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A Critical Analysis of the Costs-Benefits of Utilizing Students in a Psychiatric Facility: A Case Study

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Medical teaching institutions usually face the daunting task of obtaining enough rotation blocks for their students for clinical experience. Based on the study we report here, healthcare facilities underutilize potential students for rotations and can provide an untapped source for student rotations. If students are properly supervised, a win-win situation could occur: more rotation blocks would open, and, at the same time, these students would gain experience, improve the quality of care, and reduce operational care costs. We examined data obtained from a psychiatric facility over one year to evaluate the cost-benefit of precepting students.

KEY WORDS: Healthcare management; management strategies; students; physician assistants.

The healthcare industry is a complex and fluid system in constant change and motion while never losing its focus that the health and wellness of its patients are at its core. The CDC reported that in 2014, personal healthcare (PHC) expenditures in the United States totaled over \$2.5 trillion dollars, an almost 5.5% increase from 2013,¹ representing a continuous, steep upward trend (Figure 1).

The PHC expenditure amount, on a per capita basis for the total U.S. population, is \$8054. Physician and clinical services accounted for 23.5% of the total, equaling \$603.6 billion, or \$1892.69 per capita. This amount is directly dependent on the cost of its healthcare professionals. This variable affects not only the patients, but also the healthcare organizations that provide the services. These providers can vary widely in size, depending not only on the complexity of their operations, but also on their locale and specialty focus. A general hospital will have the highest level of complexity due to its myriad of operational areas and, therefore, a higher payroll expense than a specialty hospital, which is more focused and lean. In the same manner, a specialty hospital will have higher costs than a medical practice. However, all of these providers are affected, in one fashion or another, by the high cost of healthcare professionals.

Among the various strategies, one seems to be less used and even overlooked at times due to improper financial analysis is through the utilization of qualified students. It is commonly assumed that using medical students is inefficient and not cost effective in the assistance of treating patients. However, the analyses that gave rise to that belief may be based on faulty assumptions. In this article, we will demonstrate how the use of medical students, properly supervised, would be not only cost effective but efficient as well. This case study demonstrates how students can add immense value to healthcare operations in a wide number of ways, from actual savings on labor cost to marketing value and patient care. Professions requiring students to gain clinical experience to complete their studies include physicians, physician assistants (PAs), nurses, mental health licensed therapists, physical therapists, occupational therapists, and social workers, among others. Using students in addition to staff can help cover certain functions of higher-paid staff. In addition, lowering the workload of staff members enhances efficiencies and reduces the need to hire personnel. Adding to the debate is a misconception by some professionals about the types of duties that can be performed by students and the students' abilities to perform them. We believe that students should do more than simply shadow doctors. If properly supervised,

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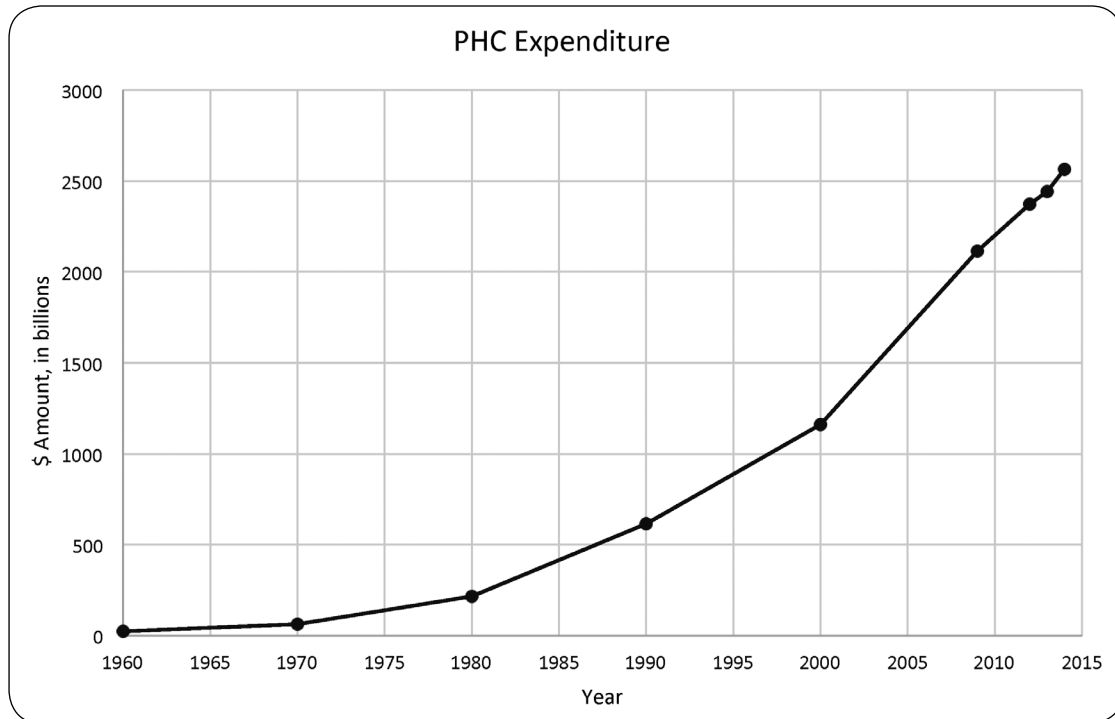


Figure 1. Personal healthcare expenditure 1960–2015.

students can act as extensions of their preceptors, allowing them to complete more tasks in less time and improving the overall quality of the practice.

Although having students requires preceptors to educate and supervise the students' work and results, these added expenses are more than offset by the workload the students can take away from the preceptor. Overall costs are more likely diminished by student activity than increased, contrary to some studies that have concluded that teaching hospitals have a higher cost of care than their non-teaching counterparts.²⁻⁶ It is important, of course, to recognize that each medical specialty has different characteristics and that the cost-benefit analysis of teaching need not be generalized across all practices. We believe, however, that the methodologies applied in our study should be utilized across the medical disciplines.

This article aims to outline both the quantitative and qualitative value of adding students to the workforce as active participants at a psychiatric hospital. The results point to significant added value, in terms of cost reduction and improved efficiencies, in the overall operations of the facility.

BACKGROUND OF STUDENT SAMPLES

Healthcare facilities, depending on the specialty and the level of care provided, often utilize students from appropriate, pertinent disciplines. For instance, facilities that employ nurses recruit nursing interns, and behavioral and psychiatric facilities seek interns from the mental health

and social work fields. This article focuses on the use of resident doctors, third- and fourth-year medical students, and Physician Assistant students. Family Center for Recovery's (FCFR) affiliations with residency programs establish the facility as an educational and training site for resident doctors PGY2 (post graduate year 2); the salary expenses of resident doctors, therefore, are incurred by the residency program and not by FCFR.

Although resident doctors are licensed and, by definition, more experienced than students, the level of clinical experience for students and residents could be similar. The two distinguishing and differentiating capacities among the three groups in our study were in the following areas:

- Blood sample collection:
 - PAs have training in drawing blood samples. PA programs encourage preceptors to have students draw blood under competent supervision. Students are covered by the school's liability insurance in all of the studied affiliations. Nevertheless, individual student confidence should always be taken into consideration before interning.
 - Medical students precepted by FCFR usually have only practiced taking blood on dummies, and there may have been long gaps of time between that practice and their clinical rotations. At the FCFR, although some of the students may have drawn blood during other rotations, only a fraction of them have actually drawn blood from a person. Medical schools,

therefore, strongly encourage preceptors to have students draw blood, under competent supervision.

- Resident doctors might have more clinical experience; however, that does not necessarily translate into the ability to draw blood. This ability would generally depend on the specialty and the individual professional experience.
- Of the sample precepted by FCFR, only the groups run by resident doctors can be billed, because they carry a valid medical license.

Even with these distinguishing capacities, the students and resident doctors included in this study worked in the same environment and office, carrying out the same duties and responsibilities, with very few exceptions. The pool of students and resident doctors totaled 149.

The average number of students precepted during any given month was 12.

Although some schools have six-week rotation blocks, for this analysis, all rotations were considered to last four weeks at 40 hours per week. (Although many students volunteered to work additionally both on weekends and after working hours, these extra hours were not taken into consideration for our analysis.)

THE SETTING FOR THIS CASE STUDY

The setting used for this study was a psychiatric residential facility, Wellington Retreat (D.B.A. Family Center for Recovery), which has 44 inpatient beds. Levels of care at the facility include intensive detoxification (detox), residential hospitalization, partial hospitalization (PHP) (day or night with community housing), intensive outpatient (IOP), and outpatient (OP). FCFR also maintains these same levels for pregnant and adolescent patients, except for Detoxification in the case of adolescents. FCFR treats all levels and types of mental illnesses across the spectrum. The residential facility is privately owned and managed by the medical director in charge, Robert A. Moran, MD, who is board certified in psychiatry, addiction psychiatry, and addiction medicine.

The specific dynamics of the treatment of psychiatric disorders require strong managerial strategies that would maximize the value of the interning students or residents in terms of their effectiveness and overall cost reductions.

Because the approach taken for this study was carefully designed for a psychiatric hospital setting, modifications would be necessary to apply it to other medical specialties. The techniques employed for this study can be used in other medical disciplines—it is just necessary to take into account other procedures used in those medical fields when determining cost-benefit analysis. For example, in general hospitals, where the number of services offered is much greater than those in a psychiatric hospital, other

cost factors must be taken into consideration in order to properly apply the analysis done for this case study.

Students cannot provide any services without the supervision of a relevant clinical staff member. In the case of notes, for example, the students' work is not to provide the service, but to capture the events and observations in writing. Afterward, the staff physician/medical director will review the notes to ensure their accuracy. All services are provided by pertinent and qualified clinical staff members. Students cannot deliver a service that must be provided by a licensed physician or counselor. FCFR takes their roles as both a premier medical facility and a training institution very seriously.

VALUE GENERATED

Quality of Care

A literature review concluded that there is a “. . . demonstrated moderately to substantially better overall quality of care in major teaching hospitals than in nonteaching hospitals . . .,” with variations depending on the specialty.⁷ In the setting analyzed for this study, an improvement in the quality of care can be observed by its higher staff member-to-student ratio.

Students are treated as staff members by the facility, and, in exchange, these students behave as such and are viewed as staff members by the patients. Qualitatively, students represent additional “eyes and ears” interested in the positive progress of the patients and, given the nature of psychiatry, truly provide added value. Students' time spent with the patients not only enhances those patients' well-being and satisfaction, but also provides a different level of insight into the patients—because the field of psychiatry is as much an art as a science. In their capacity as additional “eyes and ears,” these interns provide supplemental insight into the patients' mental status, as would an extra staff member. Ultimately, the proper care of the patient is disseminated from the medical director, who must consider the insights of many staff members, therefore, including the insights brought forth by the students. In this respect, the students become an extension of the medical director and help paint a holistic picture of the patient's mental health, as many of the patients behave differently with different staff members, for a variety of reasons.

Quality of Notes

As part of their internship, the students regularly write notes on patient visits. Each of these notes depicts a care provided by the medical director, a staff physician or clinical staff. Students do not replace the medical director, attending physician, or actual clinical staff. The medical director reviews each individual note before signing it, and, if any correction is needed, addresses it with the student as part of the educational experience. Individual students

then correct their notes, following which and both the student and medical director sign the note. As a result of this practice, the quality of the patients' progress notes has become more comprehensive as the number of precepted students has increased. Improvements also have been seen in the electronic medical records (EMRs) that have aided in the quality of the notes, which, in large part, was a direct result of student influence.

Improvements in the cognitive testing arena also have been seen. The results of cognitive testing are always reviewed by the medical director along with the students. This process of having the students review the data together with the medical director both helps the patients obtain superior treatment and also provides students with added training.

Students, therefore, are an integral part of patient care and could be viewed as an extension of the medical director. It could be argued from both a quantitative and qualitative perspective that it takes the same amount of time for the medical director to write a note for a patient as it does for him or her to review a student note. Further, it could be claimed and actually documented that it requires less time to review a note than it does to actually write it. The quality of the notes achieved does have a monetary value in that these in-depth notes provide a clear and holistic picture of the patient's status. This has enabled FCFR to lower the rate at which insurance companies rejected their claims. Claims that are processed more quickly means faster collection time, which translates into fewer workforce hours from the billing department's staff dedicated to analyzing rejected claims, correcting claims, collecting missing information, and reprocessing the claims.

Comprehensive notes prevent these additional expenses in work hours and in materials such as photocopying. Although detailed notes do not necessarily translate into better notes, they more than likely represent stronger supporting evidence for medical necessity when appealing for a level of care denied by the insurance companies.

Marketing Value

From a marketing perspective, the very fact that an institution is involved in precepting students adds value, because teaching hospitals tend to have greater stature than non-teaching ones. Teaching facilities are looked upon as providers of higher quality due to their research capabilities and the faculty that are associated with such institutions.⁷ Just as important in terms of marketing value is that these institutions have established baseline requirements for their educational facilities and preceptors. When an institution is labeled as a teaching/ research hospital, for instance, it separates itself from the ordinary and, therefore, will abide by the highest standards established by the profession and accreditation agencies. In addition, as a cross-check to the quality of the teaching hospital, medical and nursing schools have developed internal methods

to evaluate precepting facilities and physicians. If students consistently rate the facility below the school's expectations, the affiliation may potentially be terminated. Having lasting affiliations with multiple educational institutions is a clear validation of the program and its inherent quality of education and care. Overall, being labeled a teaching facility and, therefore, providing a higher degree of care, is a multidimensional marketing advantage.

Another value that is often not discussed nor measured is the impact interns provide from a social media perspective. At FCFR, approximately 23% of students left positive reviews on social media regarding the facility (the remaining 77% left no review at all). Although no negative reviews were posted, the greater the percentage of interns leaving reviews (especially positive) is priceless. No marketing ads could equal the value of positive social media reviews. At FCFR, substance use disorder is the most common diagnosis. The Department of Children and Family of Florida (the overseeing agency of addiction treatment facilities) reported slightly more than 1500 active and licensed addiction treatment programs in the state of Florida.⁸ Positive social media reviews represent a strong and valuable asset in building legitimacy and name recognition. Although it is uncommon for medical facilities in general to depend on social media reputation for business generation, in this setting it is a vital focal point. Further, in order to ensure transparency and non-biased reviews, students are asked to provide the reviews after they have completed their rotation and received their evaluation from the medical director. Additionally, the interns are also prompted to state that they were students at the facility and to express their honest opinion. Their reviews on social media help present a professional and clinical image of the facility.

Reviews are not the only form in which a facility can benefit from students. For instance, any marketing department can implement campaigns that highlight the benefits for patient care of using students. The educational institutions from which students were recruited can be tagged in such campaigns as well. This greatly enhances awareness of the students' educational institutions and also helps those institutions on their own social media pages.

One other relevant aspect where students benefit the marketing segment of a teaching facility is the word-of-mouth component. Students experience the care provided by the facility from its core operations, giving them a deeper understanding of the rationale and level of commitment by both the medical staff and administration. Their experience with the teaching facility can translate into direct referrals of acquaintances afflicted by the type of ailments treated at the precepting facility. For example, opioid addiction is categorized as an epidemic by the American Society of Addiction Medicine.^{9,10} The numbers are so staggering that it is likely that every student knows someone in his or her inner circle of relationships who suffers from some sort of substance use disorder. This presents an opportunity for

potential patient referrals by the students. In fact, in the timeframe used for this study, one patient referral came directly from a student's recommendation. This single referral translated financially at the end of 2016 as follows:

- A total of \$5500 was collected from the patient in the form of deductibles.
- The patient's insurance was billed for services totaling \$32,350 for 34 days of services (note: the amount actually collected had not been determined by the time this article was submitted).
- This equates to a daily value of \$1113.24.

By the time this article was being written, another referral had been generated by word of mouth from a student. Recommendations from students are an important source of clientele, and minimal costs are associated with this type of marketing.

Labor

The main, most visible value students bring to a facility is "highly trained labor." Students, if properly supervised, can become an effective labor force that enhances patient care while simultaneously mitigating care costs. These interns bring not only their technical skills but an eagerness to learn and add value to the facilities. To maximize such value, at FCFR, several strategies were put into place so students became an effective extension of the preceptor. The following sections of this article discuss how FCFR benefits from both cost reductions and improved patient care through the use of interns. Tasks and duties that can be performed by students rather than paid staff are discussed in these sections.

Group Therapy

Although group therapy sessions provided to patients must be led by licensed therapists, and not by students, for billing purposes, some of the groups provided to patients by FCFR can be managed by students under direct advice from the medical director and the clinical director. These group therapy sessions are provided to patients based on their needs and are not billed, but having a staff member present at the sessions is required. Students are trained in group therapy techniques by observing the dynamics during the first week before running the groups on their own. These groups are similar to self-help groups, in which the staff member or student acts only as a moderator charged with maintaining a certain level of structure in the group. Even when these groups are not billed, the presence of a staff member is required to run and supervise the group. The average hourly wage of staff members running and supervising these (non-billed) groups is \$16 per hour. Since interns are not paid, by assigning students to run these groups, the facility is saving at least that amount per hour. Further, these sessions generally take 20 hours per week, resulting in an effective labor-generated savings of \$1,386

per month (20 hours per week ÷ 5 business days a week ÷ the average business days in a month = 21.66).

Progress Notes

Students aid in the process of writing progress notes by working alongside the assigned physician. This practice saves considerable time for the physician, whose annual salary approximates \$250,000. The physician who provided the service, nevertheless, is still required to review, modify (if needed), and cosign the note.

The following progress notes are required at FCFR per level of care per week:

- Detox: five notes per week;
- Residential: five notes per week;
- PHP: five notes per week;
- IOP: two notes per week; and
- OP: one note per week.

During the year 2016, the average number of patients per day at FCFR for each level of care (including both the adult and adolescent programs) was as follows:

- Detox: one patient;
- Residential: five patients;
- PHP: eight patients;
- IOP: 12 patients; and
- OP: 38 patients.

It is worth noting that steady growth is anticipated for the Residential and Detox levels of patient care. This growth in the number of patients has cost implications. Based on the census growth rate average, the average number of business days in a month, and the notes required per level, 569 notes, on average, were written per month during 2016:

- Detox: 21 notes per month;
- Residential: 108 notes per month;
- PHP: 173 notes per month;
- IOP: 103 notes per month; and
- OP: 164 notes per month.

At a physician's annual salary of \$250,000, and taking into consideration that having a student write a note saves the physician an average of seven minutes per note (based on observation and timing of the physician writing the note)—even after factoring the time it takes for review, the average monthly savings per doctor is \$7966:

- ÷\$250,000.00 annually ÷ 2,080 = \$120 per hour;
- \$120 per hour ÷ 60 minutes per hour = \$2 per minute;
- 569 notes per month × seven minutes saved by doctor to write note × \$2 per minute = \$7966.

This monthly savings has the time cost of reviewing the note already factored in; the average of seven minutes saved is the result of subtracting the average amount of time to write the note minus the time to review it, including any potential correction. There is no extra insurance cost,

because the medical director or staff physician provides the service, then reviews and co-signs every note written by students.

Although some may question the efficiency of it taking on average seven minutes for these notes to be written, one must recognize that mental health treatment is highly subjective, so that extensive note-taking is required to describe both the current status of the patient and the various treatments to be applied.

Psychiatric Evaluation Notes

Another relevant part of the students' rotation is writing the psychiatric evaluation. This does not suggest the attending physician was not part of the process. The attending physician always is present during the initial evaluation and will continuously interview the patient to obtain any and all relevant information. Students are allowed to ask questions during the interview and afterward will write the psychiatric evaluation note. The attending physician then reviews it for accuracy, approves it, and then signs it. As expected, the psychiatric evaluation note takes a considerably longer amount of time than other notes to complete.

On average, it would take three hours for students, as reported by them, and around 45 minutes for the attending, experienced physician. In practice, reviewing notes with the students takes considerably less time than writing the actual note, by a factor of 8, as reported by the medical director. With an average of 22 initial evaluations performed in any given month, and the hourly equivalent of the physician's hour being \$120, the average monthly savings incurred per note by having students write the initial evaluations is \$1716. [The actual calculation is derived by the following: $(\$250,000.00 \text{ annually} / 2080 = \$120 \text{ per hour})$. $\$120 \text{ per hour} / 60 \text{ minutes per hour} = \2 per minute . $569 \text{ notes per month} \times 7 \text{ minutes saved by doctor to write note} \times \$2 \text{ per minute} = \$7,966.00$). This monthly savings has the time cost of reviewing the note already factored in; the average of 7 minutes saved is the result of subtracting the average amount of time to write the note minus the time to review it, including any potential correction. There is no extra insurance cost since the medical director or staff physician provides the service, reviews, and co-signs every note written by students.]

Scales Application

FCFR uses several scales to assess each patient's treatment need, including the Adult ADHD Self-Report Scale Symptom Checklist Instruction, Brief Substance Craving Scale, Hamilton Anxiety Rating Scale, Hamilton Depression Rating Scale, and about 26 others. The time it takes to complete a scale varies by scale and patient: some take just a couple of minutes, whereas other scales may take a quarter of an hour. The time depends not only on the number of questions, but also on the patient's attitude, cooperation level,

thought content, and severity of their diagnosed disease, along with other factors. Students report an overall average of 11 minutes to complete a scale in a regular manner, with an average of 7 scales performed per student per day. If a staff member were to apply the scales, the assumptions would be quite similar, with an average of 11 minutes per scale per staff member. With a weekly average of 84 scales (assuming the utilization of an average of 12 students in any given month), this would translate into 363 scales per month, meaning that the total number of minutes invested in any given month to apply scales adds up to 3993. The lowest wage of a staff member who can apply the scales to patients is \$18 per hour, so having students apply them ultimately saves FCFR \$1,197.90 per month.

Blood Sample Collection

In the setting we analyzed, patients need regular blood analysis for treatment purposes. The number of samples students draw on a regular basis varies widely, and a relevant factor cannot be obtained. For our study, the effective savings generated by having students draw blood was obtained by the fact that, prior to having students draw blood, the facility needed to have a phlebotomist on staff, at an annual cost of \$28,000; the use of students eliminated this need. Also, before students were utilized to take blood samples, whenever there were no phlebotomists available, patients would have to be sent to an outside facility to have their blood drawn. This generated unexpected expenses in transportation and time management to ensure patients received their daily group hour requirements. By having students capable of drawing blood at the facility, the need to send patients to external facilities was reduced.

The effective saving generated by using students to perform blood collection is based solely on the savings generated by not having to have phlebotomist on staff—\$28,000.00 annually, or a monthly amount of \$2333.33 (\$194.44 per student based on a monthly average of 12 students). Every blood sample collection done by students was supervised by a PA, an advanced registered nurse practitioner, a DO, or an MD on staff. Every school FCFR is affiliated with was contacted to inquire about their students' capacity and insurance liability for blood sample collection purposes.

The savings generated by replacing a phlebotomist is no longer an effective added value that students offer, since December 15, 2016, as new regulations were enacted that restricted the ability to provide phlebotomy services by the facility. Changes such as this one occur due to ever-changing regulations. We include the details of this past added value to illustrate the types of value students can potentially add; however, we did not add the monetary value as part of the effective value for projecting purposes. It is, however, integrated into the calculation for the real saving generated during the year.

Table 1. Cumulative Labor

Savings	Annual (\$)	Monthly (\$)	Per Student (\$)
Running groups	16,632.00		
Progress notes	95,592.00		
Psychiatric evaluation	20,592.00		
Scales application	14,374.80		
Subtotal	147,190.80	12,265.90	1,022.16
Referral	37,850.00		
Phlebotomist	5,924.89		
Total	190,965.69	15,913.81	1,326.15

Cumulative Labor

By adding all of the previously outlined savings incurred by the work of students, a total savings of \$12,265.90 per month is obtained. This amount does not include the influx generated by patient referral from students (\$24,112.68 by a factor of 1.57 months), nor does it include the savings generated with their blood sample collection capacities (\$2,333.33 per month). The 1.57 months refers to a month and a half (157% of a month). It is calculated by dividing the number of billed days (34) by the number of business days in a month (21.66) which equals 1.5697 (1.57). Given that the average number of students rotating at the facility at any given month is 12, the total monthly saving of \$12,265.90 would represent a unitary value of \$1022.16 per student. Lastly, the monthly value adds up to an annual savings of \$147,190.80.

If the revenue generated by referrals and savings from replacing a phlebotomist is factored in, the unitary value generated by student becomes \$1,326.15, which adds up to \$15,913.81; an annual value of \$190,965.69. Table 1 shows the cumulative labor value annually, monthly, and per student.

COSTS GENERATED BY STUDENTS

Although precepted students are not provided any financial remuneration, there are still costs associated with having these students, including:

- Initial costs for establishing the affiliation;
- Clinical education coordination;
- Physician and clinical staff obligations; and
- Routine operational expenditures such as supplies and office space.

Certain costs have not been included in the calculations, because FCFR did not incur these for precepting students. There were no incremental insurance costs for liability, because all teaching institutions have liability insurance for their students to protect them and the teaching facilities. We have already previously addressed and factored in the costs associated with time spent by higher paid staff reviewing the students' notes.

Requirements to Set Up Affiliations

Establishing an affiliation with a school requires an initial investment of time, preferably from a clinical education coordinator (from the precepting side). The typical affiliation starts when a school contacts the facility to offer the assistance of their trained students in exchange for clinical experience and education. Many institutions report that they struggle to place students. Once FCFR realized the value students provide both from a financial and reputation perspectives, it expanded its reach beyond the local affiliations. Today, FCFR has nearly 50 affiliations with institutions from all over the continental United States, with many students even traveling from as far as Ohio and Indiana. Schools that lacked local options, especially those with PA programs, were very interested in this opportunity. The affiliation requisitions are essentially the same across the board for PA programs, medical schools, and residency programs, with residency programs having the highest requirements. For PA programs, the requirements only request that the preceptor is at least a PA. On the other hand, medical schools and residency programs require that a board-certified physician oversee the students. Schools also require a minimum of labor hours, usually between 40 to 80 hours every two weeks, for each rotation block. Further, most schools will require a site visit by their clinical education department to assess the quality of the educational experience, the facility, and the overall population, as well as an interview with the precepting physician.

After the screening process, schools prepare an affiliation agreement, outlining all of the obligations required from each party. The facility would be required to provide the school its learning objectives and all required paperwork, such as liability insurance, board certifications, degrees, residency certification, and licenses, and so on. By the time these affiliation agreements were signed, they were estimated to have a cost to the institution of \$7,970.88, as a result of:

- Spending time to make the contacts;
- Reaching out to the appropriate person in the institutions;
- Obtaining a phone interview appointment;

- Setting the site review;
- Gathering the paperwork; and
- Analyzing the details of each individual evaluation.

This cost represents an initial investment; renewal costs are much lower, as that is a more streamlined process requiring fewer hours. Lastly, revenue sharing is not an affiliation cost encountered with any of the approximate 50 institutions FCFR has affiliations with, nor has it ever been encountered with any institution reached to establish affiliations.

Clinical Education Coordination

Once affiliations are completed, there are ongoing costs of coordinating the scheduling of students with the schools, documenting student attendance and compliance rules, coordinating the students' evaluations, and maintaining the affiliations. This workload usually is covered by a coordinator of clinical education and clinical staffing at major hospitals. This workload ensures that all new students receive a basic introduction to the facility and its programs, and that they all have access to the EMR. Further, this workload process also certifies that the students sign every necessary document regarding confidentiality, emergency contacts, incident reporting, and so forth. It also includes constant contact with the school to schedule the rotation blocks and to apply any changes regarding the affiliation agreements. In the case of FCFR, this workload requires 50% of the daily time of the assigned staff member, with a cost averaging \$1992.72 per month.

Consumable Supplies

Supply cost directly incurred for students is highly dependent on the specialty. In general, however, these costs are not generated by students, but rather redirected toward students. For this study, any and all supplies utilized by the students otherwise would have been used by a staff member completing the activity the student was doing. These expenses could add up in cases where students' duties are mostly observing (shadowing). Activity-based costing (ABC) techniques also could be utilized in determining the proper allocation of these supplies. Currently, FCFR does not use ABC techniques.

Office Space and Management

The need for office space dedicated specifically to students is directly proportional to the number of students per preceptor. Given the high number of students per rotation block in our sample, two offices and nine computers were allocated. The usage of EMR systems allows students to use personal devices while still being in compliance with HIPAA requirements. Portable access to the EMR not only provides the students with mobility and accessibility but,

at the same time, lowers the need for computers to be provided by the preceptor site.

Overall, the only costs for these office spaces would be the housekeeping cost and the cost of the equipment in the students' offices. The cost for housekeeping for those two offices total \$164.00 monthly. Under an ABC system, there would be more allocations such as electricity costs.

The equipment in the students' offices has a total undepreciated cost of \$3,200. These computers were not brand new, but were used previously by other staff members. This cost was only incurred when setting up the offices and, therefore, is counted as an initial investment cost since said equipment could have been used for other offices.

PHYSICIAN'S OBLIGATIONS

Precepting students create additional obligations and responsibilities for staff physicians, which require some time commitment. Every affiliation is a binding contract that requires the facility to provide quality and cutting-edge education to each student. For this to occur, physicians need to dedicate time to educate these students on the different diseases, particular cases, the rationale for treatment, medication management, drug interactions, and other relevant issues.

Precepting students adds value from both qualitative and quantitative perspectives.

At FCFR, the students are given a certain level of independence in meeting their responsibilities. In general, the precepting physicians dedicate an average of an hour and a half daily exclusively to the students. During this time, the preceptor lectures the students on disorders observed in the current population as well as others not currently represented at the facility; the rationale behind certain medication combinations; and treatment decisions and other related issues. Further, the precepting physicians also review certain notes to illustrate relevant points students addressed or should have addressed. The time used to review these notes individually has already been factored in previously so will not be counted again. The costs associated with these other functions, at an hourly rate of \$120, would total \$3,898.80 per month. However, this amount is an aggregate value and must be broken down by student. Since, on average, the number of students for any given month is 12, the average monthly cost of the precepting physician per student is \$325. However, since the time spent with the students will not vary representatively, the total monthly cost of the time dedicated to lecturing students generally is the same each month.

Table 2. Value–Cost Integration 2016

	Debit (\$)	Credit (\$)	Total Debit (\$)	Total Credit (\$)
Savings			190,965.69	
Running groups	16,632.00			
Progress notes	95,592.00			
Psychiatric evaluation	20,592.00			
Referral	37,850.00			
Scales application	14,374.80			
Phlebotomist	5,924.89			
Costs				72,666.24
Consumables		\$0.00		
Office space		1,968.00		
Coordinator's time		23,912.64		
Physician's time		46,785.60		
Annual effective savings			118,299.45	

VALUE–COST INTEGRATION

Table 2 shows the value–cost integration, depicting the effective annual saving.

The aggregated cost incurred by students annually totaled \$72,666.24, whereas associated total revenues were \$190,965.69, resulting in a net revenue of \$118,299.45. This amount, divided by the total number of students (149) precepted during the year, leaves a net revenue of \$793.96 per student. By dividing the net revenue per student by the average number of hours worked in a four-week rotation (160 hours) the net benefit obtained from each student equals \$4.96/hour.

Offsetting the Initial Cost of Precepting Students

The total initial investment to precept students incurred in 2015 was \$11,170.88 (\$7,970.88 from initially setting the affiliations plus \$3,200.00 from the office equipment at market value). Subtracting the revenue generated by patient referral and the amount generated by replacing the phlebotomist, a net revenue of \$500.16 per student (not including the initial investment cost) is obtained. With such net revenue, 23 students are required to cover the initial expenses. Most of the affiliations were signed in 2015, which lowers the number of students precepted during that year; it is also important to point out that the tracking method used at that time may also reflect a number of students lower than the actual number precepted due to ineffective tracking methodologies. Based on the records, it took 9 months to reach the 23 students required to cover the initial expenses.

OTHER SOURCES OF REVENUE

Some educational institutions provide payment to the facility in exchange for precepting students. Currently, at FCFR, there are only two such institutions. The payment amount ranges from \$300 to \$500 per student. This source of income was not included in this study's data as it was *de minimis*. It is expected that in the year 2017 that the amount received will be based on at least 12 students, which converts to at least \$3600. This practice of receiving funds from educational institutions has been addressed and deemed legal and compliant with state regulations by the Florida Department of Education. As a side note, this procedure could be avoided by any facility located in a state that has already joined the National Council for State Authorization Reciprocity Agreements.

APPLICATIONS TO OTHER SPECIALTIES

Although each medical specialty area has unique management practices and procedures, certain commonalities apply to all. The methodologies applied in our study are arguably universal and should be applied by all medical disciplines. Further, other nonmedical fields that have access to qualified students for nonpaid internships also could benefit from these approaches to cost-benefit analysis. Some adjustments would be required based on the type of medical facility the students were placed. For instance, cost structures and staffing requirements would be different for specialized medical facilities than for a general hospital. A win–win situation can take place: facilities benefit from cost reductions and enhanced prestige, while educational institutions have placements for their students.

CONCLUSIONS

Our analysis of the data for the entire 2016 period supports our contention that precepting students adds value from both qualitative and quantitative perspectives. From a qualitative perspective, the use of students adds to FCFR's reputation as a teaching facility. As a result, they can obtain the best students from around the country. Further, the quality of care also improves as a result of more "eyes and ears" monitoring the patients. From a quantitative perspective, as addressed, the cost savings from the use of these supervised students is significant. The goal of our article is to counter preconceived notions that teaching hospitals have additional costs due to precepting students. The case study at FCFR indicates differently. We intend to conduct other studies outside of psychiatric facilities to demonstrate this underlying principle of cost savings via the use of precepting students. ■■

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