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ORIGINAL PAPER

# A Nurse-Run Walk-In Clinic: Cost-Effective Alternative to Non-urgent Emergency Department Use by the Uninsured

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**Abstract** Non-urgent healthcare problems are responsible for more than 9 million visits to the emergency department (ED) in US hospitals each year, largely due to patients' lack of access to a primary care physician. To avoid costly and unnecessary ED usage for non-urgent health problems, a walk-in clinic run by nurses (CHEER Clinic) was developed as an extension of the services provided by an existing free clinic in a low-income neighborhood of Providence, RI, with the goal of providing uninsured patients with a convenient, no-cost means of accessing healthcare. An evaluation and cost-effectiveness analysis of the clinic's first 5 months of operation were performed. During this pilot period, 256 patients were seen. When incorporating the quality-adjusted-life-year value of preventive services rendered, an estimated $1.28 million in future healthcare costs was avoided. Dividing these cost-savings by the clinic's operational cost yielded a mean return on investment of $34 per $1 invested. Adding nurse-run walk-in hours at a free clinic significantly expanded access to healthcare for uninsured patients and was cost-effective for both the clinic and the patient. Ultimately, replication of this model in community clinics serving the uninsured could reduce ED burden by treating a substantial number of non-urgent medical concerns at a lower cost than would be incurred for treatment of the same problems in EDs.

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## Introduction

Total annual visits to US hospitals' emergency departments (ED) increased by 23 % from 1997 to 2007, nearly double what would be expected based on population growth alone during that period [1]. In 2010, roughly 7 % of the more than 129 million annual visits to EDs in the US were non-urgent [2], largely due to patients' lack of access to a primary care physician [3, 4]. The uninsured are more likely than those who are privately insured to use EDs for non-urgent health problems; in 2010, visits for non-urgent health problems accounted for 9.0 % of ED visits by the uninsured compared to 5.3 % for the privately insured [2]. In the state of Rhode Island (RI), where approximately one in seven ED visitors was uninsured [5], more than two in five ED visits not resulting in an inpatient stay were non-emergent (19.8 %), primary-care treatable (18.8 %), or avoidable had the patients had access to primary health care (5.4 %) [6]. A statewide study in California found that periods of ED crowding were associated with modest but significant increases in inpatient mortality, length of hospital stay, and cost per admission, reiterating the importance of diverting non-urgent patients from crowded EDs [7].

Furthermore, despite its ability to effectively address patients' immediate health concerns, the costly nature of ED care is associated with financial instability, future predatory lending [8, 9], and bankruptcy [10], particularly among the uninsured. In 2008, health care spending for uninsured individuals was estimated at nearly $90 billion, much of which ($30 billion) was paid out-of-pocket by the patients [11]. It is apparent that communities with risk factors for elevated rates

of uninsurance (e.g., those with high proportions of low-income and unemployed residents [12], non-citizens [13], and Hispanics and non-Hispanic Blacks [14]) may benefit from gaining access to a non-ED source of healthcare.

Ultimately, "safety-net" services (that have a mission of providing at least some free care for uninsured residents) like free clinics could reduce ED burden, thereby conserving limited ED resources for patients with more time-sensitive emergencies. Implementation of the Patient Protection and Affordable Care Act will diminish but not resolve the problem. Even after health care reform is enacted, free clinics will likely continue to provide an important alternative source of care to patients who might otherwise either defer care until it becomes an emergency or seek non-urgent primary care in EDs [13, 15]. For example, despite statewide health reform enacted over 6 years ago in Massachusetts (MA), there are still more than 276,000 uninsured individuals in the state [16]. The working poor who do not have access to, or cannot afford, employer-sponsored or state-subsidized insurance predominate among the uninsured in MA [17].

One study found that uninsured patients living closer to safety-net hospitals and community health centers were less likely to have an unmet medical need, postponed or delayed necessary care, and ED visits, and more likely to have had a primary care visit in the past year than those living farther from these sources of care [18]. Lowering the barrier to care at community clinics has also been associated with up to 33 % decreased ED usage by and hospitalization of uninsured patients [19, 20]. Notably, a hospital in Houston, TX recently saved more than $4.5 million in ED diversions for uninsured patients by providing walk-in access to care [21].

Based on these observations, a nurse-run walk-in clinic, the "CHEER Clinic," was implemented as an extension of the services provided at a community-based free clinic in RI to improve access to healthcare for the uninsured. The present study was designed to determine if prospective ED visitors would instead utilize walk-in non-acute care, and if this care would prove cost-effective for both the patient and providing facility. We also sought to assess whether the clinic reached its intended population by describing the demographics of the sample.

## Method

### Clinic Development and Setting

The "CHEER" (Clinica Esperanza/Hope Clinic Non-Urgent Care Walk-in) Clinic began providing care in July 2012, with the financial assistance of a local funder. It is co-located within Clinica Esperanza/Hope Clinic (CEHC), a free clinic in Providence, RI, situated in a neighborhood with multiple risk factors for uninsurance [22]. CHEER Clinic services are made available to both existing CEHC patients and non-enrolled (non-CEHC) patients. In order to qualify for care at CEHC and/or CHEER Clinic, prospective patients must be over 18 years of age and lack both health insurance and a routine primary care provider; CHEER volunteers provide referrals to alternative sources of care for insured patients or patients eligible for Medicare or Medicaid. The parent clinic is open to the public two weekday nights and one weekend morning; CHEER Clinic provides five additional hours of walk-in care on each weekday afternoon. Due to the co-location of the walk-in clinic within the parent clinic, CHEER staff has access to CEHC's medical equipment, electronic medical record system, and human resources such as community health workers trained as medical interpreters who assist patients in "navigating" the state's hospital system, as required.

Care protocols and procedures were developed based on existing peer-reviewed, evidence-based "walk-in" protocols (Table 1), e.g., those approved by the Agency for Healthcare Research and Quality [23] and used by the California Department of Corrections [24] and Georgia Division of Public Health Office of Nursing [25]. Protocols were reviewed and approved by CEHC's Medical Director, Nurse Manager, and Medical Advisory Board. Each protocol is available to all clinic staff on a centralized website.

CHEER Clinic's walk-in services were advertised through English and Spanish public service radio outlets and communication with the parent clinic's existing network of community-based organizations.

### Provision of Care

At least one nurse staffs the CHEER Clinic at all times during operational hours. Additional volunteers (non-MD and non-RN level) are trained to evaluate patients' vital signs, blood pressure, and body mass index, and document visits in the clinic's electronic medical record system. Triage and treatment are performed by the on-duty nurse based on the established protocols, with assistance from medical interpreters if required. Available tests include urinalysis, fecal occult blood testing, EKG, rapid flu test, rapid strep test, rapid mono test, cholesterol test and hemoglobin A1C. The nurse defines the initial differential diagnosis based on vital sign assessment, limited physical exam, any test results, chief complaint, and patient history. When necessary, the nurse consults CEHC's volunteer on-call physician by text message or phone call to review the putative diagnosis.

The nurse then discusses the plan of care with the patient and determines whether the patient should be referred to another source of primary health care (e.g., if

**Table 1** Non-acute care protocols used at CHEER Clinic

| Chronic diseases | Systemic complaints | Genitourinary complaints | ENT/other |
|---|---|---|---|
| Hypertension | Abdominal pain, ulcer | Urinary tract infection | Ear complaints |
| Asthma | Lower back pain | Epididymitis | Lacerations, abrasions |
| Arthritis | Constipation, diarrhea | Pelvic inflammatory disease | Head injury (minor) |
| Neurologic complaints | Eczema | Genital herpes | Epistaxis |
| Cough (not URI related) | Other dermatitis | Gonorrhea, chlamydia | Thermal burns |
| Diabetes (not already being treated) | Rhinitis, pharyngitis, URI | Genital and/or peri-anal warts | Eye injury, conjunctivitis |

*URI* upper respiratory infection

the patient is eligible for insurance) or added to the parent clinic's waiting list to receive additional follow-up and/or prescription medications, if the on-call physician believes it would benefit the patient. If the patient's chief complaint is outside the scope of established nurse protocols (e.g., chest pain, traumatic injury [falls, altercations], intoxications [intentional or otherwise]), the nurse triages the patient to the nearest ED by calling 911.

### Patient Survey

Patients are asked to complete a voluntary, anonymous paper survey (in English or Spanish) at the conclusion of their visit. The survey inquires about the patient's sex, age, race/ethnicity, and country of origin; the patient's history of previous visits to the ED and if the patient would have utilized the ED that day for their chief complaint had the CHEER Clinic not been available; and self-reported willingness and ability to pay for the care provided that day. These surveys are utilized to collect demographic data on the patient population, as well as to inform future direction and expansion of this pilot program.

### Analysis Plan

Using a combination of patient survey responses and de-identified electronic medical record information relating to aggregate counts of services rendered, data from the first 5 months of CHEER Clinic operation (July 26–December 27, 2012) were aggregated using Microsoft Excel. The primary outcome of interest was ED costs avoided by providing walk-in primary care, expressed as a net amount and also as a return on investment (ROI).

Following a method utilized in a similar evaluation [26], a Clinically Preventable Burden (CPB) score (range: 1-5) was assigned to each service provided to patients [27]. Each CPB score is associated with an estimated range of quality-adjusted life years (QALY) saved, based on how effective each preventive service is at averting future health concerns; higher CPB scores indicate more cost-effective services. After summing the number of times each service with a certain CPB score was performed during the study period and multiplying by the lower, middle, and upper bounds of the QALY saved for the respective score, we calculated a "conservative," "average," and "liberal" estimate of total QALY saved for each CPB score.

Total savings, as well as ROI, were calculated by subtracting the clinic's cost of operation from the relative QALY worth of the services rendered, and dividing by the clinic's cost of operation [26]. The ROI represents costs avoided during the study period for each $1 invested in the clinic's operation. ROI variation was explored by excluding and including the value of preventive services.

## Results

### Demographics

During the five-month evaluation period, 256 patients filled out at least one part of the CHEER Clinic survey. Of these patients, 61 % were female and 39 % were male; the mean age was 39 years (SD = 14 years). The majority of patients self-identified as being of Hispanic/Latino ethnicity (59 %); 19 % of patients identified as non-Hispanic Black/African-American, and 10 % identified as non-Hispanic White (see Table 2 for additional demographics). Of those who responded, 74 % listed a country of origin other than the US, with common responses being the Dominican Republic (22 %), Guatemala (19 %), and Liberia (10 %).

### Patient Willingness and Ability to Pay for Care

Patients were asked to write in responses to questions concerning their willingness and ability to pay for the non-urgent care they received that day. On average, after removing one outlier of $500, patients who reported any monetary amount were willing to pay up to $18.58 ($23.59, when including outlier) but self-reportedly able to pay up to $10.18, for the care they received that day. Approximately two-thirds of respondents (n = 64) could afford less than or equal to $10 for the care they received that day.

**Table 2** Walk-in clinic patient demographics (N = 256)

| | N | % |
|---|---|---|
| Age (mean years ± SD) | 38.9 ± 14.1 | |
| Sex | | |
| Female | 156 | 61 |
| Male | 100 | 39 |
| Race/ethnicity | | |
| Hispanic/Latino | 151 | 59 |
| Not Hispanic/Latino | 83 | 32 |
| Black | 48 | 19 |
| White | 25 | 10 |
| Asian | <10 | 1–2 |
| Mixed/Other | <10 | 1–2 |
| Native American | <10 | 1–2 |
| Missing | 22 | 9 |
| Past ED Utilization | | |
| Past week (n = 121) | <10 | <8 |
| Past month (n = 119) | 10 | 8 |
| Past year (n = 116) | 32 | 28 |
| Past year, more than once (n = 116) | 13 | 11 |
| Past year, total trips | 55 | – |
| Ability to pay for care received (n = 96, patients selected from a list) | | |
| $0 | 43 | 45 |
| From $1–10 | 21 | 22 |
| From $15–25 | 26 | 27 |
| From $30–60 | <10 | <10 |

Questions with fewer than 10 respondents are noted as such to protect patients' information

## Previous ED Utilization

Just over one in four survey respondents had been to the ED in the past year, for a total of 55 trips. Of these patients, 41 % had been more than once (n = 13, 11 % of all respondents). Ten patients (resulting in 12 total trips) had been to the ED within a month prior to their appointment; eight patients (resulting in nine total trips) had been to the ED within 1 week prior to their appointment at CHEER.

## Nature of Medical Problems for Which Patients Sought Care

The most frequent "primary" reason for coming to the clinic was to receive an immunization or vaccination, including the seasonal flu shot (n = 59 of 203 chief complaints, 29 %). The second-most common primary reason for coming to the clinic was to receive a tuberculosis skin test implantation or reading (n = 38, 19 %), followed closely by chief complaints of pain (n = 36, 18 %). Between five and ten patients reported chief complaints related to each of the following: complications from or screening requests for diabetes or high blood pressure; genitourinary, respiratory, or skin-related symptoms; or interest in a full physical exam.

## Outcomes

Approximately one-third of CHEER patients (n = 86) were already connected to care at the parent clinic, with eight additional patients currently on the waitlist. Of the almost two-thirds of CHEER patients (n = 160) who were not already patients of the parent clinic, 36 (23 %) were added to the parent clinic's waiting list and nine (6 %) were connected to one of the clinic's programs (e.g., healthy eating program) following their visits to CHEER.

Of all CHEER patients, almost two-thirds (n = 163) were advised to return to CHEER Clinic for follow-up care. Seven patients were referred to an outside specialist or primary care provider in the community who accepts uninsured patients. Four patients were, in fact, sent to the ED because the nature of their chief complaint was deemed either urgent or out of the scope of the covering nurse.

## Value of Preventive Services

Table 3 outlines the services rendered to CHEER patients, QALY saved, and associated QALY worth. Although few patients came to CHEER Clinic with a primary concern related to blood pressure, many patients are screened for hypertension as part of intake protocols. The most common, and most cost-saving, preventive service rendered was hypertension screening (and connection of patients to the parent clinic for subsequent treatment, if necessary), provided to 57 % of CHEER patients (n = 145). With a CPB level of 5, this saved 13.05 QALY and approximately $618,000 in anticipated future healthcare costs. Also with a CPB level of 5, provision of non-flu vaccinations and immunizations (n = 63) was the second-most cost-saving procedure, saving 5.67 QALY and approximately $269,000 in anticipated future healthcare costs.

Other high-return procedures included obesity screening (accomplished through body mass index assessment), flu vaccination, and cholesterol screening. With a CPB level of 3, obesity screening was the second-most provided (n = 123; 48 % of patients) and third-most cost-saving procedure (3.46 QALY and $164,000 saved). However, subsequent diet counseling was provided to only six patients, saving less than $1,000 in total. It is possible that this activity was under-reported, or that patients were not counseled because they were subsequently enrolled in a free "healthy lifestyle program" which was not tracked. Flu vaccination, with a CPB level of 4, was the fourth-most cost-saving procedure, saving approximately 2 QALY, and

**Table 3** CHEER Clinic services provided, QALY saved, and value of QALY saved

| Service | Number provided | Average QALY Saved[a] (years) | Average value of QALY saved ($) |
|---|---|---|---|
| CPB value: 5 | | | |
| Hypertension screening and treatment | 145 | 13.05 | $618,426 |
| Vaccinations (excluding Flu) | 63 | 5.67 | $268,696 |
| Cholesterol screening | 7 | 0.63 | $29,855 |
| CPB value: 4 | | | |
| Flu vaccine | 28 | 1.91 | $90,395 |
| CPB value: 3 | | | |
| Obesity screening | 123 | 3.46 | $163,936 |
| Breast cancer screening | 3 | 0.20 | $9,685 |
| CPB value: 2 | | | |
| Chlamydia screening | 3 | 0.02 | $977 |
| CPB value: 1 | | | |
| Diabetes screening | 79 | 0.15 | $7,019 |
| Diet counseling | 6 | 0.01 | $533 |
| Totals | | | |
| Conservative estimate[b] | – | 22.03 | $545,714 |
| Liberal estimate[c] | – | 27.34 | $1,913,940 |
| Average estimate[d] | – | 25.10 | $1,189,523 |

[a] Based on a cohort of 4 million

[b] Assuming 1 QALY = $24,777 [37]

[c] Assuming 1 QALY = $70,000 [26, 38]

[d] Assuming 1 QALY = $47,389 (Average of conservative and liberal estimates)

reducing future healthcare costs by more than $90,000. Cholesterol screening, while relatively uncommon (n = 7), saved under 1 QALY but led to a total savings of about $30,000.

Although few patients came to CHEER Clinic with a primary concern related to blood sugar, many patients are screened for diabetes as part of intake protocols. Diabetes screening was the third-most provided procedure (n = 79, 31 % of patients), but with a CPB level of 1, this measure saved under 1 QALY and only about $7,000. Less common services included breast cancer screening (n = 3) and chlamydia screening (n = 3).

In total, CHEER Clinic services saved 25.10 QALY when using average estimates (conservative-liberal estimate range: 22.03–27.34). This resulted in a total savings of about $1.19 million (conservative-liberal range: $0.55–1.91 million) in future healthcare spending.

## Return on Investment

The average cost to uninsured patients for a trip to the local ED is $792 [28]. Subtracting the average cost of a CHEER Clinic visit ($32, covered by funds provided by donors) results in an overall cost savings of $760 per patient who would have sought care in the ED. The total operating cost of the CHEER Clinic over the five-month study period was $37,870; 29 % of these funds were used to supplement the costs of medical tests obtained from the parent clinic and to cover operational expenses for hours that the parent clinic would not have been open (i.e., rent, utilities), while 71 % was used for nurse wages and related taxes.

We explored cost savings and ROI by first excluding the value of preventive services rendered, and only considering patients who would have gone to the ED. To calculate the most conservative estimates, we assumed that 49 % of the total number of patients seen (n = 123, excluding the four patients who were sent to the ED), would have visited the ED for their condition had they not been able to obtain care at the clinic. This number was extrapolated from the 65 survey respondents who self-reported that they would have gone to the ED for their chief complaint if the CHEER Clinic had not been available, as only 49 % of survey respondents provided an answer for this question). This resulted in a ROI of $1.48 per $1 invested in the CHEER Clinic for care provided, excluding preventive services (Table 4).

For the most liberal ROI estimate, while still excluding the value of all preventive services rendered, we assumed 80 % of all CHEER patients would have visited the ED, based on a published observation that 80 % of visits to a mobile healthcare van were associated with future ED visits [26]. Using this estimate increases ROI to $3.05 per $1 invested for care provided, excluding preventive services (Table 4). The mean ROI of the conservative and liberal estimates was $2.26.

When incorporating the estimated value of preventive services (outlined in Table 3), cost savings increased to $1.28 million (conservative-liberal range: $0.60–2.03

**Table 4** CHEER Clinic 5-month cost savings and return on investment

| | Conservative estimate | Average estimate | Liberal estimate |
|---|---|---|---|
| 5-month operating cost | | $37,870 | |
| Tests, other operating expenses | | $11,070 (29 %) | |
| Wages, taxes | | $26,800 (71 %) | |
| Patients who would have gone to ED | | | |
| Extrapolated self-report[a] (N) | 123 | – | – |
| Average (N) | – | 163 | – |
| Total visits[b] discounted by 20 %[c] (N) | – | – | 202 |
| Costs saved[d] | $639,559 | $1,313,054 | $2,067,156 |
| Costs avoided by preventing ED visits[e] | $93,845 | $123,530 | $153,216 |
| Value of potential life years saved | $545,714 | $1,189,523 | $1,913,940 |
| Net cost savings[f] | | | |
| Excluding preventive services | $55,975 | $85,660 | $115,346 |
| Including preventive services | $601,689 | $1,275,184 | $2,029,286 |
| Return on investment ($, per $1 invested) | | | |
| Excluding preventive services | 1.48 | 2.26 | 3.05 |
| Including preventive services | 15.89 | 33.67 | 53.59 |

[a] Forty-nine percent of survey respondents reported they would have gone to the ED for their chief complaint; this proportion was applied to the total number of patients (less the four patients who were referred to the ED)

[b] Less the four patients who were referred to the ED

[c] See [26] for rationale

[d] Sum of costs avoided by preventing ED visits and value of potential life years saved

[e] Average cost of ED visit (after subtracting average cost of CHEER Clinic visit) multiplied by the number of patients who would have gone to the ED

[f] Total costs saved, less operating costs

[g] Net cost savings divided by operating cost

million; Table 4). The ROI increased more than ten-fold, with a mean of $33.67 (conservative-liberal range: $15.89–53.59) saved per $1 invested.

## Discussion

Lack of insurance negatively affects the quality of health care received by minority populations more than any other demographic or economic barrier, [29]. In the US, 31 % of Hispanics and 21 % of non-Hispanic Blacks lack health insurance coverage, compared to only 12 % of non-Hispanic Whites [30]. Furthermore, the percentage of uninsured individuals who had a "usual source of care," such as a family doctor or community health center, fell to 38 % in 2010 from 44 % in 2000 [31]. Thus, the goal of the present investigation was to evaluate whether uninsured prospective ED visitors would substitute a visit to a non-urgent care walk-in clinic for an ED visit, whether providing this care would be cost-effective for both the patient and providing facility, and whether the target patient population could be effectively reached.

Almost half of the CHEER Clinic patients who responded to the clinic's survey (49 %) reported that they would have visited an ED that day for their chief complaint had they not been able to access care at CHEER. This provides strong evidence that the CHEER Clinic provided a valuable alternative to EDs in this community.

The immediate (e.g., vaccinations and immunizations) and preventive (e.g., hypertension, diabetes, and obesity screenings) services rendered by nurses running the CHEER Clinic resulted in high ROI, ranging from about $34 (conservative-liberal range: $16–54) per $1 invested. In comparison to a similar evaluation, the ROI of CHEER Clinic is on par with, if not greater than, that of a mobile healthcare van ($36) operating in nearby Boston, MA [26]. Even when excluding future cost-savings resulting from preventive services rendered, and only considering patients that were likely to have visited the ED instead of CHEER Clinic, ROI remained high at $2.26 (conservative-liberal range: $1.48–3.05) per $1 invested.

Hypertension and obesity screening were two of the top three cost-saving interventions carried out by the clinic. These services require very little equipment and volunteer training time. While these interventions are simple, their impacts on future health care costs are significant. Implementing these two preventive measures saved, on average, a combined 16 QALY and over $780,000 in future healthcare spending. Free walk-in clinics may provide an important means of reaching populations who are at high risk of chronic diseases such as hypertension and metabolic syndrome. Providing walk-in care within the framework of a free clinic for the uninsured also facilitates continuity of care for these at-risk patients, as high-risk CHEER Clinic patients can be immediately linked to appropriate care provided by volunteer medical providers at the regularly scheduled medical clinic.

One of most common reasons for attending CHEER Clinic was to obtain vaccinations that were required for employment or attendance at school. While vaccinations have inherent value to patients and their communities by preventing future illness [32], providing access to free vaccinations administered by a nurse has the added effect

of reducing local barriers to employment and education in a community that has limited economic resources. Thus walk-in clinics may have a positive impact on local economies.

Although it is more difficult to quantify the subsequent impact of the CHEER Clinic's walk-in health care on the local community, the demographics of the population seeking care at the CHEER Clinic clearly define a target population in need of free care. The parent clinic has served a population affected by health disparities through direct patient services at the clinic and at community-based outreach sites since 2007. Patients served by CEHC (and the CHEER clinic) are generally members of an extremely low-income, low-English proficiency group of predominantly Hispanic (80 %) individuals who are dramatically impacted by health disparities. Providing free walk-in health care for this particular demographic illustrates an important aspect of this intervention: the CHEER Clinic served as a point of entry to the health care system for patients who otherwise would not have access to quality health care. Not only are such health disparities growing both nationally and in RI, but so too is the number of individuals who have limited access to health care, predisposing them to higher morbidity and earlier mortality [33–35]. Lowering the barriers to obtaining health care for this population may reduce the long-term impact of chronic diseases on this community.

## Observations and Limitations

Many more females than males attended CHEER Clinic (61 vs. 39 % of patients), which is consistent with the gender-associated utilization rates published in a recent nationwide review of free clinics [15]. Factors accounting for this observation in this particular community cannot be explored without more detailed patient-level data, which were not collected as part of this evaluation. Preliminary population-level explanations may be related to gender differences in perceived health status [36].

Although operating costs of CHEER Clinic are low, additional funding is required to keep these patients linked to care at the parent clinic; this cost was not factored into reported results. The present evaluation was intended to serve only as an evaluation of the CHEER Clinic's preliminary five-month pilot period; future studies will evaluate whether patients were permanently enrolled in clinical care either at CEHC or another location.

Because the patient survey is voluntary, many patients (up to 64 % for some questions) elected not to fill out certain sections. This may have altered certain results that were only available as self-reported data (e.g., willingness and ability to pay for care, past ED utilization). Because the surveys are de-identified, it is also possible that patients who came to CHEER Clinic more than once filled out multiple surveys, thereby slightly altering demographics of the population served.

Just over a quarter of patients had been to the ED in the past year (28 %), but a much larger proportion of respondents (49 %) reported that they would have gone to the ED for their chief complaint that day. Although this presents as an over-reporting by the patients, when assuming that each past-year ED *visit* was made by a separate patient, it results in a past-year ED visit incidence of 41 %, suggesting that the figures roughly correlate with one another.

## Conclusions

The results of this pilot intervention support the concept that non-physician providers such as nurses and student volunteers can improve access to care for the uninsured with non-urgent health problems. Diverting non-urgent ED visits by expanding nurse-run hours at a free clinic was cost-effective for both the providing facility and the patient. A substantial number of non-urgent medical concerns were treated at a lower cost than would be incurred for treatment of the same problems in EDs, with an average ROI of over $2 for every $1 invested, even when excluding the long-term value of preventive services. When including the value of preventive services, ROI increased to $34 for every $1 invested. Particularly in communities whose residents are either uninsured, or that have other risk factors associated with uninsurance, the development of free, nurse-run walk-in care within existing free care clinics may lead to decreased ED utilization, decreased delays in seeking treatment, increased use of preventive services, and integration of patients with undiagnosed health problems into continuing medical care clinics. Ultimately, replication of the CHEER model could result in overall improved health outcomes for a group of patients that continues to be affected by health disparities.

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