



Benefits of a Student Laboratory Team in the Free Clinic Setting: Enhancing Student Education and Patient Care

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Abstract

Introduction: Lack of health insurance poses a significant problem in the United States and substantially impacts national health. Student-run free clinics, such as the Health Outreach Partnership of EVMS Students (HOPES) Clinic at Eastern Virginia Medical School (EVMS), serve to decrease the adverse health effects caused by lack of health insurance. Within the EVMS HOPES Clinic, the Laboratory Team offers valuable patient services while providing learning experiences to student volunteers. This investigation serves to assess the value of a Laboratory Team or a similar volunteer team in the student-run free clinic setting.

Methods: A retrospective review of previously collected EVMS HOPES Laboratory Team data logs, staff roster, and standard operating procedures from January 1, 2015 through May 31, 2015 was conducted. HOPES Laboratory service data for all clinics, general health and specialty, were included and analyzed. Seven EVMS students were on the Laboratory Team staff roster during the study period with representatives from both the EVMS M.D. program and the Physician Assistant program.

Results: From January 1, 2015 through May 31, 2015, six types of laboratory services were offered: blood glucose, hemoglobin A1c, urinalysis, urine pregnancy, hemocult, and electrocardiogram testing. Sixty-five laboratory tests were completed by HOPES Laboratory Team Staff with a mean number of 2.2 tests (range=0-13) completed per three-hour Laboratory Team shift.

Discussion: The EVMS HOPES Clinic Laboratory Team aids patients and educates future medical professionals. The value of the Laboratory Team in both student education and patient care supports the establishment of a similar team in other student-run free clinic settings as well.

Introduction

Approximately one-fifth of the United States non-elderly population, 44 million Americans younger than 65 years of age, lack health insurance, including 33 million adults aged 18 to 64 years.¹ Studies have shown that lack of health insurance is closely associated with significant clinical consequences.^{2,3,4} Uninsured adults experience substantially reduced

access to preventative services, chronic illness treatment, mental health assessment and acute injury care.⁵ Student-run free clinics are one of many healthcare initiatives that seek to assist the vulnerable population of uninsured American adults.

Established in 2011 in Norfolk, Virginia, Eastern Virginia Medical School (EVMS) HOPES Clinic operates twice weekly. The EVMS HOPES

Clinic offers primary care services, designated as General Clinic, as well as women's health, orthopedics, ophthalmology, dermatology, mental health, and ultrasound services, designated as Specialty Clinics. Before the EVMS HOPES Clinic, patients were without consistent healthcare services due to the lack of free health services in the area. The EVMS HOPES Clinic remains the only student-run free clinic in Virginia.

The EVMS HOPES Clinic utilizes a unique team-based leadership structure with different aspects of clinic management and operation handled by various specialized volunteer teams. All EVMS HOPES clinical staff members are students at EVMS working on a volunteer basis. One of the clinic's specialized teams is deemed the Laboratory Team (Lab Team). Not every student-run free clinic utilizes student volunteers as laboratory test providers; however, the EVMS HOPES Clinic has formulated a Lab Team to provide patients with point of care testing, or medical testing completed at or near the site of patient care providing immediate results. This study serves to assess the work of the EVMS HOPES Lab Team over a five month period and the value of a Lab Team or a similar volunteer team in the student-run free clinic setting.

Methods

This retrospective review assessed previously collected EVMS HOPES Lab Team data logs, staff roster, and standard operating procedures for five months from January 1, 2015 through May 31, 2015. HOPES Laboratory service data for all clinics, general health and specialty, were included and analyzed.

One Lab Team member was on staff in the HOPES Clinic each clinic night; this is deemed one shift. At the end of each shift, the Lab Team Member on staff documented the tests performed in a shared document accessed by all Lab Team Members. Documentation included number of each test performed and type of shift completed (Women's Health, General Health, or Specialty). Test counts for the study period were assessed for patterns of use, and

the average number of tests performed per Lab Team shift was calculated.

The Lab Team maintained a consistent student roster of seven volunteers with representatives from both the EVMS M.D. program and the Physician Assistant program. The Lab Team is organized around an advisor, lead, and a team member leadership structure. This structure involves one student acting as "Lab Team Advisor," one student designated as "Lab Team Lead," and five students categorized as "Lab Team Members." The Lab Team advisor works with the EVMS HOPES Clinic Board of Directors and EVMS administration and does not staff the clinic. The Lab Team Lead implements changes decided on by the Lab Team Advisor and oversees day-to-day lab operations. The Lab Team Lead staffs the clinic along with Lab Team Members. During the study period, one Lab Team Member or Lead staffed the clinic each night the clinic was open. The EVMS HOPES Clinic was open two times a week during the study period.

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The authors had no access to individual patient charts and were not presented with identifiable protected health information. Only test counts were available to the authors, and thus the EVMS Institutional Review Board deemed the project quality assessment exempt from IRB oversight.

Results

Over the study period of January 1, 2015 through May 31, 2015, six laboratory services were offered: blood glucose, hemoglobin A1c (HbA1c), urinalysis, urine pregnancy, hemocult, and electrocardiogram (ECG) testing. Sixty-five laboratory tests were completed by EVMS HOPES Lab Team Staff with a 2.2 mean number of tests (range=0-13) completed per three-hour shift. Figure 1 shows the number of each test performed during the

study period. The most requested test was the blood glucose measurement with a total of 21 tests completed. The least requested test was the ECG and hemocult test with four of each completed over the course of the study period.

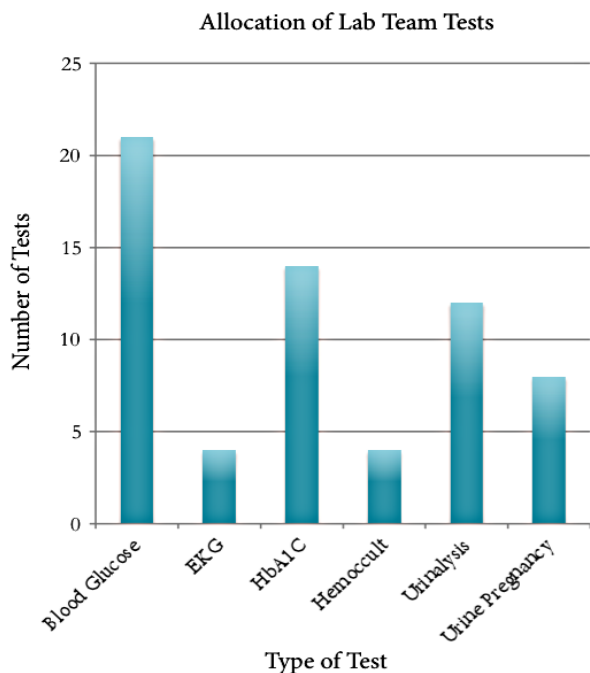


Figure 1. The Variety of Tests Performed by the EVMS HOPES Lab Team Members.

Discussion

The EVMS HOPES Clinic is a unique student-run free clinic in its employment of on-site student-performed laboratory testing. Within a five month period, 65 tests were ordered by the members of EVMS HOPES' Lab Team. Without the student volunteer staffed Lab Team, the clinic would have had to send these laboratory tests to an outside laboratory or have patients seek care in a nearby Emergency Department. By providing laboratory results at point of care, the Lab Team directly supplies HOPES clinical teams with information for diagnosis, thus increasing the amount of care available at each patient visit. Without this point of care testing, patients requiring tests would have to make a secondary appointment after the test had been sent out to an off-site laboratory or completed in the

emergency care setting in order to have their test results interpreted. This delay in care increases the likelihood of patients being lost to follow-up and limits the quality of continuous care that the EVMS HOPES Clinic can provide.

Not only does the HOPES Lab Team aid the patients seen in the clinic, but it also benefits the students employed on the Lab Team. With a mean of 2.2 tests per shift, the Lab Team provides active experience on each shift, making it a valuable extracurricular commitment for students. One Lab Team Member independently performs these tests during each shift, thereby promoting active learning and building student confidence and autonomy.

Independently performing point of care testing also allows students to gain experience in tests that are not commonly run at the bedside in larger hospitals. This may be especially significant if a student is interested in a field such as cardiology or emergency medicine, for solo ECG experience is hard to come by during early medical training. Students on the Lab Team actively learn to read and interpret ECG tests by performing the test and discussing the results with the student clinician teams and the attending physician. This experience is invaluable for students heading into the healthcare field and improves student education as well as laying the foundation for future skill development occurring in residency. Furthermore, participation in the Lab Team gives students who are potentially interested in rural medicine, a field without the luxury of laboratory personnel support, the chance to learn testing skills.

Studies have shown that calculating the cost effectiveness for point of care testing is extremely difficult because the rapid test result has a significant and pervasive impact on the overall episode of care in a way that is not easily quantifiable.^{6,7,8} Most studies agree that evaluating the cost effectiveness of point of care testing often comes down to a common sense assessment more than a rigorous actuarial analysis.^{6,7,8} Teaching students this judgment is the

basis for evidence-based ordering practices in medicine. Having an on-site, student run laboratory gives student clinicians volunteering at the EVMS HOPES Clinic a valuable chance to develop this judgment and skill.

In an era of laboratory service over-ordering and escalating healthcare costs, it is important for students to experience evidence-based test ordering practices first hand.⁹ The allocation of tests ordered during the study period shows that more blood glucose tests were performed than HbA1c tests. This observation suggests that students are aware of testing costs, test indications, and clinic resources. By using blood glucose testing when possible instead of the more expensive HbA1c testing, the EVMS Lab Team is utilizing available tests appropriately as well as following nationally recognized testing guidelines for diabetes diagnosis and care.¹⁰

Studies have estimated that upwards of 25% of each inpatient hospital bill is comprised of laboratory test fees, with few of these tests significantly changing patient care or management.^{11,12} Students volunteering as clinicians at the EVMS HOPES Clinic are encouraged to only order tests if the outcomes will change the course of a patient's treatment. By actively ordering tests at point of care, student volunteers see the direct effect of test results on medical management. This hands on experience allows students to understand the basis of evidence-based laboratory test ordering. This valuable learning experience during medical training serves to shape more resource conscious physicians.

Finally, the Lab Team fosters inter-professional learning and promotes understanding between health professions by employing students from both the EVMS Medical Doctor program and the Physician Assistant program. By recruiting volunteers across program lines, the Lab Team allows volunteers to interact with students from outside of their program. This inter-professional focus promotes understanding of the strengths of other healthcare fields, leading to more teamwork-oriented professionals in the future.

In conclusion, the EVMS HOPES Clinic Lab Team provides key services in support of the overall success of the clinic. Team members learn valuable skills while providing needed care. Student-run free clinics, which currently do not offer student volunteer-administered point of care testing, should consider formulating a volunteer team similar to the EVMS HOPES Lab Team.

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