Introducing the Harvard Medical Student Review

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“Declare the past, diagnose the present, foretell the future”

-Hippocrates

In 1797, the first American medical journal was launched in New York by three physicians. Wishing to contribute to the battle against the Yellow Fever epidemic that was plaguing the East Coast, they launched the Medical Repository and declared their mission: “The design of the papers which will be presented to the public under this title, is to illustrate the connection between climate, soil, temperature, diet, etc. and health.” [1] So began a tradition of medical scholarship in the United States.

Today, yellow fever has all but disappeared from the US, but it persists around the world and is joined by other problems, including HIV/AIDS, non-communicable diseases, and the illnesses of aging. But medicine itself evolves with unprecedented speed. We can profile the microbiota that call our bodies home, the single mutations that make us unique, and the electrical networks that underlie our consciousness. And as we translate our findings into treatments, we discover how little we really know.
Never has medicine been so advanced, but its growing promise brings challenges in delivery, management, and financing. The roles of healthcare providers are constantly in flux as science, scale, and society call for task-shifting and specialization. Meanwhile, healthcare inequalities persist, and soaring costs make daily headlines. There is more than ever an urgent need for forward-looking discourse.

Today we are introducing the Harvard Medical Student Review, an online journal that will serve as a forum for students to participate in the conversations on healthcare and medicine. Our classmates here and around the world come from innumerable backgrounds, rich in thought-provoking experiences; we have much to share. Topics may range from research to reflections on training and experiences with patients. We hope that through writing and reflection, we can spark productive debate, generate innovation, and learn from one another at the beginning of our professional education and careers.

As members of the medical community, we have a duty to review the facts and communicate the truth with clarity, precision, and humanity. In his address at the 2012 Harvard Medical School commencement ceremony, Dr. Don Berwick called upon new physicians to wield their voices proudly in carrying out this duty, as each voice “can be loud, and forceful, and confident, and will be trusted.” [2] The Harvard Medical Student Review is a space for students, trainees, and professionals to answer that call.

We hope you will join us.

We would like to thank the people who have helped us begin. Dean Jeffrey Flier and Ms. Gina Vild gave us their support and the endorsement of the medical school. The inaugural advisory board lent us their vision and includes George Church, PhD; Paul Farmer, MD, PhD; Sachin Jain, MD, MBA; Nancy Oriol, MD; David Page, MD; Peter Slavin, MD, MBA; and Beverly Woo, MD. The strategic planning committee provides us essential technical and logistical guidance, and includes Elizabeth Eggleston, MSLS; Isaac Kohane, MD, PhD; Nancy Oriol, MD; David Osterbur, PhD; and Rebecca Ward, PhD. The inaugural editorial board oversees the content and quality of the initial issues, and includes Omar Bayomy, Ashley Clement, Colleen Farrell, Jill Goslinga, Adeel Khan, Cameron Lee, Christopher Lim, Lily Liu, Nathaniel Morris, LeAnn Noh, Lisa Rosenfeld, Lisa Rotenstein, Abigail Schiff, Gabriel Sneh, Margaret Soroka, Luccie Wo, and Helen Yang. A special thanks goes to Nicholas Glasnovich, who designed the website and maintains our electronic workflow, and Hena Ahmed, our Art Editor.

References
How We Heal

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Amid the flurry of experiences of first year, like learning the anatomy of the heart and exploring the biochemistry of the cell, I received an unexpected assignment: to attend an Alcoholics Anonymous (AA) meeting and report back on what I observed. It felt like a heavy responsibility, even an intrusion, to journey into the lives of strangers as they met to discuss intimate matters, but one Saturday evening, I found myself sitting in the back row of an Alcoholics Anonymous meeting convened in the cafeteria of a local college. I heard ten individuals chronicle their stories of alcohol abuse, addiction, and ongoing recovery as subscribers to the Twelve Steps. Most cited their ritualistic attendance of AA meetings and their close relationships with their sponsors (more senior AA members who serve as personal mentors) as the most important parts of their lives.
The AA meeting demonstrated the power of one of the oldest and most underutilized modalities of healing: speaking to other human beings face-to-face – “human essence encountering human essence,” as Scharff describes in his paper Essence to Essence [1]. Despite the obvious differences in the speakers that took the podium that evening – young and old, men and women, Latino and African American and Caucasian, the professor and the recent high school graduate – all were able to find strength through sharing their experiences of addiction and through celebrating their collective commitment to recovery.

As a medical student, I sometimes catch myself believing that any given illness will eventually be cured – or at least controlled – with the next innovation in medical technology. In certain respects, this notion is reinforced as I spend these semesters studying the mechanisms of life-saving antibiotics or learning how portable ultrasound can speed all manner of diagnoses. But the AA meeting highlighted a parallel to this paradigm of healing, a parallel that Beckwith refers to as “caregiving” in his paper Redefining Suffering and Illness [2]. When it comes to alcoholism and other illnesses like depression, diabetes, and obesity, successful care may be rooted in committed care and supportive communities just as much as or more than it is in scientific innovation.

About the artist
Hena Ahmed is a second year medical student at Harvard Medical School and a self-taught oil painter. You can visit her website.

References


Post-Operative Responsibilities of Charitable Neurosurgery Clinics in Global Settings

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"Neurodiscovery in the Deep Blue" by Hena Ahmed

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Introduction

Complications from neurosurgery can be intractable and life-threatening. In the developing world, transportation, social stigma, and limited medical resources exacerbate neurosurgical disease and sustained
challenges with follow-up care. Neurosurgical medical missions are expanding their reach across the globe as groups look to bring life-changing surgical techniques into disadvantaged regions. While some missions participate in transient mobile approaches, others invest in establishing permanent health centers. The chosen strategy must, above all else, take responsibility for surgical outcomes. Delivering sustainable surgical aid depends on assuming the responsibility for collateral damage and developing support infrastructure to manage ongoing complications. To achieve this goal, neurosurgical missions must treat a narrow field of disorders, work to improve patient access to follow-up care, implement a protocol to outsource difficult cases, and integrate with the local setting.

**Mission Models**

Four styles of global surgical delivery have emerged from decades of development beginning in 1971 – the founding of Médecins Sans Frontières. The first style involves an external team bringing skills and resources to resource poor settings for a limited time. Second, an external team trains and works with local personnel to expand the reach of transient mission trips. Third, an external team collaborates with local hospitals and health professionals to establish a permanent institution that the external team can support remotely or transiently. Finally, for extreme cases, external teams coordinate travel for local patients to receive medical care in the teams’ home countries [1].

These categories often overlap depending on group resources, goals, and commitment. Missions cluster at the extremes with respect to size. Prior to the 2009 Humanitarian Action Summit, 25% of respondent humanitarian organizations providing surgery performed fewer than 100 surgeries per year while another 20% provided more than 1,000 [2]. Translating group dynamics into global health success depends on good management and self-awareness [3]. Part of this awareness requires focus both on the type of disease a team is equipped to treat and the local disease burden. Neurosurgical missions confront a complex array of significantly deleterious diseases that require clear objectives to treat effectively.

**The Case of Neurosurgery**

Many papers addressing global neurosurgical disease begin with statistics highlighting the dearth of local specialists: 50-70 fold fewer neurologists are present in some developing countries and an estimated 10-15 countries in Africa lack a single neurosurgeon [4]. These claims are important but too easily dwarfed by statistics heralding overall scarcities across medical professions [5]. Common arguments suggest neurosurgeons are too hard to train, that it is too complex to recruit and follow neurosurgical patient populations, or that resources can be better spent elsewhere.

Global trends accentuate the immediate importance of developing neurosurgical programs. Between 1990 and 2010, there was a 32% worldwide increase in disability adjusted life years (DALY) for neurological disorders. This excludes the categories of ischemic and hemorrhagic stroke, which despite accounting for 1484 DALYs/100,000 population (nearly the sum of the combined burden of HIV/AIDS and tuberculosis), have declined almost 10% [6]. The emerging neurosurgical conditions are therefore unrelated to stroke. Brain disease broadly defined to include neuropsychiatric diseases as well as stroke, meningitis, congenital
abnormalities, and injuries accounts for nearly 20% of the years of lost life and 35% of the disability adjusted life years in Europe [7]. Europe does not suffer from the same burden of disease as the regions this essay addresses, but this statistic emphasizes how consequential improved medical treatment of brain disease can be. Neurosurgical diseases can be lethal, are severely neurologically and functionally debilitating, remain poorly understood, and are difficult to diagnose and treat in resource limited settings.

There is a marked difference, however, in the effect of neurosurgical intervention on adult and pediatric populations as it relates to the overall health and productivity of a population. A study from Northern Tanzania highlights the distribution of neurosurgical disease in rural, poor settings: “Of 151 patients the most frequent diagnoses were traumatic brain injury (60%), followed by tuberculosis of the spine (14%), spina bifida (9%), space-occupying cerebral lesion (9%), and hydrocephalus (8%). The overall mortality was 10.6%; [mortality] was especially high in patients with hydrocephalus (25%), space-occupying cerebral lesions (54%), and spina bifida (29%) .” [8] Trauma and injury continue to lead as disease causing agents in the developing world [9]. In these situations, the events leading to injury affects prognosis as much as readily available medical resources. Children (ages 0-14) also account for the same percentage of disability adjusted life years due to injury as adult (ages 15-44) counterparts [10]. A discussion of the role of medical professionals and international aid organizations in preventing injuries is beyond the scope of this essay. For brevity, injuries draw from rapid industrialization, limited government oversight of construction, and poor access to healthcare.

What the Northern Tanzania study highlights is the significant mortality associated with operable congenital neurosurgical conditions. These operations provide a unique lens into longitudinal complications following surgery due to the remarkable restoration of life. Several groups have endeavored to provide life saving neurosurgical services to underserved regions. The following is an analysis of two case studies, highlighting several areas for improvement of global neurosurgical care delivery and follow up.

Case Study: VCU Annual Visits to Guatemala

This case study involves a transient mission trip organized by a group at Virginia Commonwealth University (VCU) following their recent report, “A model for neurosurgical humanitarian aid based on 12 years of medical trips to South and Central America.” [1] The VCU team ran surgical trips predominantly to Guatemala through the non-profit Heal A Child Foundation. This international organization facilitated preparative steps in Guatemala anticipating the arrival of the surgical team. It was unclear from the report how permanent Heal A Child’s presence is in Guatemala, but it did not operate out of a proprietary hospital. Rather, the Foundation arranged for time and space in local clinics while publicizing the neurosurgical clinic to surrounding areas.

Results of the VCU surgical mission are aggregated by treatment (Figure 1). Given the large number of hydrocephalus shunt placements, it is important to note the small (4%) figure for shunt revisions. In conjunction with the 5-8% reported overall complication rate – the majority of which the authors attributed to shunt failure – this is strikingly low. A 2001 Canadian trial reported up to a 62% shunt failure rate at 4 years for certain devices [11], and a 2013 American study found that by 15 year follow up dates from the initial shunt surgery, 84.5% of patients required at least one revision [12]. Of note, many shunt placement patients were lost to follow up – leaving them with morbidity and mortality not captured in the presented data.
Designing follow up procedures also raised concerns. The VCU team integrated international referral into its follow up care aided by communication with local staff through the parent foundation. In addition, the team operated only if the patient’s family committed to a follow up protocol. This required a return visit the following year, which over the 12-year study period saw a 77% successful 6-12 month follow up rate. Transportation from rural areas contributed most strongly to failure to follow up. This is not a new idea. It is well known that patients in developing countries travel inordinate distances at great personal expense and peril to access limited medical services – and increasing distances track with decreased utilization [13].

In the context of a highly specialized provision such as neurosurgery, what responsibility do transient centers have to accommodate regional transportation issues? Given overwhelming demand for services at the point of distribution, a utilitarian response would suggest no responsibility. It may be possible even to screen patients for whom follow up failure might present too much of a risk for consequences of surgery. Implementing such protocols might improve follow up and outcomes initially, but could have an adverse effect on the group’s ability to raise funds or maintain welcome in the country. Viable options for transient centers include increasing collaborative efforts with rural clinics so that they are prepared to support neurosurgery-associated complications and varying visit locations. Superficially, varied visit locations might seem to resolve certain access issues since the transient surgical teams are mobile on a trip-by-trip basis. However, this solution would challenge established infrastructure for patient recruitment.

The assignment of responsibility must adapt to accommodate the evolution of the team. A review of the VCU team’s report argues that since children are a decreasing proportion of the population in the northern hemisphere, surgical subspecialties will need to travel to train new physicians. Transient clinics accomplish this goal for readily achievable surgeries with limited follow up [14]. This kind of changing perspective on an educate-serve-train paradigm increases the probability of new physicians with each visit. Handoffs are documented sources of medical error in developing [15] and developed [16] countries alike. As surgical team members change, there must be specific protocols for revisions and ongoing issues with follow-up.
Responsibility for ensuring follow up and limiting complications might be nebulous, but ensuring care continuity is essential for transient clinics.

**Case Study: Uganda CURE Hospital**

In 2000, the international organization CURE established a hospital in Mbale, Uganda to focus specifically on addressing neurosurgical disease. CURE hospitals have traditionally developed a specialized focus, from orthopedics in Malawi to maternal health in Afghanistan. Since its founding, CURE Uganda surgeons have performed 8900 surgeries – many of them for congenital hydrocephalus. For a case where follow up is important – e.g. hydrocephalus shunts need to be replaced in children as discussed above – permanent institutions can more easily prepare for this kind of longitudinal care. Roughly 10% of CURE Uganda patients were lost to follow up in 2011 compared to 23% for the VCU team. Surgeon-driven research also estimated the economic value to Uganda to be $3.1 million to $5.2 million for 297 patients in 2005 alone [17]. These medical and economic successes would not have been possible without a commitment to community integration.

CURE Uganda maintains a strong spiritual component – with a “how you can pray for CURE” information section and a featured biography of their spiritual director on the front web page. This is part of an effort to connect with the hospital’s deeply religious patient population. Improving follow-up and communication both depend on cultivating a shared sense of mission with local communities. The case of neurosurgery makes this religious component potentially more meaningful than in other circumstances. Complex physical symptoms and altered psychology are not readily accessible pathologies for most people so faith can play an important role in processing medical treatments. Integrating with the community prepared the surgeons at CURE Uganda to refashion care for hydrocephalus.

Complications associated with shunt-based hydrocephalus gave rise to endoscopic third ventriculostomy (ETV) as the primary treatment. (Treatment and indications reviewed in Reference [18]). Initially at CURE Uganda, the average time to follow up for shunt placement was 15.2 months, with a 1.5 month lag between reporting a failed shunt and revision [19]. Concerns for emergent shunt replacement and predicted failure were difficult to manage in a setting where follow up, medical care, and knowledge of the condition in community health centers were unreliable. ETV had a much shorter period of follow up (i.e. 1 week, and 3, 6, and 12 months following the operation) because most complications associated with ETV present within the first 6 months [19]. Engineering a procedure to condense acute medical risk into an early and immediate time frame enabled CURE Uganda to achieve better long-term outcomes. Of patients treated initially with ETV surgery, 73% were “successful” or demonstrated a reduction of “irritability, vomiting and headache, decreased spasticity and improved gait, and resolution of ocular symptoms such as ‘sunsetting’ or sixth nerve palsy.” [19] Others were abandoned due to complications in surgery or replaced with common shunts. In the past 8 years, this process has been streamlined, expanded to treat myelomeningocele, and changed thinking about shunt procedures in the US [20, 21].

Data from CURE Uganda support the suggestion from the VCU team that community health awareness and access positively impacts pediatric survival. In a 2012 study, CURE doctors surveyed patients treated for
myelomeningocele for five-year survival and found that regions with community rehabilitation programs reduced mortality from 44% to a rate comparable with unaffected peers, 16% (Figure 2) [22]. Largely run by non-government organizations, these community-based programs provided additional support and medical reminders for families following pediatric neurosurgery.

Survival can largely depend on parental behavior and sociocultural choices made in light of the diagnosis. Families’ choices to avoid or delay available treatments for their children for fear of consequences (i.e. neurological symptoms, delayed milestones, and abnormal development) adversely affect the child’s prognosis, making these cases very challenging [22]. In the Mbale case study, it is possible that the community programs normalized the disease conditions thereby empowering families with validation that supporting their children throughout infancy would significantly impact their future existence.

Figure 2: Kaplan-Meier 10-year survival for CURE Uganda pediatric myelomeningocele patients under 6 months old treated with neurosurgical intervention between 2000 and 2004 [22]. Patients were stratified based on whether their home district had a community-based rehabilitation / community health worker program (n=48, 37%) or not (n= 83, 63%).

Hospitals like CURE Uganda also have an imperative to invest in future patients. Developing procedures at permanent global surgery centers not only requires longitudinal investment, but also a commitment to teaching. CURE Uganda partnered with iPATH to train neurosurgeons from across the developing world [23], in an effort to create sustainable care delivery for future patient populations. However, foreign physician training programs encounter difficulty when they try to integrate foreign doctors because of protective laws that prevent those doctors from achieving parity in patient contact. Further, when training doctors to return to their home countries, many express a lack of support from their home institutions. This might suggest that transient training teams should consider accommodating new practices.

Responsibility After Surgery

The responsibility for neurosurgeons following global missions constrained by cost, scope, and human
resources has evolved along with understanding of methods for delivering the best care. Transient and permanent centers manage this responsibility differently, but in both cases there is a clear mandate for expanding continuing care vigilance, implementing training programs, bonding with local populations, and framing prospective disease states in understandable terms.

Maintaining successful follow up for neurosurgical disease is critical for protecting the investment of health in a patient. Mentioning equitable distribution of resources raises specters of rationing that fluster physicians and donors alike. However, outsourcing cases to international providers or ignoring realities (cultural, geographic, political, or otherwise) that prevent patients from following through with critical aspects of care severely hinders a mission’s efficacy. It is important to abstract decisions to give or withhold treatments from surgeons on the ground by instead implementing selection criteria, more rigid follow-up guidelines, or traveling community clinics early in the mission planning process. Such rules will likely not prevent difficult cases from arising in the clinics, but will help surgeons begin to think of their role beyond the limits of technical services.

Propagating services rests within surgeons’ responsibility to contribute to the surgical deficit in developing countries. Missions at their core seek to fill this void: they bring skill, personnel, equipment, and time. Most groups recognize that training local healthcare professionals leads to leaving a recurring impact. To approach sustainability, groups must train according to their mission model. Transient teams can provide acute educational exposure to existing hospitals; permanent institutions are better equipped to train individuals in depth and facilitate patients’ transitions to community care teams. More longitudinal institutions are able to develop understanding of the regional burden of disease, aggregate data, and rally for others to support ongoing treatment. Reaching beyond available means or conflating objectives across mission models ruins the lasting impact of a mission.

Impact also depends highly on missions’ integration with local populations. The head of CURE Uganda’s neurosurgical unit, Dr. Benjamin Warf, articulated this shift writing, “Our sphere of responsibility has expanded, and in the parlance of Christian ethics, we have new neighbors.” [23] This terminology draws together principles of shared experience and responsibility to others. Surgical missions are never isolated and they depend on local buy-in. This is especially true for neurosurgical missions where patients do not always grasp the complications, stigma, and consequences resulting from intervention. The importance of spirituality and Christian religious thought in Uganda are essential aspects that the CURE hospital accessed with a targeted ethos of prayer. Translating this lesson to transient centers requires careful pre-trip evaluation and research. At some level, missions will always encounter cultural barriers, but their effectiveness hinges on practicing sensitivity toward local understanding of their mandate.

Communication becomes acutely delicate when neurosurgical missions confront how to convey adverse outcomes. This paper did not address certain neurological conditions because reliable surgical treatments are still being developed. This includes psychiatric or obsessive disorders, neurodegenerative disease, and epilepsy. These diseases carry significant emotional burdens that build over time. With the advent of empirical deep brain stimulation studies, treatment options are starting to emerge, but implementing these operations in developing countries remains distant [24, 25, 26, 27, 28]. Ascertaining accurate cognitive...
histories and communicating the goals of treatment for these diseases is challenging even in developed countries. Language (not translation) and cultural barriers will continue to impede implementation of neurosurgical intervention even after clinical science masters the techniques.

Conclusions

Neurosurgical missions following both transient and permanent models of global health delivery expose important factors governing responsibility after surgery. The case studies in this essay highlight facets of care delivery, burden of disease assessment, and mission organization that can profoundly influence local health and economy. With the advent of new, more comprehensive, and neurologically challenging surgeries, future missions will need to apply these lessons of integrating community rehabilitation teams, outsourcing complicated cases, training local physicians, and cultivating trust to the way they deliver care. Managing responsibility for follow up care lies at the center of this framework and will determine the overall success of global neurosurgical missions.

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2: S15.e15-S15.e18.


Weighting

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“No Wasted Chair Space” by Tony Alter

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The psychiatrist sat in an office across the hall.
His office feigned clinical friendliness, but his eyes told a story of circular, regressive arguments.
I glanced over as I entered behind the surgeon into a windowless room.
“I feel full all the time.”
Your new stomach is a walnut.
¿Cómo se traduce?
“My mom’s roux-en-y was bad like this too.”
You didn’t have that surgery.
(Maybe you should have.)
“I have pain when I eat or move.”
You have gallstones.
We can do something about that.
“But that means surgery.”
You are morbidly obese. You need it.
The “you” statements are hard
For patients to process without resentment, and doctors to tell without condescension.
(And then there is the uncertainty of advice.)
Patient-centered-medical-care breaks down when faced with these contradictions.
We’re meant to communicate, to educate, to advise, and in the end, never to choose.
But when the chairs in the waiting room grow to four feet across,
And the diabetes-hypertension-cholesterol can disappear,
How do we physicians control our rumbling urgency?
A lady was crying at the reception desk. I was on my way out and threw a parting ear;
Inability to exercise to lose weight prohibited her from a surgery to help her lose more.
The circle continues.
Cash-Only and Concierge-Based Medicine: Roles in the Health Care Payment Landscape

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The discord between physicians and insurance companies over compensation for medical services is not new. In 1936, the editor of the New England Journal of Medicine in “Unpaid Bills of Doctors and Hospitals” described the disarray between physicians and insurance, stating, “You are all aware of the fact that physicians and hospitals lose tremendous sums of money annually… The sad and grievous part of the story is that moneys have been set aside by your insurance companies to pay for the medical and surgical services...
rendered, but these moneys too frequently are not distributed to physicians and hospitals…” [12]. Unfortunately, similar challenges in the payment infrastructure exist in the health care system nearly 78 years later.

As a result of increasing frustration with the current health care payment system, a growing trend emerged in which primary care practitioners began shifting to new forms of payments for services, specifically cash-only payment practices. Another subset of physicians elect to receive both cash payments and patient insurance for services, practicing “retainer” or “concierge” medicine [1]. Analysts argue that the shift to cash-only and concierge systems reflect the deteriorating state of the current healthcare system [5]. The mounting frustration arises from a combination of private insurance payments and drastic declines in reimbursement rates from Medicare and Medicaid [6]. With increasing overhead costs, physicians are finding it less economical to accept patients from Medicare and Medicaid, with many physicians refusing to accept these patients altogether [18]. This paper will describe the incorporation of cash-only and concierge-based payment systems into the current health care payment infrastructure and the potential long-term ramifications of these changes.

In a “cash-only” or “direct payment” method of practice, physicians refuse to accept insurance and require payment upon receipt of services [4]. The first cash-only practices emerged in the late 1990s in the form of boutique practices that allowed physicians to cater to the wealthy [14]. This practice shifted as physicians also sought to eliminate the administrative and insurance hassle in their practices, and began offering services to uninsured and underserved populations for lower pay-per-visit charges [14]. This method gives primary care practitioners increased autonomy in their practice and allows for richer relationships with patients. By accepting cash-only payments, many practitioners have drastically reduced their patient volumes in order to spend more time with individual patients and deliver higher quality care [8].

Although frequent media attention and anecdotes from current cash-only payment providers portrays this form of practice as a popular and exponentially growing trend, preliminary data suggests that this form of practice is still in the vast minority of health care practice today [18]. In 2012, the Survey of America’s Physicians, one of the largest and most comprehensive surveys of physicians in the U.S., found that out of 13,575 respondents, approximately seven percent of physicians, plan to move to cash-only or concierge-based practices [18]. In addition, 9.6% of physicians who own their practices, in contrast to 4.5% who are employed by a hospital or group practice, plan on moving to concierge-based medical practice. This particularly highlights the increasing pressure on private practitioners to better manage their overhead costs based on reimbursement rates of insurers, Medicare, and Medicaid in the current payment landscape.

According to the American Academy of Family Practitioners, in 2010, only 3% of family practitioners in the organization’s Practice Profile Survey indicated that they practice in a “cash-only, direct-care, concierge, boutique, or retainer medical practice.” This amounts to approximately 3,000 physicians out of over 97,000 members. Despite this small fraction of practitioners, the Center for Studying Health Systems and Change reported as of 2008, 12.6% of all physicians practice in a non-managed care setting, an increase from 11.5% in 2005. Of the 954,000 physicians in the U.S., this figure would suggest that 118,000 are not practicing under a managed care system.
The greatest challenge for many physicians exploring the transition from managed care to cash-only or concierge-based practice lies in determining whether it is a sustainable method of practice. Of physicians, 42.7% mostly disagree and 32.8% somewhat disagree that hospital employment of physicians is a positive trend and likely to enhance quality of care and decrease costs; however, the majority of physicians (87.4%) still practice in a managed care type system [18]. This illustrates that although physicians recognize the problems in the health care system, there is hesitation in moving away from a managed care system.

Family practitioners throughout the country present different experiences with cash-only practices. According to Letters in Family Practice Management, physicians state,

“After eight years in the rat race, I opted out of Medicare, canceled all insurance contracts and converted to a cash office on Jan. 1. These changes have rekindled the fire of family medicine for me...Family physicians are in a unique position to do this because our services are affordable on a cash basis. My visits start at $35.” – Jaymi S Meyers, MD, Seneca, S.C.

One particular argument for the cash-only payment model is that it allows physicians to significantly decrease administrative costs related to insurance company filing and thus decrease total overhead costs. Brian Forrest, MD, runs an acclaimed practice of the cash-payment model called AccessHealthcare in Apex, N.C. His practice has been heralded as one of the best examples of this model. Forrest explains that through his “Access Card” discount plan, patients pay $300 a year for a card and $20 per office visit. The average patient who needs a complete physical, four follow-up visits, and a sick visit will spend in total $420 on primary care annually [8]. In contrast, the average American family spends $700 per year on health insurance premiums ($3,300 per family), which excludes co-pays, deductibles, or employers’ contributions [8]. This model is also preferred even for individuals who have insurance, particularly because the office visit costs are less than their in-network co-pays, and often includes lab tests that are also typically not covered. Therefore, these patients still saved money in the long run [8]. For his patients who did not have traditional insurance, Forrest recommended that they purchase high-deductible, low-premium plans that covered them for unforeseen hospitalizations. This ultimately saved patients money annually and still gave them access to the primary care they needed.

Other physicians have found tremendous difficulty in establishing and sustaining a cash-only practice.

“Our policy of trying to save patients money-combined with our patients’ reluctance to file claims because of the hassle had backfired...While we had more than a thousand patients, with many new ones coming in every day, few came for follow-up visits... Five years after opening my cash-only practice, I finally sold it...I’m now an employed physician, seeing many of the same patients I saw as a private practitioner...They tell me they preferred the level of care they were getting before.” – Emily Kaufman Frank, MD, Carmel, I.N.

One major criticism of cash-only payment practices refers to the impact it will have on access to health care for the underserved and uninsured. Analysts argue that with a shift towards cash-only practice, an increasing number of individuals will be unable to afford their long-term physicians. These non-concierge physicians who do not participate in managed care contracts alienate patients that cannot afford to pay both insurance...
premiums and cash-only practice payments. In addition, physicians refusing Medicare and Medicaid patients exacerbate the shortage of primary care physicians to populations that cannot afford health care without government aid. In 2012, physicians reported that due to time or cost constraints, 8.6% have been compelled to close their practices to Medicare patients and 26.7% to Medicaid patients, an increase from 6.2% and 17.8%, respectively, in 2008 [18]. Because together Medicare and Medicaid patients comprise 48.9% of physicians’ patient volumes, a decrease or elimination of services entirely to this patient population will ultimately worsen health disparities to the uninsured and underserved.

However, practitioners of cash-only payment system contend that their practices actually increase access for these underserved populations. Physicians published in the Family Management Practice Letters stating,

“I helped create a cash-only practice in Albuquerque, N.M., in January 2005. Our goal is to serve working poor, uninsured and immigrant families needing urgent as well as ongoing care… A cash-only practice allows you the flexibility to offer your services at a reduced rate to poorer uninsured patients.”

Other physicians have similarly stated,

“My overhead is low, so my services are cheap [$20-$25 per visit], which makes it possible for middle- and low-income families (including some who are insured, and others who are not) to afford me” [8].

These arguments suggest that cash-based practices may provide greater access to care than previously contended. However, this debate is ongoing with few physicians or physician organizations publicly arriving at a consensus on cash-based practices.

Unlike the cash-based practices described by Forrest, some physicians have opted to practice concierge-based medicine. In this model, physicians advertise expanded medical care and individualized attention, collecting charges from both insurance companies and directly from patients [16]. The medical community sharply contrasts in their opinion of these practices, which often are referred to as “boutique” or “luxury” practices wherein patients who pay an additional fee are offered the best care at a particular practice. In the next one to three years, 9.6% of physicians who own their practices plan to switch to concierge practice [18]. The fee charged by physicians is sometimes referred to as a “retainer” fee, and ranges anywhere from a few hundred dollars to several thousand dollars annually. Many physicians argue that this surcharge allow them to decrease their patient volume, spend more time with individual patients, invest in patient centered medical homes or electronic medical records. The growth of concierge practices and the willingness of patients to pay physician surcharges illustrates the difficulty for patients to find good quality primary care [2]. In addition, patients who cannot afford to pay this luxury retainer fee will be further excluded and add to the millions of individuals who do not have adequate access to primary care [3]. Physicians who practice concierge-based medicine were found to serve fewer African American (7% vs. 16%), Hispanic (4% vs 14%), or Medicaid (5% vs. 15%) patients. Physicians who converted to concierge-based practices from non-retainer practices (85%) kept only 12% of their previous patients [1]. Of these physicians, 84% provide charity care and 17% continue to see patients who do not make retainer payments [1]. Given the preference for and exclusion of populations in the concierge-based model, this payment system is more likely to severely impact health care access to
underserved populations.

Other driving factor in the debate is the rate of uncompensated care. Physicians seem to provide overwhelmingly high rates of uncompensated care, and thus many in primary care may view cash-based practices as a way to receive lower rates from underserved populations rather than no compensation at all. Currently, 39.3% of all U.S. physicians report providing more than $50,000 in uncompensated care annually within the current payment infrastructure [18]. Furthermore, with 45.1% of physicians planning on placing new or additional limits on Medicare and Medicaid patients and 22% planning on reducing the amount of charity care they deliver as a result of the ongoing problems with Medicare fee schedule updates, the need for a new payment delivery system is imminent.

Given the challenges physicians face with insurance reimbursements and Medicare and Medicaid programs, the passage of the Affordable Care Act (ACA) may potentially reduce the number of physicians shifting toward cash-based and concierge medicine. The Affordable Care Act primarily addresses challenges with universal coverage, insurance company abuses, uncompensated care, and Medicare reimbursements. With the universal mandate requiring insurance coverage of all individuals in the U.S. through employer-based, government-sponsored, or other private health insurance, physicians will be less likely to lose significant annual earnings in uncompensated care. An analysis of the impact of the ACA in The New England Journal of Medicine determined,

“With the number of uninsured people projected to drop by half, policymakers anticipated a substantial decrease in the uncompensated care provided at acute care hospitals. Consequently, beginning in 2014 the ACA initiates a series of payment reductions under the Medicare and Medicaid Disproportionate Share Hospital (DSH) programs. These programs, which pay out about $22 billion annually, partially reimburse nearly three quarters of U.S. hospitals for otherwise uncompensated care provided to low-income patients.” [19].

This form of re-compensation and bundled payment will ensure that physicians receive appropriate, sufficient, and regular payments for services, ensuring long-term feasibility of health care practice.

In Title III, the ACA addresses Improving the Quality and Efficiency of Healthcare, particularly in the context of Medicare payment reforms. The ACA expands payments and reimbursements from Medicare, particularly in the context of preventative and rural health practices. Because cash-based medical practices are favored by physicians in low-to-middle income rural areas, the expansion of Medicare reimbursement coverage in these settings may lead fewer physicians to adopt these practices.

Private insurance company reimbursements represent their own challenges, and although the ACA does not directly identify changes in reimbursements for physicians from private insurers, it does address reducing insurance company frauds and abuses. The Center for Consumer Information and Insurance Oversight (CCIIO) enforces the ACA provisions for reimbursement by overseeing private insurers. Because many practitioners of concierge-based medicine charge a premium for their services in heavily populated regions, the enforcement of insurance reimbursements in essential to limiting an increase in demand and subsequent
rise in health care costs in heavily populated areas.

Because the scope and long-term effects of cash-payment and concierge-based practices are not fully understood, it is difficult to assess health outcomes resulting from these practices. However, given the preference for certain populations within each model, health outcomes are more likely to be negatively impacted in a shift to these payment methods. Many of the experiences of these physicians are anecdotally described, and little investigation has been conducted into the regional distribution of these practices and the factors that are associated with success or failure in these models. These practices indicate a much greater problem in the payment structure of healthcare at large and continued delay of improvements could have severe consequences for the patient population in the U.S. The ACA may potentially resolve some of the concerns of payment infrastructure and long-term viability of medical practice in the U.S., limiting the migration of physicians to cash-based practices in rural settings and concierge-based medicine in urban settings.

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Socioeconomic Status, Stress, and Coronary Artery Disease

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“Mending a Broken Heart” by Nicolas Raymond

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Coronary Artery Disease (CAD) is the leading cause of death and disability in the United States, accounting for 1 in every 6 deaths [1,2]. In 2010, the disease cost the U.S. almost $109 billion in medications, health services, and loss of productivity [3], making it an important consideration for national health policy. In considering the health issues related to the disease, it is helpful to examine the root causes of CAD, which...
can be broken down into a genetic component (40-60%) and an environmental component [4,5,6]. Of the environmental causes, socioeconomic status (SES) has proven an especially powerful and curious factor [6]. This paper will look at the impact of SES on CAD development and perpetuation. It will focus on the interplay between SES, stress, and CAD, and provide policy recommendations for the future.

Michael Marmot’s Whitehall Studies provided the first hint that SES influenced CAD. Whitehall I looked at 17,530 London Civil Servants ranging in age from 40-64 [7]. Marmot found that the age-adjusted prevalence of angina was 53% higher and ischemic electrocardiographic abnormalities were 77% higher in those who were in the lowest employment grade compared to those who were in the highest [7]. Further, at 7.5 year follow up, the coronary mortality was almost 4 times greater in the lowest employment grade compared to the highest [7]. Whitehall II expanded this study to females and found similar patterns [6]. The difference in cardiovascular problems and deaths was initially thought to be due to the difference in coronary risk factors between the two groups: those in the lowest grade smoked more, exercised less, were more overweight, shorter, and had increased prevalence of hypertension [4]. However, even after Marmot adjusted for these factors, the cardiovascular differences between the two groups remained significant [7]. Marmot concluded at the time that one’s employment status was more accurate at predicting his chance of dying from CAD than any of the known common risk factors [7].

Why was this? One proposed idea was that those of lower SES were faced with greater stress, both at home and at work [8]. One group, using the Whitehall II cohort, looked at free salivary cortisol levels in individuals both when they woke up and thirty minutes after as a marker for stress levels. Cortisol levels immediately after waking up did not differ between those of different SES on workdays or weekends [8]. When measured thirty minutes after awakening, however, those of lower SES had higher cortisol levels than those of higher SES, and this effect was observed on both workdays and weekends [8]. Other sources have also documented greater stress in those of lower SES [9].

The term allostatic load has been used to describe the wear on the body that results from continuous or prolonged activation of the body’s stress system [9,10,11]. Normal exposure to stress, including elevated heart rate and blood pressure, is not detrimental and may even be protective [10]. Constitutive activation of these pathways, however, overwhelms the system and results in detrimental effects [10]. One example is a decreased ability to recover from stressful situations [9]. So, for those of low SES, not only is the body exposed to stressors more constantly and for greater periods of time, it also possesses a reduced ability to recover from the stress [9].

There have been various other biological mechanisms proposed for how stress ultimately leads to CAD development. Some groups have noted that those of lower SES have higher levels of plasma fibrinogen, which is associated with an increased risk of CAD [12]. Others have implicated the pro-inflammatory cytokine IL-6, which also plays a role in CAD development, and is elevated in response to psychological stress [9]. Others still have looked at the effect of chronic stress during developmental windows in childhood [10].

Stress during childhood offers an interesting perspective into potential environmental contributors to CAD development. For the majority of the 20th century it was thought that cardiovascular conditions such as stroke
and CAD were mainly influenced by adult lifestyle and behavior [10]. More recent trends, however, show that environmental factors during childhood strongly influence adult disease outcomes [10]. For example, childhood respiratory illness correlates with adult lung disease, and nutritional defects during the prenatal period are associated with greater incidence of cardiovascular disease later in life [10]. Recent studies have also shown that adults with a history of depression and mistreatment during early childhood are almost two times as likely to possess elevated C reactive protein levels [10].

What is the root of all this stress? There are a few obvious answers: those of low SES are more likely to live in areas of greater population density, crime, and noise pollution. In addition, they frequently have limited access to resources such as healthy supermarkets, restaurants and health services [11]. These are plausible, yet somewhat downstream explanations.

Marmot offers a possible root. He proposes that poverty results when an individual cannot meet the fundamental needs of autonomy and empowerment [6]. So under this framework, those of lower SES feel greater stress because of a lack of control and empowerment in their lives, and it is this increased stress that puts them at greater risk for CAD [6]. A study in the Netherlands displayed that an individual’s perception of decreased control in his/her life was correlated with increased CAD [6]. In Whitehall II, Marmot asked women about how much control they felt they had in the home and those who reported less control possessed higher risks of CAD [6]. Finally, in the Czech Republic, those who reported lower control at work had higher risk of myocardial infarction [6]. Marmot suggests two ways in which individuals of low SES feel disempowered and helpless: stress caused by amount of control in relation to demand and stress originating from an imbalance between efforts and rewards [6].

Some may argue that those occupying jobs that allow them to maintain a high SES have more stressful demands placed on their time [6]. As Marmot points out, it is not necessarily the quantity of stressful demand but rather how much control is afforded in comparison to that demand [6]. So while a banker or physician may work 100 hours/week, they are in control of many aspects of their lives. Their high SES affords them the ability to choose where to live, where they eat, and where to partake in recreational activities and consequently there is little to no imbalance between efforts and rewards. Those of lower SES may also work 100 hours/week but are usually in positions where comparatively less control is afforded [6], and due to lower compensations, this extends to the home environment as well. These individuals are often told what to do and are under perpetual and strict scrutiny. When these individuals return home after work, they are often traveling to areas that they may not want to live in, that are polluted with noise and crime, and that frequently offer no healthy grocery stores, restaurants, or recreational facilities. There is a grave imbalance between efforts and rewards as hard work in this circumstance is much harder to translate into upward social mobility and a sense of autonomy and empowerment. These individuals are less likely to have, as Marmot puts it, “a reason to lead lives they have reason to value.” [6]

How can policy be tailored to solve issues of lack of autonomy and empowerment? The first place to intervene is during childhood. As the studies above display, chronic stress during times of development has been implicated in increasing one’s chance of not only CAD, but of various other ailments as well. Childhood is also a time when it is easy for individuals to feel out of control, especially when compounded by the stress
effects of poverty.

There are a few interventions that could help empower children of low SES. The first is to improve access to quality education and extracurricular programs. In quality schools, the child is usually surrounded by supportive peers and instructors and is removed from the stresses that may be waiting at home or in the outside environment. Many schools in low SES areas are of poor quality, have high dropout rates, and are inundated with drug and criminal activity. One solution to improving access to quality education and moving towards empowering children and reducing stressors may be a widespread implementation of charter schools.

Charter schools receive public funding but are exempt from many of the rules and regulations that govern normal public schools [13]. This important point allows these schools to reallocate resources from maintaining a public school bureaucracy towards building networks that place special emphasis on academic achievement and the creation of safe zones [13]. Students gain further autonomy by being able to choose their school instead of being placed in a random, poorly structured public school that may be difficult to access. [13]. Charter schools have been widely successful throughout the nation, and in 2012, Chicago’s charter schools held the top 9 spots out of all Chicago high schools for ACT scores. [13]

Year-round charter schools also pose an interesting solution to the problem. Research has shown that the education gap between those of high and low SES starts very early on [14]. Specifically, the gap seems to manifest itself during the summer months of elementary school where those of higher SES are afforded greater access to resources [14]. Year-round schooling may serve as an equalizer of sorts by hindering the formation and perpetuation of the education gap.

Another intervention could be greater access to primary care for children. Children of lower SES have poorer mental health and carry a higher stress burden than those of higher SES [10]. Access to a primary care physician may help these children cope with mental health issues and possibly ameliorate some of their stress burden. The less stress burden carried forward, the better health outcomes later in life [10]. Frequent contact with a primary care physician could also help bring to light cases in which the child’s environment, school or home, is unsafe.

Adults pose a much more difficult problem. Taking Marmot’s analysis into consideration, a large source of stress comes from personal feelings of lack of autonomy and disempowerment. Improving these feelings in those of low SES would require adjustments to the job and home environment.

To improve the job environment, there needs to be changes that empower the worker and that offer better rewards for his/her efforts. Possible solutions include greater wages, greater governmental support and/or better work health insurance coverage. Employee reward programs that focus on promoting employee autonomy and self worth, and on creating a perfectly transparent promotional system would further lessen stress in the work environment. A system defined by an ambiguous correlation between efforts and achievement leaves individuals feeling as if they have no control over their own upward mobility. Having concrete goals to work toward and knowing exactly what steps are required for promotion incentivizes...
individuals to pursue longitudinal job experiences, and creates a better sense of community and stability in the workplace.

The home environment is more difficult to change since SES often dictates where an individual has to live, which subsequently influences what he/she has to eat and the types of recreational opportunities that are available. One possible way to improve low SES neighborhoods is to empower and motivate residents to change and improve their own community. Mobilizing the youth could prove especially fruitful. These projects could range from educational campaigns on the merits of healthy eating to park and home restorations. Other examples include having skills workshops for community members or holding fundraisers for community development projects. If individuals in the community are involved in the improvement and change around them, they will feel a greater sense of ownership and attachment to their community, and ultimately a greater feeling of empowerment and autonomy.

Low SES, by influencing stress levels, has clear biological and social links to CAD. Providing children with a quality education, healthy places to eat, and a safe environment has the potential to help them escape the low SES poverty trap, and to improve their health status. For adults, worker reform, initiatives that promote transparency, and the establishment of communities individuals feel connected to and empowered by are potential ways to reduce environmental stressors. The ultimate goal is stress reduction through empowerment and autonomy—a goal with the potential to have widespread implications for CAD prevention.

References


Redefining Suffering and Illness

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Introduction

In order to nuance and reframe dialogues around healthcare, I introduce and define fundamental terms and
concepts with the aid of anthropological and sociological literature, modifying and updating them as reason, need, and humanity require. I establish *suffering* as the experience of threat or damage to *personhood*, with *illness* as its manifestation. I then describe and distinguish two ways of attempting to manage *health: caregiving*, a moral exchange that sustains personhood for both provider and receiver; and *biomedicine*, an interpretive system that seeks mainly to govern pathophysiological *disease*. I briefly apply these concepts to highlight shortcomings within the current focus of the medical profession, and I invite continued engagement with these terms in order to bring closer to lived-experience our conceptualization of what is at stake.

**Suffering and Personhood**

The condition of suffering is universally familiar as something experienced both directly and empathically. Nonetheless, it can be a difficult concept to circumscribe; for example, it certainly applies to experiences beyond pain, and not all pain is suffering. We have long sought to concretize our intuition and management of suffering through systems as seemingly disparate as Buddhism and anesthesiology, and it occupies a fundamental role in our senses of living, purpose, and morality. Eric Cassell thoughtfully provides a definition of *suffering* that I find rigorous and robust, and I will adopt it in my discussion.

Most generally, suffering can be defined as the state of severe distress associated with events that threaten the intactness of person. [1]

Some might accuse this definition of circularity if they equate the concepts of distress and suffering, but *distress* is a set of bodily events that we observe and can attempt to measure (e.g. tachycardia, tachypnea, endocrine and neurocrine shifts, electroencephalic re-patterning) while *suffering* relies upon subjectivity. “Suffering is an affliction of the *person*, not the body.” [1]

To strengthen this distinction and provide the definition with utility, we require an elaboration of *personhood*. Cassell anticipates this requirement with the provision of a “simplified description of the person” that enumerates and explains what he argues to be requisite components.

- A person has a past…
- A person has a family…
- A person has a cultural background…
- A person has roles…
- A person has a relationship with himself or herself…
- A person is a political being…
- Persons do things…
- Persons are often, to one degree or another, unaware of much that happens to them and why…
- Persons have regular behaviors…
- Every person has a body…
- Everyone has a secret life…
- Every person has a perceived future…
Everyone has a transcendent dimension—a life of the spirit, however expressed or known. [1]

This operational definition is useful and largely correct. For example, pain (which we intuit must at least sometimes be a type of suffering) can be understood as suffering inasmuch as it responds to threats against the individual body and against the potential for agency in the future; grieving the loss of a loved one can be understood as suffering inasmuch as it represents response to fractures of family, network, and social role.

However, as Cassell himself notes, this definition only as a simplifying, general model. It has likely exceptions, and I do not argue that every criterion above need be satisfied in every case for personhood to be understood. For example, consider how this definition would apply to mentally- and physically-disabled individuals, who may experience severe lifelong limitations in agency, political activity, cultural engagement, expression of subjectivity, and so on, but who still occupy important positions in families and communities. For many, if not all, the prevailing intuition is that these individuals are still persons, and so an even more comprehensive crystallization of personhood remains to be crafted.

Health, Illness, and Disease

Next, I define the concepts of health, illness, and disease. The World Health Organization stands by a rather grandiose definition of health that it drafted in 1946:

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. [2]

I have heard it said in jest that this state is only achieved during orgasm; in all seriousness, it is difficult to imagine that very many people ever achieve it for very long. Indeed, this definition is operationally inaccessible. Health can be better understood as a state in which personhood is relatively stable, a state in which illness is minimized. Arthur Kleinman, Leon Eisenberg, and Byron Good defined the concept of illness that I borrow from and expand, and they contrasted it with the concept of disease:

...disease in the Western medical paradigm is malfunctioning or maladaptation of biologic and psychophysiologic processes in the individual; whereas illness represents personal, interpersonal, and cultural reactions to disease or discomfort. [3]

This distinction has held sway in recent discourse around health and suffering, for it does formalize a dichotomy that is intuitively accessible within American culture. Disease is a biomedical, pathophysiologic concept dressed with jargon and redressed institutionally, while illness, like suffering, is concerned with subjectivity, intersubjectivity, and personhood. This definition, however, is problematic because it suggests that disease is ontologically prior to illness; that is, it implies that biomedical diseases are objective and factual, rather than the fluctuating cultural models and in-group interpretations that they are. Thus, while these two terms can be very useful within their cultures of origin, I propose that illness be redefined in the following way for greater robustness and broader utility:

Illness represents the personal and interpersonal manifestations of and responses to suffering.
This modification allows for applicability outside of the cultures that spawned the original illness/disease distinction (if personhood can still be agreed upon), and it is consistent with the first definition of health I proposed.

This conceptualization is validated by my own experiences with patients, whose experiences with suffering ought to be trusted as a primary source in such a discussion as this. I have sometimes heard those with chronic or congenital diseases describe themselves as healthy – not ill, diseased, or sick – because they had come to reconcile their identities with their disease states, thus refortifying their personhoods. They may live with chronic aches or functional deficits, or they may know that their lifespans will be cut short, but it is possible for their senses of self and integration to remain or re-emerge intact and healthy.

Conversely, this conceptualization would label those in mourning, for example, as “ill” or “unhealthy.” This may seem inappropriate or even offensive, but only inasmuch as illness and health are held categorically to be medical concepts. I suggest that it is culture-bound and myopic to believe that experiences and states of suffering must be wed to the biomedical model; even the WHO definition of health explicitly requires social well-being, though unfortunately this often falls outside the realm of medicine as typically practiced. It is both rigorous and practical to recognize the epistemological priority of suffering and, concordantly, to grant it more linguistic referentiality than disease. This can be achieved by redefining our normative terminology with respect to it, as I have done here.

**Caregiving**

There are two dominant approaches for managing suffering, personhood, health, illness, and disease; they are caregiving and biomedicine. Caregiving is an intersubjective, reciprocal exchange between a caregiver and a sufferer that maintains personhood for both. It is one of Kleinman’s primary concerns, and he has explicated it in several ways in some of his Perspectives in *The Lancet.* In one, he offers a slightly culture-bound, operational definition:

> Caregivers protect the vulnerable and dependent. To use the experience-distorting technical language: they offer cognitive, behavioural, and emotional support [4].

While he bemoans the distortions in this terminology, the definition is familiar, for it recalls the functions we as Americans might perform or be told to perform when friends or family are suffering. With this familiarity invoked, Kleinman abstracts and generalizes the concept of caregiving, emphasizing its phenomenological foundation:

> But, to use the close experiential language of actually doing it, caregiving is also a defining moral practice. It is a practice of empathic imagination, responsibility, witnessing, and solidarity with those in great need. It is a moral practice that makes caregivers, and at times even the care-receivers, more present and thereby fully human [4].

He also describes the intersubjective activities of caregiving more explicitly:
The person receiving care shares her experience and story as a gift with the caregiver, in reciprocation for the practical things that need doing along with a sensibility akin to love. What is exchanged is the moral responsibility, emotional sensibility, and social capital of the relationship. The exchange changes the subjectivity of both the caregiver and the person receiving care [5].

These definitions recall Cassell’s personhood, and we can see in them how caregiving attends to many of its elements to allay threats thereto. The caregiver provides a physically and figuratively safe space through “empathic imagination”, “witnessing”, and “solidarity.” This allows the sufferer to share and to come to terms with changing understandings of body, spirit, past, present, and future. Interpersonal roles and identities for both the caregiver and sufferer evolve, and agency is redefined and reestablished in the sufferer. “Responsibility” in this endeavor lies in the management of interpersonal politics and “social capital”, which are disequilibrated when the suffering are distinguished from the well. These are only some of the ways in which caregiving can be understood as therapy and management of personhood, and so it is easy to see why Kleinman argues that the practice can make both parties more “fully human.”

Drawing in part from Kleinman’s discussions, it is possible to distill several features that further characterize caregiving; as a practice, it is idiosyncratic, dynamic, uncertain, committed, and reciprocal. By idiosyncratic, I mean that caregiving is entirely dependent on the relationship between the provider and sufferer; it is necessarily contingent upon culture, relationship, and personal history, and so in some respects it is fundamentally individualized and unsystematizable. By dynamic, I mean that caregiving must be responsive to the evolutions of both the sufferer and the provider through the course of illness. Thus, prognoses will necessarily be uncertain, and many questions may remain unanswered; ideal caregiving can only ever assure the outcome that the sufferer’s personhood will not have been neglected. Given this uncertainty, caregivers must remain committed to their healing endeavors because failures of caregiving result in insult to the personhoods of both parties and, thus, increase suffering. This emphasizes the reciprocal nature of caregiving, as the provider is fulfilling a critical and fundamental human role for herself/himself at the same time that she/he is accompanying the suffering. Idiosyncratic, dynamic, uncertain, committed, and reciprocal: caregiving is the quintessence of our partaking in and of our service to humanity in a world of suffering.

**Biomedicine**

Biomedicine does not operate solely at the level of interpersonal practice like caregiving, but, as Good describes, it is a “culture” and a system of “symbolic formation” with “organizing activities.” That is to say, it “formulates the human body and disease in a culturally distinctive fashion” whereby participants “construct sick persons as patients, perceived, analyzed, and presented as appropriate for medical treatment.” While biomedicine is often touted as an endeavor to relieve suffering, it specifically holds diagnosis and treatment of pathophysiological disease as paramount, and it is founded upon a “devotion to maintaining biological life.” The theoretical underpinning of this focus is the belief that “ultimacy resides in depth, downward to the levels that generate surface phenomena”; “experiential or behavioral matters … are matters separate from the real object of medicine. The fundamental reality is human biology.” [6]

As Good describes biomedicine, he states that “this means of interpreting reality is both powerful, illuminating
many disease phenomena and providing the basis for therapeutics, and at the same time profoundly ideological and often misleading.” [6] That biomedicine sometimes has incredible healing utility is undeniable inasmuch as diagnostic and therapeutic technologies can at times alleviate both disease and suffering. The ways in which biomedicine can be misleading are several, and they stem from its epistemological architecture – that is, its reliance upon science as the method of discerning fundamental, truthful knowledge of reality. For example, it is a common belief that “the promise of scientific medicine is that the knowledge does the work.” [1] Cassell elaborates that this implicit belief underlies the movement towards patient empowerment and also the willingness to allow interns to treat patients as frequently as (if not more often than) attending physicians do. While these two consequences are not manifestly problematic, discontinuity of care and devaluation of the therapeutic alliance are. Exalting science without valuing the power of intersubjective care in the relief of suffering is hypocritical, and I believe it to be a failure of humanity.

Another epistemic error underlies the increasing fetishization of technology. I have already argued that uncertainty is a necessity in caregiving, yet it has long been considered one of the thorns in the side of biomedicine. As early as the 1950s, ethnography of medical students cheerily dubbed it “idealism” that “many students… hoped never to treat a patient without first establishing a diagnosis” since “‘any clunk can carry out the treatment once you know what the trouble is.’” [7] And as recently as July 2013, physician-author Chris Adrian explained his failure to become a hospital chaplain in this way: “As a physician I don’t believe that what we do as technicians of illness and health ultimately means anything unless it succeeds.” [8] As Cassell simply states, “uncertainty is intolerable” [1] to many physicians, so their historical pattern has been the zealous adoption of novel technologies – “machines, instruments, drug treatments” – that have accompanied continuing scientific discovery. They use them to “oversimplify the inherently complex and produce certainty where doubt is necessarily present.” [1] This pattern has progressed into a dependency that has reshaped our pathways of care, resulting in profound but unspoken institutional fetishization. Concomitantly, the norm in episodes of suffering is over-treatment of users, rather than individualized, dynamic, and uncertain care of persons.

Applying the Terms in a Discussion of Medical Education

There should be no wonder that dissatisfaction and calls for reform abound when the hegemonic hermeneutic of suffering systematically fails its proclaimed mission, as it minimizes subjectivity and humanity. The inculcation of this hermeneutic is one of the functions of graduate medical education. Byron Good provides an ethnographic analysis of Harvard Medical School students [6] that rigorously details the reconstruction of medical student lifeworlds.a The humanistic inclinations of medical students, the desires to engage in the moral experience of caregiving, are indefinitely suppressed as they are forced to handle patients uniformly, rigidly, definitively, transiently, and unidirectionally. The impetus to return caregiving to medicine on individual or institutional scales is denied a safe space for expression and it is all but extinguished as the framework of biomedicine perpetuates itself. Kleinman describes this phenomenon as well.

Absent a moral sensibility of what clinical work should be in a world of divided and hidden values, idealistic students are remade as cynics, much like the residents and attendings they emulate. And I also
think this is why there is increasing suspicion and distrust among the public of what physicians and policy experts really value in health system reform. That is, self-interest in career advancement, efficiency, cost control, and profits are suspected to lie behind words about quality of care as the not so disguised, hypocritical primary values of health-care professionals. [9]

However, he holds out hope for biomedicine as he describes a way that physicians could better resolve this inner conflict.

The pedagogy for engaging hidden values and divided selves is the moral building of the clinician as a fully developed human being. Such pedagogy uses the humanities not to educate students to be social scientists, humanists, or ethicists, but instead to cultivate and develop a deeper, richer, and more receptive sensibility: critical, aesthetically alert, and morally responsive. It is this sensibility that animates and is animated by the everyday practice of caregiving... [9]

There are glimmers of hope that Kleinman’s wishes may come to fruition. The Medical College Admissions Test in 2015 will include a section called “Psychological, Social, and Biological Foundations of Behavior” that will require all American pre-medical students to prepare for their medical careers in new ways. Graduate medical courses in social medicine are becoming more common and better liked, as are courses concerned with meditation, therapeutic touch, and longitudinal care. At the same time, Dr. Hunter “Patch” Adams (famous for the eponymous 1998 Hollywood film starring Robin Williams) and his Gesundheit! Institute have been advocating fiercely but unsuccessfully for more than 40 years that our nation redesign its structures in a more person-centered manner. As a second-year medical student myself, with only a few weeks separating me from the wards, I am grateful and impressed that I have been taught to have as much awareness as I have of the issues I address here. At the same time, I am curious to see how and why I will succeed and fail to give meaningful care as my training continues.

**Conclusion**

I have attempted to clarify central elements relating to healthcare, not as a political problem but as a philosophical entity. I presented health and illness as conditions related first and foremost to personhood, elevating them beyond the purviews of biomedicine and disease alone. Concordantly, I introduced caregiving as the maintenance activity of personhood, which functions to alleviate suffering. With these terms in place, I applied them briefly in a discussion of medical education to give new critical language to the uneasiness and dissatisfaction a number of individuals in training and in the field bear.

I understand the ambition of my definitions and welcome critical discourse as much as further application of these terms. My greatest concern is that, as political discussions and fiscal debates revolve in their perpetual ebb and flow, the humanity that we ought to aspire to is forgotten. It is of the utmost importance, then, that we approach purpose and action – within healthcare and beyond it in our lives – without forgetting the ideal breadth of our concerns or the ideal humanity of our activities.
Endnote

a ‘Lifeworlds’ are the specific sets of epistemological referents, values, and practices implicitly accepted and shared amongst groups of individuals (ie. Heideggerian referential totalities). One could less precisely explain that one’s lifeworld consists of all the things one takes for granted as normal.

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References


Three Lessons in Global Health Management

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Amongst global health practitioners here at Harvard, it is often said that global health is not yet a discipline, but instead, more accurately, a set of interdisciplinary problems. Given the diversity of fields that global health spans, one must continue to learn global health continually throughout one’s career. However, the things that we need to learn in this line of work are not purely epidemiological, clinical, legal, or otherwise based in formal scholarship. Rather, it is important also to acknowledge and to learn from the often overlooked underlying natures of both global health projects and management in general. Below, I briefly present three invaluable lessons I have learned as the executive director and co-founder of a global health nonprofit, Community Health Council (CHC).²

#1: Alone, You Can’t Do Much
A few years ago, when I was working in the CHC office in Cambridge, Massachusetts, I can vividly recall the 17 other people working there, all of whom were under my direct management. It helped me to keep track of everyone to require all employees to keep records of their upcoming assignments for each day in shared Google Calendars. One morning — I still can recall — it was about 9:15am, and I was still sipping my morning coffee. Going over everyone’s Google Calendar, I was able to see in a single glance the assignments that everyone was working on from 9 AM to 10 AM and an amazing feeling washed over me. I was able to see, in real-time, that 17 hours worth of work would be accomplished before I finished my morning coffee. It was a great revelation. Seventeen hours, after all, would have been a long day’s work for me. In this moment, however, we were accomplishing this workload in one hour. In this moment, I felt the true power of having a team help you with the legwork, and indeed, there is a lot of legwork to be done in global health work.

To illustrate further the power of teams, I often share an analogy from the life of Walt Disney. A “person-year” is equivalent to 2,000 hours of work (40 hours per week times 50 weeks per year equals 2,000 hours per year). Snow White, the first cartoon-movie, required two-million drawings and 200 person-years worth of work. This means that if, in February 1936, Walt Disney had begun drawing the first pictures of Snow White alone, he today would have only the first 31 minutes of the movie completed. Because Walt Disney, in February 1936, had a team of 900 people, Walt Disney Corporation was able to release Snow White before Christmas, just nine months after beginning. When I told this anecdote to a friend, an executive at a Fortune 500 company, he shared with me that it was recently determined that his company’s marketing department alone had accomplished in a person-eon of work the past year — that is, a billion years’ worth of work for a single person. By bringing to bear this volume of hours on today’s global health crises, we will be able to affect real change. Let’s consider how this compares with working alone. Even if you work 100 hours per week, 50 weeks per year, you are still only accomplishing 6,000 hours’ worth of work every year, which is not enough to affect change at the population-level. It is important, therefore, to answer one of two questions: “What team do I want to join?” or “What team do I want to build?”

#2: Know When to Take Off the Turban

In applying a philosophy of teamwork, one sometimes find oneself caught amongst the competing interests of different parties or individuals, struggling to keep people and partnerships together. In order to maintain unity, it is important to compromise but it may fall upon one’s own shoulders to broker this in times of stress, often putting aside one’s own preferences in the process in order to achieve goals and avoid conflict. This kind of situation reminds me of an anecdote I once heard about Mohandas K. Gandhi, the Indian civil rights leader of the early 20th century. Early in Gandhi’s career, before concluding that India must have independence from Great Britain, he, a lawyer by trade, had taken the British government to court to in order to contest the legality of racist laws that enforced untouchability in British India. However, he was wearing a turban as he was about to walk into the courtroom, and the judge would not let him enter unless he removed it. Gandhi removed his turban and entered the courtroom, and many of his supporters were very upset by the compromise. Gandhi explained, “On this day, we were not fighting for our right to right to wear our religious garments in a government building. We were in court to fight the immorality of untouchability (paraphrased).” Gandhi would later write that, if one compromises on the non-essentials, one is more likely to achieve the
"essentials." Indeed, Gandhi had won that court case, which would not have been possible had he refused to remove his turban [1]. From this, we derive our lesson: know when to take off the turban. Compromising on non-essentials helps one achieve what’s essential and it is an important skill that can be employed to keep teams and partnerships together. This, after all, is essential in the pursuit of ambitious objectives.

#3: Success is a Batting Average — Take Your Next Shot

When a baseball player gets a .300 batting average, it means that he gets a “hit” 30% of the time. The other 70% of the time, he is getting “out” in some way. Yet, we consider a 30% success rate to be so impressive that we put many such players into a museum (the Hall of Fame). The former president of Motown Records in the 1970’s, Skip Miller, once told me “I’m a 5% man…because only 5% of my artists generate most of our revenue.” This person, at the top of the music business, expected of himself a batting average of .050. Yet in medicine, when it comes to serving patients, we expect extraordinary batting averages of 0.950 and above. All this is to say that it is important to know what sort of “batting average” to expect from yourself in a given project; it is easy to imagine that a baseball player who expected to bat .950 might be perennially frustrated. More than this, if we can learn to think of success itself as a “batting average,” we’ll probably be more effective in the field. Sometimes you strike out, but other times you get a hit, so it is important to set batting expectations appropriately. Your attitude will affect your happiness and your ability to push forward on a project.

Consider also the advice of Mike Krzyzewski, head men’s basketball coach at Duke University, who advises players to always be thinking of the next shot. Krzyzewski teaches that if a player is thinking of his last shot, and it was a miss, then at the next, he will be more likely to miss again because he’s shaken up from the last [2]. If he hit the last shot, then the player is likely to be cocky, and thus in fact more likely to miss the next shot. For this reason, Krzyzewski says, he does not keep track of his wins or losses. Put your last shot out of your mind completely. Learn from your failures but avoid dwelling on them — put them out of your mind when it is time to move forward. At the same time, do not keep track of your successes; sooner or later they may make you cocky or complacent and cause you to miss your “next shot.” This advice very nicely complements the idea of success as a “batting average,” for it teaches us how to behave when we miss (or hit) our most recent shot.

Conclusion

To be sure, in global health — a discipline that many say does not yet exist — there are many occasions to reflect upon the philosophy of batting averages, both after the occasional home runs and the all-too-common strikeouts. In all cases, we can seek to increase our batting averages and achieve our goals by working in teams. In global health, as in other fields, population-level impact can only be created now through large teams, for it is not individually possible to put forth the hours required. There is no choice but to work together — we cannot work alone. One must answer one of two questions: “What team do I want to build?” or “What team to I want to join?” Thereafter, each person will necessarily encounter the need to “take off the turban” at times, but the results are worthwhile.
Endnote

a Learn more at www.communityhealthcouncil.org.

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Biomedical Image Analysis as a Diagnostic Tool in the Clinic

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Biomedical Image Analysis is a well-established field of research that is beginning to emerge as a potentially fruitful diagnostic tool in clinical medicine. Advances in imaging instrumentation have allowed us to visualize the natural world with greater clarity than ever before. In the laboratory, we utilize imaging to evaluate biological phenomena at the molecular, micro, and nano-scale to derive an understanding of underlying mechanisms. In the clinic, we utilize imaging to evaluate gross anatomy and diagnose various forms of pathology. Three imaging modalities in particular, Computed Tomography, Magnetic Resonance, and Ultrasonography, have revolutionized the diagnostic capacity of clinical medicine. At present, image interpretation by a physician is largely qualitative and occasionally supplemented by manually-acquired quantitative measurements. Advancement in scientific computation has vastly expanded image-analysis capability, and opened the door to automated diagnostic functions yet to be developed.

Patient images contain a wealth of information in the form of objects and patterns. The crux of image analysis is the conversion of this image data into quantitative information. A computer is able to derive meaning from these image features by exploiting morphological, color, and intensity metrics. Image analysis generally follows a universal sequence: image acquisition, artifact mitigation, feature extraction, measurement / thresholding, and clinical correlation. Utilizing this process, computational image analysis provides a way to answer meaningful clinical questions.

Computerized image analysis offers several advantages over human vision analysis, mainly in the form of quantitation, automation, and reduced need for human intervention. Qualitative human evaluation is subjective and not standardized, which results in a relatively low inter-observer reproducibility in reading patient scans. Utilizing a quantitative method such as computerized image analysis allows for standardized, repeatable analyses able to be performed by multiple clinicians. This process decreases likelihood of human error-associated inaccuracy.

Another advantage is automation: computerized image analysis is an automated process which exploits the computer's inherent superiority in rapid calculation and handling large volumes of data. This is especially important in three-dimensional analysis whereby data is abundant and analysis can be complex. Image processing time is dramatically reduced which allows greater patient volume handling and an overall improved clinical workflow efficiency. Further, computerized image analysis automates tasks typically conducted by a human. Imaging "pre-reads" (any form of superficial or first-pass interpretation of a medical image) may now be conducted by a computer instead of a clinician.

Automated image analysis and computer aided detection as a research domain is in its youth, but promising studies have emerged recently. Examples from the literature include studies that have proposed methods for automatically detecting micro aneurysms from digital fundus images [1], masses and micro calcification clusters in mammography that are precursors to breast cancer [2], thyroiditis in ultrasound images [3], and cardiac ischemia in myocardial perfusion CT images [4].

Fu et al. describes a computer-aided diagnostic system to classify colorectal polyps by type in colonoscopic imaging [5]. The technology utilizes image-analysis techniques such as component transform, texture analysis and support vector machines to differentiate polyps. The classification performance of the proposed
technology outperformed conventional visual inspection (evaluation by a physician). This work is a prime example of how image analysis can extend beyond detection functions and provide meaningful clinical insights – potentially better than human analysis.

Segovia et al. proposed a technique for automatic diagnosis of alzheimer's disease utilizing both PET imaging and neuropsychological test data [6]. Prior work in this research domain has established computer aided diagnostic methods for dementia utilizing image analysis exclusively. The team showed that in all test cases, the accuracy achieved using both neuropsychological scores and imaging data was substantially higher than the one obtained using only the imaging data. This study is particularly impactful as it shows the breadth of clinical application for image analysis techniques, especially when used in conjunction with other clinical data.

Looking forward, diagnosis of cardiovascular disease is an effort particularly amenable to developments in image-analysis technology. There is a large body of research around Coronary Artery Disease (the number one cause of human mortality) that deals with characterization of high-risk plaques as they appear in various imaging studies. Harnessing this knowledge in order to detect vulnerable plaques prior to a potentially fatal heart attack would prove impactful from a public health perspective. Application of image analysis techniques to cardiovascular disease is currently an area of intense research and should be supported further.

Today’s critical healthcare problems require a multidisciplinary approach to yield innovative solutions. Biomedical image analysis is a field of research which applies engineering principles to the biomedical sciences and medicine. Automated image analysis technology has potential to improve clinical workflow efficiency, tighten diagnostic accuracy, and reduce clinical resource utilization and their associated costs. In the future, image analysis paves the way for automated diagnosis that may eliminate physician involvement altogether. Whether or not the algorithm’s output is the definitive diagnosis remains a point of contention, so for now, this type of technology serves to guide physicians. When image analysis algorithms develop into more clinically robust tools, we must be ready to implement them into our diagnostic protocols and discuss their value for patient care.

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Playing with Fire: Linking Intelligence to Our Genetics

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The race to map the genetic underpinnings of intelligence is on, and Chinese sequencing powerhouse BGI is in the lead. In August 2013, BGI (formerly the Beijing Genomics Institute) set out to determine the genetics of genius using next generation sequencing technologies and is arguably the most capable entity in the world to
find the truth [1]. With more than 150 sequencing machines, it has the largest genetic sequencing facility in the world, and it has already sequenced more than 50,000 genomes[2]. BGI has previously applied its sequencing throughput to unraveling the genetic nature of several diseases, including autism and obesity [3]. Its workflow is fairly simple: find people with a trait to be studied, compare their DNA sequences with the genetics of people who lack the trait, and then channel the Ts, Cs, Gs, and As that make up each individual’s genetic code into large data centers where the institute’s thousand or so bioinformaticians begin digging into the heaps of data. To accomplish its next sequencing tour de force, BGI has spent the past several years investigating the genomes of approximately 1,600 highly intelligent children, and it is in the process of probing the data.

Attempts to identify such genes are usually met with criticism and embroiled in controversy; many experts claim that it will forever remain impossible to predict IQ, even with hundreds of thousands of genomes sequenced [4,5] . The intellect is a complex trait that relies on the interaction of thousands of genes. When Robert Plomin, a geneticist at King’s College London, attempted to find common genetic variants that could explain intelligence in 2010, he could not find one single variant amongst more than 350,000 possibilities across the genes of more than 7,900 gifted children [4]. And even if IQ could be mapped down to specific mutations, intelligence is still thought to be approximately 50-60% environmental [6].

However, more important than the question of whether BGI can accomplish this feat is the question of whether it should. Many scientists shy away from studying the genetics of intelligence due to ethical considerations and public pressure [4,7]. Science, public opinion, and ethics are intimately linked; ethical dilemmas have often altered the pace of discovery, recently, for example, in stem cell research when the currents of controversy slowed the advancement of science. It was not long ago that political bans prohibited the use of public funding for stem cell research, limiting progress for nearly a decade [8]. The currents were fortunately reversed in 2009 when Obama lifted the ban and opened up hundreds of millions of dollars for the field and sent a message to an international scientific community that stem cell research was open for business again. The ethical implications of sequencing controversial traits like intelligence have not resulted in any policy restrictions yet, but these could be on the horizon. Therefore, we must critically consider the implications of a genetic map for intelligence.

Some warn that success in mapping intelligence could herald a dark and gloomy future, with eugenics regaining popularity and societies scrambling to raise their collective IQs. It would be a future where prenatal whole-genome sequencing has become common practice and parents screen for desirable traits, including intelligence, and terminate as necessary. They might begin to screen in vitro for fertilized embryos with their preferred traits. Babies might one day even be genetically engineered, opening up many different possibilities. In one future, as explained by Geoffrey Miller, an evolutionary psychologist at NYU Business School and the University of New Mexico, each generation of selection could increase IQs by 5-15 points resulting in a society of super intelligent citizens after a few generations [9].

While this future might be hard to imagine, in some ways it has already arrived. Sixty to ninety percent of pregnant women with positive tests for Down syndrome decide to terminate the pregnancy [10]. A woman might terminate for many reasons, but on the whole it is conceptually difficult to separate this practice from
terminating babies because their IQs are not high enough – both are cases where the child could reasonably be expected to live a happy and fulfilling life but is terminated due to some undesirability from the parent’s point of view. So, if we as a society permit screening for intelligence, what about for other undesirable factors such as obesity, addiction, or depression?

The controversy against sequencing intelligence is by no means a new debate. During the Human Genome Project, similar criticisms were raised, including that employers and insurance companies would genetically discriminate against people, developing a disease is not guaranteed by genetic risk factors, people would misunderstand their own genetics, prenatal screening would allow parents to select specific traits for their fetus, and that the social ramifications of behavior-based genetics would have negative societal effects [11]. The debate regarding prenatal screening is so familiar today as Murray and Llvny argue with regards to the discovery of a gene for red hair:

“As inconceivable as it may seem to end a pregnancy because of red hair, one can imagine prospective parents recalling the misery of their own childhood as redheads and insisting that they are not willing to inflict similar suffering on their offspring.” [11]

Clearly, they were as worried in 1995 about prenatal screening traits as we are today in 2014. And the debate raged even deeper to social and moral issues like intelligence with regards to crafty individuals pushing political agendas because of behavioral implications of genetics with regards to issues like violence or socioeconomic status. Is it fair for people to be destined to a certain life of prison or poverty because of their genetics?

But the real issue is not the similarity of the debate of today with the debate of the 90s, but of the discoveries we might have never achieved if we had just given up on the promise of the genetics – that is the unknown unknowns tend to be the most fruitful results of any endeavor. After more than a decade after the completion of the Human Genome Project, the studies based on the human genome have elucidated the biological mechanisms of a variety of diseases from cancer to psychiatric disorders. It even ushered in a therapeutic revolution with regards to targeted therapies for cancer based on the genetic mutations present in a patient’s tumor. Developments such as these would have never been predicted prior to the human genome, but yet have saved so many lives.

The present day issue of sequencing intelligence might bear similar fruits. A genetic map for intelligence could help screen for children who have a strong genetic intelligence but might not be realizing their full potential due to environmental causes or could even help isolate developmental problems in these children from birth. Because environment contributes significantly to intelligence, augmenting a child’s education early in their development could compensate and prevent permanent disabilities. There are many useful and positive interventions that could be informed by a better understanding of the genetics of intelligence, and these goals are worth pursuing – and of course there are unknown unknowns we can’t even predict, but are just as worthy.
There is enough that is uncertain in the world – let us not hesitate in answering the rare questions we are poised well enough to ask. Fear of the worst case scenario will keep us from realizing the best. Entrepreneur Jonathan Rothberg is someone forging ahead in this spirit. After having helped sequence the genomes of a Neanderthal man and James Watson, he announced in October 2013 that he is now embarking on a study he calls “Project Einstein”. Rothberg plans to uncover the roots of mathematical genius by sequencing 400 mathematicians and theoretical physicists from top institutions around the world [12].

Big steps in the history of mankind have often been met with skepticism and intense criticism; I would argue that understanding the genetic underpinnings of intelligence and having a map that would allow us to maximize it are great potential steps that lie close ahead. We live in an age of information where we know more than ever about ourselves, including our genetic backgrounds and future health. As we delve deeper into our biology and acquire more tools to probe our makeup, we must not shrink from the topics that unsettle us. Knowledge is power. The potential benefits of understanding at a genetic level every aspect of our personalities, our brains, and our health outweigh the costs and potential detriment to society – which can be limited through thoughtful social and legal policies and national legislation. We should celebrate this genetic power, but not abuse it.

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Essence to Essence

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Illustrations created and provided by author (SS).

I have been warned more times than I can count that medical school will change me for the worse. That I will burn out in the face of mind-numbing paperwork, cynical co-workers, and an endless supply of unjust suffering. That healthcare’s culture of workaholic martyrdom will melt the ‘me’ right off of my bones. That I will become a sterile cog in a broken machine.

My response as I was entering medical school? “Pfffttttt.”

I mean, come on. I had handled difficulty before. How could medical school be any different? A part of me felt that my would-be “advisers” were underestimating my passion and talent. Or perhaps they were projecting their own regret onto my opportunity. Well, they didn’t know me. I was confident that while medical school would be a challenge, I would make it through with my soul intact. And truth be told, medical school began as I had imagined it: I was exploring a new city, learning constantly, and making a ton of friends. All was
...at least for a while. About six months into my first year, things began to feel out of place. At first, I figured I had caught a mild case of the existential fever others had warned me about before. Okay, I admitted. So I'm not a hotshot. The learning curve may have hit me like a brick wall. And I might not remember why I signed up for medical school in the first place. So it goes. But soon I was admitting that I might not remember the last time I drew anything. Or listened to music. And that I actually couldn't think of anything I found enjoyable. And I might have lost my sense of taste. And I might not see a reason to go to class. Or to get out of bed. Or to live. But hey, whatever. I'd be fine. I couldn't recognize myself in the mirror, but I'd be fine.
But I wasn’t fine.

My emotions stopped. My thoughts and movements stiffened to a halt. Death began to seem like a pleasant option compared to this total nullification. I realized all of this probably wasn’t what people were warning me about before I entered medical school. Something entirely different was happening – my brain had somehow broken. At some point it was explained to me that I had bipolar disorder. The diagnosis consumed me. Every thought, word, action, and relationship in my life now seemed best explained by my newfound insanity. I was sickness.
The day eventually came for me to return to medical school, and I felt beyond unprepared. How was an ill person in any position to heal another?

I would have to find out on the job, I guessed.

My physician mentor whisked me into the room with a fifty-something-year-old patient and his wife. The doctor began to list the man’s latest signs and symptoms: off-the-charts blood chemistries, cardiac arrhythmias, and possibly cancerous polyps in his irreparably scarred GI tract. The patient was entering the final spiral of chronic alcohol abuse. His wife received the news with grinding ambivalence. This visit might literally have been the hundredth time she and the physician have tried to stage an intervention for her husband. The patient stared emptily at the floor; his eyes glinting like the bottom of a whiskey bottle. Yet another conversation going nowhere.
As the wife and the physician spoke more and more, I learned how the patient’s life had been sucked dry by his affliction. Such a relatable emptiness! I felt a sudden stir within me, someone familiar choking back to life. And to my surprise, I began to speak. The patient turned his jaundiced eyes toward mine in reply. Our gazes locked, and before I knew what was happening, I was making an attempt to locate the person, the man in the bottle. I asked him questions about his frustration, disorientation, humiliation, and all those other messy emotions that come with a dislocated identity. Questions for him. Questions that alcoholism couldn’t answer.

And he responded. For a brief moment, we encountered one another. No medical student. No patient. No bipolar disorder. No substance abuse. No good. No bad. People.
The moment went as quickly as it came; the rest of the visit was pretty mundane. The doctor and I counseled the patient and his wife about different options for his ongoing clinical management. They thanked the doctor and me for our time, and left the room smiling. My instructor gave me some pointers, and we were on to the next case. Only as I left the hospital did the awe strike me.

Wow.

As a medical student and future doctor, I expect to see a lot of people who never thought they would join the Imploded Identity Club.

My hope is that my personal hell has prepared me to find those moments to step out of the hospital’s indifferent chaos and be present with others as they are. Human essence encountering human essence.
For both their sake and my own.