SOURCES OF SUPPORT

Internal sources

- Partners HealthCare, USA.

  Salary (CTC)
- Government of Ontario Ministry of Health and Long Term Care, Canada.

  Salary (JH)
- Harvard Medical School, USA.

  Salary (AM)

External sources

- No sources of support to be reported, USA.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We did not search PsycINFO as stated in the protocol we deemed it irrelevant to the study topic. At the time of search, HealthStar was no longer available as a separate database. The CINAHL search was intended to replace ProQuest Nursing & Allied Health Source.

INDEX TERMS

Medical Subject Headings (MeSH)

*Quality of Health Care; Ambulatory Care [*standards]; Ambulatory Care Facilities [*standards]; Chronic Disease [*therapy]; Disease Management; Emergency Service, Hospital [*standards]; Physicians' Offices [*standards]

MeSH check words

Humans