

H&P

THE STANFORD MEDICAL STUDENT JOURNAL

VOLUME 14 | NUMBER 1 | WINTER 2009



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- Neurological Imaging Cases
- Population Health Manuscripts
- New Student Insights
- The Building Of The Li Ka Shing Center

New Beginnings

LETTER FROM THE EDITORS

Thank you for reading this issue of H&P, themed *New Beginnings*. The editorial board decided on this subject since the medical school is rapidly undergoing several changes. For one, this Fall marked the welcoming of the Class of 2013, the latest addition to our student body. In addition, our campus is undergoing developments with the anticipated introductions of the Li Ka Shing Center for Learning and Knowledge and the The Lorry I. Lokey Stem Cell Research Building.

The H&P itself has turned to a new direction. This issue ushers in a new design format for the journal, which we hope will enhance the readers' experience. We are proud to have Ashling Loh-Doyle, a Stanford undergraduate and founder of design firm Lotus & Ash, direct us in the redesign effort with her stylistic direction and technical expertise.

This issue begins with two neurovascular cases summarized by Jonathan Kleinman and Ryan Snider that will illustrate major advances in molecular imaging, highlighting their effect on improving patient outcomes. Next, Evelyn Ho introduces two population health manuscripts that showcase public health work done by medical students in 2009 in conjunction with the Mayview Community Health Center and the Santa Clara County Health Department. These two articles were selected for publication after review by faculty members due to their outstanding nature.

Next, the H&P continues to spotlight issues in international health with an article by Shane Wong addressing the dire situation of treating mental illness in developing countries. His piece stands as a call to action and should make us all consider this neglected aspect of global health.

The Features and Perspectives section headlines three articles which detail intimate views into life at Stanford Medical School. Woody Chang's article on the transition from a lab manager to becoming a first year medical student provides a unique, grounded insight into the similarities and differences between two fields right on our medical campus—basic research and clinical medicine. Elise Min's piece on the depth of human emotion felt by third and fourth year students on the wards as they begin to confront the intersection between medical culture and human suffering will move you. Finally, Nathaniel Myall, himself a third year medical student starting clinical rotations, reflects on his troubled time as a patient at Stanford following recovery from surgery and conveys the depths of uncertainty and lack of control that often face both providers and patients in the hospital.

Our humanities section features an essay by Katherine Bell on her experiences in anatomy class. Katherine's prose is candid and emotional, reminding past anatomy students of the mixture of joy and fear that accompanies the first day of dissection, while giving outside readers an inside look into this unforgettable experience.

The last section of the H&P traditionally features a leader in medicine, and in this issue Roberto Valladares provides an interview with Dr. Oscar Salvatierra. Their conversation uncovers how truly incredible the life of a career scientist and pediatric surgeon can be. We hope you enjoy the H&P.



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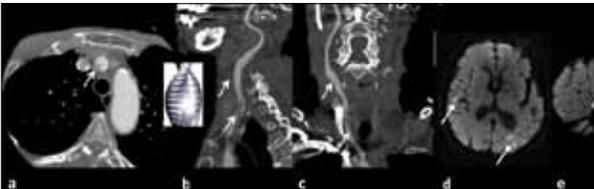
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-RYAN SCHUBERT AND ANDREW CHANG

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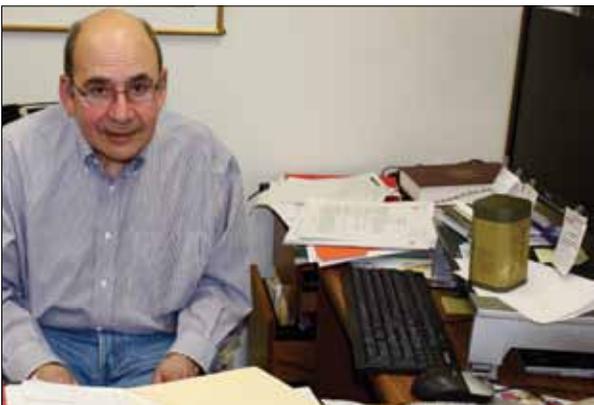
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JONATHAN T. KLEINMAN



ANUBHA AGARWAL



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Two Cases with Neurovascular Imaging

JONATHAN T. KLEINMAN AND RYAN SNIDER

A TERRIBLE HEADACHE

A 31-year-old man with hypertension presented to the emergency department with a three-week history of intractable throbbing non-radiating constant headache. Associated symptoms included: nausea; vomiting; decreased appetite; 10 pound weight loss; and photophobia. Pertinent negatives: no diplopia; loss of vision; aphasia; dysarthria; impaired coordination; vertigo; weakness; loss of consciousness; or change in mental status. The patient experienced five distinct 25-minute episodes of right face, arm, and leg numbness over the preceding weeks, and visited five different emergency departments, all with unrevealing workups despite a lumbar puncture, non-contrast head CT, and MRI.

Given the chronic nature of this headache, the patient was admitted to our institution for further evaluation. Contrast enhanced head CT at Stanford shows sagittal sinus, right, and left transverse sinus thrombosis (Figure 1a: top row and lower row [contrast windows narrowed]). Follow-up MRI shows the clot as bright (Figure 1b) and MR venography shows flow voids (Figure 1c). No parenchymal injury was appreciated on follow-up MRI. Hypercoagulable tests were negative and no cause was found for thrombosis. Since discharge he has stayed on Coumadin, experienced no focal neurological deficits, but is still experiencing fatigue and occasional headaches, which are treated well with Tylenol.

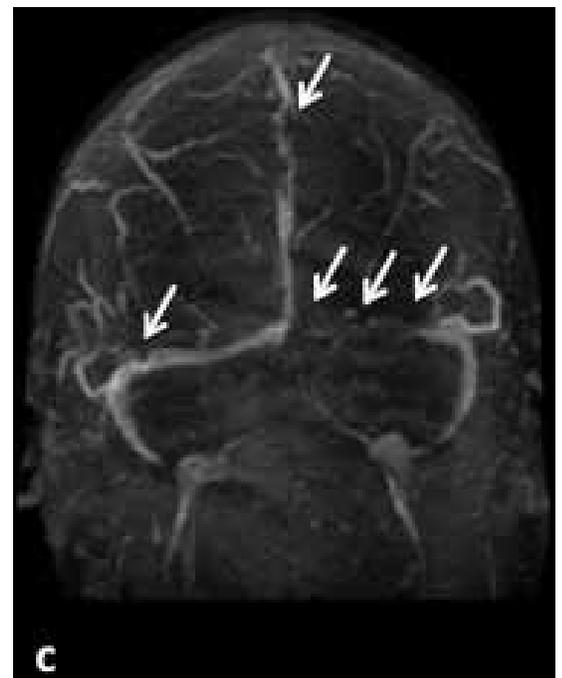
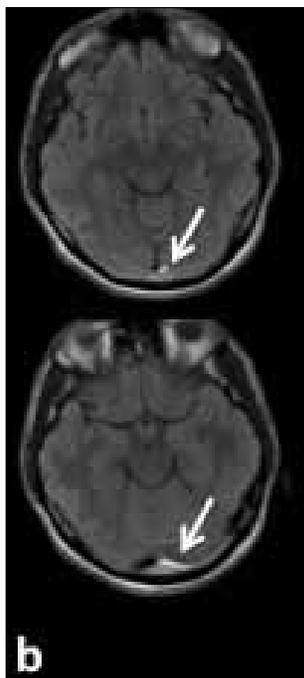
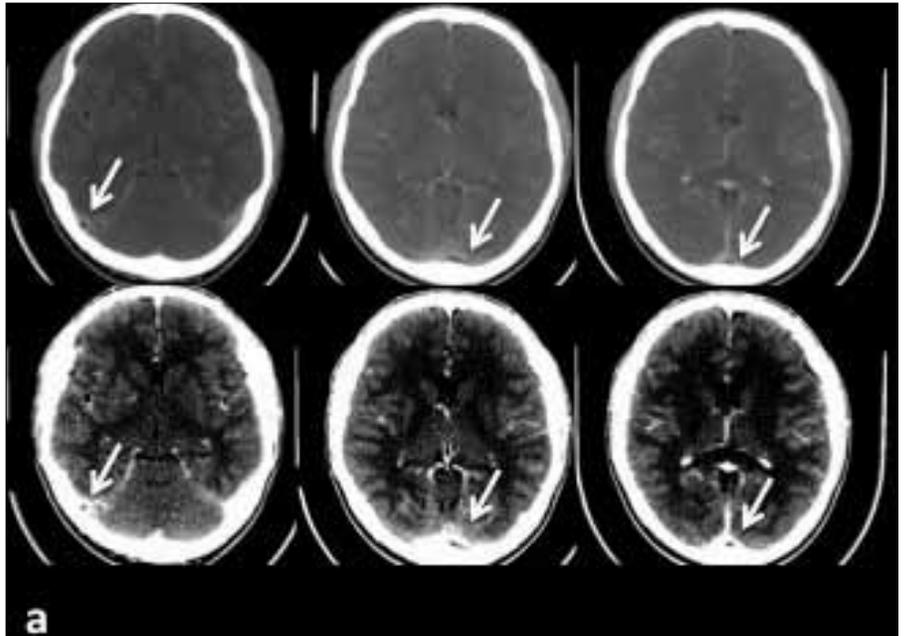


FIGURE 1: CONTRAST ENHANCED HEAD CT

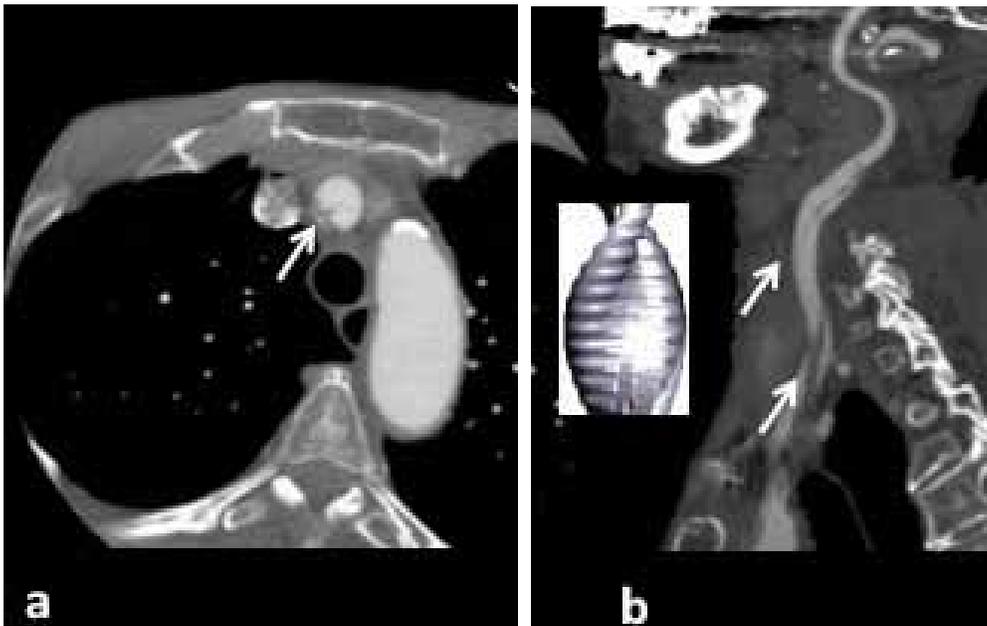


FIGURE 2:
A-C: CT ANGIOGRAPHY
D,E: DIFFUSION-
WEIGHTED MRI

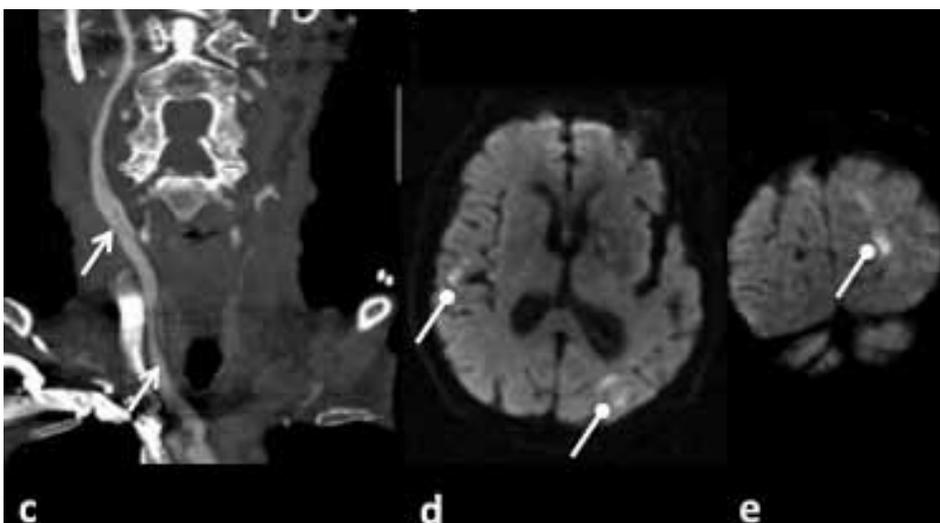
ONE LUCKY LADY

A 74-year-old woman with a history of hypertension and half-pack per day smoking history presented to the emergency department with acute global aphasia and right-sided weakness. Per the patient’s husband, the patient awoke at 6 AM and made coffee, after which she went outside to smoke a cigarette, which is her normal routine. When she hadn’t come back in at 7 AM, her husband went outside and found her slumped over in a chair, unresponsive, drooling, and not using her right arm well.

In the ED, she was significantly disabled with a National Institute of Health Stroke Score (NIHSS) of 16: including global aphasia, forced gaze deviation, and right sided weakness. Her head CT performed at this time was unremarkable, showing no intracerebral hemorrhage or acute changes associated with ischemic stroke (loss of

gray/white matter differentiation, or sulcal effacement). Shockingly, the CTA showed an ascending aortic dissection (Stanford class A), at which point cardiothoracic surgery was called for intervention, but the family decided the patient would not want invasive surgery. The CTA also showed: a completely occluded left common carotid (not shown); right brachiocephalic dissection (Figure 2a); right common carotid dissection twisting helically up the length (Figure 2b,c); MR diffusion showed minimal left MCA/PCA territory watershed infarcts as well as an embolic right temporal lobe infarct (Figure 2d,e). This patient was incredibly fortunate to have an intact circle of Willis.

At discharge, her language was fluent, she followed all commands, and was walking. Three months later, she was seen at a follow up visit in clinic, at which time she had a NIHSS of 0, signifying a phenomenal recovery. **H&P**



Her husband ... found her slumped over in a chair, unresponsive, drooling, and not using her right arm well.

POPULATION HEALTH MANUSCRIPTS

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The following manuscripts resulted from two groups of medical students who worked with community partners in the local community to impact the health of populations. As part of the Population Health Curriculum, facilitated by the Office of Community Health, students complete 6-month long projects that respond to some of the most pressing community needs. Through these projects, students have the opportunity to learn about a local

public health issue, how they can work to address them, and about the expertise in the community. These two manuscripts were selected based on the quality of the completed project, the analysis of the background of a current issue, and the reflections on the role of physicians in addressing the needs of the community.

— EVELYN HO

OFFICE OF COMMUNITY HEALTH

Assessing Readiness for Successful Transition to Electronic Medical Records at MayView Community Clinic

MALINI DANIEL ; STESHA DOKU ; KATHLEEN JACOBS ; JAY NATHAN; YINGDING BRYAN XU COMMUNITY PARTNER: LAILA GULZAR, PHD, MPH, RN, DIRECTOR, SERVICES QUALITY & RESEARCH, MAYVIEW COMMUNITY HEALTH CENTER

ABSTRACT

Traditional paper-based medical records are plagued with high overhead costs, low efficiency/impaired workflow, and no ability for automatic error-checking. Electronic medical records (EMR) can serve to ameliorate all three of these problems. While EMR is used effectively in large hospital settings across the nation, few studies currently exist regarding EMR use and cost-benefit analysis in community health centers (CHC). In this study, we worked with MayView Community Health Center (MCHC), a Bay-Area CHC, to enhance its preparedness to transition to an EMR system. Our project involved developing and conducting an EMR preparedness assessment through a staff and leadership survey to determine where the organization was on the continuum of preparedness for EMR transition. The survey was a modified version of set of 3 comprehensive EMR preparedness surveys available at the Community Clinics Initiative website. There were 30 sampled participants, of which 25 were respondents. Respondents were sampled from both senior management and clinical staff. From the survey, we were able to extract success indicators which guided interpretation of our results. Overall, we found that at MCHC, there is an organization-wide commitment to adopting an EMR with the highest degree of readiness, for which the CHC is moderately prepared. As MCHC continues its efforts to become fully prepared, its leadership should emphasize a) enhancing IT capacity and preparedness, b) acquiring adequate resources to plan a systematic transition and c) assuring sustainable adoption of EMR.

OBJECTIVES

Given the potential barrier to successful Electronic Medical Records (EMR) implementation, it is important to develop a general and scalable assessment for determining both the readiness and customization properties of EMR in CHCs. Our primary goal was to develop and administer such an 'EMR readiness survey' at MayView Community Health Center. In this survey, we look at important factors such as staff attitudes towards EMR, IT infrastructure, and whether there is sufficient organization and support within MayView. From this survey we extrapolated 'Indicators of Success' for EMR transition. As MCHC moves through EMR implementation, the 'Indicators' serve as a reference checklist of the necessary components for a smooth transition to EMR.

BACKGROUND

Community health centers (CHC) serve as a vital source of primary medical care for a large number of patients from underserved communities and disadvantaged backgrounds. Their smooth functioning is critical in providing perinatal care, preventative measures, and health screenings for patients who might otherwise be excluded from the healthcare system. Yet given the low fees they charge their clients, many centers typically find their budgets strained and their resources pushed to the limits (1). Surveys of health center staff indicate how common these issues are and demonstrate a consensus that, among myriad other factors, better data management procedures are a top priority for future investment (2).

Traditional paper-based approaches to keeping patient records, managing referrals and diagnostic test requisitions, and writing prescriptions have several disadvantages including overhead costs of space, time, and labor in storing, safeguarding, retrieving, record-

ing, and interpreting pertinent clinical information. Ironically, using a partially computerized system may actually create more of a burden, as information must be manually inputted into the computer or printed out and used in paper format anyway. Finding a more efficient approach to managing patient data would reduce demands on the time and budgets of community health centers, and the best option currently available to achieve this goal is to utilize an electronic medical record (EMR) system (2, 3, 4).

Such systems centralize and standardize the recording of patient data, the tracking of a patient's medical condition, and the prescribing of appropriate treatments. In addition, they provide error-checking functionality not available with paper. For instance, they can alert a healthcare provider that a prescribed medication poses a risk of an adverse drug or allergy interaction. From a managerial standpoint, an EMR can provide a quick overview of a medical practice's service utilization, allowing for faster and more precise adjustments to ensure an optimal allocation of resources (5). However, there are also many barriers to EMR including physician attitude and resistance toward EMR adoption, high costs, privacy concerns, lack of standardization among EMR systems, and questionable return on investment (1, 3, 6, 7, 8).

Few research studies have been conducted on the costs-benefits of EMR, especially in CHCs. Those that have been published demonstrate variable benefits. One study demonstrated a five-year benefit of \$86,000 per provider including savings in drug expenditures, improved utilization of radiology tests, better capture of charges, and decreased billing errors (9). In addition, Grieger et al. found that savings matched costs 16 months following implementation (10). However, these two studies took place either at private practices or academic hospitals, settings that don't match well with CHCs. In a study that tracked six CHCs as they implemented EMR, only one reported notable financial benefits compared to costs (2). A majority of financial benefits generally came from increased efficiency. Although CHCs didn't seem to benefit financially as much as private practices from EMR, they do see greater quality improvement than private practices do (2). Thus, it is important to evaluate the implementation in CHCs within the context of quality improvement. More research is needed to better understand how EMR adoption and its individual components affect the operation of and quality of care specifically at CHCs.

COMMUNITY PARTNER

MayView Community Health Center's overarching goal is to provide high-quality primary health care to low-income families in the northern Santa Clara and southern San Mateo counties. During 2008, about 5,600 patients received 19,000 services at MCHC's three clinics. Services include general medical care for children and adults such as physical exams, chronic disease care, and counseling; preventative care such as screenings, immunizations, and STD testing; family planning; and perinatal care. Of the population served,

Finding a more efficient approach to managing patient data would reduce demands on the time and budgets of community health centers, and the best option currently available to achieve this goal is to utilize an electronic medical record (EMR) system.

the majority are women and children, likely reflecting the importance of women's health, perinatal, and child care at MCHC. In addition, a large majority of patients and families served are Latino and approximately 93% of families are below 200% of the Federal Poverty Level. MCHC uses a sliding fee scale system and provides services even if patients are unable to pay at the time of visit (11). MCHC is strongly committed to continuous quality improvement in care and service provision for the most vulnerable and neglected population.

This project was possible because of many years of partnership between Stanford Office of Community Health and Mayview Community Health Center. The partnership was truly reflected in how the community partner worked along with the group, sharing project tasks and responsibilities at every step of the way, and ensured that the group was adequately guided through the process.

METHODS

What initially began as an implementation of e-prescribing to improve the safety of managing prescription medication became a greater assessment into readiness for transitioning to electronic medical records. We conducted a survey to determine how ready MCHC was to transition to electronic medical record instead of implementing a stand-alone e-prescribing program.

In order to facilitate this goal we began with an extensive literature review to understand both the process and challenges that other community health clinics had encountered in implementing EMR. Our literature review provided both a basis for determining 'indicators of success' which serve as specific guidelines to determine readiness and as a basis for developing a general 'readiness assessment tool' to gather data towards analyzing the indicators. Our tool became a readiness survey which we developed from established research from the Community Clinics Initiative (12). We modified the available tool to be used particularly with MCHC staff, with the help of our community partner liaison as the 'eyes of the organization'. Through discussions and working side-by-side with her we were able to determine the relevant areas for questioning and who to target the survey questions

too. We administered the survey on paper at a monthly staff meeting (initially we hoped to administer the survey online but worried both that the response rate would be low if staff were asked to participate in the survey on their own time or that there may be concern about getting to an internet-ready computer). The survey results were collected and analyzed as discussed below.

SURVEY CONSTRUCTION AND ANALYSIS

Questions were created on a Likert-like scale from one to three, one meaning the clinic was not prepared at all and three meaning the clinic was fully prepared. There were 25 total respondents of which thirteen were support staff, six were leadership and administrative personnel, four were providers, and two had the dual role of provider and administrative staff. Four had worked with MCHC for less than one year, seven had worked with MCHC for 1-5 years, five had worked with MCHC for 6-10 years, seven had worked at MCHC for greater than ten years, and two were unreported. Such demographic data indicates that a good mix of personnel were sampled; data were obtained from individuals with varied jobs and experience.

Averaging the responses for all participants for all questions reveals that on the effort continuum from poor readiness to full readiness, MCHC has reached moderate preparedness for EMR implementation. In order to subdivide this analysis to see where the clinic is prepared and where concerted efforts have to be devoted, the survey can be analyzed according to its five sections: organizational alignment, organizational management capacity, operational capacity, technical capacity, and EMR preparedness. Each will be subsequently examined.

ORGANIZATIONAL ALIGNMENT

Organizational alignment questions were given to all participants. There were additionally two organizational alignment questions which were intended only for physicians; these are analyzed separately. The overall organizational alignment score analysis revealed that MCHC is moderately aligned and ready to support EMR adoption. In fact, the raw numbers did not significantly deviate from this average with the exception of one question; when staff was asked how they thought the EMR planning process should be conducted, the staff was overall in favor of all staff being involved in the process which itself should favor team orientation, communication and collaboration. The two organizational alignment questions for physicians asked them whether they understood the EMR system and what their involvement should be. The results indicate that while physicians want to be involved in the planning and decision-making processes related to EMR implementation, they feel that they currently only have a moderate understanding of how EMR systems work. From this finding, we note that significant physician education is important prior to the planning and decision-making processes to ensure that physicians can play a valuable role in these processes

as well as effectively utilize EMR once implemented.

ORGANIZATIONAL MANAGEMENT CAPACITY

Organizational management capacity questions were given only to senior management staff. These questions were designed to determine the current management efficacy for EMR implementation. The analysis reveals that MCHC is moderate in its management structure and directives. Data also indicates that a good structure is in place for MCHC to make an informed and appropriate decision about EMR implementation. The survey indicates a few areas for improvement. Survey results show that data integrity checks are rare, usually only done when a specific problem occurs. MayView may improve by evaluating data integrity on a more consistent basis using a validated tool and taking corrective action when shown necessary. This is particularly important to the EMR process for the aforementioned necessity of collecting valid and informative data to adjust the process where necessary; the utility of data is enhanced when it is known (using a validation tool) that data is appropriately informative.

OPERATIONAL CAPACITY

Operational capacity questions were given only to senior management staff. These questions were designed to determine workflow efficiencies, and physician practice patterns to assess the overall operations of clinics. Clinics were rated to have moderate organization and operational capacity. Important deviations include that the clinic performs moderately well with scheduling patient follow-up—it is done in accordance with clinic guidelines on a regular basis. Given adequate resources, MayView may look into customizing patient follow-up to patient's needs and monitoring patient utilization. This is an important benefit of the EMR system. EMRs can show previous appointments and indicate no-show appointments, which physicians can see prior to patient encounters and can talk to patients about what could help them increase their vigilance. Another operational capacity aspect that the organization scored low in was to assess individual provider practice patterns. CHCs are recommended to adopt a mechanism to provide their practitioners regular feedback regarding individual practice patterns, including best-practices and peer comparisons. This could benefit the clinic by making sure patients are getting equitable care and physicians follow prescribed standards of care.

TECHNICAL CAPACITY

Technical capacity questions were given only to senior management staff. These questions were intended to assess the IT infrastructure, management and personnel. The IT infrastructure needs significant strengthening as MCHC prepares for an EMR transition. It is recommended to have an information technology team whose members are assigned responsibilities according to existing skill sets.

Such a team would ensure that the inevitable technical problems with the EMR would be resolved to avoid frustrations, work-delays, and potentially incomplete medical records associated with spotty EMR use. The survey also reveals that the office manager has limited IT experience; more training for the office manager and recruitment of an IT manager would greatly benefit the organization in the necessary troubleshooting for EMR choice, adoption, and maintenance.

EMR PREPAREDNESS

EMR Preparedness questions were given only to the senior management staff. This series of questions determines the readiness of MayView for implementing EMR in terms of established protocols, understood timelines and perceptions, revenue impact, etc. There were three questions designated for the CEO alone and one question designated for the CEO and the medical director; these are analyzed separately. Survey scores indicate that MCHC's existing overall preparedness for EMR transition falls in the "low to moderate" category. The senior management reports that they have studied the pros and cons of an EMR and can make an argument for the net benefit of one, though they need to put more effort in specific areas to bolster their commitment to ensure EMR's success. This is a dangerous pitfall in implementing an EMR system; without the support of the members of the clinic and the desire to work out initial problems, an EMR system cannot succeed. Furthermore, EMR costs have not yet been fully considered. For a "fully prepared" score, costs would have to be thoroughly examined and the initial productivity declines, reductions in schedules, revenue impact, and costs of on-going trainings would need to be evaluated. It is important to take these costs into consideration when calculating the expected return on investment. The senior management staff also has to develop a timeline for EMR implementation,

MayView also needs to begin addressing EMR benefits in terms of quality improvement as well. Roles and responsibilities for analyzing EMR choices, negotiating with the vendor, contract terms, and EMR quality and efficiency metrics have not been developed. Such problems are necessary to fix in order for efficient implementation with the potential for on-going analysis to determine problems and improve the system. . Having a project manager will be invaluable as MayView transitions to an EMR platform. A project manager is necessary for an efficient implementation and on-going analysis to

ACHIEVEMENT OF LEARNING OBJECTIVES

1. Read, analyze, and synthesize literature on EMR readiness and implementation in community health clinics.
2. Using existing readiness assessment tools and literature, create staff and leadership surveys to assess MayView's organizational preparedness to implement EMR.
3. Administer the survey to a sample of staff and the leadership.
4. Feed the data in an online Organizational EMR Readiness Assessment tool, analyze the data and prepare a short report of survey findings.
5. Assist with creating an "MayView manual for Transitioning to EMR" (including readiness assessment findings, indicators of EMR success, resources available for EMR planning and implementation, and suggestions for an EMR implementation plan).

determine problems and improve the system. A needs assessment for hardware and technical equipment is also recommended for costing. Survey respondents note that IT has not been updated and that more IT is not available, and where it is, it has not been updated. In addition, physician and organizational incentives for EMR implementation are not yet in place. Putting such incentives in place first will likely provide momentum for staff members to push for EMR and aid greatly in the planning process.

The CEO has noted that she has established a general consensus for EMR with partial physician buy-in; this could be improved upon by developing a broader consensus and an organizationally-aligned plan for EMR integration. The CEO and medical director indicated that they have not yet created a clinical requirement for EMR—that may be considered once EMR adoption process is actively underway. The CEO also notes that she has devoted substantial time to EMR planning and will establish a separate budget that lasts at least twelve months beyond the implementation phase to account for productivity decreases. However, the staff report not being aware of ground work underway for EMR adoption. Expanding communication to the broader staff will improve staff understanding and cooperation to successfully implement an EMR and accomplish even more of the organization's goals in the future.

The EMR preparedness survey was a very useful process for Mayview leadership and staff to learn about organization's strengths and where the future efforts should be directed to, for successful EMR transition. And the "Indicators of Success" developed from the CCI's preparedness surveys will serve as a guide/checklist to ensure and monitor that all important areas are addressed and strengthened. It is highly recommended that all community health center leaders undertake this process and prepare their organizations to make the transition as more effective and efficient institutions.

ACHIEVEMENT OF LEARNING OBJECTIVES

We have achieved the following learning objectives:

1. Read, analyze, and synthesize literature on EMR readiness and

implementation in community health clinics;

2. Using existing readiness assessment tools and literature, create staff and leadership surveys to assess MayView's organizational preparedness to implement EMR;

3. Administer the survey to a sample of staff and the leadership;

4. Feed the data in an online Organizational EMR Readiness Assessment tool, analyze the data and prepare a short report of survey findings;

5. Assist with creating an "MayView manual for Transitioning to EMR" (including readiness assessment findings, indicators of EMR success, resources available for EMR planning and implementation, and suggestions for an EMR implementation plan).

OBSERVATIONS ON COMMUNITY ENGAGEMENT

The principles of community engagement center around certain key values: understanding a community and its challenges prior to developing and implementing assistance efforts, respecting and utilizing the resources already present in the community to successfully meet objectives, and the need for community self-determination, during the intervention process and beyond. Health professionals must be cognizant of their own limitations in understanding diverse communities and implementing reforms; simply entering the community with pre-prepared problem lists, objectives, program ideas, and notions about the people involved will not provide for effective, sustained results. Insofar as community engagement is a partnership, both parties must strive to build a trusting relationship, where the primary objective is the betterment of the health of the community. One challenge we faced in accomplishing these objectives was defining our community; were we working for the patients of MayView, or the staff? We answered this by realizing that the implementation of an EMR system would clearly benefit both, as we found ample evidence showing improvements to patient waiting time, prescription filling, compliance with checkups, and patient safety in healthcare settings utilizing an EMR system. The long-term advantages to the staff were clear from the beginning, through time, cost, and manpower savings. Given that our community partner was a health care clinic and our ultimate goal was to survey the clinic staff to ascertain their perspectives on the readiness of MayView to accept an EMR system, we found that we came to better understand one of our communities - the MayView staff. Though we did not learn about the patient population directly, we feel that the information gathered in this project can be useful in enhancing the care they receive.

ATTRIBUTION

All members of the group (MD, SD, KJ, JN, YX) contributed equally to writing, administering, analyzing the surveys as well as contributing content to the final manuscript. The manuscript was also reviewed and edited by the community partner, Laila Gulzar, PhD, RN. We would like to take the opportunity to thank MCHC

for their involvement and partnership, especially in allowing publication of project data meant purely for internal organizational learning and growth. **H&P**

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Determining the Impact of Active Tuberculosis in Employees of Childcare Facilities in Santa Clara County

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ABSTRACT

In California's Santa Clara County, tuberculosis (TB) rates are among the highest in the United States, with an average of 13.4 cases per 100,000 individuals. Young children are particularly susceptible to community-acquired infections such as TB due to lack of developmental understanding required for good hygiene and an immunologic susceptibility to various bacteria and viruses. In order to investigate the impact of TB in childcare settings, a retrospective chart review was conducted on all case files of TB patients (1351 cases) in Santa Clara County between 2005 and 2008. Inclusion criteria included indication of having previously worked in the childcare industry or self identification as a childcare or daycare worker, teacher, teacher's aide, or some other occupation including close contact with and provision of care for children. Those cases that met inclusion criteria were subject to further review, to determine if thorough contact tracing was performed and if pertinent childcare/school sites were investigated. 11 cases of childcare workers in Santa Clara County with TB were discovered, 5 of which had extra-pulmonary TB, 6 with pulmonary TB. Of the six cases with pulmonary TB, only one contact investigation was conducted because of resource limitations, and exclusion criteria of the Santa Clara Public Health Department.

INTRODUCTION

Children in the United States are at risk of acquiring tuberculosis from infected adults who work in child care settings. Several case reports have emerged within the United States and abroad of children being exposed and infected with TB in childcare settings (Aivazis, Dewan, Driver, Gillman, Nolan, Sarrat, Smith) through mainly adult-to-child transmission. As a result, there is a potential mandate for adult childcare providers to be regularly screened by public health authorities for TB and other community acquired infections to prevent adult-to-child transmission of TB.

BACKGROUND

While tuberculosis (TB) afflicts nearly 25 million people and kills upwards of 1.5 million people annually worldwide, these deaths mainly occur in developing countries in Africa and Asia (CDC). Some cases, however, do find their way into the United States, primarily through customs and immigration. In 2007, 13,299 TB cases

were reported in the United States (a rate of 4.4 cases per 100,000 persons), and 779 of these cases were among children aged 14 and under (CDC). Within Santa Clara County alone TB rates are, at 13.4 cases per 100,000 individuals, significantly higher than the average US rate; possibly this is due to the higher than average level of immigration from countries with high prevalence of TB (SCC Public Health Department). Therefore, the risk for contracting TB within the US and especially within Santa Clara County cannot be dismissed.

Young children are particularly susceptible to community-acquired infections such as TB due to lack of developmental understanding required for good hygiene and an immunologic-susceptibility to various bacteria and viruses. While tuberculosis has been on the rise in the under-15 population since 1987, with a 40% rise in the last two years, daycare outbreaks have not been noted thus far in the literature as being a significant risk factor (Schwartz). However, there is still a case to evaluate the risk within daycares in Santa Clara County given the significantly higher TB rates within the county. When kept in close quarters with other children and their guardians as in a childcare facility, there is severe potential for rapid TB transmission (Schwartz). In fact, children in daycares exhibit a two to three times greater risk of acquiring these infections (Nesti). Furthermore, children under five are at greater risk of developing active TB (Marais). While TB significantly impacts the health of the infected child, the subsequent clinical follow-up and stringent medical interventions are potentially devastating to the families, especially to those where one or both of the parents must take time off from work. In the US, it is estimated that families who have children in child care lose at least 13 days of work per year for all types of infections (Huskins). Additionally, community acquired respiratory infections amongst children within the day-care setting have significant implications for the child's development in language acquisition and development delays (Schwartz).

Literature reviews have uncovered TB case reports in childcare facilities from the US and other developing countries (Aivazis, Dewan, Driver, Gillman, Nolan, Sarrat, Smith). Of particular note is that the index case in many of these outbreaks was found to be an adult daycare resident or worker who had previously contracted tuberculosis. For example, a documented outbreak of TB in a private-home family childcare center in San Francisco between 2002 and 2004 resulted from infection by an adult result residing in the family-run childcare center (Dewan). During the contact investigations for the outbreak, 67 total unique persons-of-interest were found to have contacted the index patient for an extended period of time, and a total of eleven active TB cases (nine of whom were children under the age of seven) were found. The affected childcare facility was located in a private

apartment and had been operating for several years, but none of the adult workers or residents had been screened for TB before the first documented pediatric case. Other documented cases from around the US also seem to follow a pattern of TB spreading from an adult resident of a childcare facility to children in a family-run in-home childcare program (Nolan). With regards to ad-hoc in-home childcare programs that are unregulated, these programs empirically tend to be implemented and operated by immigrants, which represents a significant risk for contact exposure to children given the elevated LTBI rates seen in immigrants to the U.S.A. As described by Nolan et al., one significant in-home daycare outbreak came to pass in an Ethiopian neighborhood daycare, where one of the residents had active pulmonary TB, and of the four children in the daycare, all four children tested positive on tuberculin testing and 3 were diagnosed with active pulmonary TB.

In contrast, childcare facilities run outside of the home also tended to show transmission from an adult index patient who worked rather than lived in the facility. Take for instance, an epidemic of 35 pediatric TB cases in a Swedish daycare center in 2005 (Gillman). The index case was a preschool teacher who worked closely with many of the children. Similar documented cases included a 24 year old teacher trainee with TB pleuritis who infected 24 children in Greece (Aivazis), an adult daycare worker who infected 11 children in Spain (Sarrat), a 22 year old childcare provider who infected 3 children in Houston (Smith), and many others. Again, in both types of facilities – private homes and out-of-home - the index cases were adults who had lived or emigrated from TB-endemic countries. These studies pose that the major mode of transmission of the tuberculosis did not occur from child-to-child within the daycare setting, but from adult child care providers or residents to the children.

This adult-to-child mode of TB transmission has led to the development and administration of numerous public health policies and interventions around the world. Interventions that have proven valuable for reducing infections within child care centers include the following: (1) formal written policies for infection control within the child care center, (2) formal education of child care center staff concerning infection control practices (needs to be repeated, preferably on a recurring basis), (3) good hand hygiene by both staff and children, (4) appropriate cleaning of contaminated surfaces, (5) separation of food preparation and diaper changing, (6) exclusion of certain ill children, (7) cohorting ill children when exclusion is not possible, (8) ensuring adequate age-appropriate immunization of child care attendees and staff, and (9) optimal ratios of children to staff (Brady). Additionally, as reiterated by Smith et al., all the children in the described case study (except those without parental consent) were given isoniazid prophylaxis for three months, and the same prophylactic regime was recommended for the adult workers. In carrying out this protocol, the public health officials followed the guidelines of the American Academy of Pediatrics Committee on Infectious Disease

and the American Thoracic Society, which recommend prophylaxis by isoniazid for three months following TB exposure in children aged four and younger. Additionally, Marais et al., similarly point to preventive chemotherapy as a necessary prophylactic measure in extreme cases where contact exposure of children to active TB caregivers and/or HIV/TB caregivers is confirmed. Public health departments should reinforce these interventions by active surveillance, including annual TB testing of child care workers.

PURPOSE

Due to the increased risk for potential for severe outbreaks of TB within childcare settings, our purpose is to determine the capability and comprehensiveness of the Santa Clara County TB guidelines for employees of childcare centers, and if necessary, introduce additional policies that would help mitigate adult-to-child TB transmission in these facilities. Our goal is to proactively reduce the number of pediatric TB cases in Santa Clara County by ensuring the improvement of TB testing among employees of childcare centers.

OUR PARTNERS

Our project involved close collaboration with the Tuberculosis Prevention and Control Program at the Santa Clara County Public Health Department. The department serves 1.5 million residents living from Palo Alto in the north to Los Gatos in the south, encompassing the entire metropolitan area of San Jose. The county is presented with over 300 suspected TB cases annually and will administer a thorough index patient interview and subsequent patient contact investigation in order to determine any possible sources or recipients of TB transmission.

METHODS

The public health department records all suspected and confirmed TB cases in Santa Clara County. A total of 1351 records detailing TB cases between 2005 and 2008 were reviewed. Cases that met inclusion criteria were added to a tool developed to catalog TB cases with potential childcare center associations. Inclusion criteria included indicating having previously worked in childcare or self-identification as a childcare or daycare worker, teacher, teacher's aide, or some other occupation including close contact with and provision of care for children, (e.g. sleepaway camp counselor). Those cases that met inclusion criteria were reviewed to determine whether a contact investigation was completed in the household/close contacts of the index case and whether a contact investigation in the childcare/school setting was done. For index cases that received medical care at the County run TB clinic, medical charts were reviewed in addition to the public health department record (e.g. nine of the eleven total cases). Contact investigations done in a childcare/school setting were evaluated to determine whether transmission had occurred in the childcare/school. The evaluation of the infectious status of the index

TABLE 1

CASE NUMBER	AGE	GENDER	POSITION/TITLE	TYPE OF TB	OUTCOME
2005-114	54	White F	School secretary at "Boy's Ranch"	Extrapulmonary	
2005-269	42	Ethiopian F	Housekeeper at day care center	Extrapulmonary	
2005-068	46	Indian F	School principal	Extrapulmonary	CXR not done
2006-256	22	Latino F	Child care provider	Not active TB	
2007-076	34	Filipino F	Teacher	Culture-Negative TB	
2007-212	37	Filipino F	Teacher's Aide	Pulmonary	
2007-012	19	Filipino F	Daughter of home daycare owner	Pulmonary	Smear Positive
2007-055	46	Filipino M	Husband of home daycare owner	Pulmonary	Smear Positive
2008-267	32	Filipino F	Preschool teacher	Pulmonary	Smear Positive
2008-186	27	Filipino M	Camp counselor	Pulmonary	Smear Positive
2008-274	63	Peruvian F	Nanny	Extrapulmonary	
2008-212	65	Indian M	Childcare worker seeking employment	Pulmonary	Smear Positive

patient and contact investigations completed were reviewed to determine whether the management of the index and contact investigation was consistent with county policy.

DATA & RESULTS

A retrospective chart review of active TB patients and suspects from 2005-2008 revealed that twelve people with active TB (three per year) were found to be working in childcare and school settings in Santa Clara County. In terms of case demographics, patients were mostly female and immigrants from outside the US, primarily from the Philippines. Age varied widely from 19 to 65, while job positions included teachers, school administrators, a center custodian, and a nanny. Five of the twelve in the chart review were not considered to be infectious (either extrapulmonary or culture negative TB). One "extrapulmonary" TB patient did not complete the evaluation to determine their infectious status (chest x-ray or sputa test not performed). Six had pulmonary TB – three smear positive (one was a resident of a home daycare facility and one worked in an out-of-home center), two were smear negative (one was a resident of a home daycare facility and one was a worker in an out-of-home center), and one (ID# 2007-212) did not have results of a sputa test. The results are summarized in Table 1.

TABLE 1: CASES OF TUBERCULOSIS FOUND IN CHILD-CARE SETTINGS

Subsequent contact investigations were performed in the six pulmonary TB cases. One of the three smear positive patients (ID# 2008-212) was detected on pre-employment screening, so did not work with active TB. Next, one patient (ID# 2007-055) demonstrated transmission to a household contact (a

smear negative case). No contact investigation with contacts outside the immediate family was performed, which is inconsistent with the policy of the county. The final patient (ID# 2008-186) also did not have a contact investigation performed outside the immediate family, but since he did not demonstrate transmission in the household contacts, this was consistent with the policy of the county. Of the three smear negative, culture positive TB patients, one was a household contact to a smear positive case (ID# 2007-012). As a result, a contact investigation in the family daycare should have been performed but again no evidence of this investigation was found. The other patient (ID# 2008-267) did not demonstrate conversion in the home, but a contact investigation which was not necessary according to the county policies still was performed in this case. The results are summarized in Table 2.

TABLE 2: PULMONARY CASE OUTCOMES

In summary, of the six cases identified after chart review, there were five childcare/school sites (ID# 2007-212, 2007-012, 2007-055, 2008-267, and 2008-186) that could have been investigated. Patient 2008-212 was detected on pre-employment screening. According to county policy, two cases (ID# 2007-212 and 2007-012 – the husband and daughter) met criteria for proceeding with a contact investigation. Three of these five cases did not meet criteria for contact investigation, but one case did have a contact investigation performed (ID# 2008-267). At this site no transmission was detected - only one child was found to be Tuberculin Skin Test (TST) positive, but this child had traveled abroad recently. Therefore, there was a breakdown of county policies in two of the five (40%) pulmonary TB cases that required further contact investigations.

TABLE 2

CASE NUMBER	CHILDCARE SITE CONTACT INVESTIGATION (Y/N)	OUTCOME (TRANSMISSION OCCURRED?)
2007-212	N	Unknown
2007-012	N	Unknown
2007-055	N	Unknown
2008-267	Y	No
2008-186	N	Unknown
2008-212	N/A (Did not work - Identified upon screening)	N/A

POLICY DISCUSSION

Tuberculosis screening of childcare center employees and volunteers in Santa Clara County is mandated by California law, as documented in sections 121525-121555 of the California Health and Safety Code and section 49406 of the California Education Code. Childcare center licensing requirements administered by the California Department of Social Services documented within Title 22, Division 12 of the California Code of Regulations stipulate similar, though less stringent, tuberculosis screening requirements for childcare center personnel. The following discussion will be restricted to the California Health and Safety Code which forms the basis for the Santa Clara County Public Health Department's current tuberculosis screening policy.

Employment by a licensed childcare facility is contingent upon satisfying state-mandated screening requirements no more than 60 days prior to initiation of employment. The prospective employee must produce a physician-signed certificate showing proof that he or she has been examined and has been found to be free of communicable tuberculosis (Section 121525a). Subsequently, all employees found negative for active tuberculosis at the time of hiring must undergo follow-up testing at least once every four years. In all cases, the screening test performed must be recommended by the Centers for Disease Control and Prevention (CDC) and licensed by the federal Food and Drug Administration, e.g. tuberculin skin test or interferon gamma release assay (Sections 121525b, 121530). In addition to employees, childcare center volunteers who have frequent or prolonged contact with enrolled children must also adhere to these screening mandates (Section 121545). School governing authority maintains the right to require more frequent or extensive examination than that required by the Health and Safety Code (Section 121525d, 121550).

Should an employee or volunteer be found positive for communicable tuberculosis (≥ 10 mm induration on the tuberculin skin test), a chest radiograph should be performed and interpreted by a licensed physician (Sections 121530, 121535). If the individual is found free of communicable tuberculosis, the physician can provide medical clearance and should consider treatment for latent infection. Any employee or volunteer with a prior positive skin test who

shows symptoms of tuberculosis should be restricted from work until a chest radiograph ruling out active disease is acquired (Santa Clara County TB Screening Guidelines, sccgov.org). In accordance with Sections 121362 and 121363 of the Health and Safety Code, physicians should report all cases of communicable tuberculosis to the local health officer, and thorough contact investigations should ensue.

Employers are responsible for maintaining up-to-date documentation (physician-signed certificates) of all employee and volunteer screenings. The county health officer is responsible for confirming that the childcare centers comply with the aforementioned health code provisions (Section 121540). Childcare providers will be cited by the Santa Clara County Public Health Department if the Health and Safety Code mandates are not followed. Failure to address violations in a childcare program will be reported to the Community Care Licensing Division of the California Department of Social Services.

The Santa Clara County Department of Public Health's current policy is that all TB suspect and TB confirmed cases working in preschool/childcare facilities will be evaluated for their infectious potential. (All extrapulmonary cases will be evaluated for pulmonary TB). Any TB confirmed cases that are sputa smear positive and cavitary on chest x-ray will have a contact investigation done in the preschool/childcare facility. All other TB confirmed cases will have a contact investigation done in the preschool/daycare if there is transmission in the household contacts. If there are no indicators in the household, or it is unclear whether transmission has occurred, a contact investigation will be done in the preschool/daycare if resources allow. There will be an evaluation of TB screening practices in any daycare/preschool with a TB suspect/confirmed case and education provided to the staff.

If a childcare center is suspected of not appropriately screening its employees for TB, or if an employee is diagnosed with active TB, they will be audited by the Santa Clara County Public Health Department. Education about proper screening practices that conform to the Health and Safety Code will be provided, and additional oversight of TB screening will ensue in subsequent years by the Santa Clara Public Health Department. If the audit reveals that Community Care Licensing code has not been upheld, then the Santa Clara

County Public Health Department will report this lapse to Community Care Licensing.

Therefore, based upon the chart review of TB cases between 2005 and 2008, we recommend the following new policies. Any childcare/preschool with an index case working as an employee will undergo an audit/review of their screening practices for TB. The childcare/preschool will be educated on any aspects that could improve their screening. If they are found not to be compliant with licensing code, we will report them to licensing. The childcare consultant public health nurse will revisit the preschool the following year to “check in” and see if they are doing screening properly.

CHALLENGES

A major limitation of this study was that it was a retrospective chart review performed on records that were not designed for such a review. Absence of many critical data points leading to incomplete charts and contact reports may have led to an underestimation of actual index cases during the review. Future studies should be prospective and designed for a chart review of TB contact investigations in mind. In addition, any future study should attempt to explain any reason for not recommending and not completing a full course of TB therapy.

CONCLUSION

This retrospective review of 1351 Santa Clara TB cases from 2005 to 2008 revealed a total of 11 cases of TB in childcare settings. Of these 11 cases, four could have been appropriate for contact investigations, however, due to resource constraints, only one contact investigation was conducted, which revealed no transmission of TB. Based on these findings, we conclude that the current policy of requiring child-care workers to produce a physician-signed certificate showing proof that he or she has been examined and has been found to be free of communicable tuberculosis should continue to be enforced. In addition, we recommend that any childcare organization with an index case should undergo an audit by the Santa Clara Public Health Department to examine their screening practice for TB. If they are found to be in violation of the licensing code for childcare, they will be reported to licensing for further review.

LEARNING OBJECTIVES & COMMUNITY ENGAGEMENT

Our main learning objectives for this project was to fully understand the complicated sets of procedures and guidelines for TB control, especially pediatric TB control in Santa Clara County. To do this, we undertook a research project attempting to use a retrospective chart review of TB cases to inform on the extent of policy adherence in preventing adult-to-child TB transmission in childcare facilities in the county. Our group learned as a whole that retrospective chart reviews on charts not designed for such a review are incredibly difficult in terms of data collection and analysis. Conclusions drawn

Based on [our] findings, we conclude that the current policy of requiring child-care workers to produce a physician-signed certificate showing proof that he or she has been examined and has been found to be free of communicable tuberculosis should continue to be enforced.

must be taken with caution as results may have been under-reported. While the absence of many data points was problematic, the subsequent challenges of data analysis on incomplete data sets served to help us understand the entire project even better. As a result, we believe that we achieved our stated learning objectives, and in many cases, exceeded them.

Community engagement, from the group’s perspective, was simultaneously both exhilarating and challenging. It was exhilarating because we were allowed to practice the principles of community-based research - facilitating relationships, needs-finding, assimilating into local culture, iterative feedback cycles, and dissemination strategies - on a real-life public health organization that directly serves a large population. The experience served to put a human-face on the theory and principles we learned in medical school while still allowing us to make mistakes and learn in a protective environment. Future studies involving the community would hopefully benefit from our experience in this particular project. The main challenges of community engagement involve mainly the same principles that made the project exciting. Community partners are often not research facilities so data collection and analysis is not nearly as important as serving their residents, so research in this environment was often difficult but expect. The Santa Clara County Tuberculosis Prevention and Control Program, however, was an exception as it was both a interactive and engaged community partner as well as a competent research facility.

ATTRIBUTION

All group members participated in the planning and execution of the retrospective chart review. In particular, NM, LG, and HF were responsible for the background information and literature review. SA, AC, and HF were responsible for the data collection and analysis. KM and CL were responsible for the guideline and policy sections. Finally, all group members participated in the guidance and development of dissemination materials (powerpoint, manuscript, etc.) for our community partner.



CDC

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AGNIESZKA CZECHOWICZ

Devil's Stigma and Holy Water Prayers: Challenges in Global Mental Health

SHANE SHUCHENG WONG

450 million people around the globe suffer from mental disorders every day, and one in every four people will develop one or more mental disorders at some stage in life.¹ Yet developing countries tend to prioritize the control and eradication of infectious diseases and reproductive, maternal, and child health.² Left in the wayside is a long list of mental disorders: a list that includes five of the ten leading causes of disability that amounts to 14% of the global burden of disease, but only 2% of the global health budget.¹ It is therefore not surprising that a recent analysis of the World Health Organization's Atlas Project- a comprehensive set of health statistics at country, regional, and global levels- found widespread, systematic, and long-

1 WHO (2002). Mental Health Global Action Programme. Geneva, Switzerland: World Health Organization.

2 Prince, M., Patel, V., Saxena, S., Maj, M., Maselko, J., Phillips, M., & Rahman, A. (2007). No health without mental health. *Lancet*, 370, 859–877.

term neglect of resources for mental health in developing countries.³ Why is this?

For one, stigma and discrimination against the mentally ill is widespread, making many people worldwide reluctant to seek help.⁴ According to Dr. Graham Thornicroft of the Institute of Psychiatry, King's College London, rejection and avoidance of people with mental illness and their families seems to be a universal phenomenon.⁵ In rural Ethiopia, researchers from Addis Ababa University found that 75% of relatives of people diagnosed with schizophrenia or mood disorders said they had experienced stigma because of the presence of mental illness in the family, and 37% wanted to conceal the fact that

3 Saxena S, Sharan, P Garrido M, Saraceno, B. (2006). World Health Organization's Mental Health Atlas 2005: Implications For Policy Development. *World Psychiatry*; 5: 179-84.

4 Michels KM, Hofman KJ, Keusch GT, Hrynkow SH. (2006). Stigma and global health: looking forward. *Lancet*; 367: 538–39.

5 Thornicroft G. (2006). *Shunned: discrimination against people with mental illness*. Oxford, UK: Oxford University Press.

a relative was ill.⁶

Such discrimination is often formalized and sometimes even codified in law. For example, although most countries have some provision for disability benefits, 45% of developing countries specifically exclude mentally ill people from such entitlements.⁵ Without updated mental health policies and legislation to protect the basic rights of the mentally ill, little can be done to coordinate mental health services and activities to reduce the burden of mental illness on a national scale.

Another reason for widespread lack of resources directed towards the large burden of mental illness on developing countries is the public's attitude towards mental illness. One public perception attributes mental illnesses to stress or animistic illnesses, rather than medical causes.⁷ For example, in Sierra Leone, Liberia and Ethiopia, epilepsy as diagnosed by physicians may be attributed to the workings of devils by locals.⁸ The very existence of mental illnesses may be denied by local family practitioners.⁸ Moreover, such attributions associate mental disorders with blame and rejection, as opposed to sympathy or helpful responses towards the mentally ill.⁹

People therefore believe that mental illnesses can be dealt with by discussion or prayer, rather than consultation with health professionals. In Ethiopia, according to Dr. Clare Pain of the Toronto Addis Ababa Psychiatry Project, coming in for treatment at hospitals is the least preferred option for people seeking help for mental illnesses.¹⁰ The vast majority of patients instead rely on an estimated 300,000 natural healers that utilize traditional means of healing in local communities. Many are priests of the oldest Christian religious systems, who rely on 'holy water' and the effects of spiritual treatments. In one rural Ethiopian district, 65% of relatives of patients diagnosed with schizophrenia or mood disorders suggested praying as their preferred method of treatment.⁶

According to Dr. Suzan Song, a child psychiatry fellow at Stanford University, praying, body washing and purification rituals are all used to treat common disorders such as post-traumatic stress disorder, depression and substance abuse. These may work by decreasing stigma in the community, and increasing self-worth and acceptance of the individual by the community.⁸ Only when all traditional means of healing have failed do patients seek medical care in the hospitals.

Unfortunately, even when patients try to seek Western models of medicine, psychiatrists are not readily available. In 2006, only 12 psychiatrists remained in the entire country- an average of one psychiatrist per 5.83 million Ethiopians.¹⁰ For the 95% of Ethiopians

living outside the capital, access to the hospital is severely limited by poor transportation infrastructure in rural areas.^{11,10} Left with little choice, some families may be forced to "tie up" patients with severe mental disorders at home.¹⁰ Lack of access is even more astonishing in other countries: Chad, Liberia and Sierra Leone have only one psychiatrist in each country, while Rwanda and Afghanistan have only two psychiatrists each.¹²

According to Dr. Clare Pain, it is not surprising that there are often more patients than the staff can handle in Ethiopia.¹³ Patients are regularly sent away and forced to return to line up early next morning and hope to be seen- as appointments are rarely made. Mental health services are also limited by a lack of equipment and the limited number of medications available. Even when medications are available, it can be challenge.⁸ Medications donated by the non-government organizations or national agencies may have already expired. There is also a lack of consistency due to unsteady sources, so medications may have to change due to circumstance and dosages may be less than ideal.

Due to the widespread neglect and endemic stigma related to mental illness, mental health care in developing countries remains unfairly disadvantaged. Most developing countries continue to give low priority to mental health policies, despite evidence that mental disorders cause a high and growing disability burden and long-term effects on quality of life. There is also an astonishing shortage of psychiatrists available to treat the mentally ill. Despite these major barriers, a sustained effort can help reform and improve mental health care in developing nations. Governments must update mental health policies, implement national mental health legislation, and promote public education; community leaders and family members must facilitate the provision of social support for the mentally ill by building on local resources and facilitating interventions for inclusion within the community; human right groups must advocate for and protect the rights of the mentally ill; and organizations in more fortunate developed countries can help by increasing resources directed towards promoting global mental health, especially in capacity building and professional training. **H&P**

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From Staff to Student

WOODY CHANG

I parked my car on the same floor of the parking structure as I had done in the previous three years. I picked up the same backpack: left shoulder first as always. I walked out of the same building and crossed the same street.

But I knew that this routine was not the same as the routine that I had mastered in the past three years. Instead of having my large laptop for logging my experiments, I had a netbook to take notes on in an attempt to keep up with my professors. Instead of taking a right into the side entrance of the Center for Clinical Sciences Research Building, I veered to the left, heading down the path taken by sleep-deprived medical students I had observed for many mornings in years past. Instead of sitting at the corner desk inside room 1150 and heading straight for the micropipettors, I ran right past the window, only catching a glimpse of the catalog books, sample box of Matrigel, and can of compressed air that now stand upon my former desk as I raced towards the medical school lecture halls.

Every morning, I walk past that desk and think about my relationships in the past and how becoming a medical student has changed them. Perhaps most evident to me is the change in the way that my former superiors see me, particularly the post-doctoral candidates whose research had helped me become a Stanford medical student, but also kept me in lab many a weekend. Before I found out that I had been accepted to medical school, the mouse researchers' favorite question to me was, "Did that mouse have pups last night?" The question was usually followed by a playful dressing down of my posture by another two post-docs as they would ask me to stop slouching so that I would, in their words, not be "mistaken for a depressed emo kid." The graduate students would say hello to me in the morning, then become completely focused on experiments and disinterested every time I started to talk about the old Oracle Procurement system or complain about the dry ice package that was returned because a Shipper's Declaration was not filled out.

Of course, as the lab manager, there would not be a day that went by that I didn't have to order a primer or get some more enzymes

from New England Biostores, or even bring up a specific cage of mice for observation. These orders were usually followed by the words, "It's an emergency and I need it right now!" I was seen as the hard-working "recent graduate" (a phrase that gets less true with each passing year) who understood the basic concepts of science but had little experience in doing complicated science, and was good at helping with manual labor, finishing the mouse genotyping, and staying after hours to make sure that experiments were running smoothly. In the game of science, I was relied upon as a steady rock in middle relief to help take care of a few experiments (for the post-doctoral candidate in most cases) and set up, the closer the research came to resulting in publications and posters. My position was a job essential to the lab and I was always treated fairly in what I was asked to do, but there is not a great deal of glory to be found in the long sessions of mouse husbandry. There certainly was not an immediate reward for smelling like the mouse room every night for three years.

It seemed that my social usefulness to my labmates was more about what I thought to be a good restaurant around campus, what

are good television shows to watch, or how long I would last in a graduate student computer game match. But sure, I could do things that they were impressed by, like being able to lead the entire lab in song or fix a computer that had confused IT for weeks.

When I initially told them that I was applying to medical school last year, they did not take me particularly seriously.

"You, a doctor?" the veteran post-doc would joke, "You sure could use your mouse training to go to vet school." Every week, at least one graduate student would tell me, "You should really apply to grad school instead." I grumbled at all of this. I was committed and focused on getting into medical school, but a lot of talk from the lab suggested I do something else.

All of that changed after I got that phone call in lab from Dr. Garcia, the Director of Admissions, and I found out I was going to medical school. A month later, I started to notice changes in my labmates' interactions with me. Topics over lunch now delved into medical research and specific applications of the basic science advancements taking place in the lab. The first question in the morning from the post-docs became "Why is your medical care system the way it is?"

Perhaps most evident to me was the change in the way that my former superiors see me.

Everything in my life seemed to become a topic of interest, from my singing career to my improvisation teacher's performances in San Francisco. Instead of being the guy in the background taking care of organizational stuff, I was seen as a future leader of society. All talk of graduate and veterinary school from my lab mates was replaced by encouragements to come back whenever I felt that I needed help.

"For what it's worth," said the veteran post-doc, "I think you will make a great doctor."

"I think you'll be able to apply what you've learned here," said the other technician, "to all of your training."

And, every week, at least one graduate student would tell me, "You're welcome to crash at our department happy hours if you have a spare moment in the late afternoon. I truly felt that I was starting my journey to play in the "big leagues."

Well, then again, not all things have changed. Last week, I recieved a phone call from another post-doc in my previous lab who wanted to know if the Peking Duck Chinese Restaurant was a good

place to eat. I still have awkward interactions with professors, even with those that I worked for. And, I still find myself walking into the lab more that I care to admit, though only to take a shortcut to the anatomy labs. But no matter how my former labmates' see me now, the fact of the matter is that my circumstances have changed along with this transition back to being a student. Nevertheless, it is nice to know that parts of my old relationships have not changed too much and that I can enjoy a little of the past without being stuck in it. And if the lab that I decide to work at needs a New England Biolabs catalog, I know the first place where I will look for an extra. **H&P**



ANDREAS RAUSCHECKER

FROM CLASSROOM TO CLINIC:

A Friend I Met Who Never Met Me

ELISE MIN

His fingertips were cracked where in each crease dirt had its home. A large mass was palpable in his epigastric area, and his scaphoid abdomen further added to my curiosity about his untold story. Maybe he was a homeless man, an alcoholic, or a victim of child abuse. Or perhaps he fought in the Vietnam War like the other patient I saw today. Or he might have been a John Doe, or a prom king of his high school class back in the 60s, or the quiet nerd wishing to move on from high school and its drama. I tried to imagine snapshots of my new friend's biography. The endless possibilities carried me away as I listed one potential story after another as I tried to give context to my "unresponsive patient with history of metastatic lung cancer" in the ER. My thoughts wrote themselves out in an invisible scroll knowing that his story would always be a mystery.

When I finally found time to be with the patient privately, I knelt down next to his bed with my left hand on his and my right hand on my stethoscope, together surfing the waves of his labored breathing. My eyes were at his chin level, staring at his scruffy facial hair of both grey and white—signs of wisdom and history. I saw a drop of liquid making its way down the side contour of his slightly wrinkled face. Secretly, I hoped it was a real tear drop. An experienced hospice nurse who happened to walk in at this serene moment shattered my hopeful thoughts with a brutal fact: "that's just because his eyes are open and are drying up, so they are secreting extra fluid. When a person is dying, anything that seems out of ordinary is normal." And he asked, "is this your first time seeing this?" I have no doubt he is a kind-hearted man, but his question made me cringe. He seemed to be implying that as I go through my training, there will come a time when I will no longer react to suffering with warm tears or the soft humming of my favorite hymn, *Amazing Grace*. Will I really be unable to spend even just an hour of my day mourning for a dying patient? True, at some point I will be an intern conducting death exams on recently deceased patients, announcing the time of their departure and filling out all the relevant paperwork. Simultaneously, I will have to take care of other patients and be ready to discuss their cases at early-morning rounds.

When I examined my patient's eyes more closely, I found the pupils dilated and unreactive to light. I knew he couldn't see me, and without any response to a sternal rub, there was little chance he could feel my warm hand on top of his. As time began to pass, my one hour encounter with him seemed to become a series of little goodbyes, which can be objectively described as: right lung collapse followed by fluid-filled left lung struggling to expand, left lung collapse and an eventual stop of his heart beat. And after a few minutes, I was called to help out with the paracentesis of another patient.

I paused for a moment. Why did I feel that I needed to take time to remember my friend? What was making me fight back? Frankly, I was and still am afraid. As much as I wish I didn't have to admit it, I feel so vulnerable. Like a soap bubble, I feel as if I could pop with a small flick. Each day in the hospital is filled with absolutely incredible stories that serve as permanent tattoos on the skin of my being. For Christ's sake, a man died in my arms today—my very first witnessing of death. I am no longer Elise from yesterday nor am I Elise of tomorrow. It's an absolute privilege not only to be alive but to be able to witness the essence of life in others so intimately and so frequently. The sheer volume and number of dramatic events in the hospital scare me at a point in my life when I am competing with time to obtain my basic human needs—sleeping, eating, and even taking bathroom trips during the day. My worst fear in life is that I will lose the human side of myself during medical school and residency and that only when I'm much older with my own share of wrinkles and grey hair will I rediscover my humanism. The more I serve in the inpatient unit of Santa Clara Valley hospital, the more my fear seems real and dangerously close. My feelings are clearly real enough to make me chose my keyboard over the couch to sleep in the resident lounge--writing comforts me.

Life is about choices. Whatever I do, I always have to choose to keep my soul alive. I refuse to let it die—even temporarily. Even if one argues that this is a means to a better goal, and that at some point I can merely laugh at the days when I did not sleep, I refuse. The world already has more than enough physicians whose first reaction to their recollection of clinical years and residency includes complaints of its intensity. And a few decades later, that misery becomes a source of bonding experience, almost like the pledging process of fraternity brothers. No doubt, I totally empathize with those physicians. In-patient care is a world of sheer craziness. But this does not mean I have to conform; this does not mean my first encounter with a dying patient has to be any different from future encounters with my other dying patients; this does not mean a part of me needs to be suppressed. I actively want to put an end to the mentality that the brutality of medical training is an evil necessity inevitably leading to the destruction of one's humanism and emotions. I'm not interested in having my soul sucked out by a soulless schedule to later find myself searching for that soul once I have an "M.D." behind my name. Being a healer does not start once I've gotten that degree. I am a healer now. Yes, surely limited in knowledge at the current moment. But I am here today to make sure every moment and encounter with a new soul has meaning.

It's 4AM now, and yes, I answered my own question as to why I'm giving up sleep tonight to scribble away these very thoughts in the intern room. **H&P**

Insights from an Inpatient Ward

NATHANIEL MYALL

The prospect of delaying the start of my third-year clerkships in favor of having surgery initially seemed unthinkable. On the one hand, undergoing and recuperating from an operation, not to mention attending a myriad of required pre- and post-op doctor's appointments, was not how I had envisioned spending my coveted free time after weeks of studying for the Step 1 exam. Moreover, as I thought about classmates who were delving into their year of research or venturing abroad to pursue clinical experience in foreign countries, my reason for taking time off seemed to pale in comparison, offering little in the way of furthering my clinical skills or improving my standing for residency.

In reality, however, the experience of being an inpatient at Stanford Hospital, thrust into a world that I had before only vicariously known, taught me more about the patient perspective than anything I could have learned in the first two years of medical school. Although we all intuitively understand that there is a division between our experience of the clinical setting as medical students and the experience of our patients, the extent of this divide is not something I would intimately understand until I was forced to trade in my white coat for a hospital gown and accept the role of patient.

Having been born with physical disabilities, I always knew in the back of my mind that surgery for my condition would someday become a medical necessity, so it was not completely unexpected when that day finally arrived and my first craniofacial operation was scheduled during this past summer. The operation itself lasted seven hours after which I was admitted to Stanford Hospital for five days as an inpatient, where I spent the first night in the Intensive Care Unit before being transferred the next morning to one of the floors.

Over the course of those five days, the same hospital that had become so familiar to me as a medical student seemed to transform itself into a place that was altogether foreign, discomfiting and, at times, even frightening. The room to which I was confined most hours of the day seemed inexplicably smaller and more claustrophobic than those I had packed into with groups of five or six attending physicians and residents during rounds. The corridors that I had wandered countless times just months prior now felt cold and forbidding as I shuffled up and down them with an IV pole by my side, trying to work up strength in the days following surgery. Likewise, where I had once been confident and eager, buoyed by the prospect of visiting patients, I now felt vulnerable and self-conscious, weighed down by the unshakable sensation that in depending so completely on the care of others, I was, in turn, losing a part of myself.

As I lay in bed, detached from the normal flurry of activity that rang through the hallways and occasionally spilled into my room, I

also realized just how frenzied and chaotic the hospital environment must seem to those outside of medicine. There were the multiple room changes, the replacing of IV lines, the nurses and physicians who moved in and out at random hours of the day and night to give instructions and administer medication—all of this, of course, both necessary and appropriate to my care, but also equally exhausting and unnerving. In contrast, as students, or even health care providers in general, it is easy to overlook the dizzying pace of the hospital because it reflects our own behavior and flight of ideas. With several patients to care for at once and only so much time at our disposal, our minds run in overdrive, continually mulling over patient information, lab results, drug dosages and treatment regimens. As an inpatient, however, trapped, defenseless and completely at the mercy of these surroundings, it is easy to feel overwhelmed by this environment, especially when you already possess so little control over your own physical condition and well being.

This feeling that I lacked control over my own circumstances was only compounded by the uncertainty that is inherent to medicine. In the role of provider, trained to view medicine as an objective science, we grapple with uncertainty systematically by collecting more information and narrowing accordingly our differential diagnoses and plans for care. However, for as much as we understand about the mechanisms of the human body and disease, one of the more intangible elements of medicine is timing. Because each patient is different, what may take a week to heal for one person may take much shorter or longer amounts of time for another, and physicians typically only provide patients with estimated timelines for healing, not exact predictions. While this may be sufficient in our minds as students and providers, for the sick patient, a timeline may provide only limited comfort. As I considered the projected course of recovery that the surgeons had mapped out for me, it was easy to let my mind, against all my better understanding of medicine, conjure up panicked thoughts of worst-case scenarios.

As I discovered during those five days, there is an enormous difference between being a medical student and being a patient at Stanford Hospital. For all of my familiarity with the clinical environment as a student, coming from this background afforded me little comfort or security against the harsh reality of the inpatient experience. Undoubtedly, part of this is simply because the experience was new for me. Having only ever witnessed the inside of a hospital from the perspective of outpatient or medical student, the details that characterize the inpatient experience were harder for me to fully comprehend before surgery and, perhaps as a result, easier for me to ignore. However, to explain the impact of my hospital experience simply by its novelty would overlook the ways in which my perspective as a medical student actually detach me from that of patients.



ODMARA BARRETO

I understand now that this is particularly true for me in regards to my perception of the hospital. Right or wrong, this place represents my classroom as much as it does a center of patient care. It is here that as students, we begin to apply our knowledge to real patients, develop and refine our clinical skills, and, ultimately, learn from our mistakes. As we walk the floors, donned in our white coats with our stethoscopes hung around our necks in the anticipation of auscultating heart sounds or discerning the wheezes of an emphysematous patient, it is easy to become consumed with this perspective of the hospital and to get swept up in the novelty and intellectualism that define our experience there. Despite these emotions, we still rightfully try to feel empathetic towards our patients. However, unless we ourselves know what it is like to be in their position—vulnerable, exposed and dependent on others—it is easy to let our own meaning of the hospital buffer us from the reality of what it represents to its patients inside.

This influence of our own perspective is not something that we can easily avoid. Although we will not be medical students forever, it remains that as long as we are in the role of the provider our perspective will always be to some degree detached from that of the patient. Even as residents and later as attending physicians, there will be particular elements to our clinical experience, just as the case now as

students, that will distract us from understanding the impact that the hospital and our care have on patients. Yet, we learn early on in our medical training that in order to treat the whole patient and not just the illness or disability, it is important to understand these perspectives and to ask those questions that draw us into our patients' experiences of living and dealing with illness. Though my experience in the hospital may have been limited compared to some, I caught a glimpse into the world of the patient, one that I am hopeful will remain with me throughout the rest of my training, keeping me forever mindful of my patients' perspectives and helping to bridge that gap between them and myself. **H&P**

The First Cut is the Deepest

KATHERINE BELL

Today I performed my first surgery. As I made the first slit alongside the ribcage, my face burned hot with adrenaline as I concentrated on steadying my wavering hand. I was inundated with anxiety, fearing that my work would be imperfect, that this cut would forever tarnish the virgin, vulnerable body. But along with apprehension I felt the power of the ultimate trust that patients grant their surgeons. One small caveat though—my patient was dead.

I entered the room of blue-bagged, rigid bodies feeling weak and nauseated from the smell of formaldehyde, thinking that these bodies lying naked, exposed on the tables were not long ago grandmothers who bounced their grandchildren on their knees, or fathers who

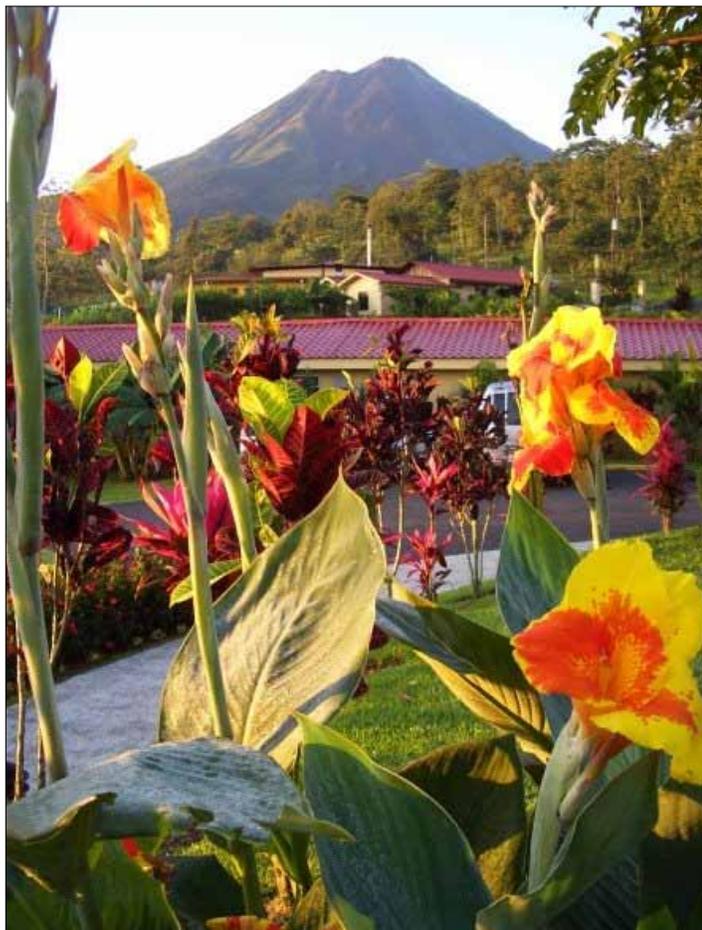
walked their daughters down the aisle. The moment of silence in memory of the body donors, led by our professors, congealed this thought in my mind. And for a moment, I feared that I would be the one medical student each year that faints on the first day of anatomy.

The bag was slowly unzipped by the second year TA, who, despite her gentle nature, showed no trepidation in seeing the unveiled corpse. As first-year medical students, our eyes widened at the sight of our first real dead body, though we all tried to hide our discomfort. Many of us had seen the dead at funerals before, but these bodies had not gone through hair-styling and makeup, nor were they wearing their most elegant suits. Instead of feeling the relief some of us had felt seeing our deceased Granny looking pale and stiff yet glamorous at her funeral, I think a few of us winced when we discovered that this body was in no way beautiful.

She was an elderly woman, maybe seventy-five, with slight shoulders despite her voluptuous breasts that had fallen from the midline into a solidified, misshapen mass. The ample adipose tissue of her abdomen had become lumpy and dimpled, and her elderly skin was thin and wrinkled like a transparent sheet of white silk marred by a lifetime's worth of age spots and moles. I was relieved to find that her head was covered under a cloth, hidden from us until the next quarter when we would focus on the head and neck. I hope I will find the face of a woman at peace with her death. Under the cloth, in contrast to her body, I could almost perceive that her face had once been pretty.

The topic of the day was the thorax, including the sternum, collarbone, and ribs, as well as its surrounding musculature. Not an insignificant region of the body. The other three of us in the group let Stephanie, who had prior experience in dissecting human bodies, make the first incision down the sternum. She too did not seem to hesitate before the first cut was made, and I wondered if I would ever reach the point where I felt at ease around the cadaver. I noticed that I held my gloved hands as if I had touched something dirty, when in fact I hadn't touched anything at all.

The three of us took turns slitting the skin with the scalpel, and I was last. Joel, who thinks surgery may be in his future, handed me the scalpel to cut along the costal ridge, the lower edge of the ribcage. Yesterday I had never heard of a costal ridge. But today, near the end of my first day of medical school, I am already beginning to speak the language that I once thought was reserved for white coat-wearing physicians, far more distinguished and sophisticated than myself.



WILLIAM SLIKKER



WILLIAM SLIKKER

Tentative at first with the scalpel in hand, I slowly applied pressure, not enough at first, then too much, and I adjusted until the force was just enough to glide the blade along the bone of the rib. I was surprised at how easily the skin, the tissue I had always considered to be impenetrable, gave way to the scalpel. My next job was to expose the big chest muscle, pectoralis major, which required slicing from the sternum horizontally through the breast.

These breasts had once nursed children to sleep, I thought, but then I immediately tried to rid my head of this image. The breast tissue had a bright yellow tinge and was mostly fat tissue at this advanced age, but I knew the milk ducts were still there somewhere from a previous life.

Joel then began slicing the fascia, which looked like a wet Kleenex, and the other connective tissue to expose the underlying muscle. The muscle looked like dark chicken meat, and I decided not to eat the rotisserie chicken in my fridge for dinner tonight.

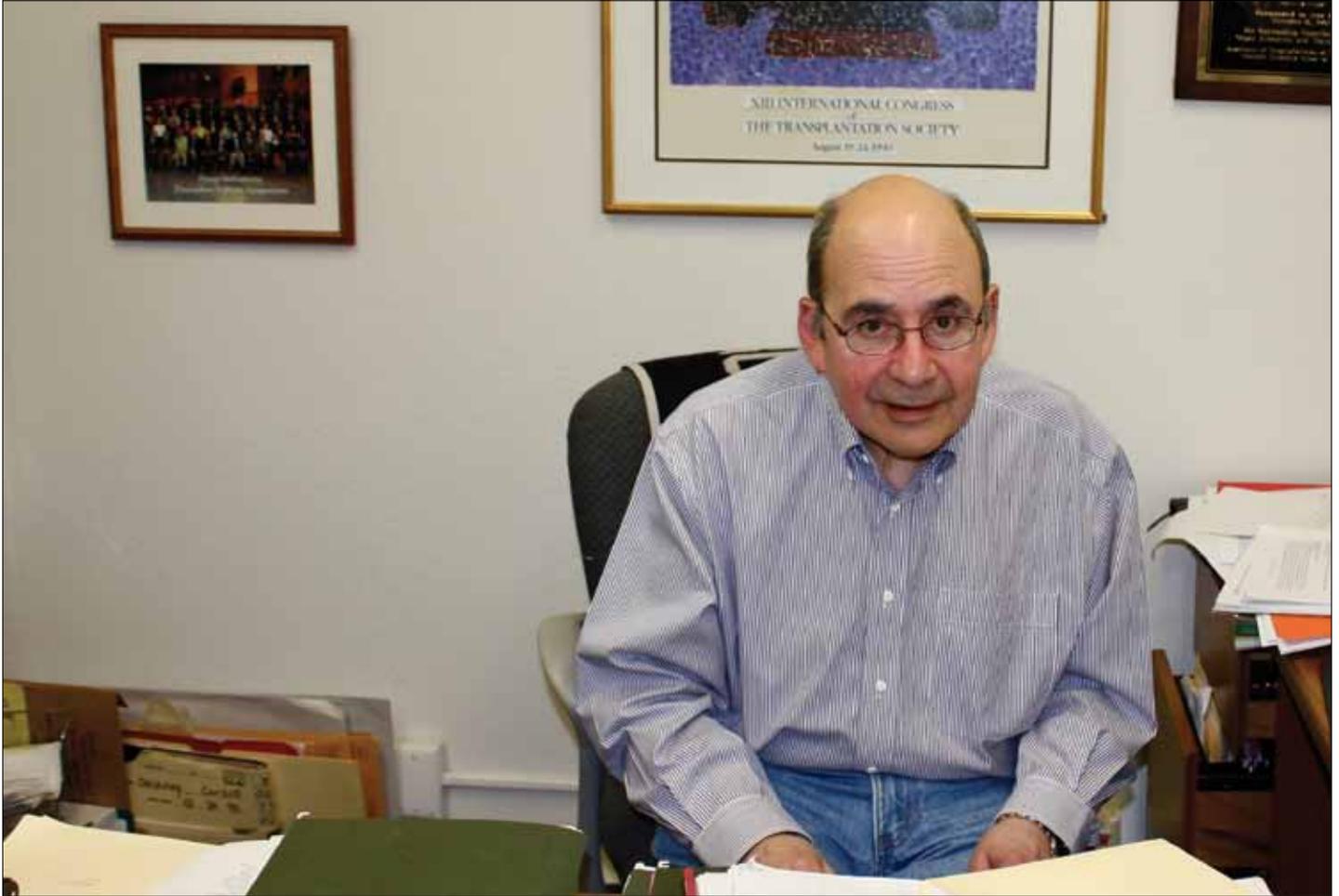
Nevertheless, my experience that day convinced me that the lady lying before me was no longer just a body, but the ultimate educational sacrifice for a student of medicine. I observed how the blood

vessels and nerves formed complex highways alongside the bones and muscles, how the now exposed fibers of the muscles were innervated by nerves that had allowed her to shake hands, to wave hello, to embrace. I was struck by the rainbow of colors and myriad of textures that were formed by the different tissues types. By the end of the anatomy lab, my initial disgust had transformed into eager curiosity.

And man, was I wrong. Her body is one of the most beautiful I have ever seen. **H&P**

LEADERS IN MEDICINE

• Dr. Oscar Salvatierra / 26



ROBERTO VALLADARES

Leader in Medicine: Dr. Oscar Salvatierra

ROBERTO VALLADARES

Dr. Oscar Salvatierra is a Professor of Surgery and Pediatrics, Active Emeritus, and an Advising Dean at the Stanford University School of Medicine. As a recognized international pioneer of organ transplantation, he has been on a mission throughout his professional life to advance organ transplantation, kidney treatment, and the societal issues that stem from these fields. His research interests have led to many medical firsts and over 290 publications. He has also inspired and empowered generations of young doctors through his

commitment to the education of medical students, residents, and fellows.

Q. Why did you decide to pursue a career in medicine?

A. I grew up very poor as my mother emigrated from Mexico and only had a 6th grade education. I saw how disadvantaged people lived and developed a desire to help people. I also liked science and that led me to premedical studies. When I got into medical school I didn't know that I wanted to be a doctor. I only thought that's what I wanted to be. I was immature and was involved in a riot after a football game where I let the air out of a squad car's tires. I was arrested, put in jail, and made the third page of the Los Angeles Times. Everybody wanted me kicked out of medical school except for one person—the Chairman of the Department of Surgery. That brought me to my senses and really turned me around. I was motivated to do whatever

I needed to do to make things right and to provide for the sick and disadvantaged.

Q. What led you to urology when you were in medical school?

A. I like to work with my hands and enjoyed building model airplanes. I knew that I was going to be a surgeon and thought of neurosurgery at first. I found out that I did not only want to be a surgeon, but I also wanted medicine and physiology. I finally decided on urology after exploring various surgical specialties. After my urology residency, I took six months of vascular surgery and then ended up in Vietnam performing mostly general surgery. I then spent a year at Letterman Army Hospital performing reconstructive surgery on some of the worst injuries from the Vietnam War. These experiences gave me a desire to work on being double boarded in general surgery and urology. The board of general surgery at the time wanted me to complete almost the full general surgery residency. Instead, I applied for a transplant surgery fellowship at UCSF.

Q. What were some of the challenges you faced and how did you overcome them when you worked as a surgeon in Vietnam?

A. When I was in Vietnam for one year, mainly in 1967, the biggest challenge was to deal with dying soldiers. It is terrible that we have about 4,000 dead in Iraq; however, to put it into perspective, in Vietnam we had over 58,000 dead. The casualties were just rolling in from ambushes. The worst thing I experienced was a dying soldier who was still conscious. There wasn't much you could do to save their lives, and they would just cry out and say, "hold me," because they were dying alone—without family. I really realized what life meant when I saw these soldiers losing their lives alone—without family support—and that made a tremendous impression on me.

Q. How did your time in Vietnam impact the direction of your career?

A. I discovered that I wanted to help people by working to make changes to improve my specialty area. This meant engaging in parallel research to my surgical career. It also meant engaging in public health and societal issues that were relevant to my specialty. I was the only physician on the nine member national commission that administered the Agent Orange Litigation Settlement. I also had a lot to do with getting Vietnam veterans recognition of their service-connected disabilities. A mentor of mine, Samuel L. Kountz, also inspired me

to explore some public health issues. Samuel L. Kountz was a great surgeon, scientist, and humanitarian. This led to me getting involved with Senator Albert Gore and Senator Ted Kennedy in developing the National Organ Transplant Act.

Q. What were some of the most important discoveries that you made and that have caused you to be named one of the international pioneers of organ transplantation?

A. I was the first one to transfuse potential kidney recipients with the donor's blood. This was thought not the thing to do at the time; however, it opened up the door to show that one could actually administer foreign histocompatibility antigens with a transplant. This has led to many of the tolerance induction protocols that we are currently using. The patients with the best overall results over time are the ones who have donor specific blood transfusions. I also did all of the

hemodynamic studies to understand how to best manage infant recipients of adult-size kidneys. This was important because there are not size-compatible donors for infants and small children. Many kidneys at the time were being lost due to graft thrombosis. We showed that through certain treatment principles we could avoid graft thrombosis in the implantation of these large kidneys. I also developed a way to use very small urinary bladders of 30cc



COURTESY OF LUCILLE PACKARD CHILDREN'S HOSPITAL

capacity or less. These were not being used until we developed a way to put in the ureter without incurring reflux or obstruction. I have also been involved in developing new immunosuppressive protocols.

Q. What were the challenges and rewards of being the principle lay person responsible for the passage of the organ transplant act in 1984?

A. To put it into perspective, that was a quarter century ago and people did not have the understanding or acceptance of transplantation that they do now. Liver and heart transplantation were considered experimental and were not reimbursed by third-party payers. There was no national system for organ transplantation. If a transplant center procured an organ; sometimes, it was easier for that transplant center to send the organ overseas than to share it with a center seventy-five miles down the road. This had to be changed and the real challenges came from the fact that not everyone was in favor of the



COURTESY OF LUCILLE PACKARD CHILDREN'S HOSPITAL

legislation. I attribute that to people not understanding or accepting organ transplantation as we do today. For example, the American Medical Association and some members of the Administration were very much against our proposed legislation. Passing the legislation required developing an understanding of transplantation in the individual senators and representatives. After two years of work we got an overwhelming vote to pass the legislation in both houses of Congress. The National Organ Transplant Act brought organization and discipline to the transplant community. It grouped transplant programs into rejoinings so that they were in essence forced to cooperate with each other. This meant that there was greater efficiency in terms of organ procurement, utilization, and equitable access. What has resulted is the greatest system in the world, with the best registry because it's compulsory and provides reliable data for both future research and policymaking. Compared to the rest of the world, we perform the greatest number of transplants each year. Not only that, but the number and quality of transplants is progressively increasing each year.

Q. What have been some of the most difficult or challenging aspects of your career in medicine?

A. I have never looked at difficulties. I have only looked at trying to make things better. I somehow always found things out there on the horizon that needed to be worked on. I didn't do everything myself,

but would bring a group of people to work on certain issues to make them better. I was constantly on the move; if something was futile, I recognized it as futile and just continued to move forward. The challenges that I encounter keep me energetic, involved, interested, and not willing to give up until certain goals are achieved.

Q. What have been the most rewarding parts of your life in medicine?

A. I have had several rewarding parts: (1) each patient that is made better after a transplant, (2) improvements in my specialty field, (3) healthy policy changes, and most importantly (4) the training of students and younger doctors.

Q. How do you balance your personal life with your career?

A. As a surgeon you need discipline, organization, and focus in order to have time left for your family. Throughout my career I have always looked at each surgery as being a perfect surgery. I did not close the wound until I was satisfied that everything was just right. Doing it that way I have had very few take backs. Take backs are harmful, discomforting, and impair a successful outcome for the patient.

Q. What are your interests outside of your career?

A. I have three main interests outside of my career: (1) my family, (2) making sure that I have my date night with my wife every Friday, and (3) my work with electric trains. My son has also taken up my interest in model airplanes and I join him as he flies his planes in San Jose over the weekends.

Q. What do you enjoy the most about working with medical students?

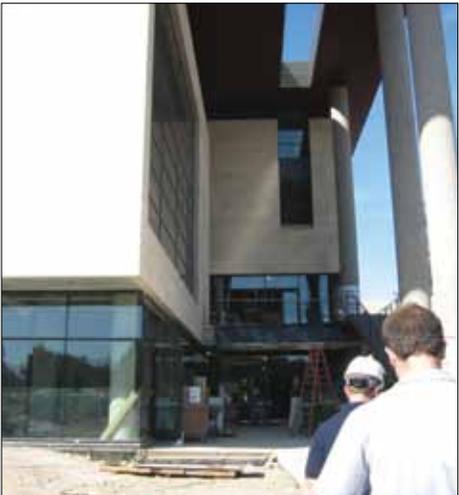
A. I enjoy visualizing them as young doctors who are doing things better than what I could have done as a young doctor. I enjoy providing them with the help, encouragement, and inspiration to be the best possible doctors that they can be—and I mean that!

Q. Do you have any advice for medical students?

A. You are entering the best profession in the world. I consider it a privilege to be able to treat patients and to interact with students. Do the best that you can and don't give up unless you see something that is truly futile. Even then you have to move forward and maintain your integrity and honesty at all times. Always remember that life is about people. Showing respect and sensitivity to our fellow man is not only how we should behave as physicians, but it is also the great facilitator in promoting our success. **H&P**

PHOTOESSAY : AN EARLY LOOK INTO THE CONSTRUCTION OF THE LI KA SHING CENTER - SEPTEMBER 2009

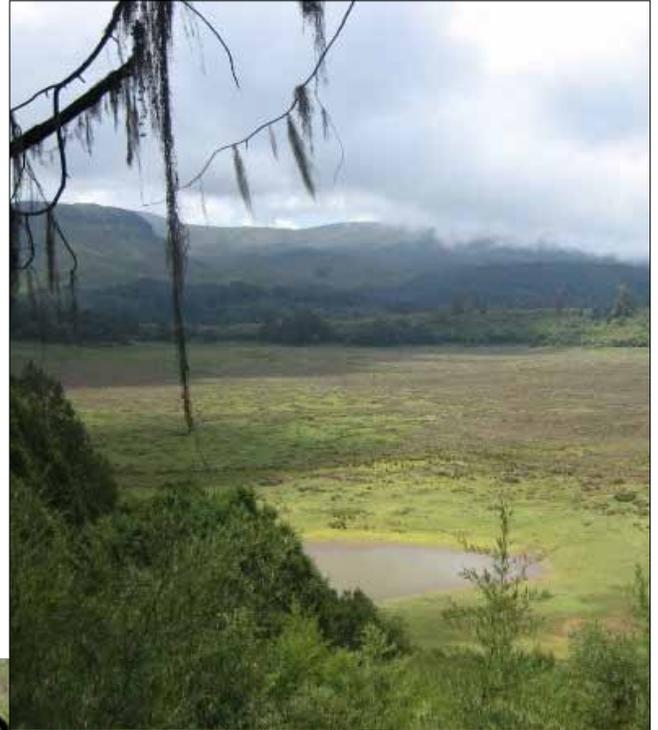
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STUDENT SUBMISSIONS



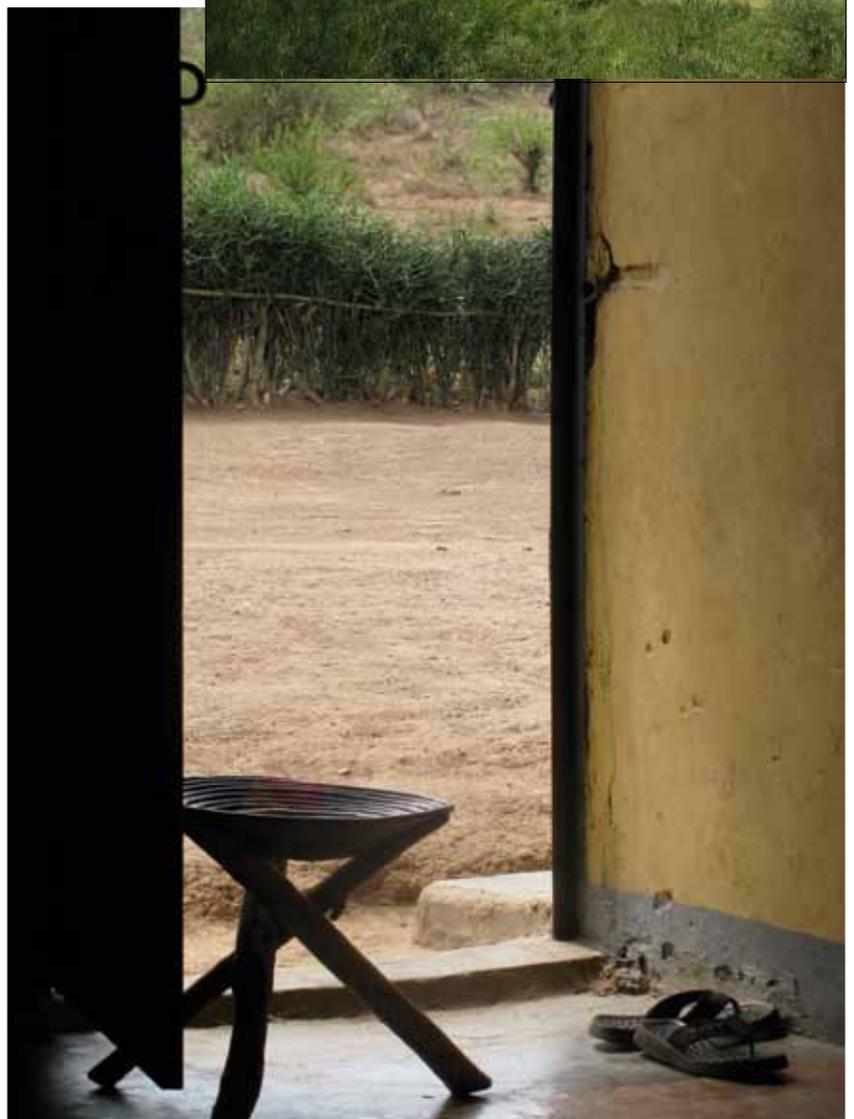
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