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Deciding to Visit the Emergency Department for Non-Urgent Conditions: A Systematic Review of the Literature

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Abstract

Background—A large proportion of all emergency department (ED) visits in the U.S. are for non-urgent conditions. Use of the ED for non-urgent conditions may lead to excessive healthcare spending, unnecessary testing and treatment, and weaker patient-primary care provider relationships.

Objectives—To understand the factors influencing an individual’s decision to visit an ED for a non-urgent condition

Methods—We conducted a systematic literature review of the U.S. literature. Multiple databases were searched for studies published after 1990, conducted in the U.S., and which assessed factors associated with non-urgent ED use. Based on those results we developed a conceptual framework.

Results—Twenty-six articles met inclusion criteria. No two articles used the same exact definition of non-urgent visits. Across the relevant articles, the average fraction of all ED visits that were judged to be non-urgent (whether prospectively at triage or retrospectively following ED evaluation) was 37% (range: 8–62%). Articles were very heterogeneous with respect to study design, population, comparison, group, and non-urgent definition. The limited evidence suggests that younger age, convenience of the ED compared to alternatives, referral to the ED by a physician, and negative perceptions about alternatives such as primary care providers all play a role in driving nonurgent ED use.

Conclusion—Our structured overview of the literature and conceptual framework can help to inform future research and the development of evidence-based interventions to reduce non-urgent ED use.

INTRODUCTION

Background

Non-urgent Emergency Department (ED) visits are typically defined as visits for conditions for which a delay of several hours would not increase the likelihood of an adverse outcome.^{1,2} Most studies find that at least 30% of all ED visits in the US are non-urgent,

although select studies such as those using National Hospital Ambulatory Medical Survey data report lower percentages (<10%).³⁻⁸ Visiting the ED instead of another care site (e.g. physician's office, retail clinic, urgent care) for a non-urgent condition may lead to excessive healthcare spending, unnecessary testing and treatment, and represent a missed opportunity to promote longitudinal relationships with primary care physicians.^{4-6,9-12} A recent study projected \$4.4 billion in annual savings if non-urgent ED visits were cared for in retail clinics or urgent care centers during the hours these facilities are open.¹³ With increasing demand and a shortage of primary care providers, non-urgent ED use will likely increase in the near future. Recent predictions suggest that implementation of the Affordable Care Act and resulting expansions of insurance coverage will contribute to even higher levels of ED usage.^{14,15}

There is widespread interest in interventions to discourage non-urgent ED visits. A 2006 survey found that 30% of emergency physicians work in hospitals that have implemented practices to discourage non-urgent visits.¹⁶ Interventions by health systems and payers have included patient education on what is appropriate ED use, financial disincentives such as higher-copayments for ED visits, and encouraging primary care physicians (PCPs) to provide care in the evenings and weekends.¹⁷⁻¹⁹ Despite these efforts, non-urgent ED visits have continued to rise.²⁰ One explanation could be that prior interventions have not adequately addressed the underlying issues that lead patients to visit EDs for non-urgent conditions.²¹ Moreover, policies to deter ED use can have negative, unintended consequences. For example, enrollees in high-deductible health plans, who bear a higher share of the costs of an ED visit, are less likely to seek care for a true emergency.²² Non-urgent ED use has been discussed in the peer-reviewed literature for the last three decades;²³ however, no systematic review of non-urgent ED use in the U.S. has been published to date.

We conducted a systematic review of the literature and developed a conceptual framework to understand why individuals visit the ED for non-urgent conditions. Our goal was to highlight gaps in knowledge, inform future research on this topic, and empirically inform future interventions that attempt to decrease the number of non-urgent ED visits.

METHODS

Study Design

We conducted a systematic review of the peer-reviewed and grey literature to identify factors associated with non-urgent ED use by adults in the U.S. Studies outside the US were excluded because they may not generalize to the unique features of the U.S. healthcare system.²⁴ A health sciences research librarian worked with the study team to develop our search strategy. We searched multiple databases including: Cumulative Index to Nursing and Allied Health (CINAHL), OAISTER, ISI Web of Science, New York Academy of Medicine Grey Literature Database, PsychInfo, and PubMed. Searches used the following free text and Medical Subject Headings (MeSH) terms: ("Emergency Service, Hospital" OR "emergency room" OR "emergency department") AND ("nonurgent" OR "non-urgent" OR "unnecessary" OR "inappropriate"). We also used the "related citations" function in PubMed to identify any articles determined to be similar to articles selected for inclusion, and we

hand-searched the reference lists of all included articles. The search for abstracts was conducted in January 2011.

Data Processing

Two reviewers (L.U.P. and E.G.) independently examined each abstract returned by the PubMed search, and one reviewer (L.U.P.) reviewed the abstracts returned by the other search engines (less than 10% of the total abstracts reviewed). If either or both reviewers determined that an abstract met inclusion criteria, it underwent a more thorough full-text review. One reviewer (L.U.P.) evaluated the full-text articles on whether they met inclusion criteria and extracted data on all included articles. To meet inclusion criteria, articles had to be published after January 1990, be written in English, and present some quantitative data (including descriptive data) on non-urgent ED use. We excluded dissertations, articles without abstracts, and articles exclusively focused on pediatric or non-U.S. populations. Articles that presented qualitative data only or reviewed existing literature were not formally included in the review, but were used to inform the creation of a conceptual framework.^{24–35}

To facilitate data extraction, we created a standardized data form to collect information from included articles. Information gathered, as available, included: study population, sample size, setting, design, comparison group, response rate, definition of a non-urgent visit, independent and dependent variables, key findings, and use of a conceptual framework. A variety of terms were used to describe non-urgent visits including “inappropriate visits,”³⁶ “avoidable visits,”¹⁶ “nonemergency visits,”³⁷ and “minor illness visits.”³⁸ In this article we chose the most prevalent term, “non-urgent visits”. The research team elected not to rate the quality of articles because all the studies were observational in nature and the majority did not use multivariate statistics.

RESULTS

Identification of Relevant Articles

The initial search strategy generated 1,983 abstracts. An additional seven abstracts were obtained by hand-searching the reference lists of full text articles and using the “related citations” feature in Pubmed. From this list, the reviewers identified 63 articles for full text review, of which 26 satisfied criteria for inclusion (Figure 1). The primary reasons for exclusion included lack of quantitative data and an exclusive focus on non-U.S. patients.

Overview of Articles and Definition of Non-Urgent

Six studies (23%) described only visits for non-urgent conditions (Table 1). Of those, four articles (16%) described non-urgent visits to the ED and two articles (8%) compared non-urgent ED visits to PCP visits for similar conditions.^{37,39} The other 20 articles (77%) compared nonurgent ED visits to other types of ED visits, including urgent visits, urgent and emergent visits,^{40,41} and all ED visits.^{16,38} (Table 2)

No two studies used the same exact definition of non-urgent visits. Eleven articles (42%) identified non-urgent visits through retrospective review of medical records, 11 (42%) identified non-urgent visits prospectively at triage, and three articles (12%) used

retrospective patient self-report (See appendix for additional detail on definitions). Across the relevant articles, the average fraction of all ED visits that were judged to be non-urgent (whether prospectively at triage or retrospectively following ED evaluation) was 37% (range: 8–62%). Four articles (15%) presented a conceptual framework to guide the study design and interpretation of results. Three articles used the Anderson model of healthcare utilization^{23,37,42} and one article used Mechanic's model of illness behavior.⁴¹

In the remainder of this article, we summarize findings from the subset of articles (n=16) which included a comparison group of either urgent ED patients or all ED patients AND examined whether differences among these groups were statistically significant. We also include illustrative examples from the remaining studies (n=10) regarding self-reported reasons for non-urgent ED use and barriers to use of alternative locations.

Factors Associated with Non-Urgent ED Use

Age—Among the nine articles that examined age, six found that younger adults were more likely to have non-urgent visits compared to older adults.^{36,43–47} Effect sizes were generally large (OR>2). Three articles found no association between non-urgent ED use and age.^{23,38,48}

Race—Among the nine articles that examined race, four articles found that Blacks were more likely than Whites to have a non-urgent visit.^{23,43,46,49} However, five articles reported no association;^{16,38,45,47,48} One study pointed out that Blacks had higher rates of non-urgent ED visits despite the fact that they were less likely to utilize healthcare in general.²³

Gender—Findings were inconsistent across the 10 articles that examined gender. Four articles found that women were more likely than men to have a non-urgent visit,^{36,43,45,47} and two articles concluded the opposite (i.e., men were more likely than women to have a non-urgent visit).^{38,44} Four articles found no association.^{16,23,46,48}

Income—Among the four articles that assessed income,^{16,23,38,47} two reported that persons with low incomes were more likely to make non-urgent ED visits.^{23,47} Effect sizes were generally moderate (OR<2).

Insurance—Among the 13 articles that examined the uninsured, two found that uninsured patients were less likely to use the ED for non-urgent visits,^{23,50} two found that the uninsured were more likely,^{36,38} and five identified no association.^{16,40,45,48,51} One study found that the uninsured were more likely than Health Maintenance Organization (HMO) patients but less likely than Medicaid patients to have a non-urgent ED visit.⁵² Articles that looked at Medicaid patients found that either Medicaid was predictive of non-urgent ED use^{23,36,43,46,52} or there was no association.^{16,38,50,51} Effect sizes were generally moderate (OR<2).

Social Support—The only social support measure reported in the literature was marital status. Among the four articles that looked at the relationship between non-urgent ED use and marital status, no article identified an association.^{16,38,45,48}

Health Status—Among the four articles that examined health status, two found that persons with poor health were more likely to have non-urgent visits,^{23,47} and two identified no association.^{16,45}

Previous Healthcare Experiences—Previous healthcare experiences refer to an individual's utilization history both within and outside of the ED. Two articles examined previous healthcare experiences. One article found that a recent hospitalization was associated with lower odds of having a non-urgent visit, more frequent ED visits was associated with higher odds of having a non-urgent visit, and the number of primary care visits had no association with having a non-urgent visit.⁴⁸ In contrast, another article found that the average number of physician visits in an outpatient setting other than the ED was higher for persons with non-urgent ED visits.²³

Culture/Community Norms and Personality—Culture/Community norms refers to the practices of others within one's community (e.g., the propensity of neighbors to use the ED.) Personality factors are those related to an individual's emotional, attitudinal, and behavioral response patterns. Examples of relevant traits include decision-making style and risk aversion. No article that compared non-urgent to urgent patients assessed culture or community norms or personality factors; however, one study of non-urgent patients found that personality factors such as coping mechanisms were not associated with going to the ED vs. PCP for a non-urgent condition.³⁹

Perceived severity—Perceived severity refers to the patient's perception of the urgency of his/her illness, which is a function of both personal beliefs and knowledge on what is an emergency. No article that compared non-urgent to urgent patients explored perceived severity; however four articles that focused only on non-urgent ED visits described patients' perceptions of the urgency of their conditions. In these cases, the vast majority of patients (>80%) felt that their condition was urgent/could not wait for treatment.^{53–56}

Convenience—Convenience refers to the ease with which a patient can seek care including travel, timing, and location. Among the three articles that discussed convenience,^{16,38,47} all found that convenience factors played a role in driving non-urgent ED use. For example, one study reported that the leading reason why the non-urgent group used the ED was "ease of use."³⁸ A descriptive study of non-urgent ED users found that 60% of non-urgent ED patients felt that the ED was more convenient than their PCP.⁵⁵

Cost—Cost refers to the financial burden incurred by the patient. While no article that compared non-urgent to urgent patients assessed cost, one study of just non-urgent ED patients found that 42% chose the ED because of payment flexibility (i.e., no requirement to pay at the time of care.)⁵⁴

Access—Access refers to the ability of the patient to obtain timely care outside the ED. Four articles found an association between poor access (e.g. difficulty in obtaining healthcare, not having a regular physician) and non-urgent ED use.^{16,40,45,47} Only one article identified no association between poor access and likelihood of having a non-urgent visit.⁴⁸ Furthermore, a Harris Interactive survey reported that ED physicians felt that waiting

times for appointments with PCPs and limited access to physicians on weekends were the leading reasons for non-urgent ED use.¹⁶ In a descriptive study of non-urgent ED patients, authors reported that the most significant barrier to getting care outside the ED was inability to get an appointment at a clinic.⁴²

Referral/Advice—Referral/Advice refers to being counseled to go to the ED by a provider. Two articles (one with a comparison group and one of only non-urgent ED users) suggested that healthcare provider referral may be a substantial driving force in non-urgent attendance.^{38,55} One article found that about half of the non-urgent patients who presented during business hours were advised to go there by a PCP.⁵⁵

Beliefs and knowledge about alternatives—Three articles (two with comparison groups and one of only non-urgent ED users) directly addressed beliefs about alternatives. One article reported that 76% of non-urgent ED users chose the ED because they felt they would receive better care there.⁵⁴ A Harris Interactive survey reported that non-urgent ED users were more likely to think that other places were more expensive than the ED.¹⁶ Finally, another article found that persons who were not satisfied with their regular source of care were more likely to make a non-urgent visit to an ED.⁴⁷

DISCUSSION

Due to the heterogeneity and limitations of the articles, it is challenging to summarize what drives the decision to seek ED care for non-urgent conditions. The limited evidence suggests that younger age, greater convenience of the ED compared to other ambulatory care alternatives, referral to the ED by a healthcare provider, and negative perceptions of non-ED care sites all play a role in decisions to seek care in the ED for non-urgent problems. Other factors appear unrelated to non-urgent ED use or more commonly, the results are inconclusive due to inconsistent results or because they have been studied rarely. Because of the weak evidence base, we argue that all of the factors assessed in the literature are candidates for future research.

We believe a key limitation of these prior studies is the lack of a robust theoretical framework on what drives non-urgent ED use. To potentially guide future work, we created a theoretical model of the decision making process and factors that may influence a patient's decision to visit the ED for a non-urgent condition. We based the model on review of included studies, as well as qualitative studies and commentaries.^{21,24,26,28,29,31,33,35,57} Qualitative studies which used patient interviews and focus groups were important to include because they generate hypotheses regarding reasons for use that can be probed in future empirical work.

The model depicted in Figure 2 suggests that a patient arrives at a decision to seek care in an ED by consciously or unconsciously weighing several considerations. First, the patient experiences acute symptoms – either a new problem or a flare-up of a chronic condition that is not immediately debilitating or clearly emergent (e.g. chest pain, signs of stroke). The patient then considers various options including going to the ED, going to another location, or not seeking care.

In our model the decision to go the ED is influenced by an array of causal pathway factors and associated factors. While ALL of the factors depicted in the model likely influence non-urgent ED use, the causal pathway factors act as independent predictors. In contrast, we believe associated factors influence ED use via one of the causal pathway factors. For example, while certain models suggest that gender may be associated with non-urgent use, there is no a priori explanation as to why gender would be influential. We believe that gender, an associated factor, could possibly impact the decision to seek care in the ED for a non-urgent condition by affecting the perceived severity of the condition and beliefs and knowledge about alternatives (both causal pathway factors). In our review, the distinction between causal pathway and associated factors is also important as almost all interventions to decrease non-urgent ED use focus on causal pathway factors.

Although our model does not directly address healthcare supply because we focus on the perspective of the individual patient, one could imagine that the availability (or lack thereof) of options, including a limited supply of providers or an extended wait to be seen, could raise or lower the threshold for seeking care. In addition, while features of the healthcare system such as overall access to care or societal context are not the focus of our framework, they play a role in an individual's decision-making by influencing their knowledge, beliefs, and attitudes about alternative locations for care.

The literature we reviewed on non-urgent ED use has several key limitations. First, descriptive studies of just non-urgent ED visits are hard to interpret. For example, although the self-perceived severity of their problem was high among patients who visited the ED for what others judged to be non-urgent, we do not know if perceived severity is similar among those who go to other care sites. Second, the comparison of urgent vs. non-urgent ED visits used in the vast majority of studies may be flawed. Urgent problems (e.g. chest pain) are qualitatively different than non-urgent problems (e.g. sore throat). The more relevant question is: why does the patient with a self-recognized non-urgent problem choose the ED rather than seek care at an alternative location or simply stay home? Only two studies compared non-urgent ED visits to non-urgent PCP visits;^{37,39} however, we cannot draw conclusions based on these papers because they did not evaluate similar independent variables. Ideally, future studies would also include patients who became ill with a time-limited condition but chose not to seek care. Third, studies disproportionately focus on associated factors (e.g., age, gender) which are easy to measure and classify but do not provide a causal mechanism for driving non-urgent ED use and are difficult or impossible to modify. We hope that our theoretical model can guide future work to assess the frequency and relative importance of different causal factors.^{37,39} Fourth, there are problems in clarifying the relationship between predictors of non-urgent ED use and the definition of non-urgent use itself. For example, based on current research it is unclear whether older adults are in fact less likely to go to the ED for minor conditions *or* whether their visits are more likely to be deemed “urgent” because they are frail or have multiple co-morbid conditions. Lastly, health services research often makes broad generalizations about populations. Because non-urgent ED users are likely a diverse group, the better approach might be to try and break up non-urgent ED users into different strata.³⁸ For example, some individuals may be using the ED due to habit, preference, or lack of education regarding

alternatives. The intervention chosen might vary by the different strata. Prior to applying them, the precise issues or challenges need be identified so that the correct intervention(s) is applied to encourage or enable desired behavior by patients.

It is widely presumed that redirecting non-urgent visits to alternate settings is a desirable policy goal, if for no other reasons than to reduce healthcare spending and enable EDs to focus their efforts on more acutely ill and injured patients. However, efforts to deter non-urgent ED use could produce unintended consequences. Imposition of steep copayments and deductibles to discourage ED use may deter some patients from timely care-seeking for serious or even life-threatening problems. Even steering patients to alternate settings from the ED triage desk is not without risk. Some studies have shown that as many as 3–5% of patients triaged as “non-urgent” require immediate hospitalization after further evaluation in the ED.⁴⁰ Another unintended consequence to consider is increased utilization; efforts to encourage alternatives to the ED, such as retail clinics, may induce patients who previously would have stayed at home to seek care. Likewise, it is only acceptable to discourage non-urgent use in communities where patients have real alternatives such as accessible primary care providers. High rates of non-urgent ED visits can in fact be an indicator of poor primary care access, as suggested by the ED Use Profiling Algorithm which classifies ED visits by whether they could be treated elsewhere or although emergent, could have been prevented by earlier access to primary care.⁵⁸

LIMITATIONS

The major limitation of this review is that the validity of findings is limited by the quality of included articles. Few studied used multivariate statistics so we are unsure whether the identified factors are associated with non-urgent ED use controlling for other factors. Also, the diverse (and controversial) criteria used to define non-urgent visits limits the comparability of findings.

CONCLUSION

Despite the significant policy interest in deterring non-urgent ED use, our literature review highlights both the limited understanding of what drives non-urgent ED use and flaws in most of the published studies. If health plans, policy makers and providers want to reduce use of the ED for non-urgent problems, they must ensure that their interventions are evidence-based and tailored to address the needs and concerns of the populations they are designed to serve.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix

Definitions of Non-Urgent Visits

Among articles that reviewed medical records retrospectively, criteria used to define non-urgent visits included admission to hospital,^{36,38,47,48,59} diagnoses,^{37,44,46,59} vital signs,^{36,38,48} complaint,^{36,38,48} timing of visit,^{36,59} arrival to ED (e.g., non-ambulance),^{38,59} procedures and/or tests ordered,^{44,47,52} patient's ability to wait for evaluation or care,^{43,46,51} co-morbidities,^{36,48} whether visit was for an accident/injury,⁴⁷ triage evaluation,⁴⁶ and referral.³⁸ Among articles that determined level of urgency at triage, criteria included: vital signs,^{42,45,50,54,55} ability of patient to wait for evaluation or care,^{40,53,56,60} expectations of procedures/treatments/resources,^{42,54,55} symptoms,^{45,50,55} age,⁴⁵ responsiveness,⁵⁴ level of distress,⁵⁴ medical history,⁴⁵ duration of symptoms,⁴⁵ referral,⁵⁰ and complaint.⁵⁰ Among articles that asked patients to retrospectively self-report the urgency of their visit, criteria included whether patient could have been seen by a primary care provider,^{16,49} admission to hospital,²³ whether visit was for an accident/injury,²³ procedures performed,²³ referral,²³ arrival to ED,²³ perceived seriousness of condition,²³ ability of patient to wait for evaluation or care,¹⁶ and timing of visit.¹⁶

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Take-Away Points

- Articles on the topic of non-urgent ED use were very heterogeneous with respect to study design, population, comparison, group, and non-urgent definition.
- The limited evidence suggests that younger age, convenience of the ED compared to alternatives, referral to the ED by a physician, and negative perceptions about alternatives such as primary care providers all play a role in driving non-urgent ED use.
- Efforts to deter non-urgent ED use can produce unintended consequences that must be considered.
- Future studies would benefit from the use of a robust theoretical framework on what drives non-urgent ED use.

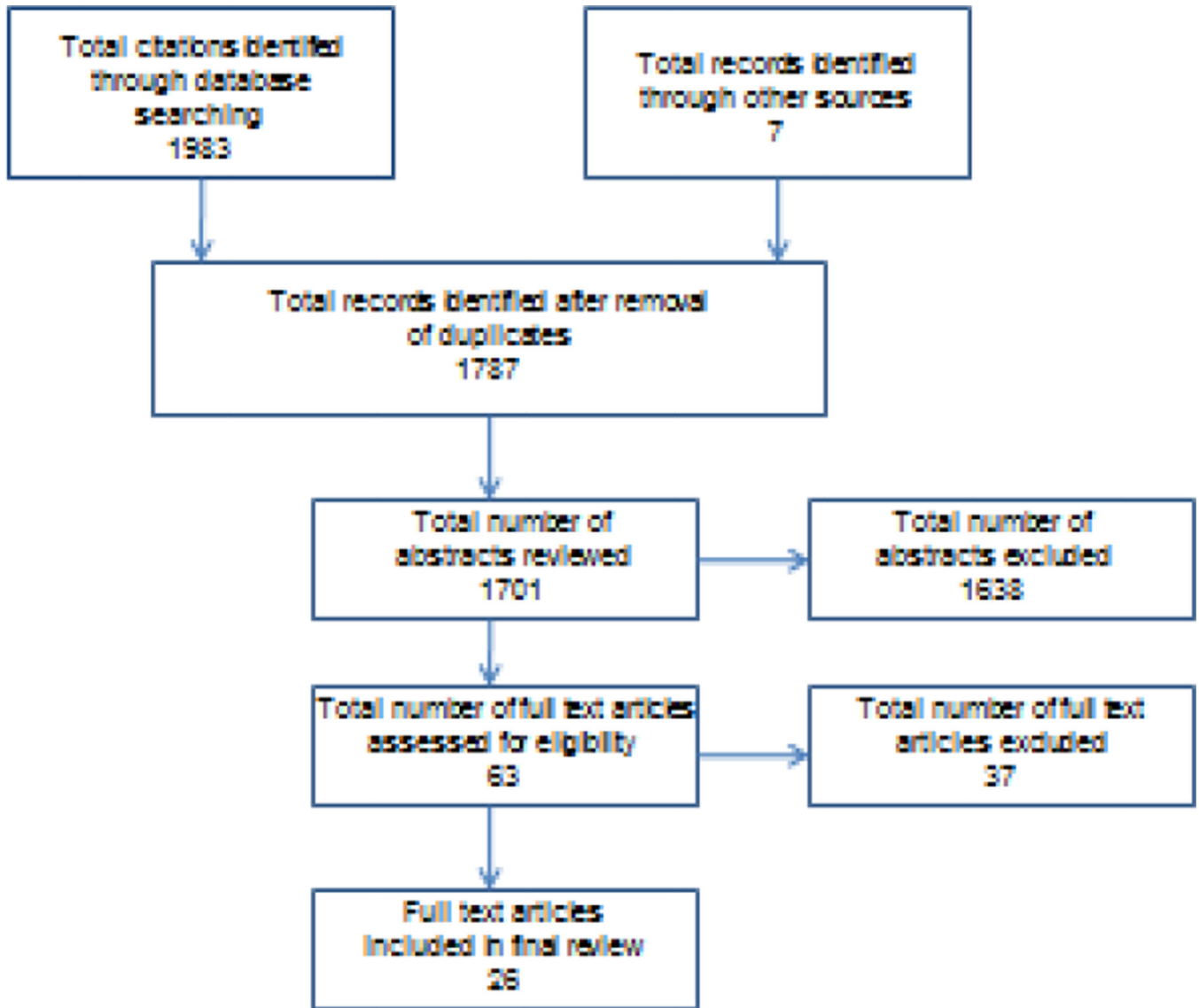


Figure 1.
Study Selection Flow Diagram

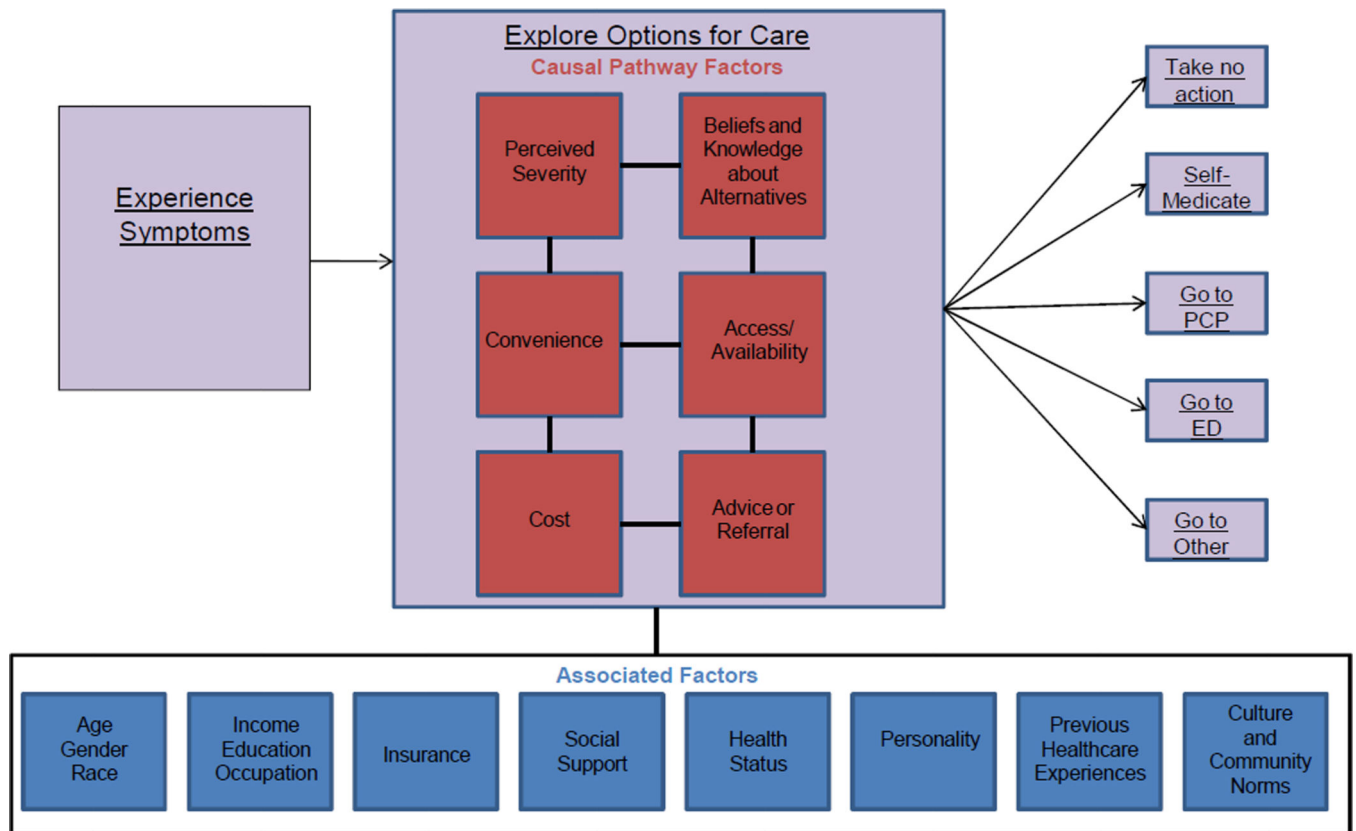


Figure 2.
Conceptual Model of Non-Urgent ED Use

Table 1

Design Features and Results of Studies of Non-Urgent Visits (n=6)

Reference	Study Design	Non-urgent Definition	Sample Description and Setting	Sample Size
Brim (2008) ⁴¹	Cross-sectional survey	Determined prospectively at triage (based on vital signs and expectations of procedures and treatments)	Convenience sample of adults presenting during business hours to one ED in Washington State	64 ED patients
Butler (1998) ³⁶	Cross-sectional survey and review of health plan administrative data	Determined retrospectively from review of medical record (based on diagnosis). Also used alternate definitions from the literature to test the sensitivity of the logistic regression model	Enrollees of one Medicaid HMO in Colorado who had a non-urgent visit to an ED or PCP	581 patients with 1943 visits (outcome of interest was whether a particular nonemergency visit was to the ED or primary care provider)
Gill (1996) ⁵²	Cross-sectional survey and medical records review	Determined prospectively at triage (based on ability to wait several hours or more for an evaluation)	Convenience sample in one ED in an unspecified location	268 ED patients
Northington (2005) ⁵³	Cross-sectional survey	Determined prospectively at triage (based on vital signs, responsiveness, level of distress, and expectations of testing)	Convenience sample of adult self-referred patients in one ED in North Carolina	279 ED patients
Redstone (2008) ⁵⁴	Cross-sectional survey	Determined prospectively at triage (based on symptoms, vital signs and expectations of resource use)	Convenience sample of adults with an established primary care provider presenting with a non-urgent condition to one ED in Colorado.	240 ED patients
Schwartz (1995) ³⁸	Cross-sectional survey	Not clearly defined: Patients with conditions that were not life threatening such as flu, cold, or sprains	Patients who had a non-urgent visit to either one ED in Georgia or to a family practice clinic (FPC)	52 ED patients and 42 FPC patients

Table 2
Design Features of Studies Comparing Non-Urgent ED visits to Other ED visits (n=20)

Reference	Study Design	Non-urgent Definition	% Non-urgent	Sample Description and Setting	Sample Size	Covariates
Baker (1995) ⁵⁵	Cross-sectional survey and chart review	Determined prospectively by physician rating at triage (based on whether patients needed to be seen within 24 hours)	43%	Adult ambulatory ED patients in a Los Angeles public hospital	1190	None-Descriptive statistics only
Bond (1999) ⁵⁸	Retrospective chart review	Determined prospectively by nurse at triage (based on whether patient required a physician assessment in under two hours)	62%	Northern Virginia ED patients with seven or more visits within 12 months	122 patients with 1,185 visits	None-Bivariate only
Campbell (1998) ³⁵	Retrospective medical record review	Determined retrospectively by medical record review (based on vital signs, admission to the hospital, chief complaint, presence of acute exacerbation of chronic condition, timing of visit)	37%	ED patients with a PCP seen on weekends or evenings	332	None-Bivariate only
Coleman (2002) ⁵⁷	Cross sectional survey and review of health plan administrative data	Determined retrospectively by medical record review. Compared four distinct definitions based on 1) Diagnosis at discharge 2) Whether patient was admitted to the hospital 3) Whether the patient walked to the ED 4) Whether the patient presented during clinic hours	1) 38% 2) 55% 3) 43% 4) 38%	Patients enrolled in a Colorado HMO outpatient care management program. Program included older patients with multiple chronic illnesses, high utilization history or PCP referral.	104	Age, gender, chronic conditions, co-morbidity, functional status, caregiver support, use of skilled home health nursing services, prior ED use
Cunningham (1995) ²²	Cross-sectional survey	Determined retrospectively by patient self-report (based on whether visit resulted in admission, whether the visit was associated with an accident or injury, whether a surgical procedure was performed, whether the patient was referred to the ED, whether the patient arrived by ambulance, and whether the patient reported their condition to be very serious)	40%	Adults across the U.S who participated in the National Medical Expenditure Survey	14,000 households with 9,461 household-reported ED visits	Health status, insurance coverage, demographic characteristics, socioeconomic status, number of physicians and EDs in county of residence, per capita income
Davis (2010) ⁴³	Retrospective review of administrative and claims data	Determine d retrospectively based on administrative and claims data (based on procedure ordered and ICD-9 codes)	24% of visits by Medicaid patients and 16% of visits by	Members of the largest insurer in Hawaii who had an ED visit that did not	650,000 enrollees	Age, gender, chronic diseases, and having a weekend or weekday visit

Reference	Study Design	Non-urgent Definition	% Non-urgent	Sample Description and Setting	Sample Size	Covariates
Doty (2005) ⁴⁸	Cross-sectional survey	Determined retrospectively by patient self-report (based on whether patient reported that the condition could have been treated by a regular physician if one had been available)	23%	Adults across the U.S. (ages 19–64) who responded to the Commonwealth Fund Biennial Health Insurance Survey	4,350 adults	Poverty status and insurance coverage
Garcia (2010) ⁵⁰	Retrospective review of medical records	Determined retrospectively based on medical record review (based on whether patient should be seen within 2–24 hours)	10%	National sample of ED visits by persons under 64 years of age (National Hospital Ambulatory Medical Care Survey)	Not described	None-Bivariate only
Harris Interactive (2005) ¹⁵	Cross-sectional survey	Determined retrospectively by patient self-report (based on whether visit occurred during business hours and could have been treated by a PCP or could have waited 24 hours for care)	21%	General public (oversample of recent ED users)	1000 patients who used the ED in the last year	None-Bivariate only
Gooding (1996) ⁵¹	Retrospective review of medical records	Determined retrospectively by medical record review (based on medical provider classification patient record form and whether non-routine diagnostic procedure were performed)	19% (with another 40% potentially non-urgent)	National sample of ED visits by persons under 65 years of age (National Hospital Ambulatory Medical Care Survey)	25,509 ED patient records	Age, sex, race, ethnicity, region, urban location, hospital ownership
Han (2003) ⁴⁷	Cross-sectional survey and retrospective review of medical records	Determined retrospectively from medical record review (based on complaint, presence of high risk condition, vital signs, and hospitalization)	73% of patients had at least one non-urgent visit in a six-month time frame	Homeless adults attending soup kitchens in 8 U.S. cities	241 adults with 688 ED records	Age, gender, race, marital status, and education
Liu (1999) ⁴²	Retrospective review of medical records	Determined retrospectively from medical record review (based on whether the patient requires medical attention immediately or within a few hours)	54%	National sample of ED visits by adults (National Hospital Ambulatory Medical Care Survey)	135,723 ED patient records	Disease category, age, sex, race, region, MSA, hospital ownership, insurance
Maclean (1999) ⁴⁰	Retrospective review of medical records	Determined prospectively at triage (definition not precisely defined)	52%	Random sample of patients presenting to 89 hospital EDs in 35 states	7,934	None-Descriptive statistics only
Niska (2010) ²	Retrospective review of medical records	Determined prospectively at triage (definition not precisely defined)	8%	National sample of ED visits by adults (National Hospital Ambulatory Medical Care Survey)	35,490 ED patient records	None-Descriptive statistics only

Reference	Study Design	Non-urgent Definition	% Non-urgent	Sample Description and Setting	Sample Size	Covariates
Petersen (1998) ⁴⁴	Cross sectional survey	Determined prospectively at triage (based on vital signs, history, age, symptoms, and duration of symptoms)	50%	Adult patients who presented to one of five urban teaching hospitals in the Northeast with the chief complaint of abdominal pain, chest pain, or asthma	1696	Age, sex, race, insurance, education, marital status, employment, English speaking, regular physician, comorbidities, health status
Rubin (1995) ⁴⁹	Cross-sectional survey and chart review	Determined prospectively at triage (based on referral, symptoms, complaint, and vital signs)	37%	Patients presenting to one urban ED	507	None-Bivariate only
Sarver (2002) ⁴⁶	Cross-sectional survey and medical record review	Determined retrospectively from medical record review (based on whether visit resulted in admission, procedure/tests were conducted, whether the visit was for an accident or injury)	40%	Adults across the U.S who participated in the National Medical Expenditure Survey and had a usual source of care other than the ED and who had at least one healthcare contact during 1996 or could not obtain needed care	9146	age, sex, race, education, health status, employment status, income, insurance, region of residence, and rural vs. urban residence
Schappart (1995) ⁴⁵	Retrospective review of medical records	Determined retrospectively by medical record review (based on initial triage evaluation and diagnosis of presenting condition and whether patient required attention within several hours)	55%	National sample of ED visits by adults (National Hospital Ambulatory Medical Care Survey)	Not described	None-Bivariate only
Shesser (1991) ³⁷	Cross-sectional survey	Determined retrospectively by medical record review (based on vital signs, referral, hospital admission, chief complaint, arrival by ambulance)	15%	Patients presenting to one urban ED during business hours	549	None-Bivariate only
Young (1996) ³⁹	Cross-sectional survey	Determined prospectively at triage (based on whether patient could wait 12–24 hours for treatment)	49% of ambulatory ED patients; 39% of all ED patients	Ambulatory patients who presented to 56 hospital EDs across the U.S.	6187	None-Bivariate only

Table 3

Socio-Demographic Factors Associated with Non-Urgent Use (n=16)**

Reference	Factors							
	Age	Gender	Race	Income	Education	Employment status	Insurance	
Bond (1999) ⁵⁸							Uninsured/public aid more likely (71%) than insured (53%)	
Campbell (1998) ³⁵	Younger age groups (37–42%) more likely than older adults (11%)	Females (41%) more likely than males (28%)				No association	Medicaid (42%) or uninsured (44%) more likely than private insurance (25%) or Medicare (12%)	
Cunningham (1995) ²²	No association	No association	Blacks greater likelihood than Whites (OR: 1.68)	Lower income Greater likelihood than high income (OR: 1.38)	Lower education greater likelihood than higher education (OR: 1.03)		Medicaid greater likelihood than uninsured (OR: 1.47) Medicare greater likelihood than uninsured (OR: 1.61)	
Davis (2010) ⁴³	Adults age 18–49 greater likelihood than older adults (OR: 5.0)	Males greater likelihood than females (OR: 1.25)						
Doty (2005) ⁴⁸			Blacks (35%) more likely than Whites (20%) or Hispanics (17%) No association Whites vs. Hispanics					
Garcia (2010) ⁵⁰							No association comparing Medicaid, private insurance, and uninsured	
Harris Interactive (2005) ¹⁵		No association	No association	No association	No association		No association	
Gooding (1996) ⁵¹							Uninsured greater likelihood than HMO (OR: 1.12) Medicaid greater likelihood than uninsured (OR: 1.15)	
Han (2003) ⁴⁷	No association	No association	No association		No association		No association	
Liu (1999) ⁴²	Younger age greater likelihood than older age (OR: 1.79)	Females greater likelihood than males (OR: 1.12)	Blacks greater likelihood than hites (OR: 1.08)				Medicaid greater likelihood than private insurance (OR: 1.14) Private insurance greater Likelihood than Medicare (OR: 1.33)	

Reference	Factors							
	Age	Gender	Race	Income	Education	Employment status	Insurance	
Petersen (1998) ⁴⁴	Adults age 16–30 greater likelihood than >60 (OR: 4.8) Adults age 31–40 greater likelihood than >60 (OR: 6.5)	Females greater likelihood than males (OR 1.3)	No association		No association		No association	
Rubin (1995) ⁴⁹							Higher % of the urgent group self pay (33%) vs. non-urgent group (22%) Higher % of non-urgent group commercial/HMO (38%) vs. urgent group (25%) No association between level of urgency and Medicare and Medicaid	
Sarvet (2002) ⁴⁶		Females greater likelihood than males (OR: 1.44)	No association	Low income greater likelihood than higher income (OR: 1.70)	No association			
Schappert (1995) ⁴⁵	Adults 15–24 higher rate of non-urgent visits (26.3 visits per 100 persons per year) vs. all other age groups	No association	Blacks higher rate of non-urgent visits (31.8 visits per 100 persons per year) vs. Whites (18.3 visits per person per year)				Medicaid patients made up a larger % of all non-urgent visits (25%) as compared to urgent visits (20%)	
Shesser (1991) ³⁷	No association	Non-urgent group higher % of males (53% vs. 42%) than group of all ED patients	No association	No association	No association		Non-urgent group higher % of self-pay (23% vs. 15%) and a lower % of Medicare (2% vs. 9%) than group of all ED patients No association between level of urgency and commercial insurance, HMO, and Medicaid	
Young (1996) ³⁹							No association	

* The majority of finding in the table are completed by adding the phrase “to have a non-urgent ED visit.”

** If an article (n=16) did not contain any of the factors listed in the table, it was not included in the table.

*** Only statistically significant findings are reported (p<.05). Non-significant findings are reported as “no association.”

Table 4

Miscellaneous Factors Associated with Non-Urgent Use (n=16)^{**}

Reference	Factors						
	Marital Status	Health Status	Previous Healthcare Experiences	Convenience	Access	Referral/ Advice	Beliefs and knowledge about alternatives
Cunningham (1995) ²²		Poor health greater likelihood than excellent health (OR: 2.17)	Average number of visits in an outpatient setting other than the ED higher for persons with non-urgent ED visits versus persons with only outpatient physician visits (5.6 vs. 4.8)				
Davis (2010) ⁴³		Adult without chronic conditions greater likelihood than those with a chronic condition (ORs: 1.11–1.67)					
Harris Interactive (2005) ¹⁵	No association	No association		Non-urgent ED users (27%) more likely to not want to miss work than all ED users (15%)	Having a regular physician higher among non-urgent ED users vs. all ED users (35% vs. 27%)		Non-urgent ED users (20%) more likely than all ED users to think other places are more expensive than the ED (12%)
Han (2003) ⁴⁷	No association		No recent hospitalization associated with higher odds of non-urgent ED visit (OR: 1.85) More frequent ED visits associated with increased odds of non-urgent ED visit (OR: 1.16) No association (number of primary care visits)		No association (self-reported difficulty getting healthcare)		
Petersen 1998) ⁴⁴	No association	No association			Persons without a regular physician greater likelihood than those with one (OR: 1.6)		
Sarver (2002) ⁴⁶		Poor health greater likelihood than good health (OR: 2.94)			Persons who said it was difficult to obtain an appt with their usual source of care more likely (9%) than not likely (5%) Persons with a wait time of more than an hour at their usual source of care more likely (9%) than no appt needed (5%)		Dissatisfaction with regular source of care associated with non-urgent visit (OR: 1.13)

Reference	Factors							Beliefs and knowledge about alternatives
	Marital Status	Health Status	Previous Healthcare Experiences	Convenience	Access	Referral/ Advice		
Shesser (1991) ³⁷ Young (1996) ³⁹	No association				Patients with a usual source of care more likely to be assessed as urgent (55%) compared to those without (46%)	Referred to the ED more likely to be assessed as urgent (61%) than not referred (49%)		

* The majority of finding in the table are completed by adding the phrase "to have a non-urgent ED visit."

** If an article (n=16) did not contain any of the factors listed in the table, it was not included in the table

*** Only statistically significant findings are reported (p<.05). Non-significant findings are reported as "no association."