

# A Model for Interprofessional Health Disparities Education: Student-Led Curriculum on Chronic Hepatitis B Infection

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**BACKGROUND:** Although health disparities are commonly addressed in preclinical didactic curricula, direct patient care activities with affected communities are more limited.

**PURPOSE:** To address this problem, health professional students designed a preclinical service-learning curriculum on hepatitis B viral (HBV) infection, a major health disparity affecting the Asian/Pacific Islander (API) population, integrating lectures, skills training, and direct patient care at student-run clinics.

**SETTING:** An urban health professions campus.

**METHODS:** Medical and other health professional students at University of California, San Francisco, organized a preclinical didactic and experiential elective, and established two monthly clinics offering HBV screening, vaccination, and education to the community.

**RESULTS:** Between 2004 and 2009, 477 students enrolled in the student-led HBV curriculum. Since the clinics' inception in 2007, 804 patients have been screened for chronic HBV; 87% were API immigrants, 63% had limited English proficiency, and 46% were uninsured. Serologically, 10% were found to be chronic HBV carriers, 44% were susceptible to HBV, and 46% were immune.

**DISCUSSION:** Our student-led didactic and experiential elective can serve as an interprofessional curricular model for learning about specific health disparities while providing important services to the local community.

**KEY WORDS:** medical education-undergraduate; underserved populations; medical education-curriculum development/evaluation; disparities; community based interventions; student-run clinic.

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## BACKGROUND

The Institute of Medicine and Liaison Committee on Medical Education have called attention to the shortage of medical curricula that address health disparities<sup>1,2</sup>. The Society of General Internal Medicine Health Disparities Task Force has recommended the inclusion of curricular content focused on eliminating inequities in health care quality through health disparities education<sup>3</sup>. Current preclinical curricula on health disparities are primarily lecture-based, offering students little opportunity to connect with affected populations or to appreciate the unique challenges of implementing community interventions<sup>4-6</sup>. One strategy to integrate experiential learning about health disparities into preclinical curricula is through service-learning, an educational model that combines direct community service with formal learning objectives and student reflection<sup>7-12</sup>. Such service-learning curricula have been widely implemented in nursing, dentistry, and pharmacy schools, and are becoming more popular in medical schools<sup>7-9</sup>. At Cook County Hospital, faculty and community members developed a successful hospital-community partnership to teach interns about health disparities, which received positive evaluations from both community teachers and residents<sup>13</sup>.

While most health disparities curricula are developed and implemented by faculty, health professional students at our campus led the creation of an interprofessional service-learning curriculum focused on a local health disparity, chronic hepatitis B viral (HBV) infection. Chronic HBV affects one in ten Asian/Pacific Islanders (APIs), compared with 1 in 1,000 in the general population, and is responsible for up to a 13-fold higher mortality rate from liver cancer in APIs compared to whites<sup>14,15</sup>. Chronic HBV has particular salience in San Francisco, where 33% of the city's population self-identifies as API, compared to 5% nationally<sup>16</sup>. In 2007, a coalition of community agencies, including the San Francisco Department of Public Health (DPH), launched "SF Hep B Free," a citywide campaign to screen all API residents for HBV and to make low-cost vaccines available to those at risk.

Although HBV is a major health disparity affecting the API community, recent reports found that both physicians and API

patients demonstrated low awareness and knowledge about HBV screening, transmission, and epidemiology<sup>17,18</sup>. The CDC recommends screening populations with a prevalence of hepatitis B infection greater than 2%, but screening rates in at-risk API populations remain low<sup>14</sup>.

The confluence of demographics, municipal priority, and national medical education recommendations provided a unique opportunity to develop a focused health disparity curriculum at University of California, San Francisco (UCSF). In this report, we describe the San Francisco Hepatitis B Collaborative (SFHBC) service-learning curriculum for preclinical health professional students, which may serve as a model for designing and structuring other interprofessional preclinical curricula on health disparities.

## METHODS

### Overview of Program

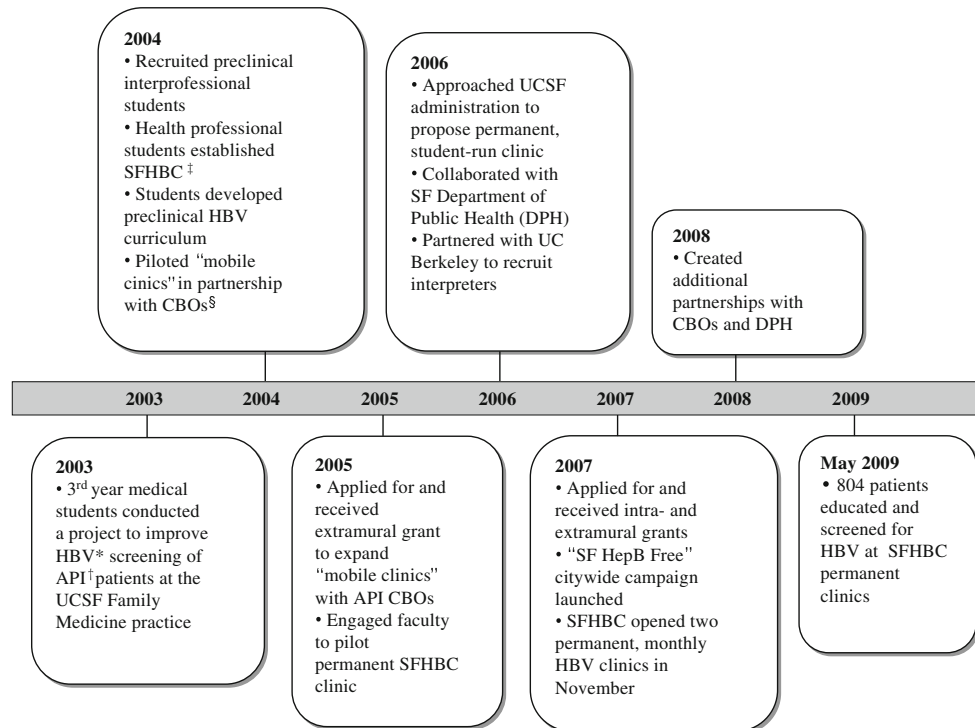
SFHBC is a student-led organization whose roots trace back to 2003 (Fig. 1), when ten third-year medical students at UCSF completed a project designed to improve HBV screening of API patients at the Family Medicine practice. A subset of these students, in conjunction with a faculty advisor, formed SFHBC in 2004. They worked closely with faculty in the Departments of Family and Community Medicine and Internal Medicine, establishing a didactic

elective on HBV and expanding student involvement to include preclinical students from the Schools of Nursing, Pharmacy, and Dentistry. In 2007, SFHBC established two permanent monthly clinics, located at UCSF Mount Zion Medical Center and at Chinatown Public Health Center, the latter affiliated with the DPH. These permanent clinics enabled SFHBC to provide free HBV screenings, free to low-cost HBV vaccinations, and for those with chronic HBV infection, follow-up visits for education and specialty clinic referrals.

### The SFHBC HBV Health Disparity Curriculum

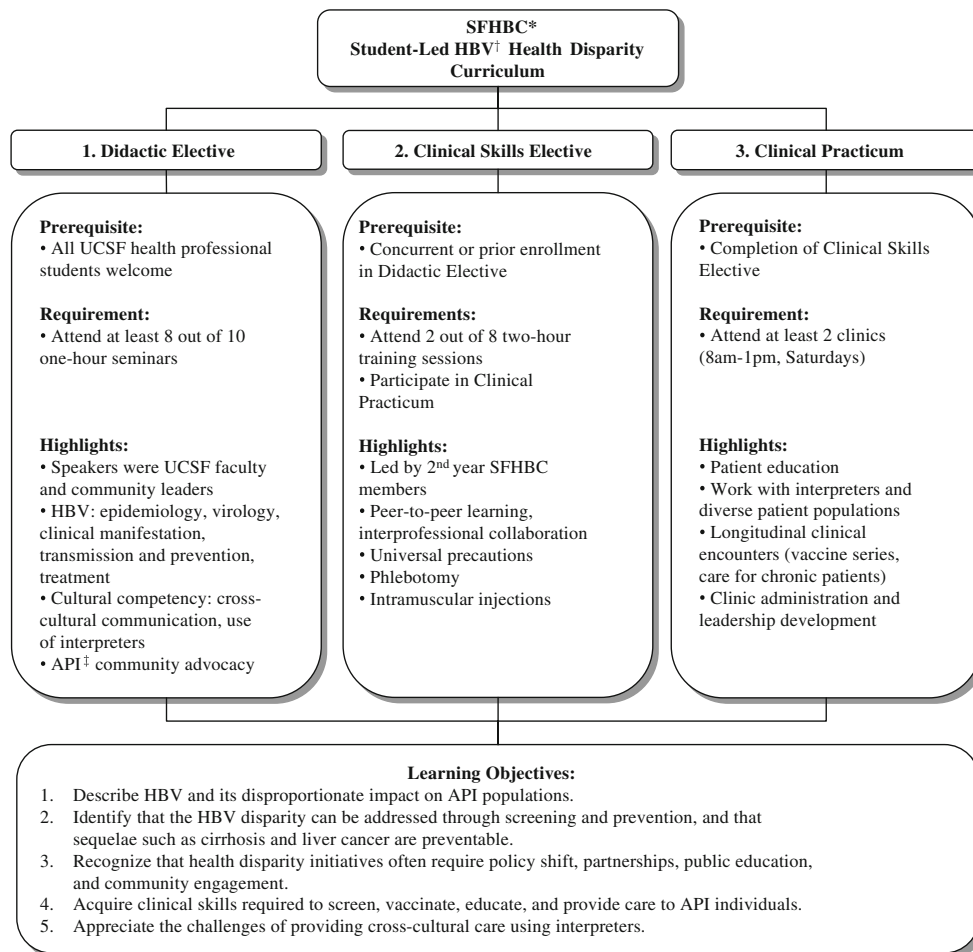
The SFHBC curriculum, initiated by preclinical students from different health professional schools and designed for their peers, consisted of three components: a didactic elective, clinical skills elective, and clinical practicum (Fig. 2). The goals of the curriculum were two-fold: (1) to address the HBV health disparity facing the API community through direct clinical interventions and (2) to increase awareness about the HBV health disparity among health professional students.

Student participation in the curriculum was voluntary and offered through all preclinical health professional schools those who enrolled received course credit. Students could either enroll in the didactic elective alone for one course credit or participate in all three aspects of the curriculum for two course credits.



\* Hepatitis B Virus  
 † Asian/Pacific Islander  
 ‡ San Francisco Hepatitis B Collaborative  
 § Community based organizations

Figure 1. Development and implementation of HBV\* health disparity curriculum.



\* San Francisco Hepatitis B Collaborative

† Hepatitis B Virus

‡ Asian/Pacific Islander

Figure 2. The SFHBC\* student-led HBV<sup>†</sup> health disparity curriculum.

## Community Outreach and Culturally Competent Care

Community outreach for the clinics was targeted toward the at-risk API population. Patients were recruited through language-concordant media, word of mouth, e-mail lists, community presentations, and provider referrals; we also received referrals through the DPH's citywide campaign to eliminate HBV. To address language barriers and provide culturally competent care, student board members established a partnership with UC Berkeley, where undergraduates fluent in API languages (Chinese, Vietnamese, Korean, Japanese, and Tagalog) were recruited and trained to serve as interpreters. In addition, patient education materials were made available in these languages, and language-concordant telephone scripts were used for patient follow-up reminders.

## Roles of Students and Faculty

Prior to establishing permanent clinics, students spent several months writing grants and working with key faculty advisors.

Students received intra- and extramural grants to start the two permanent clinics, with additional support through in-kind donations from UCSF Medical Center and the DPH. This financial support enabled SFHBC to provide free screenings to all patients and free or low-cost vaccinations to HBV-susceptible patients.

Recognizing that successful volunteer recruitment and community engagement require sustained effort, funding, and partnerships, students in SFHBC created an interprofessional leadership advisory board with three interconnected branches: internal affairs, clinic operations, and outreach. The board consisted of 15 to 25 students who met weekly to discuss upcoming course logistics, clinics, outreach events, and organizational issues. Student board membership changed yearly as students advanced through school. Leadership was transitioned to first-year students in the winter quarter of each academic year, providing overlap between outgoing and incoming board members.

Data were collected on student participation rates, patient demographics, test results, and vaccine use at each clinic. The Institutional Review Board at UCSF approved this study.

## RESULTS

### Educational Outcomes

Between 2004 and 2009, 477 students enrolled in the SFHBC didactic elective, consisting of 54% pharmacy, 24% medicine, 17% nursing, and 5% dental students. Ninety-three percent were first-year students, with the remainder being in their second or third years. Over three-quarters (78%) of students also enrolled in the clinical skills elective and participated in the clinical practicum. Annual enrollment in the SFHBC elective steadily increased from 67 students in 2004–05 to 142 students in 2008–09.

Between October 2008 and May 2009, students participated in an average of 1.89 clinics (SD  $\pm$ 1.32), with medical students volunteering twice as often as students from other schools ( $\bar{x}$  = 4.1 clinics,  $P$  = 0.004). Three-quarters of participants were female and two-thirds identified themselves as API. Of those who self-identified as API, 65% reported being fluent in an API language and 32% were born in Asia.

### Clinical Outcomes

From November 2007 to May 2009, SFHBC educated and screened 804 patients. Fifty-eight percent of patients were screened at UCSF Mount Zion Medical Center, and 42% were screened at Chinatown Public Health Center. The average age was 49 (SD  $\pm$  16) and 55% were female. Eighty-seven percent of our patients were first-generation API immigrants, hailing from 14 different countries, with the majority from China, Vietnam, Hong Kong, Japan, Burma, Taiwan, and Korea. Fifty-three percent had immigrated within the last 15 years, and 63% reported limited English proficiency. Interpreters speaking nine different languages and dialects were provided in over 1,229 distinct encounters at the two clinic sites. From March to May 2009, when patients began to report their income, 55% of patients reported an annual household income less than \$25,000, well below the median household income in San Francisco of \$71,957<sup>19</sup>. Forty-six percent of patients were uninsured.

Serologic testing revealed that 10% of patients were HBV-infected [positive for hepatitis B surface antigen (HBsAg)], 44% were HBV-susceptible [negative for both HBsAg and hepatitis B surface antibody (anti-HBs)], and 46% were HBV-immune (HBsAg-negative and anti-HBs-positive). HBV-susceptible patients were encouraged to get vaccinated. Ninety percent of these patients completed or were on track to complete the three-shot vaccination series.

## DISCUSSION

The disparity in HBV prevalence between APIs and the general population, coupled with San Francisco's demographics, presented an opportunity for students to create a preclinical curriculum that simultaneously: (1) provided a needed service to the surrounding community and (2) educated health professional students about engaging in community advocacy and addressing health disparities.

There is a growing emphasis in health professional schools to incorporate community-based and patient care experiences early into the preclinical curriculum<sup>20,21</sup>. Creating a structured, service-learning elective allowed our students to work

with an underserved community soon after entering graduate school. Health professional students often come from backgrounds where volunteerism is valued and expected, especially in settings of helping vulnerable persons, and many students are eager for direct patient contact early in their health professional programs<sup>22</sup>. In a survey of 49 medical schools with one or more student-run clinics, the most commonly cited reasons for student volunteerism included opportunities to serve the poor, interact with patients, and learn clinical skills<sup>23</sup>. Our curriculum also allowed students to gain an early understanding of clinic operations and to take an active role in a larger citywide public health intervention addressing a health disparity.

Our outreach efforts, using language-concordant methods, successfully reached our target population, as the majority of our patients were API immigrants with limited English proficiency and low socioeconomic status. Given these language and financial barriers, such patients often suffer from poor access to care and subsequent poor health outcomes<sup>24–27</sup>. In fact, limited English proficiency has been suggested as the largest barrier to successful management of chronic HBV infection—a potentially treatable condition—ultimately putting patients at risk for complications of liver disease and furthermore posing a potential public health hazard for disease transmission<sup>24,28,29</sup>.

Community-based outreach efforts and screenings have been shown to be effective strategies to promote HBV knowledge and awareness among API populations<sup>15,30,31</sup>. Our 90% completion rate for the three-shot HBV vaccination series was higher than reported in the literature<sup>32,33</sup>. This success may be attributed to intensive patient education during initial screening encounters and return visits, follow-up phone calls to patients who missed return visits, as well as culturally appropriate and language-concordant patient materials and telephone scripts, which have been shown to improve vaccine compliance rates<sup>34–36</sup>. A major challenge experienced by other community HBV screening programs has been ensuring follow-up care, particularly surveillance for disease progression and initiation of antiviral treatments for HBV-infected individuals<sup>37</sup>. We addressed this issue largely through our partnership with the community-based Chinatown Public Health Center, where we provided HBV-infected individuals with initial follow-up and referrals to specialty clinics.

The majority of students were of API descent, mirroring the ethnic makeup of the patients. This inherent interest of API students to learn about and address disparities within their own ethnic community is important, as race-concordance between patients and providers has been shown to improve health care outcomes<sup>38–41</sup>. This may partially explain the high proportion of student participants from the pharmacy school, which has a high enrollment of API students. Pharmacy students were likely also drawn to the elective as it was one of their few opportunities for sustained patient interaction and involvement in clinic operations. Preclinical medical students had many competing electives from which they could choose, including those with direct patient contact, and thus, it is promising that so many students were interested in this elective.

A unique aspect of the curriculum was its emphasis on interprofessional collaboration in the clinics and on the leadership board. During clinics, we attempted to create

interprofessional pairs for all aspects of patient care, allowing students from different health professions to learn from one another. Ultimately, we believe this allowed for productive teamwork, development of mutual respect, and shared learning among students from different health professional backgrounds, outcomes which have been borne out in other interprofessional clinical settings<sup>42-44</sup>.

While our curriculum was successful in its broad scope of community outreach and student involvement, we faced challenges in its development and implementation. Finding permanent clinic sites for the clinical practicum took 3 years, requiring faculty, institutional, and community support, student-written grants, and student persistence. Although our initial grants enabled us to provide free screening and free or low-cost vaccinations to all of our patients, long-term sustainability of our clinics will require additional funding. In terms of quality of care, although enrolled students participated in two clinical skills training sessions, all but a few were novices at performing phlebotomy and intramuscular injections. Therefore, balancing student learning and patient discomfort, an ethical dilemma of many student-run clinics, required vigilance from student coordinators and clinic preceptors<sup>45</sup>. For clinical procedures, we paired students with different experience levels, hoping to enhance both student and patient comfort. Finally, ensuring a consistent flow of patients into each monthly clinic required regular promotion within the API community, which we were able to do successfully through partnerships with community-based organizations and the city's DPH.

A limitation of this curriculum is that during the first year of the permanent clinics, we did not formally survey students or patients about their experiences, although students conducted volunteer debriefings after each clinic. We have since begun to evaluate the impact of the curriculum on students' knowledge and attitudes toward health disparities and interprofessional education, and to implement a formal reflective component into our service-learning curriculum. We will also evaluate the effect of our clinics on patients' knowledge and their attitudes toward student-run clinics.

The challenges to developing an interprofessional service-learning curriculum were not insurmountable and are akin to common challenges reported by other student-run free clinics throughout the country—each requires careful planning, preparation, faculty involvement, and community and institutional support<sup>46,47</sup>. Student engagement was critical to overcoming many of our challenges, as students' collaborative energy, enthusiasm, and perseverance resulted in fruitful outcomes, such as bringing together faculty and community groups and securing funding. Similar to how the voluntary, student-led nature of service-learning programs at Rush University were fundamental to their success over the past 2 decades, we believe our integrated didactic and experiential service-learning curriculum will continue to flourish under student leadership<sup>12</sup>. Our successes support the idea that engaging preclinical students in health screenings, outreach, and advocacy is one powerful way to reduce health disparities while training students to address them<sup>11</sup>.

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