Complexity-Based Triaging and Scheduling for Reducing Clinic Wait Times in Student-Run Free Clinics

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Abstract

Student-run free clinics are a valuable resource for both patients who lack access to care and undergraduate medical education. Free clinics often face specific challenges, such as long clinic wait times, necessitating the development of strategies to minimize wait time and enhance patient satisfaction. We provide a guide for the use of patient complexity to facilitate patient scheduling and the proper assignment of students to complex patients based on training level. An estimation of the complexity of each patient may provide valuable information to clinic organizers and ultimately reduce patient wait times.

Introduction

Student-run free clinics (SRFCs) play a critical role in underserved populations and in undergraduate medical education.[1] They offer free healthcare services to un- or underinsured individuals while simultaneously providing valuable opportunities for students to acquire clinical skills and learn about healthcare disparities.[2] However, long wait times can undermine the quality of care delivered at these institutions, with quality improvement data from multiple SRFCs demonstrating that patients frequently remain dissatisfied with both wait and treatment times during their visits.[3,4]

Wait times in clinics pose a universal healthcare challenge. There is a wealth of literature exploring ways to improve patient flow and reduce clinic wait times, ranging from human resources and novel technologies to open access scheduling and management policies.[5-10]

However, strategies to reduce wait times are heavily dependent on medical specialty and clinic context. There is a scarcity of literature that has been dedicated to reducing clinic wait times in a free clinic setting, where clinic flow is unique for a variety of reasons: free clinics often operate on a first-come-first-serve basis with limited operational hours, a large proportion of patients require interpreter services, and medical students typically conduct all parts of a visit before staffing with an attending physician.[1,11,12] In one study conducted at Stanford-affiliated free clinics, an open access scheduling system—a scheduling system in which patients can obtain same-day and walk-in appointments—was implemented using free online scheduling tools, enabled visits to be spread throughout the day, and decreased patient wait times.[13] More operational protocols and strategies are needed to tailor to the unique challenges of a SRFC. In this article, we propose the use of patient complexity to facilitate patient

triaging and minimize clinic wait times, and provide an evidence- and experience-based guide on estimating patient complexity.

Project Proposal: Estimating Patient Complexity

A student-run free clinic stands to gain many benefits from an efficient triaging system that allows clinics to anticipate and schedule patients based on level of complexity. This theoretical strategy has been named "complexity-augmented triage" by Saghafian et al.[14] Studies using similar principles of triage and scheduling based on complexity have shown that this can increase efficiency and significantly reduce wait times in ambulatory care settings.[15,16]

Scheduling and assigning patients based on anticipated complexity enables junior students to practice their history-taking and physical exam skills on simpler or "bread-and-butter" cases while assigning senior medical students and residents to more complex patients. In a student-run free clinic, one major time-limiting factor can be having students in various levels of training see patients before staffing with an attending physician. One study found that student History & Physicals took the longest of all the steps at a patient visit to a free clinic and that implementing a time limit of 25 minutes significantly reduced overall wait time.[17] Unfortunately, this time limit does not allow for flexibility when some patients' chief concerns require more time to diagnose and work-up than others. Assignments based on patient complexity would improve clinic efficiency as it is well known that effective history-taking, particularly for complicated cases, revolves around knowing the right questions to ask: a skill that students refine throughout their time in medical school and residency.[18,19]

In the long run, being able to accurately predict a patient's complexity would by extension allow clinics to predict how much time a patient visit would require for scheduling purposes. A patient who is returning simply for follow-up or medication pick-up with no new concerns can be allocated a shorter time slot than a patient with multiple new concerns. Furthermore, appointment times can be scheduled and staggered accordingly. For example, complex patients can be given a scheduled arrival time and be spaced out more throughout the clinic day. A long-term goal could be the establishment of a complexity score, or complexity calculator, that could be computed by the electronic health record system automatically to facilitate scheduling and student assignments, rather than a subjective assessment. However, the accuracy of such a score or calculator should be well established before implementing such changes, as to avoid situations such as overbooking too many complex patients deemed by the calculator to be "simple."

Implementation and Drawbacks

The core question in implementing this proposal then becomes: how can we facilitate estimation of patient's level of complexity in the free clinic, prior to scheduling or assignment of patients to medical students? In other words, what factors should be considered? Patient complexity is a highly multifaceted concept because it often includes not only medical conditions but also the psychosocial factors that contribute to healthcare. One study investigating the definition of complexity in a primary care setting identified the following predictors, among others: age, poorly controlled diabetes, prescription of antipsychotics, alcohol-related diagnoses, and inadequate insurance.[20] Another study identified various elements of complexity including mental health status, old age, female gender, lower education, social relationships, poor quality of life, and heavy utilization of healthcare resources.[21] Considering this and from our own anecdotal experience specific to free clinics, we have identified the following factors, among many, that could be taken into consideration for an estimation of patient complexity:

1. Past medical history and previous encounters which can be gauged by number of comorbidities and medications, and past psychiatric history. Patient visit time was found in one study to be associated with number of patient diagnoses, as well as whether the patient was a new patient or had been seen previously at the practice.[22]

2. Patient's chief concern(s) for the present visit. Not surprisingly, new concerns

requiring full work-up or history and physical typically require more time than follow-up visits.

3. Social history, including adherence with treatment plans and potential barriers to care. In one study, primary care providers described complex patients as those with "multidimensional needs, such as socio-economic, medical, and mental health", which pose a significant challenge to providing optimal medical care.[23]

4. Language barriers and need for interpreter services. One study found that telephone and patient-supplied language interpreters were associated with longer visit times while full-time hospital interpreters were not.[24] Free clinics are often limited by the availability of on-site volunteer interpreters.

5. Insurance status. From our clinical experience, underinsured patients often have more severe disease at time of presentation due to delays in receiving care, and more concerns to address at each visit due to difficulty and barriers in seeking care from other providers.

Of course, more empirical evidence is needed to determine which are the strongest predictors of patient complexity and visit length in a free clinic setting. Future studies could have free clinic primary care providers review a random sample of their visits, identify which patients they consider complex, and conduct a logistic regression modeling complexity using a variety of potential predictors. Alternatively, the same logistic regression could be conducted using amount of time spent for each free clinic patient as the dependent variable, to identify predictive variables of longer visits.

As a long-term solution, implementation of a calculator for patient complexity could be built into pre-existing electronic medical record (EMR) systems—for example, just as EMRs have developed algorithms for the prediction of an appointment no-show risk,[25] so EMRs could develop algorithms for the prediction of patient complexity and estimated clinic time. As a short-term pilot to assess the efficacy of this idea that may be easier for volunteers and researchers to implement, an online calculator that takes input data and outputs estimated complexity and predicted appointment time could be used. Most simply, referring medical providers and students could subjectively estimate the complexity of each patient they see to be and include this information in the appointment follow-up notes to be utilized when scheduling the next visit.

The major drawback of this proposal is inevitably, predictions of patient complexity or visit time may be inaccurate due to the inherent variability of a patient encounter. For example, patients may be scheduled for a simple follow-up, yet during the visit they bring up multiple new concerns such as chest pain or seizures that require full work-up. It is difficult to precisely predict the length of individual patient encounters, however, even in the hypothetical scenario where a patient is deemed not complex and assigned to a more junior medical trainee, working with a more complicated patient and collaborating with senior students and preceptors within clinic would still provide valuable learning experiences to less experienced students. Other drawbacks of this system are due to the unpredictable nature of clinic flow in SRFCs. Many free clinics experience volatile cancellation and no-show rates or reserve appointment times for walk-in visits to address acute patient needs. Based on a survey of 86 medical schools, over 40% of SRFCs report that over 80% of their visits are walk-in appointments[1]. While this type of clinic structure allows for flexibility with visits and provides high-acuity patients the opportunity to easily seek care, this structure also complicates the implementation of a complexity-based triage system. However, this complexity-based system could then be modified for use at check-in to assign students.

Conclusion

Long clinic wait times are notorious in healthcare and disproportionately affect student-run free clinics due to various factors such as limited operational hours, high demand for clinic services, and various socioeconomic barriers in the patient populations. We propose the use and estimation of patient complexity as a way of improving scheduling efficiency and reducing clinic wait times. Estimating patient complexity could allow for proper assignment of

students to patients based on medical training level, and in the long term could help free clinics schedule patient volume and arrival time according to complexity. This will ultimately enable efficient service towards the community while providing students with opportunities to refine their clinical skills.

Disclosures

The authors have no conflicts of interest to disclose.

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