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We would like to dedicate this issue of the Journal to the speakers during our First Annual Medical Dialogue Symposium: Dr. Lewis Goldfrank, Dr. Elizabeth Norman, Dr. Barry Goldstein, and the American Red Cross in New York.

About the Cover Art

“Sourire Sincère” by Beth Koh

Being in the medical field as a researcher, a nurse, or a surgeon, is highly noble. However, medical workers often forget what is most important: being able to emphasize and relate to their patients. This skill cannot take a year, five years, or even ten years of medical training to learn. Expression of emotions, being universal to all, can be achieved even through a language barrier and is a true connection between the doctor and his patient, which is essential to establish trust. This drawing depicts many different smiles that a medical worker may encounter, whether it's the smile of the patient out of relief, the family of the patient out of appreciation, or the doctor himself out of comfort. But, the smiles are only one emotion to which a doctor should pay attention, although here the smiles are representative of emotions as a whole. Doctors cannot forget that first and foremost patients are humans, with desires, needs, and feelings.



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Table of Contents

Letter from the Editors	4
The Illness of Healthcare Lee H. Igel, PhD.....	5
Interpreting the language of healthcare Neha Sathe.....	7
Trust and Responsibility Domenech Asbun	11
Who are “They” Anyway? Tyler Barnet.....	13
Whole Foods or Hole in Your Wallet: A Look into Organics Irene Lou and Jennifer Lee.....	15
A New Kind of Medicine: Mining the Computational Universe for Models in the Biomedical Sciences Garrett Neske.....	17
Value and Potential: a Defense of Medical Panhumanism Seth Weisberg	22
Humans are Imperfect –Doctors are Humans Nina Ng	25
Reaching for the Elusive Gold David Lebowitz	27
Patient’s Perspective Ann Carletta	32
HPV Vaccine: The future of gynecologic oncology now Keren Eztion and Kelleigh Briden	35
Sub-Sahara African Government’s Influence on the Socioeconomics of the AIDS Pandemic Calvin Lambert.....	39
Four Simple Steps to Learning the Art of Whole Person Healing William Shin, MD.....	45



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Letter from the Editors

Dear Reader:

We are very excited to present to you this first issue of MDR, the Journal of Medical Dialogue Review. We aim to present to you issues, trends, and opinions in medicine without the technicalities and jargon often found in academic medical journals. Our journal shall be of interest to everyone, including aspiring physicians, nursing students, current healthcare practitioners, as well as the general public. It shall be a bridge between the people affected by healthcare, the people currently practicing healthcare, and the ones who hope to be effectors of the healthcare system. In our journal, you will find reviews and perspectives from not only outstanding undergraduate and graduate students, but also from patients and current experts in healthcare.

This Fall Issue starts with a professional analysis of the current state of the healthcare system by Dr. Lee H. Igel, Clinical Assistant Professor at NYU's SCPS, and ends with clinical advices from Dr. William Shin, a practicing Pediatrician in the City of New York. In our Medicine and Society section, Neha Sathe presents a case depicting physicians literally being lost in translation, where simple language barriers can hinder the quality of care; Irene Lou and Jennifer Lee take a closer look at organic food and the ideas currently associated with them; Tyler Barnet questions the credibility of "They," whom we often take as the paragon of expertise; and Calvin Lambert reviews the effects of Socioeconomics on AIDS patients. Briden and Etzion also present some very interesting insights on the HPV virus. Our medicine and humanities section features a philosophical argument against Darwinianism by Seth Weisberg; a perspective of a student-intern on trust and responsibility in medicine by Domenech Asbun; and a patient's perspective based on her experience during neurosurgery. We also have a Literature in Medicine section featuring the works of Nina Ng and David Lebowitz, both influenced by the work of Atul Gawande, yet presenting distinct views on some medical readings.

As a reader of MDR, you are undoubtedly included in a circle, where dialogues about medicine are supported and free ideas about the healthcare system are exchanged. We challenge you to get inspired, to think critically about what you read, and to question what you learn. We encourage you to research areas of medicine that interests you and to submit your own article to MDR. Starting from the next issue, you will be welcome to submit "letters to the editors," where you can publish your own opinions about a previously published article. We hope that you really take this opportunity to explore medical issues pertinent to yourself and to society.

On behalf of Medical Dialogue, we genuinely want to thank you for choosing to read MDR and we look forward to continue serving you!

Sincerely,

The Editors of the Medical Dialogue Review



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The Illness of Healthcare

Lee Igel, PhD

Within 5 or 7 years, as the physician workforce experiences the zenith of the natural progression of younger workers coming in and older workers going out, medicine will have completely evolved from the historically very personal form of healthcare delivery to a mostly impersonal form. Contained in this transformation are wholesale professional changes. These changes are, individually and collectively, the result of changes in values, expectations, and objectives that have already occurred but that have not yet been negotiated—and that means healthcare delivery remains based on relic assumptions. What has been missing is a diagnosis of the tragic condition of healthcare as the result of a withering away of its traditional structures and its move to pluralism. This broad disconnect makes healthcare different today than during any other century and that makes it entirely different from the type of healthcare most people expect.

Medicine today continues to operate on old world sensibilities and the persistence of nostalgic beliefs. The overall growth of the United States population, an increased demand for physicians' services due to economic expansion, an increased demand for more medical care by an aging population, an increase in malpractice insurance premiums and concomitant legal issues, insurance carriers that dictate practice methods and income, physicians' salaries that lag behind the rising rate of inflation, the retirement of practicing physicians, the fact that physicians spend long hours—an average of nearly 60 hours per week—involved in professional activities, a

general decline in productivity, and geographically-dependent lifestyle effects are broad strokes that make today's medicine already structurally divergent from the historically personal form with which most of the middle-age and older population is familiar.

As the majority of the population moves through mid-life and into elder years, healthcare will assume the proportions of every social, political, and economic decision because health is a most basic need of every person. But almost every scholar, politician, practitioner, public advocate, and member of the press who has proposed a "reform" has overlooked this simplicity. This makes the prescriptions of reform disappointing for no other reason than partisan politics and economics cannot resolve what is actually an issue about the advancement of change in the institutions conserved in our free society. And, just as important, the proposed programs mistakenly deal only with surface social phenomena and inseparably dismiss social analysis.

Below the surface is the fact that the practice of medicine—and the doctor-patient relationship from which all healthcare provision in our society emanates—has already begun to bifurcate into a profession that is not only female-determined, but one that is also age-determined. It is significant that one extreme social transformation has proceeded with a minimum of attention from anyone who is involved with or utilizes healthcare: the physician workforce that existed in the United

States before the last quarter or third of the 20th century had been male-determined from the start; it is now becoming female-determined. The incitement of this latest revolution in American healthcare is evidenced by the fact that females now account for half of all medical school applicants where thirty-five years ago they comprised less than one-tenth of the applicant pool. Socially and psychologically, this shift will alter every traditional impression of the physician. Nothing like this has happened since females began replacing male teachers during the 19th century. Economically, the increasing number of females in the workforce has already changed things in momentous ways. Chief among them has been the growth in the number of females who join the physician workforce and who also continue to involve themselves in traditional roles at home, which has been the driving force behind flexible work schedules.

Female physicians born during the time between the early 1960's and as late as 1980 were among the first band of physicians to demand flexibility and variety in their schedules. When these requests were accommodated, male physicians of the same generation requested similar elasticity in their schedules and then so too did physicians en masse. But these accommodations, granted by physician-employing organizations, have often been without systematic contemplation of the implications of acquiescence and that has helped make flexible work arrangements, which have traditionally been disparaged by the medical profession, the prevailing characteristic of the latest healthcare evolution. This is a factor of something to which not even a handful of people are even beginning to pay attention: the older population of physicians assert different expectations about their work compared to the younger generation of physicians.

Physicians of the Baby Boomer generation—those 45 years old and older—have experienced dramatic, almost 180-degree, practice management changes throughout their careers. They most likely began and spent most of their careers in private practice as solo

practitioners or in small groups, but are now likely employed by or similarly associated with a large healthcare organization. These physicians convey satisfaction in their jobs because they are entrenched at a point in their careers where they are given opportunities to voice their opinions and make high-level decisions. Practicing medicine has also provided a respectable level of affluence for most members of this generation because of less-stringent economic constraints on medicine during the early and middle years of their careers. But younger physicians have been largely deployed into the field during a time when medical practice management has been relatively static, having been run by an organization of some form or another. In the not-too-distant future, every working physician will for the first time in the United States have been enveloped in a career-long bureaucratic system that systematically leads to a more impersonal, less satisfying work experience. Like professionals in other industries who do not find satisfaction in their jobs, physicians will increasingly turn to activities outside the workplace in order to balance out their dissatisfaction. Such sentiment, though largely shrouded by more pressing surface concerns, has already made dealing with physicians who view their work as a “job” rather than a “calling” the central management issue of every healthcare organization and every healthcare consumer over the past 20 years.

Over the past quarter century, while the demanding modes of change experienced by physicians and patients have not radically changed the elements of healthcare, the clearest indication that healthcare—and medicine, in particular—is no longer composed of “mom-and-pop” type outfits is that what used to be a “physician” is now a “provider” and what used to be a “patient” is now a “consumer.” But while we know that medicine is today less a social institution than it is a business institution, we have not yet accepted this reality. We have not yet accepted that today the most obvious expression of the healthcare system is that it has bypassed the doctor-patient relationship in favor of a system almost totally defined by group

practice relationships, health maintenance organizations, and “managed care.”

We are now more than fifteen centuries since the Greek physician Hippocrates “modernized” medicine, having discredited the Cnidian convention that favored diagnosis and classification of diseases over attention to the individual patient. Though a regard for the former remains a matter of disrepute in the practice of medicine, it is a concern for systems, not people, that has again become policy and practice throughout healthcare. A reliance on systems has ushered in the era of consolidated healthcare organizations—“healthcare blocs”—that are the integrated units of modern medicine. The goal of each bloc is to establish internal support and alliance, and to eliminate and protect against any internal and external barriers, limitations, and obstacles by investing in the creation of institutions for the bloc to be effective. Within each is the oft-concealed belief that economic progress is the highest, most justifiable goal and the lingering question, “What is the return on investment?” This is, fundamentally, Economic Medicine. But now the urgent question is whether this institution is alert enough and engaged enough to handle the New Medicine.

That is, has Economic Medicine integrated the principles and philosophies of Hippocratic medicine? And by virtue, will the New Medicine integrate these principles in a way that is socially, politically, and economically meaningful today? From any given historical point, it is true that healthcare has existed primarily to preserve the well-being of human beings. It is equally true that healthcare has always entailed the prevention, treatment, and management of illness if human well-being is to be preserved. What has changed—and what we can reasonably expect to continue to change—are the conditions and requirements of a healthcare system as it functions in society.



Interpreting the Language of Healthcare

Neha Sathe

Complaining of abdominal pain, a three-year old girl was brought into the emergency room of a local hospital by her Spanish speaking parents. It was late, and no interpreter was available. The girl's physician spoke no Spanish, so her parents could not properly communicate the girl's condition to the doctor. The physician diagnosed the girl as "colic" and sent her home without a prescription.

An hour later, the parents returned to the emergency room, believing that something was still wrong with their daughter. The same physician treated the girl again. Still, no interpreter was present to convey the extent of the problem. The little girl was discharged again, though this time with a prescription.

For a third time that night, the family came back to the hospital. By this point, the girl's condition had escalated—her abdomen rigid, the tenderness and fever growing. After finally admitting her, doctors found that she possessed a perforated appendix and peritonitis. She remained in the hospital for thirty days due to complications¹.

This case, though extreme, illustrates the impact language barriers have on obtaining adequate healthcare. As the hospital had no resources available to address these barriers, the limited communication between the parents and the doctor probably led to the initial misdiagnoses of the little girl.

In another, more serious situation, a Spanish speaking teenager told his girlfriend that

he was "intoxicado" before fainting. When his girlfriend called the paramedics, they understood the word to denote "intoxicated," while the intended meaning was "nauseated." Consequently, the patient was treated for drug overdose for a whole 36 hours before being reevaluated to the new diagnosis of intracerebral hematoma with brain stem compression and a subdural hematoma secondary to a ruptured artery².

In this case as well, poor communication made a critical difference on the treatment of the patient, greatly diminishing the quality of care. Altogether, they present a grim picture of the difficulties that limited English proficient (LEP) individuals face in healthcare settings.

With the percentage of the total population who speak English less than very well increasing from 4.8% in 1980, to 6.1% in 1990, and 8.1% in 2000, such instances of language barriers present a mounting challenge to hospitals around the nation³. In fact, one study at an inner city hospital found that Spanish-speaking parents most frequently cite language problems as the greatest barrier to getting healthcare for their children. Language issues were cited even over other significant obstacles, such as lack of health insurance, unreasonably long waiting times, and inability to pay hospital bills⁴. Research on other language groups is sparser, but a 2003 study in *The Journal of General Internal Medicine* showed that LEP Asian Americans share similar problems in language access to health, possessing among the lowest levels of satisfaction with the quality of their healthcare⁵.

Although many hospitals do possess translation software, telephonic interpreting services, and most importantly, trained onsite medical interpreters, the asymmetry of care between English proficient and non-English speaking patients clearly demonstrates that demand outstrips the supply. An earlier study found that 46% of LEP patients do not receive interpreters⁶.

When interpreters are finally used, hospitals frequently rely on ad hoc interpreters as means of communication. These types of interpreters include family members (often children), fellow patients, friends, and nonclinical hospital employees^{1,7,8}. Although this seems more convenient than communicating through telephones or calling down an interpreter, these ad hoc interpreters tend to make errors that are more likely to have clinical consequences on the patients, according to a study in Pediatrics. Specific examples of such errors include omitting questions about drug allergies and omitting instructions on the dose, frequency, and duration of a medication—items crucial to assigning patient treatment².

Furthermore, using family members as interpreters presents a variety of issues other than simple mistranslations. The role of a translator conflicts with that of family; therefore, family members often edit the message to the patient or doctor, essentially taking control of the situation. Such practices encroach upon the rights of the patient and threaten his or her confidentiality⁹. Additionally, these interpreters usually do not possess the training in medicine needed to understand a doctor's instructions, rendering them unable to translate accurately. It is especially risky to use children as interpreters because they often do not have a solid enough grasp on either language, let alone the particulars of medical terminology, to translate medical directions^{1,2,7}.

Despite these findings, hospitals often lack training programs to ensure the efficacy of the interpreters they do staff. Only 14% of hospitals across the country offer training programs for

medical interpreters, and in half of these hospitals the courses are only optional. With trained medical interpreters making the fewest mistakes in translation, hospitals should initiate more extensive training programs that stress translation techniques as well as concepts of healthcare and ethics². This improvement in the communication between patients and healthcare providers, in turn, can improve the quality of healthcare LEP individuals receive.

The government has obviously recognized the issue, mandating that all federally funded agencies, including federal hospitals must provide adequate resources for LEP individuals¹⁰. Moreover, access to healthcare is accepted as a basic civil right for all citizens, regardless of national origin; therefore, the absence of an interpreter effectively violates this right¹¹. However, hospitals still neglect to provide adequate interpretation services because the law is minimally enforced. Even LEP individuals aware of the laws surrounding language access and understand their right to an interpreter are usually unable to receive interpretation services¹².

A 2002 Office of Management and Budget (OMB) report analyzed the implementation of this law, finding that providing translation services in hospitals, private physicians' offices, dentists' offices, and emergency departments would cost the country \$268 million per year. This equates to approximately \$4.04 per visit by an LEP patient¹³.

Although these costs are manageable, one of the hesitations in enforcing the law and ensuring interpretation services is that the cost will lie on patients, physicians, and/or hospitals—all groups already under strain with the burgeoning costs of health administration and insurance. However, numerous studies have shown that these costs vastly outweigh the health costs the LEP population faces due to inadequate care.

The OMB report also suggests that providing proper care to LEP patients in the first place would reduce their need of health services

in the future, thereby reducing the cost of health care in that respect. This concept relates to the cases initially presented, where simple errors in translation resulted in drawn-out, costly hospital episodes.

Another approach involves having states pay for medical interpretation services under Medicaid or the State Children's Health Insurance Program (SCHIP). Currently, ten states use this method to provide translation services. However, Medicare currently does not pay for translation services. This oversight is significant not only because it affects the 2.3 million LEP seniors in the United States, but also because it is inconsistent with the federal government's stance on interpretation services as a civil right. Lobbying to change this policy may encourage private insurers and state Medicaid programs to cover interpretation services as well, as Medicare payment policies commonly influence the policies of other insurers¹⁴.

Through these methods, the government could enable healthcare providers to offer translation services to all of their patients. Examining how language barriers can lead to inferior healthcare reveals the necessity of government taking such decisive action to tackle this problem. This action may not be simple or costless, but ensuring everyone, regardless of language spoken, has access to quality healthcare is well worth that cost.

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Trust and Responsibility

Domenech Asbun

I spent the seventh month of 2006 interning with a group of surgeons at Hospital San Juan de Dios, in San Jose, Costa Rica. My time was spent observing the surgeons in all of their weekly practices, from patient consultations and check-ups to surgeries and the recovery room. Apart from the concrete knowledge I acquired—learning about anatomy, terminology, and the major pitfalls of laparoscopic cholecystectomies—I gained an invaluable understanding of the patient-doctor relationship. This aspect of the practice may not be something you usually consider when thinking about medical school courses, but I found it to be a crucial part of the profession that necessitates active insight and effort on behalf of the physician.

The first thing I came to realize is that a patient begins to invest his or her trust as soon as contact with the doctor begins. This observation came from the initial consultations, where people would first meet the surgeon and explain their pains and maladies. Disease makes no discriminations, and so all types of people—proud, worried, stubborn, optimistic—walked through those doors. I noticed that even the most well-informed patients were basically sitting across from the doctor for a reason: they had questions, problems, and wanted a solution.

By being on the receiving end of assistance the patients automatically invest their trust in the doctors and their abilities. There is no amount of pride or information that can bypass this phenomenon, as it is the doctors, and the doctors only, who have spent their lives preparing and

practicing this problem solving. And as soon as a doctor receives that trust, he or she is responsible for it. Anything the doctor says can be set as truth; a hint of worry in the doctor's voice can spark deep anxiety for the patient, just like an assuring smile can promise the patient a good night's sleep.

As an intern I would sit beside the doctor, in a wrinkled white coat with my last name marked onto the chest pocket and quietly paying attention. While the patients explained their concerns, they would often look towards me as much as they looked at the doctor. More than once I was directly referred to as "Doctor", and thanked for my help as well. Although I told patients that I was not actually a doctor but a college student, the patient would continue to direct his concerns towards me. Again, the patient was placing his trust in the doctor, and by being on the side of the doctor I was sometimes as much a recipient of it as he or she was. Even something like seeing a white coat on a person can be enough to subconsciously make a patient believe that I may know the answer. Besides the importance of a proper diagnosis, a doctor cannot and must not underestimate the psychological and emotional influence he or she has over other people when holding their trust.

The next step for the patients, if they required it, was the surgery. In terms of placing trust in another person, this is without a doubt the most obvious aspect of the profession. As a patient of surgery you are allowing a group of strangers to take your consciousness and open and expose parts of your body that you've never

even seen, hoping to emerge a healthier person. In surgery the physician must do everything in his or her power to assure that the physical medicine is being practiced as carefully and properly as possible. This extends beyond the blatant necessity for surgeons to acknowledge and observe their technical abilities. For example, if a surgeon (who before beginning the surgery is dressed in sterile coverings, something like large aprons with sleeves) brushed up against a non-sterile piece of equipment, he or she would pause the surgery and change the “infected” dressings to ones that are sterile, even if it was the only the surgeon’s shoulder that needed changing. Excessive? Not in the least—anything less would mean a risk of infection, and no matter how minimal the risk, it is there.

After the surgery was done, the patients would be sent to the recovery room. Some left within a day or two, while others found themselves in recovery for weeks. Some patients got to know most of the staff by first name, and could even recognize the American intern standing behind the residents during morning rounds. Thus, the patient-doctor relationship did not end with the stitching up of the patient at the end of surgery. For months or years afterwards patients still come back for check-ups with the physicians, and so the trust-giving lives on.

I saw that this third phase of the relationship is as important as the original two. Most explicitly, it is important because if a doctor does not care for the patient properly he or she may have a complication during recovery, which is good for neither the doctor nor the patient. Even such details as thoroughly explaining to a patient his or her condition are of significant importance.

Some of the patients that I met were bariatrics patients; that is, they were undergoing surgery to treat their obesity. One of the procedures I saw for this to correct basically reduced the size of the patient’s stomach to a small fraction of what it originally was. Now, if these patients go home without having been properly informed of the condition of their

bodies, they can potentially be back in the hospital the next day. The stomach, once reduced in size, is basically held together as a pouch by stitches. Therefore, if a patient does not understand the fragility of his or her stomach at the time, and if they do not understand how much of a commitment they have to make to a new diet for months at minimum, complications could arise from simple misunderstanding. All it would take is one meal of careless eating to send could potentially require them to the emergency room. For fairly recently operated patients, an eighth of a sandwich could be careless eating—they won’t know this unless the doctor tells them. They are *trusting* the doctor to tell them. This is a concrete example of the responsibility of physicians after the main procedure is finished, and in reality is very clear compared to other more subtle examples of the same principle.

From my time in Costa Rica I also came to another important conclusion. Apart from all the concrete reasons for adhering to the responsibilities bestowed by trust, a physician has another more encompassing—and more important—thought to consider. Doctors are *servicing people*. Not fixing cars or debugging computers, but providing a service to fellow human beings. Unless someone is willing to make this commitment, to serve the health of others for a living, he or she should not consider being a doctor. The patient, of course, goes to the doctor because of his or her position as a specialist, because he or she can do things comparatively few in this world have learned to do. Yet it is an expert that specializes to serve, nonetheless, and the fact that a physician serves humans in the most intimate way possible means that they must dedicate as much care and attention to their patients as they can. The process begins with a person and a concern, but develops into a life-impacting relationship worthy of the most thorough dedication on behalf of the doctor.



Who are “They” Anyway?

Tyler Barnet

Rumors often gain momentum by assigning “They” as an author and faulty claims give steam to medical misconceptions, some of them will be addressed in the following article.

Two girls gossiped nearby. “Did you know that ice water burns more calories than warm water?” I raised a brow and lowered a room-temperature beverage from my lips to the table. Rotating my head to watch her mouth move, I waited for more. “Yeah! That’s what they say.” I noticed the girls dish heaps of ice into their drinks—convinced that “they” is analogous to a boardroom of hoary-haired experts.

The word “They” is small, but it’s outgrown itself into an authority on nearly everything—especially the body. It is the Wizard behind the science of Oz, the silver bullet of unsubstantiated gossip, a word that connotes omniscience. “They” are the experts—predicting, instructing, defining, preventing. And if ultimately tossed to trial by counter evidence, “They” survives blame effortlessly; “They’re” invisible and located in the Nowhere.

For instance, despite its relation in sound, “Chlamydia” has nothing to do with the “Clap.” The “Clap” is actually Gonorrhea—the number-one most reported STD—and won its nickname from the obsolete French word for a sexual sore, *clapoir*. Chlamydia’s real slang moniker is the “silent disease,” because about three quarters of infected women and about half of infected men have no symptoms. *Both* the Clap and Chlamydia are bacterial infections, but are distinctly individual.

Many toss rotten apples at psychiatry and “They” are often guilty for the unfavorable reputation given to mood-stabilizing drugs such as Wellbutrin. Although drugs like Wellbutrin are arguably deserving of critique, the same approach should be taken when considering a popular smoking-cessation drug like Zyban. This drug is a brand name for *Bupropion Hydrochloride*, but so is Wellbutrin, which is therefore transitively identical to Zyban. Both are manufactured by GlaxoSmithKline who simply repackaged Bupropion after discovering its power to reduce cigarette cravings, going so far as to recommend equivalent dosages.

Antihistamines, often criticized for inducing fatigue, need some defense as well. Histamine in the body *is* the culprit chemical for allergic response, however histamine in the brain actually keeps us alert. First generation antihistamines— Benadryl (Diphenhydramine) and Doxylamine Succinate— are doubly sleep-aids found in drugs like Unisom and Nyquil because they contact the brain with ease. So, most over-the-counter snooze drugs are simply first-generation antihistamines and not novel concoctions.

It’s the second-generation antihistamines such as Claritin (loratadine) that have difficulty crossing the blood-brain barrier and are only effective in the rest of the body. Since the brain rebuffs *second-generationers*, they can’t interfere with the histamine active sites, which allows the person to remain alert and earns these antihistamines the title of “non-drowsy.”

It’s irritating to be at the end of drug companies’ strings— purchasing the same medicine twice because of smart marketing—or maybe we’re shamed when falsely linked to a disease. The overuse of “They” brings a murky problem into specific relief—a little curiosity will expose misconceptions. By making connections we can at the very least be keen consumers and reveal “They” are not the men behind the curtain.

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Whole Foods or Hole in Your Wallet: A Look into Organics

Irene Lou and Jennifer Lee

It seems that today's biggest trend in food is going organic. From organic fruits and vegetables to organic snacks and even ketchup, the organic craze has found its place in mass culture. How does something qualify as being organic, and is organic food really that much better for us? ¹

Organic is defined by Webster's collegiate dictionary as, "food produced with the use of feed or fertilizer of plant or animal origin without employment of chemically formulated fertilizers, growth stimulants, antibiotics, or pesticides." Basically what it breaks down to is that organic farming is done without certain food additives and chemicals used to speed up the growth or gain a higher yield. According to Consumer Reports, the price of organic produce is on average about fifty percent more than "regular foods" and organic meats usually cost twice as much². The concept of organic has become such a monumental trend in how we eat that it is being used, and often misused in food labels. *Caveat Emptor* (buyer beware) when purchasing such foods labeled "organic" or "natural." The United States Department of Agriculture states that if your label says simply "organic" instead of "100% organic," that you may be getting preservatives and other synthetic ingredients. Foods labeled simply as "organic" are only 95% organic; the remaining five percent of the ingredients can be non-organic and/or man-made³. In addition, labels with "all natural" on them are completely meaningless, because "natural" has not been clearly or well defined by

their standards. The Center for Science in the Public Interest (CSPI) lists gums, not the chewing kind, as a food additive. But gum exists in nature within bushes, trees, seaweed, and bacteria.⁴ Natural does not necessarily – and usually does not – mean organic.

So why then are consumers so willing to pay up to twice as much for their grocery bill? In 2003, the global organic market saw a 10.1% increase, growth bolstered by the increased demand for organics in North America.⁵ This insistence on organic we view as an urban phenomenon, whereas in more suburban areas people tend more towards freshness and foods that are non-processed. Posing some of these questions to Karen Koenig, Ph D., assistant professor at the NYU School of Medicine, she shared the fact that she believes this organic philosophy is something for people to believe in and take part in. New York for example, as are most urban areas, is a built environment, and "organics is a way for people to satisfy their desire to commune with nature." Dr. Koenig, who personally has a very healthy dietary lifestyle, does not buy into this business of "organic" and as she says, "I think my point of view represents that of the entire public health and epidemiology community." The reason is that organic does not always mean "natural" in the sense that everything put into the product is wholesome. This ideology stems from the findings of Bruce Ames, Ph. D., and Chairman of the Department of Biochemistry at University of California at Berkley. Ames, a noted and

well-respected scientist invented in 1973 the Ames test, which detects whether or not certain chemicals cause mutations in bacteria. This assay for carcinogens is still widely used in cancer research today, but in the course of his research, Dr. Ames found that ingredients naturally found in foods are equally as carcinogenic as synthetic chemicals.

In an excerpt from John Stossel's book *Myths, Lies and Downright Stupidity*, Dr. Ames declares that almost anything you find in a supermarket at the parts per billion level contains carcinogens. When asked if "organic" produce makes any difference, he emphatically declares, "No, absolutely not, because the amount of pesticide residues-- man-made pesticide residues--people are eating are actually trivial and very, very tiny amounts! We get more carcinogens in a cup of coffee than we do in all the pesticide residues you eat in a day."⁶ That almost makes you think twice before ordering that double shot latte in the morning, almost.

Plants naturally produce pesticides to protect themselves from insects, fungi, and predators (such as humans), so in essence organic foods which do not tamper with nature intrinsically contain the very chemicals organic farmers ardently avoid. What to do given this dilemma? Dr. Koenig advocates not the organic food movement, but the healthy food movement. Avoid eating foods that are processed and refined, and when buying produce, look beyond what the label claims. That means instead of rationalizing that if you buy organic, because it is more expensive, it has to be better, and better for you, the smart consumer does a little more work and reads labels.

Organic agriculture is a multi-billion dollar industry, and it is growing domestically at a rate of 12% as of 2000 according to the USDA. This means the number of small scale organic farms is growing, but also that organics is a new market that has yet reached its maximum potential. It is clear that what's pushing the growth of the organic industry is the number of people who believe that organic is better. Retail giant Wal-Mart made a statement this past

March that they were going to increase the number of organic products that they carry in their stores, allowing more people of wider socio-economic capabilities to buy organic foods. In the words of Dr. Koenig, "there is something philosophically and intrinsically wrong about this relationship, Wal-Mart is about mass produced, while organic is about small scale." There is no doubt that many people will continue to buy into the trend, however every individual can make a choice on how to go about eating healthier, and eating organic is not the only way.

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² "When Buying Organic Pays (and Doesn't)." Consumer Reports. Feb. 2006. Available at <http://www.consumerreports.org/cro/food/organic-products-2006/when-buying-organic-pays-and-doesnt/index.htm>. Accessed 15 Oct, 2006

³ "Organic Food Standards and Labels: the Facts." Apr. 2002. United States Department of Agriculture. Available at <http://www.ams.usda.gov/nop/Consumers/brochure.html>. Accessed 15 Oct., 2006.

⁴ "CSPI's Guide to Food Additives." Center for Science in the Public Interest. Available at <http://www.cspinet.org/reports/chemcuisine.htm>. Accessed 15 Oct, 2006.

⁵ "Industry Statistics and Projected Growth." Organic Trade Association. 2003. Available at: <http://www.ota.com/organic/mt/business.html>. Accessed 25 Oct, 2006

⁶ Ames, Bruce. Interview with John Stossel. Myths, Lies, and Downright Stupidity: Get Out the Shovel-- Why Everything You Know is Wrong. Hyperion: 2006.



A New Kind of Medicine: Mining the Computational Universe for Models in the Biomedical Sciences

Garett Neske

Abstract: Computational models have proved to be useful in elucidating the behavior of systems studied in biomedical research. It is undoubtedly the case, however, that most pathological systems are computationally irreducible, deeming models based upon traditional mathematics inadequate in understanding the complete behavior of these complex systems. Using the ideas from *A New Kind of Science*, it is possible to devise a novel research methodology that relies on algorithmic (or “simple-program”) models that can theoretically capture the entire behavior of the system under consideration. Through searching the space of simple programs and comparing the behavior of select programs to the behavior of pathological systems, it would be possible to model cures for various diseases at the computational level.

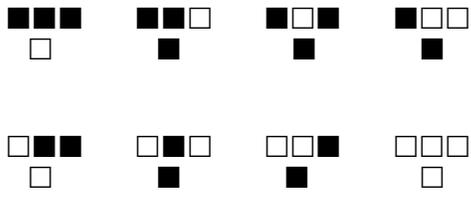
Introduction: Systems biology is the study of the interactions of the components of biological entities at the submicroscopic, microscopic, and macroscopic scales. These components might include biomolecules, genes, cells, or even whole organisms. Systems biology has become especially important in biomedical research. There is an inherent complexity in the systems of concern to biomedical researchers. This complexity is manifested in highly non-linear dynamics and quite complicated interaction networks. For instance, cancers are characterized by a virtually uncontrollable proliferation of metastatic cells, with a basis in a multi-component problem

consisting of several mutated genes and complex biochemical interactions. Many neurodegenerative disorders, such as Alzheimer’s disease, are the result of misfolded proteins, the source of whose anomalies are not well understood. Certain problems in contemporary biomedical research have been addressed through the implementation of computational models, the majority of which are based upon traditional mathematics, predominantly differential equations. While such models are powerful tools in elucidating pathological behavior, they exhibit inadequacies, especially when faced with highly complex biological systems. For one, as the complexity of the system under consideration increases, so does the complexity of the model, deeming analysis quite difficult and costly. Furthermore, many complex systems are computationally irreducible, meaning that they cannot be fully understood through a finite collection of mathematical equations. In this article, a new methodology in computational biomedical research is proposed based upon the ideas expressed in Stephen Wolfram’s *A New Kind of Science*.

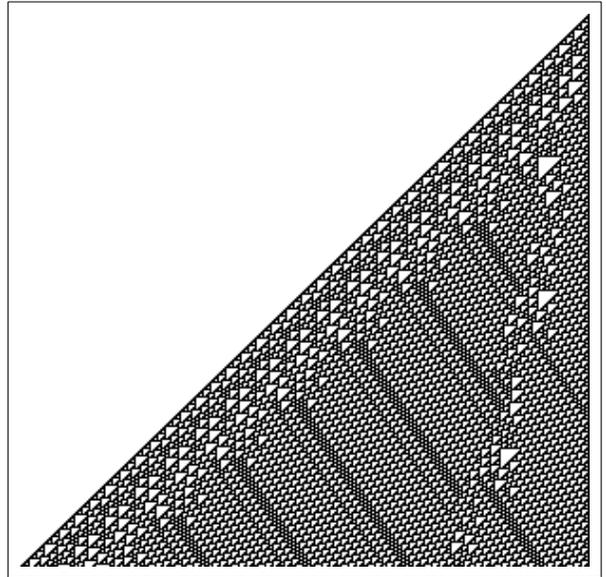
NKS and Its Applications: In the 21st century, the techniques of computational systems biology have found a place in the realm of medicine.¹⁻⁴ Many of the models of computational systems biology are based upon traditional mathematics. Unfortunately, traditional mathematics appears only to be adequate in completely clarifying the behavior

of regular and predictable systems.⁵ Since the systems encountered in biomedicine are quite far from predictable, though not necessarily random, it is undoubtedly the case that traditional mathematics cannot capture a full picture of such systems.

In 2002, computational scientist Stephen Wolfram, creator of the world-renown computer program Mathematica, published the product of nearly twenty years of research, *A New Kind of Science*, from here on referred to as NKS. This book has catalyzed a major intellectual revolution in the global scientific community since its publication. One of the major tenets of NKS is that quite simple rules can give rise to great complexity. This certainly holds at the level of computational models and, with more research, will undoubtedly be shown to hold for actual natural phenomena. Wolfram discusses a number of model systems he refers to as “simple programs.” Such systems include cellular automata, Turing machines, network systems, and others. To focus upon cellular automata, these systems often consist of a grid in two dimensions in which the cells of the grid are assigned a particular color (black and white for a binary system) based upon a preset rule. As an example, one may consider the so-called rule 110 cellular automaton, whose rule is given below.



The first sub-rule, for example, states that wherever there are three black cells, the next step in the evolution of the system must consist of one white cell. While the rule is really quite simple, its repeated application gives rise to a curious complexity:



In addition to the assertion that simple rules can give rise to substantial complexity, Wolfram also introduces a notion that he denotes as the Principle of Computational Equivalence, which holds that any system whose behavior is not obviously trivial (such as an exhibition of repetition) is equal in computational complexity to any other such system. These systems, as the Principle of Computational Equivalence holds, are also likely to be computationally irreducible, meaning that their behavior cannot be described completely via a finite “shortcut,” such as the tools traditional mathematics. Thus, it seems that the only way to fully understand most complex systems is to formulate a methodology consisting of a systematic running and inspection of these simple programs. The implications for this notion in the physical and biological sciences are enormous. Indeed, many of the simple programs in NKS can elucidate the behavior of problems in nature, notably (for this article) in biology.⁶⁻¹¹ A possibility that has not received as much attention is the application of NKS to problems in the biomedical sciences. In effect, this application of NKS may very well be among the most difficult thus far, since the concern is not solely with the rules for a pathological system, but a mechanism by which these rules can be changed to cause a more benign state. For instance, it is not enough to know the rule for a system modeling cancer cell

or oncogene activity, but also the mechanism by which these rules can be changed.

Medical NKS: The primary challenge of computational biomedical research from an NKS standpoint is the clarification of a rule of a simple program that models a pathological system and a mechanism that may change this rule, or have the effect of changing this rule, to effect a more benign state. While several authors have discussed the utilization of the ideas of NKS for the biomedical sciences¹²⁻¹⁴, including Wolfram himself¹⁵, and programs such as cellular automata have served as classic models for phenomena such as heart and neural tissue excitation¹⁶, no general NKS methodology for medical research has yet been proposed.

This article introduces such a methodology. The first process in this new research direction concerns finding a model simple program for a pathological system. This in itself is not a simple task, for it is extremely difficult to determine a system's rule from its behavior.⁵ Rather than performing such a horrendous computation, it is more meaningful to perform a search through the space of simple programs whose underlying rules are known and compare the programs with the real-world system at hand. This process is commensurate with Wolfram's *new* kind of science, which is focused on the systematic study of simple programs. Through the use of algorithms that recognize similar patterns in objects (generally known as pattern recognition algorithms), this should be applicable to biomedical systems. In effect, engineering of such pattern recognition systems can itself be carried out via an NKS approach.¹⁷ In any case, the first step of computational complexity research should be observation of how a model system evolves.¹⁸ To use again the example of cancer, the scientist could research a cellular automaton model of abnormal cell division or a network system modeling cancerous cellular signaling. This model system can then be compared against a myriad of simple programs, effectively "mining the computational universe," to find the appropriate program rule

The second stage of medical NKS requires computational studies on how to affect the rule of the program such that it models a more benign state. Unfortunately, the mechanisms for changing system rules is a relatively unexplored area of computational complexity theory, but one that is integral for medical NKS. For instance, perhaps by performing operations upon multiple simple programs (e.g. "adding" them together), the result would be a more benign system. Research along these lines is highly encouraged. The first two stages of medical NKS concern computational models and the operations performed upon them. The last stage requires a bridging of the gap between the world of models and medical pragmatics. It is necessary at this stage to research potential drugs and therapies that will mimic the behavior of the manipulation of the model simple program to a more benign state. That is, while a *computational* mechanism that changes the effective rule of a simple program may have been found, it is now required that real-world mechanisms be discovered that exhibit the same behavior.

Medical NKS, while a relatively simple research methodology, would prove to be quite challenging. The complete methodology would require the collaboration of an eclectic group of players, including physicians, biologists, chemists, physicists, computer scientists, mathematicians, and so-called "pure NKS" researchers. The first stage of medical NKS, for example, requires the study of a wide variety of simple programs for a meaningful comparison to the pathological system at hand. The second stage requires the special attention of computational complexity theorists to create methods by which the rules of a simple program can be changed computationally. The third stage requires the research of traditional players in biomedical research, such as biologists and chemists. Considering the amount of effort required to implement medical NKS, one may rightly wonder why the biomedical community should focus on this method rather than the various other computational methods now available. The answer to this question predominantly concerns the concept of

computational irreducibility. Most computational methodologies rely on the implementation of traditional mathematics, such as differential equations. These methodologies have proved to be quite powerful in elucidating certain aspects of complex systems. For computationally irreducible systems, however, traditional mathematics cannot capture their complete behavior. While computational techniques from a non-NKS standpoint can uncover certain aspects of the irreducible system, they cannot result in a holistic understanding of the system, which is the goal of systems biology. Given the complexity of pathological systems, it is very unlikely that computational studies based upon traditional mathematics will discover cures for diseases such as cancer and Alzheimer's disease. Potential cures would undoubtedly be predicated on a complete understanding of the pathological system. By searching the space of meaningful simple programs and comparing them with pathological systems, it is indeed theoretically possible to model cures at the computational level. Thus, the primary reason for the beneficiality of medical NKS in comparison to other computational techniques lies in its explanation of how the *whole* system evolves and operates. One may again consider the system of cancer. The spatial layout and dynamics of the networks involved in cancer are considerably complex. Indeed, cancer can be described computationally as a veritable frenzy of cellular signaling circuitry. This multi-body problem is intractable from the standpoint of traditional mathematics. Despite the simplicity of the rules of the network systems shown in NKS, however, many of them can give rise to behavior that is just as complex as cancer or even more so.

Performing a systematic search through the space of network systems may presumably yield a program whose spatial organization and evolution are very much like those manifested in cancer. The program may then be manipulated so as to yield a system that models genetic interactions of normal cells. This computational manipulation would provide biomedical

researchers with a direction for real-world manipulation through novel drugs and therapies.

Conclusion: Many aspects of biomedical research have taken a computational route in the 21st century. Sophisticated computer models based upon mathematical formulae can convey aspects of the behavior of pathological systems that were previously beyond human understanding. It is very unlikely, however, that models based upon traditional mathematics can suggest cures because such models are inadequate in describing the entire system. Thus, if the goal of medical research is indeed to work toward a cure, a different computational methodology is needed. In effect, in order to understand the whole system, it is necessary for the computer program to *be* the model, not just a means toward a model. A systematic search through the space of simple programs that are similar to pathological systems can undoubtedly yield tremendous insights on how to cause a non-pathological state. Novel drugs and therapies can be created based upon the NKS research. Medical NKS would prove to be a challenging novel methodology requiring the research of players from a myriad of fields. There remains much to be done in way of NKS, such as the building of a database of simple programs and ways to search this database; meaningful applications of NKS to the physical, biological, and social sciences; and, most importantly, education of both scientists and non-scientists in the promise of NKS. Given the exponential increase in the sophistication of computer technology coupled with the ever-growing knowledge of pathological systems, NKS may very well prove to be the most powerful computational methodology available to the biomedical sciences.

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Value and Potential: a Defense of Medical Panhumanism

Seth Weisberg

The shallow and non-reflective mind takes a very superficial position on the maxim of survival of the fittest. Callous intellectual types and even members of the slightly informed masses can often be heard chortling at or disparaging the efforts of seemingly quixotic Doctors and medical professionals to save the life of someone who will be severely damaged after stabilization – such is often the case surrounding the unfortunate circumstances of handicapped infants and people born with severe developmental defects. Why save them, they are obviously unfit, they just drag down the group, our group, they make me less fit, why even try? A logical position to take is to weed out the weak whenever they are found. Bring up the averages; improve the composite composition of the group, its more profitable that way, more people pull their own weight, the whole leaden sled of our society will move faster into the future. To quote from just one example of this view, to show how pervasive and uncontroversial it is in our society, the following appears in a book by the novelist Tom Montelone on how to write novels, “It’s quite possible that all the advances and miracles of modern medicine have weakened the human gene pool to such an extent that our species may be doomed to extinction.”¹ This position to take on the matter of spending resources to take care of people who will be ostensibly less fit for the rest of their lives, to ‘weaken the gene pool’ as they ignorantly put it, ignores certain critical observations that come from a deeper understanding of the dynamics of natural selection among entities with interacting parts, such as our gene pool. From here on, this

position will be referred to as the ‘narrow Darwinian argument’. Though this is a mild stance to take on eugenics, at least in comparison to some extreme instances through history, from Lycurgus of Sparta to Adolph Hitler, hopefully it can be shown that almost any form of eugenics is ultimately negative, extending especially to why doctors are justified in attempting to save nearly any individual.

We shall attempt to put forth a clear line of reasoning for why the above position is logically untenable. Presented in the following is an argument for the intrinsic value of every human life (human life here is defined as a functioning consciousness, not mere metabolism or persistent vegetative state) and how the position and connection of a human to a larger entity augments this intrinsic value far beyond what it would be alone.

While attacking the position espoused by Montelone can be seen as a mild straw man characterization of a valid position to take on the matter of putative social Darwinism, the essentials of the argument are stated quite cogently in the quotation. There are several avenues of attack available to us, though almost none uses the same logic put forth by lazy social Darwinists and their narrow Darwinian argument.

The first reply uses subjective reasoning. It can best summed up best as a formulation of Kant’s categorical imperative or Jesus’ and Confucius’ Golden Rule. Why save someone who will never be able to raise their arms again?

Because you would want someone to do the same for you. This maxim is the distillation of all morality. It is an elegant and time tested proposition arrived at again and again by concerned individuals spanning time and place from 15th century BC Egypt to China to Plato to Shinto to 21st century Atheism.

The only problem with adopting this view and putting it into practice operationally is that its scope is limited to the individual subjective. Though previously unpopular for various strange reasons, the theory of group selection, or as it is called today, hierarchical or multi-level selection, provides a very interesting additional piece of information that has to be taken into account when deciding issues of morality.

A blind adherence to the golden rule, however faithfully followed, could lead to an organism level bias that eventually leads to the degradation of the larger encompassing entity that constitutes the next highest level of selection. Though the exact definition of an evolutionary individual is somewhat contentious and hence beyond the scope of this article, a good heuristic definition is anything that is functionally integrated, has a definable beginning and end in time and in space, though localization is not a necessary criterion. Given that there are other levels extant aside from the clearly definable level of the individual organism and that individual organisms are the raw substance out of which the higher levels are made and that the welfare of the higher level is directly related to the average welfare of the constituent individuals, it follows that increasing the fitness of the individual organisms to contribute materially to the processes going on in the higher level is beneficial to all. This seems like a good set of premises to bolster the previous 'narrow Darwinian argument' but as will be shown, this seriously conflates criteria of fitness at different levels of the hierarchy.

At the level of the individual organism, fitness is measured in the number of offspring, at least this is traditionally how it has been done. Likewise, for larger groups, such as tribes, cults, states, nations, villages, ethnicities, or any other

stable group that is linked functionally with the same culture and stock of mental constructs used to conceptualize the external and internal world: their fitness is also measured in reproducibility or fecundity. Extinct and sterile groups abound in examples through history. The culture of the ancient Babylonians is now gone, though they did split through fission, daughter cultures splitting and evolving into Assyrians, Persians, and so on into modern times, but the progenitor's unique culture and endemic conceptualizations are now gone. Likewise, the Shakers, a religious cult in 19th century America did not believe in procreation and now their culture with all its material trappings is gone, surviving only as written record and memories in those who were members of fitter groups.

The survivability of groups is influenced strongly by their own internal beliefs against the geologic environment and the competitive environment where other groups contest with them for resources. For a group of humans, knowledge is the most potent and valuable asset that a group can possess because this allows the physical stuff of muscle and bones to transform the surrounding environment, including other agents, into useful things and livable areas. Knowledge has one ultimate source and enabler only: the human brain. The human brain depends utterly on a properly functioning body to supply all its parts with nutrients or it quickly dies. Modern medicine, in preserving the bodies, and hence the brains of members of its group provide the group with the one thing that has more potential value than anything else known, a functioning brain. Only brains can generate new knowledge and only brains can transmit this knowledge to other brains. The more brains there are the more value potential exists (taking into account practical considerations, such as food supply and space, etc). Of course, brains are more likely to communicate if they comprise a unified, or at least compatible, culture or set of cultures. A culture is simply a collection of brains with similar sets (sets of conceptualizations about ontology, epistemology and metaphysics, however dimly grasped - whether put into such terms or not). The value generated by each brain must be integrated over

the population as a whole, for the creations of one can be used by all members of a functional level.

This is the point in the argument where certain important admissions must be made. Each brain is unique, utterly and to an almost preposterous degree. True, each brain is representative of the species *H. Sapiens*, but the potential details of each one that differentiate it from others are literally uncountable. Each can take the same set of physical inputs through its sensory organs and interpret and transform that raw data in stereotyped but unique ways, some of which might make a connection or put disparate and seemingly incongruous data points together in ways that lead to whole new realms of knowledge and study. In this way, each brain is potentially as valuable as any other, because of our own ignorance of what bit of information will cause any given brain to do at any time. This is a bit of reasoning that Pascal would highly approve of, as he used a similar method to prove the necessity of a logical person believing in God. This argument does not make quite so bold a claim (or use such questionable premises), only that it is our uniqueness and uncertainty about the true state of the World that provides for the logical regarding of each brain as a source of potentially unlimited value – if not necessarily for that individual organism than necessarily for his group, and his own fitness is tied to the average fitness of the group as a whole.

So it is for these reasons that the Doctor is justified in spending his limited time and energy saving people the use of their brains by treating the body. As these brains form the physical gate between the inner and outer worlds, and each brain is its own gatekeeper, letting in what it will and deciding where to send it – it is the functioning brain ultimately that generates value. To preserve and fix these brains, or the bodies that support them is an act of paramount worth. Objects like goods and cash, things with a specific value can be traded among people, can move from here to there in civilization, concentrating and dispersing; it is only through the creative and synthetic act of a human mind

converting information from the world into new knowledge that new value is created. To be a defender and supporter of such fragile systems, a doctor or medical professional, someone who spends their time fixing the body of another guarantees in a way that no other profession can, the preservation of unlimited potential value, and that's a pretty rewarding prospect.

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¹ Monteleone, T.F., *Complete Idiot's Guide to Writing a Novel*. Alpha Press, 2004.



Humans are Imperfect –Doctors are Humans

Nina Ng

Imagine that yourself being admitted into a hospital as the result of a fierce but seemingly not life-threatening abdominal pain. A junior resident is assigned to examine you and advise you. Ultimately, she assumes that it is not a very serious case and does not even administer a cat scan or x-ray of any kind for further confirmation. Later on, you die and the worst part is that the death could have been prevented if you had received a scan. A few questions seem to beg questioning: Why was I being seen by a junior resident instead of an experienced doctor? Was the decision not to order a scan a responsible one? Should the resident be held accountable and punished for your death? The above scenario may seem unrealistic or exaggerated but the unfortunate truth is that many people do frequently die from the decisions that residents and doctors make and Atul Gawande documents many of these cases in his notable book Complications: A Surgeon's Notes on an Imperfect Science.

Gawande describes many of his experiences as a surgical resident and addresses some of the questions that are unceasingly asked about the procedures doctors follow and decisions that they make. One of the first problems that he discusses is that of residents. Most people would not want to be taken care of or operated on by a resident—even if he is a senior resident. Some people do not even like to be taken care of by a doctor who appears to be young! This sense of unwillingness is understandable. After all, who would not want the best care for himself or his family or his children? If every patient were operated on by

an experienced doctor and all residents can do is stand by and observe, these trainees would never gain the necessary experience to fill in the large shoes of their mentors. As Gawande puts it, the haunting reality is that novices cannot be trained without compromising patient care—meaning delays in recovery rates, organs that should not be punctured being accidentally punctured, and more deaths that may have otherwise been prevented if an experienced doctor had been making all the decisions.

The issue of how a resident gains experience is only one among many other difficult factors that unfortunately complicate the field of medicine. Perhaps the idea that a resident could inadvertently cause unnecessary damage to your body is not the most frightening part about medical care but that doctors who had graduated from top medical schools could do the same. Gawande recalls many cases in which doctors discover or admit that terrible mistakes had been made. In one incident, a cardiac surgeon skipped a small but important step during a heart valve operation and killed the patient.¹

Gawande speaks from his own experiences and those of other surgeons and doctors that he knows. What makes his book worthwhile is the authenticity of his words. In all his recollections of events, the young surgical resident does not attempt to hide specific information or sugar-coat the reasons for the outcomes. His decision

¹ Atul, Gawande. Complications: A Surgeon's Notes on an Imperfect Science. New York City: Henry Holt and Company, 2002.

to be blunt could have posed as a huge problem when releasing his work to the public. He reveals mistakes as if they are normal—and they are. But to what extent are their errors considered acceptable? Humans are not foolproof and doctors are no different. Gawande takes a risk by admitting this in the way he does and telling these stories that could put doctors in bad light. One thing readers should be aware of is that even though some may think his accounts are completely true, the surgical resident may have exaggerated certain points since he is still a writer who is out to sell books. Though this is not a concrete fact, it is a point that should be taken into consideration when examining Gawande's text.

Complications is divided into three sections with titles that pinpoint perhaps what Gawande feels to be three important categories that cause complications in medicine and they are respectively named "Fallibility", "Mystery", and "Uncertainty". Within these sections are various anecdotes—some incredibly shocking, others simply baffling, and almost all are revealing. The structure of the book makes it easy to pick off from where you leave off. Even if you did not read the book all at once, you still would not miss a beat because each short story has its own meaning and definition. Gawande's memoirs are so fascinating that you cannot help but keep the pages flipping. Topics vary from incidents involving unexplained baby deaths, patients spared of death and patients who faced unnecessary deaths because of pure luck of draw, doctors who suddenly lose their touch and many more.

Although many of the stories are horrifying and eye-widening, this book was not written to scare pre-medical students and patients. It is merely meant to show the reality of this truly imperfect science and that it is unreasonable to believe that doctors should be infallible. Among the failed cases that Gawande describe, there are also many situations that counter them and bring light to this often incredibly burdening profession. Some patients that were mentioned in Complications have incredible stories of survival and many were changed--their

personalities and their lifestyles--for the better by their experiences. Doctors will, unfortunately, continue to make mistakes from time to time but they will never cease to strive for the ever-eluding state of perfection.



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Reaching for the Elusive Gold

David Lebowitz

“No physician is really good before he has killed one or two patients.”

~Hindu Proverb

From the moment when we take our very first breath, our culture constantly teaches us to strive for the best and to never settle for second place so easily. Where an A is possible, we won't shoot for the meager B+. Why should we lease the shoddy Oldsmobile instead of buying that sleek, sexy BMW? We are born into the pursuit of Stepford lives, existences that are infused with blissful perfection. And yet, we stumble and fall on our faces even when we think that everything is running smoothly. We are mockingly advised in such moments of failure that we should not despair since we simply *cannot* “have it all,” but can we? If not, why are we endlessly bombarded with billboards plastered with the Brad Pitts and books glorifying the world's Hillary Clintons? Where does the desire to be perfect in every way, shape, and form stem from, and why is it so impossible to shake? In *Complications*, an essay collection that tracks the various past medical experiences of surgeon Atul Gawande, the author ponders such questions from several vantage points. To Gawande, the drive for perfection in the medical profession is puzzling at best, a force that he is regularly affected by in the operating room yet cannot fully comprehend. The text works relentlessly to uncover the enchanting nature of Gawande's craving for flawlessness in medicine, a profession that according to him is, contrary to popular opinion, an “enterprise of uncertain

information and fallible individuals” (“Introduction” 7).

Gawande employs two principal textual environments throughout *Complications* whose conflict pervades its essays and thus leads the reader to interpret the work not only as a mere book of an aspiring surgeon, but also as the journal of a man who faces a fundamentally mental struggle. One of the two atmospheres that Gawande frequently creates emphasizes the physician's comfort and ease in the medical environment to such an extent that it is as if he has transformed in such moments into a mere robot. Gawande himself is no exception to this peculiar yet nevertheless pronounced trend, asserting that “the highest praise I can receive from my fellow surgeons is ‘You're a machine Gawande’” (“Computer” 38). The author continues to relate that doctors have the potential to seek “machinelike perfection” so desperately that they sometimes resort to only “perform[ing] one set of narrow procedures over and over again” (37), in order to gain programmed expertise in one area of medicine, as was the case at Shouldice Hospital, where the surgeons only execute hernia operations. Such doctors do not make mistakes, and Gawande initially envies them; their proficiency has conquered their humanity and their hands have practically been transformed into metallic pincers that impeccably cut and then reattach the tiny sinews of the human body. From the computerized description of the doctor in such pieces of the text, Gawande affirms that in some respect, he believes that it is possible for a human to become “perfect” in the practice of medicine,

that people have the potential to become metal-like “machines” (38) to thereby perform procedures seamlessly. In fact, Gawande notices that even though time and age might eventually undermine any doctor’s earned “perfection,” (“good doctors go bad” [“Good” 89]), they can at some point be “the best” (88) and possess the ability to work “eighty, ninety, a hundred hours a week...” with “absolute efficiency” (93).

Contrasting with this character of coolness and organization that denotes the possibility of perfection in Gawande’s selections is one that is antithetical to it, one of uneasiness that connotes the inevitability of failure and inadequacy. While performing one of his first central line insertions, for example, Gawande notices that the patient “gives [him] a look” (“Education” 14), presumably since the former is a noticeably young and relatively inexperienced resident. This dubious glare is that which sets the mood of the scene and arouses self-doubt within Gawande, eventually leading him to bungle the procedure by “spearing the clavicle instead of slipping beneath it” and causing the patient to subsequently yelp “ow!” in pain. In a separate yet similar incident, a young woman comes to the ER because a nail is jammed deep within her foot. Gawande could not and did not immediately devise a plan to extract the nail safely; instead, he “idiotically” blurts “wow, that must hurt” (17). Although he later pulls out the nail swiftly and “went home elated” (18) about his success, Gawande tells that “for a moment I froze. Could I really do this?” (17-18). It is in such atmospheres of tension that Gawande’s humanity lies exposed, in that he becomes nervous to such a degree where he cannot ensure flawlessness in the “delivery of care” (“Computer” 37), something that patients come to expect as the standard.

Despite later realizing that “doctors tend to have a fierce commitment to the rational” (“Thirteenth” 109), Gawande acknowledges that his initial approach to medicine was dominated by a very unreasonable desire to be like the perfect robot whose image he conjured in other areas of the text. The medical failure that Gawande’s nerves generate throughout his

experiences insinuates that perfection is not possible, that the absolute quality of medical precision that is implied in other areas of his essays is not only questionable but also unrealistic. It is not in his power to execute medicine like a perfect machine, without *ever* screwing up. Doctors may attend hundreds of conventions where vendors construct “two-story-high kiosks...with pulsing lights and brushed-steel displays” (“Nine” 79) to sell medical equipment, but ultimately they know that “maybe machines can decide, but we still need doctors to heal” (“Computer” 46). To Gawande, we are forever left to fantasize about perfection (in his case, about not making mistakes or inflicting any pain unto the patient), but cannot ever hope to actually procure it for ourselves. In this sense, complete excellence can never be a viable human trait, since emotion and fear will forever challenge and successfully overturn it. Gawande proposes that perhaps perfection, with all of the seemingly magical and fantastic qualities that it can bestow upon its beholder, really is just a mirage that we humans are endlessly fooled by.

In “Reporting On a Dramatic Brain Operation,” fifty-two year old Dr. Thomas Ducker is in charge of excising what he calls the “two monsters” (Franklin 157), or very dangerous growths from the brain of patient Edna Kelly. Predictably, Ducker is anxious when performing the precarious operation (he mutters, “This is a very frightening place to be”), yet he nevertheless behaves very composedly during the duration of the surgery to “patiently...separate the aneurism from the surrounding brain tissue” (161). In this, Ducker conquers his apprehension and differs from Gawande, whose more sensitive resident nerves overcome his reason and lead him to medical ineptitude. Gawande’s second textual quality (one of pressure in which fear of being flawed in a profession where “errors are unacceptable” [“Computer” 37] is dominant), which implies that perfection is proscribed from an individual, is thus limited to the realm of the novice. Although there will undoubtedly be cases in which even a more experienced physician will feel a measure of societal demand to save every

single one of his patients, with time and age, each professional will develop his own method of dealing with such pressure to not allow it to affect him. The dichotomy between the essays' distinct characters therefore reveals the true essence of conflict that underlies Gawande's writing; in some instances, he suggests that perfection is plausible, and in others, he vociferously denies its feasibility. This contradiction, in all of its complexity, illustrates Gawande's qualms about his profession; as a new doctor, he remains a slave toward trying to be perceived as faultless by his patients and colleagues, thus believing in perfection's possibility. Still, his intuition tells him that such perfection is prohibited from him, because of the fact that he is human and *not* a machine.

In his work, Gawande uses colloquial language and not mechanical terminology to impart the details of presumably very intricate medical procedures. For example, the author deliberately chooses to bring common everyday items into the text when telling of his experiences. During an operation, he "stretch[es] the skin taut with the thumb and forefinger," and "make[s] one smooth slice down to the fat" ("Education" 16). Another surgeon "holds the scalpel like a pen" and "lifts the rib cage as if it were the hood of a car" ("Final" 189). Gawande does not mention the wide range of surgical instruments that he undoubtedly uses throughout the course of surgery, nor does he frequently recall the anatomical names of body parts when performing various operations. We read about "floppy guidewires" ("Education" 15) and "infected gallbladders" ("Body" 224), and not about Doyen scissors or Cholecystitis. Using such technical jargon would shroud the text's true goal, which involves leading the casual reader to glean meaning from its pages. This technique allows every reader, even one who has no medical background, to understand the main plots of Gawande's essays, and hence, the larger more universal ideas surrounding perfection that he ultimately seeks to unearth through writing them.

Gawande writes in such a way as to bring himself down from the godlike doctor pedestal

and level himself with the "ordinary reader" who is presumably not another physician. Doing so establishes one of the elementary premises of Gawande's work, upon which many of his conclusions are built: that the MD label does not intrinsically attribute endless knowledge and perfection unto its holder. Gawande insists throughout many of his essays in *Complications* that he really is just an ordinary run of the mill guy. He is a father who naturally frets when his son Walker goes "into congestive heart failure" ("Education" 31); he is sentimental; he sometimes makes mistakes and fails. Near the beginning of his book, before describing the encounters with moribund patients and the various "hernia factories," Gawande establishes that what "startles me [about medicine] is how fundamentally human an endeavor it is" ("Introduction" 4). Such aspects indicate Gawande's idea that in the end, even the best doctor is only a human who occasionally screws up and never positively knows whether "the actions [he] chooses will prove either wise or helpful" ("Red" 252).

This writing technique, in all of its dimensions, highlights Gawande's humility and humanity; through the text, he transforms from a superhuman into an everyday person whose views we value, one whose observations and conclusions we are able to identify with. Gawande explains, for example, that throughout Amy Fitzpatrick's pregnancy, she suffered from severe nausea and vomiting to the point where "the situation had moved beyond the doctors' control, and worse, their understanding" ("Queasy" 139). Although her condition baffled all of Ms. Fitzpatrick's doctors, some nevertheless believed in the possibility of perfection, that "science...can erase uncertainties" ("Mystery" 203). In retrospect, Fitzpatrick tells Gawande that it was in fact the doctors who "admitted they didn't know how to explain her nausea or what to do about it" ("Queasy" 144) that she liked best, and not the pompous ones who pretended to know what was wrong with her. The transformation from removed, robotic deity to unpretentious human is thus critical in order for the patient to more deeply appreciate his doctor, and similarly for us

to believe more strongly in Gawande's integrity as an author. The non-elitist, unassuming vocabulary is a tool geared toward gaining the reader's respect, to persuade him to care about and listen closely to Gawande's words of self-analysis that flow from the pages to such an extent that he will seek to somehow apply them to his own life. The desire for perfection is one that is not limited to the confines of the medical field, after all. Indeed, the mental fantasy of achieving flawlessness does not only consume the minds of doctors like Gawande, but those of members of western civilization as well.

To Gawande, however, it is not enough to merely accept the drive for perfection as an underlying aspect of human life without fully analyzing the nature of such a complex desire and more importantly, its possible ramifications. Gawande is an inquisitive and skeptical writer who consistently questions if perfection in the medical arena, no matter how enticing it may be, would ultimately prove to benefit society. Although trained flawlessness would most likely mitigate malpractice lawsuits and improve patient survival rates, it comes at a hefty price; "something vital is lost in medicine by machine," that is, compassion and the "human touch" ("Computer" 45). Gawande's judgment is corroborated while he observes an autopsy, whose proceedings suggest that eventually even the most sentimental "surgeons get used to the opening of bodies," and that it becomes "easy to detach yourself from the person on the table" ("Final" 189). Such doctors are the ones who speak to Gawande in impassive "Spock-like voices," the ones who become so desensitized to the drama of their profession that they find aptness, and not the sheer fulfillment of saving a human life, to be "the thrilling excitement" ("Computer" 41) of medicine. He shuns such a removed approach to the practice of medicine, calling it "dangerous" ("Good" 93) and "prone to systematic mistakes" ("Red" 238). According to Gawande, to be a doctor is "to have the confidence to wield that scalpel in the first place" ("Education" 15); it is to have the passion for alleviating other people of even the most trivial discomforts, as is exemplified in Gawande's telling of certain European

physicians who operate to even "control...chronic blushing" ("Crimson" 153).

The above-mentioned aspects of his essays collectively indicate that Gawande challenges and then startlingly topples the very merit of perfection in his work. The human doctor's desire to transform into a mechanical entity that will make no mistakes has ultimately proven to "alienate many of the people [he] seeks to serve" ("Computer" 45). Through the realization of such an aspiration, the doctor will no longer be a caring individual with a heart, but rather a cold and unfeeling entity who does his job as if it were a perfunctory chore. Gawande thus discovers that the formerly alluring nature of perfection becomes worthy of contempt; with all of its superficial and short-term gains, the existence of perfection eventually creates a rift between the patient and his doctor, a crucial relationship that according to Gawande cannot afford to be compromised. The doctor's profession requires him to fulfill "an...obligation to serve as knowledgeable guide and confidant" (46); he must be capable of feeling pity and even maternal-like love for his patients, something that robotic detachment impedes him from accomplishing. Whether or not perfection in the medical field is realistic thus becomes irrelevant in Gawande's frame of mind, since it inherently leaves much to be desired by neglecting to implement the very essence of medicine, which is compassion. He reasons that he should shun flawlessness since it would incapacitate him from experiencing the emotion that is necessary to develop his dedication to humanity and the preservation of life.

To reduce this investigation of what keeps Gawande ticking and writing to the clichéd idea that he deems perfection as a peak that is impossible for a human to reach would be to commit a grave injustice against the rich and provocative aura of his text. Indeed, in some respect, the surgeon believes that becoming a flawless robot is achievable, albeit at the cost of something that is perhaps more important in the larger scheme of his profession and his very life. Nevertheless, in spite of all the logical

reckoning, Gawande is realistic and recognizes that we are not always capable of accepting the notion of “being happy with what we have”; sometimes, what we have is not enough – we strive for more and work to become machines in almost every aspect of our being. Ultimately, Gawande leaves us to ponder not if perfection is achievable, but if its realization will in fact always prove to enrich our lives. His text scrupulously explores this question yet never once seeks to propose a definitive solution to it; like any part of our identity, perfection has both its gains and its drawbacks. Gawande knows that this matter does not lie within his reach to resolve in a generalized fashion; in the end, we must be the deciders of our own fates, with the drive toward pure perfection relevant to our unique circumstances. Yet, with Gawande’s words of introspection resonating in our minds, we will at least concede that it is foolish to blindly shoot for the gold; sometimes, silver is not only inevitable, but also more precious than its glimmering rival.



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Physically Healthy, Emotionally Wealthy, Mentally Wise

Ann Carletta

My New Year's Resolutions for 2005 were written in a beautiful card of Van Gogh's Starry Night. The resolution addressing health read "Make a conscious choice to respect my body through better nutrition and regular exercise. Do all necessary neurological testing." Little did I know that fifty weeks later I would be walking into NYU Medical Center for Neurosurgery.

At 8 years old I walked behind a boy as he swung a baseball bat. A good whack to the left temple was enough to alter the way my brain functioned. During the course of the next year I would occasionally lose my eyesight thinking it was kind of cool to be temporarily blind and still be able to hear what was going on around me. Then one time, the eyesight did not come back. I collapsed to the floor and woke to find myself off to the hospital for a battery of horribly painful tests.

The bright side of random, temporary unconsciousness was the perspective of life I got early on. It really made things that other kids and adults complained about seem petty. "Waa, waa, Jimmy took my baseball bat"! "Boo hoo, my wife ran off with the gardener." Give me a break. The gardener was better looking than you, right? I never gave the fainting much consideration and for the next 15 years I continued to take my "pills".

Upon becoming an all-knowing college graduate, I decided that medication was unnecessary. I threw my Phenobarbital in the garbage and planned to forge ahead with life. 48 hours later I was on the floor, violently

convulsing, while sharp teeth were piercing holes in my tongue. The pain of biting my tongue, however, made the bruises I had on my body from walking into the wall and collapsing onto the floor seem insignificant. There's always an upside.

The Grand mal seizure was frightening enough to get me to go to a doctor. It would be the first time I went to a neurologist as an adult. I wanted off the medication I had taken for 25 years. As far as I was concerned, there was nothing wrong with me. The MD felt otherwise. We replaced the barbiturates with a newer medication and I went for routine testing. With the change of medication came the shift from fainting to seizures. Instead of losing my vision and then consciousness, I lost my ability to speak and would stare in a way that unnerved those who saw it. The problem in not being able to speak is that you can't assure the people who see this way that you are okay. When I do come out of that state and can speak coherently the first thing I do is apologize, not because I had a seizure, because I scared the hell out of them whether they admit it or not. You can't hide panic.

In 1995, I decided to go back to the neurologist. It had been 6 years since my last appointment. Seizures were becoming more frequent and occasionally interrupted my workday. As we discussed changing medication *again*, the neurologist started talking about the advancements there had been in surgery for people who have my type of epilepsy. Wait! What? Epilepsy? No one had ever said that to

me before. Was he looking at someone else's chart? I had a seizure disorder. I did not have epilepsy, you know

that disease where *those people* flail all over the floor. Sure, I had hit the ground once or twice, but as far as I was concerned it was due to drug withdrawal. The surgery, he continued, would entail snipping out the little, trouble-causing sections of my brain in hope I would be better off without them. I left highly insulted that he would even suggest I had epilepsy. I scheduled my EEG and MRI, filled my new prescription and went for blood work. Epilepsy...the nerve of some Neurologists!

Year after year the seizures and medication increasingly affected me. I felt they were contributors to my memory decline more so than just aging. My waning intelligence concerned me. The seizures aggravated me. I could only wonder what the long-term effect would be on my brain. It would be another 6 years before I took any action.

As 2005 began, I followed my New Year's resolution and saw a new neurologist. My records showed 35 years of seizures and a slew of medications, none of which had been successful in controlling my seizures. He asked if I had considered surgery. I flashed back to the first time I had heard the question ten years earlier. Maybe it was time to rethink it. Regardless of whether or not I would choose surgery, I still needed the majority of the evaluatory tests so I began to schedule them, in order of least committal.

While testing could have been completed within a short period I dragged my feet and it took me 10 months to go through them all. This is a brief description of each test.

MRI (Magnetic Resonance Imaging). You lay down on a narrow bed, have your head taped so it can't move it and are shifted into a tube that is barley bigger than you are. The machine gathers information from the brain. Mine said "left side bad".

VEEG (Video Electroencephalograph). While it sounds intimidating, physically there is no pain involved. Electrodes are glued to the scalp and the brain's activity is recorded. The information they are seeking is obtained when you have a seizure. To increase the odds of having seizures you are taken off medication. Within a few days I had four seizures and was sent home. Job well done!

Wada: Sodium amobarbital is injected into you to put your brain to sleep one side at a time to determine the language and memory function in the left and right hemispheres. Results may determine which side of your brain is dominant and how you might do if a portion of it is removed.

Neuropsychological Testing: Two days of verbal, written and hands-on testing to evaluate perception, memory, speech, intelligence and personality. I wonder how accurate the personality test can be when the person taking it is wondering if she will be alive on Christmas. The test evaluations qualified me as an "ideal" patient for neurosurgery since the offending party was my left temporal lobe.

With all that said, the surgery was still elective and I needed to make a decision. It was a 50-50. Would the surgery put an end to the downhill memory or would it leave me in a worse position than I had started? Statistics were 0.5% risk of death and 1% risk of stroke. While stopping seizures would be a great reward, and I presume it is the reason most people opt for surgery, for me the biggest payoff would be lessening the speed of decline in memory and what I viewed as intelligence. Seizure-free would simply be a bonus. I decided to take the risk.

As I talked to my neurosurgeon about the upcoming surgery, he kept reminding me that there would be two surgeries, which as much as it may seem odd, comforted me. The craniotomy was the initial entry to my brain. A "computer system" is installed, and then you are brought back to consciousness. The equipment remains inside of you until the neurological team gets

enough information to determine the specific areas they would like to remove. It was seven days of being fully conscious with wires coming out of my head. The removed piece of skull marked with my name was kept in storage until surgery #2.

After providing information by seizing after surgery #1, it was to the OR to have the "real" neurosurgery, A.K.A. a lobectomy. I knew all along they were would be removing part of my brain but it hit me hard months later while watching the videotape. An overwhelming feeling came over me as I saw sections of my brain being removed. They were part of me, being taken away and would never be returned. I started to cry and was thankful that I had waited months before watching it. I may even consider it the most painful part of the surgery as I was grieving the loss of a friend.

When asked what I feel a future healthcare professional can learn from this, I am more inclined to recommend what future patients can learn. Research your options of MDs who specialize in the area for which you are seeking treatment. I was extremely fortunate to have this extraordinary neurological team, but I did my homework.

From a patient's point of view I would have liked the *option* of seeing a neurologist who had epilepsy. However, I would still choose the MD I feel would do the best job, epilepsy or not. Education, interest and compassion must all be present for me to feel I am getting the best treatment. The emotional support from the medical team has a momentous impact on healing.



HPV Vaccine: The future of gynecologic oncology now

Keren Etzion and Kelleigh Briden

Introduction

The Human Papillomavirus (HPV) is a common sexually transmitted disease, however as of late it has been given little attention in the media and in medical offices – as noted by the lack of knowledge the general public has about the disease. Much has been printed about HPV in the news since the recent FDA approval of the new vaccine Gardasil®. The vaccine is expected to prevent certain types of HPV. With the release of Gardasil®, the social debate began over who should be vaccinated, as well as when the vaccine should be obligated to be administered; as part of well-child visits or yearly visits to the gynecologist's office. Such detail is important due to the largely intimate nature of HPV infection. The creation of the HPV vaccine is a dramatic development that has the promise to reduce the prevalence of cervical cancer and genital warts through the prevention of certain types of HPV transmission.

Published Findings

HPV is a virus transmitted through physical contact with an area that has been infected. Often HPV presents itself as a mild abnormality that the body can often take care of in time as part of the normal immune response⁷. The HPV test, to determine the prevalence of HPV, is commonly administered by a gynecologist after the presentation of an abnormal Pap Smear – a test given as part of a general gynecologic visit to test for abnormal cells on the surface of the cervix⁸. A Pap Smear is essential for the early detection of cervical cancer because cervical cancer occurs where squamous and granular cell types meet; the Pap

Smear analyzes those specific cells to look for any abnormalities inside the cells. If a Pap Smear is returned with an abnormality, the gynecologist may recommend an HPV test. The test is similar to the Pap Smear in its administration in that it involves the sampling of tissue in the cervix. The sample, however, is then processed differently. The tendency of having an abnormal HPV test is positively correlated with having an anomalous Pap Smear, immune deficiencies, or smoking⁹. HPV test results are categorized as normal, mild abnormality, or high-grade abrasions. Gynecologists commonly follow a course of passively monitoring a mild abnormality because the patient's body may take care of the abnormality on its own¹⁰. High-grade abrasions are often countered more aggressively because more serious issues could be implicated, such as cervical or pre-cervical cancer¹¹.

The FDA recently approved Gardasil® after clinical trial because “results showed that in women who had not already been infected, Gardasil® was nearly 100 percent effective in preventing precancerous cervical lesions”¹². The HPV vaccines (including those that are still waiting approval) work by using particles that resemble of the virus so that upon injection into the body, an immune response is generated without actually infecting the body with the full-blown virus so that when injected into the body an immune response is generated without infecting the body with the virus¹³. In the attempt to target the 100 types of HPV the present vaccines are effective against HPV types 16 and 18, which combined are blamed for 70%

of the mild abnormalities returned on HPV tests and 50-60% of the high grade abrasions¹⁴. In targeting a few of the most common low-risk and high-risk HPV strains, the expectation is that the vaccine will “prevent the majority of cases of genital wart and cervical cancer respectively”¹⁵.

The only drug approved by the FDA as an HPV vaccine as of now is Gardasil®, manufactured by Merck & Co authorized for administration to girls and women ages 9 to 26. Gardasil is a quadrivalent (four types) vaccine prepared from virus-like particles of the major capsid protein of HPV types 6, 11, 16 and 18¹⁶. HPV types 6 and 11, which were not discussed previously, are common “low-risk” types that are blamed for genital wart presentations. Gardasil® is currently available and the options should be discussed fully with a gynecologist.

Debate

With all this progress, the deliberation on whether to mandate these vaccinations has garnered a great deal of attention. Between the media, government, and just about anyone with internet, it has become yet another battle in the war of conservatism vs. science. The religious population and many of the rest of country’s social conservatives have joined together in morally denouncing an obligatory vaccination. As the two sides take to arms, the Center of Disease Control’s, *Advisory Committee on Immunization Practices*, a fifteen member board of professional experts¹⁷ with experience in related fields, will have to navigate through each side’s claims and decide if they should make the recommendation that the vaccines be compulsory.

The main argument against the required vaccinations are from groups that believe that as a result of being vaccinated, young girls will be encouraged to engage in sexual activity, as they could inappropriately reason that it would be safer to have unprotected sex. People who advocate this line of reasoning believe it is better to continue practicing the current methods of dealing with the virus; such as public outreach education programs, annual visits to a

gynecologist, and in case of infection, the plethora of treatment options. As stated earlier, research shows that yearly pap smears reduce the risk of cervical cancer by 70%. Upon infection, males and females alike are presented treatment options ranging from creams to surgeries, at a wide range of price levels: Cryotherapy, Trichloroacetic acid, Proflox and Electrosurgery, and Imiquimod.¹⁸ At the same time, questions about the effectiveness of the drug are a concern for some; the vaccine only protects against four types of HPV, only two of which are actually cancer causing. The vaccine does not target the several other HPV types that are known to have oncogenic potential: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, 82. Additionally, according to recent studies, HPV often clears up without treatment as a result of the body’s natural immune response. For example, research shows that HPV 16 spontaneously cleared in 80% of women in less than two years.¹⁹ Opponents question the necessity and effectiveness of the HPV vaccine, and are skeptical that any benefit from the vaccine would outweigh the possibility of propelling young women into a false sense of safety for unprotected sexual activities.

Counter arguments claim that the vaccine is something of too much value to delay instituting it as a requirement. Although the only cancer-causing strains that the vaccine prevents are HPV 16 and 18, it has been determined that 70% of all HPV-linked cervical cancer is connected to these two strains. Since Cervical Cancer is the second most common cause of cancer in women, this could prove to be a great advantage in saving lives²⁰. Many argue that current treatment is not enough; that the physical and emotional side effects of infection and treatments are enough of a reason alone. Some treatments may result in physical discomfort, while some go as far as to warn of gastrointestinal disruption, and transient bone marrow depression. Others, in extreme cases if applied in an “over-enthusiastic” fashion, can lead to vomiting, coma, respiratory depression, hematuria, renal failure, and even fatalities.²¹ Emotionally, infection may result in fear, embarrassment, anger and shame, and could

negatively affect healthy sexual activity, potentially impacting relationships causing further pain on the patient. Many claim that for such a vaccination to effectively eradicate a virus, the majority of people need to be vaccinated, and thus immune to the disease. When the virus runs out of places to infect, it will die out. Only when the vaccine is a requirement can we guarantee that this will occur. Such success is true of many of the mandatory vaccinations already in place. In fact, a recent survey performed by the Gallop Institute showed that 46% of patients questioned their doctors if certain common vaccinations that are currently mandatory are still actually necessary; this is due to the decreased threat level since the vaccinations had been introduced, and required. This success is what is hoped for with mandatory vaccination of the HPV vaccine.

At this point in time, the topic is drawing more and more attention. It is estimated that 20 million Americans are currently infected with anogenital HPV.²² This year, 15,000 women in the United States will be diagnosed with cervical cancer, and 4100 of those cases will be fatal²³. The discussion on whether to mandate vaccinations for young women is an important one. In this already ideologically polarized country, this issue which combines politics, science, and sexual behavior, with patients emotional and physical pain, is going to have deep implications whichever way the decision goes.

Conclusion

As of now Gardasil® has been affective, however it is important to remember that the vaccine has only been under study for 5 years (Merck is committed to continue further testing as a requirement of the FDA approval²⁴). Any actual cancer markers can not been seen for several decades, as of yet the vaccines have been successful in preventing any precancerous changes and in producing an immune response by the body, but for now the need of a booster to maintain this immune response after a span of time is unknown²⁵. In clinical trial, no serious adverse affects were presented to be of notable consequence²⁶. For now, the vaccine's effect on

pregnancy has not been determined because the testing possibilities have not been realized. It is currently recommended that women should not become pregnant for six months after receiving the vaccine²⁷. The CDC is recommending the routine vaccination of 11 and 12 year old girls because the vaccine will be most effective in preventing HPV infection if given before the age of promiscuity²⁸. Because the vaccine targets specifically 16 and 18, it is possible that in the future other strains of HPV would become more prevalent in the implication of cervical cancer, but it is the hope that in time science will progress to include many types of HPV for a greater breadth of protection²⁹. Despite the limit of the drug, the implications it may have on the incidence of HPV and consequently cervical cancer are incomprehensible as gynecological oncology moves into a new era.

⁷ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

⁸ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

⁹ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

¹⁰ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

¹¹ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

¹² FDA Media Release on Gardasil®. 8 June 2006.

¹³ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

¹⁴ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

¹⁵ Soper, David. *Reducing the Health Burden of HPV Infection Through Vaccination*. *Infectious Diseases in Obstetrics and Gynecology*, 2006. 1-5

¹⁶ Merck & Co., Gardasil® product description. 2006.

¹⁷ Advisory Committee on Immunization Practices Home Page; Available at <http://www.cdc.gov/nip/acip/> Accessed October 15, 2006

¹⁸ HPV burden of illness and treatment cost considerations

¹⁹ HPV burden of illness and treatment cost considerations

²⁰ Geipert, N. *Vaccinating men for HPV: new strategy for preventing cervical cancer in women?* J Natl Cancer Inst. 2005 May 4;97(9):630-1.

²¹ HPV burden of illness and treatment cost considerations

²² Assessing the annual economic burden p1108

²³ Geipert, N. *Vaccinating men for HPV: new strategy for preventing cervical cancer in women?* J Natl Cancer Inst. 2005 May 4;97(9):630-1.

²⁴ FDA Media Release on Gardasil®. 8 June 2006.

²⁵ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

²⁶ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

²⁷ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

²⁸ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.

²⁹ Blank, Stephanie. *Gynecologic Cancers: New Hopes on the Horizon*. Lecture. 26 September 2006.



Sub-Sahara African Government's Influence on the Socioeconomics of the AIDS Pandemic

Calvin Lambert

Advancements of AIDS research have led to the development of nucleoside reverse transcriptase inhibitors (NRTI) and non-nucleoside reverse transcriptase inhibitors (NNRTI). These entities act as deoxynucleotides, which are building blocks in synthesizing a DNA strand. Throughout the replication process of HIV, the virus will mistakenly incorporate these deoxynucleotides into its nascent DNA chain; however because these nucleotides lack a 3' hydroxyl group necessary for a phosphodiester bond which maintains the structure of DNA, replication of the genetic material ceases. Various studies have confirmed the efficacy of a combination of these two drugs, gaining prevalence in usage amidst highly-active antiretroviral therapy (HAART) and antiretroviral therapy (ART). The combination of these two drugs offsets the toxicity that would be induced if each were taken separately. For example when taken alone, the nucleoside reverse transcriptase inhibitor, zidovudine, increases the risk of lactic acidosis, which results in the build up of lactic acid, a by-product of respiration, within the cells to toxic levels leading to an increase in heart rate or an increase in cerebral metabolism having debilitating effects on the health of any individual.

AIDS seems to continue to plague impoverished areas of the world, particularly in the underdeveloped regions of Sub-Sahara Africa despite the breakthrough of antiretroviral treatment. The disparity that exists in the

socioeconomic statuses of people worldwide widens a gap that should not exist when it comes to the well being of a human being to whom no price can be assigned. As of 2005, the percentage of individuals living with HIV/AIDS in the Sub-Sahara Africa region is 64%, with the rate of new HIV infection reaching a staggering percentage of 65% ("Sub-Sahara Africa", 2006). By the end of that year, the region's population of individuals living with HIV/AIDS was about 25.8 million people, encompassing almost two thirds of the global population living with HIV/AIDS. The significance in numbers in terms of transmission and HIV/AIDS cases in sub-Sahara Africa merits great medical attention as means of containing the relentless growth of this pandemic.

Socioeconomics is a relatively new subdivision of social sciences that examines how finances impacts the social life of individuals within a community in terms of healthcare, employment opportunities and other areas that affect society; particularly, it is the relationship that exists between economic activity and social life. The ideals that serve as the foundation of socio-economics are elaborated in Beat Burgenmeir's *Socio-Economics: An Interdisciplinary Approach*. Burgenmeir explains the difficulty in establishing a sound social sect of economics that requires "a number of different talents: intuition, knowledge of institutions, analytical skill, and mastery of instruments (Burgenmeir 1992)." In other words, the economy must be interactive with

society and its constructs; however, with the lack of funding for care and treatment for AIDS reserved by the government of underdeveloped countries is a strong testament to where socioeconomics dissipates.

The need for a social element in economics was expressed as early as the 19th century when revolutionary economists such as John Stuart Mill and John Ruskin advocated for an economic intervention in social affairs. Mill stressed the notion that “man has physiological needs, and related material needs such as safety and protection (Burgemeier 1992).” If economics is the science associated with how goods are produced, manufactured and distributed through society, then it indeed has social motives that should not go ignored. A country’s economy always had an obligation to meet this need in servicing society; however, through governments’ other preoccupations, the health of individuals are neglected.

Since the first documented case in the Congo in 1959, AIDS has become a pandemic. The following examples reflect the state of governments within sub-Saharan Africa around the time that AIDS cases became more prevalent, namely the 1990’s. These examples reflect the seemingly neglectful attitude towards health: in the year 1995-1996, Ethiopian government’s contribution to the health expenditure of its citizens is significantly low in comparison to the household contributions (see figure 1). Similarly, this governmental neglect of the governed is reflected in Sierra Leone where the budget spending on health in 1990 decreased from 7.3% to 3% as a result of an increase in funding towards the escalating civil war in the country. The war stemmed from the rebel army, Revolutionary United Front’s desire to seek control of the lucrative diamond sector (“The Processes of Health Sector Reform in Sierra Leone”, 2006).

Figure 1: 1995-1996 Ethiopian Government Expenditures:

<i>Total Expenditures</i>	1454.31 million Birr (230.11 million US \$)
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<i>Health Expenditures</i>	9.59 (1.52050 US \$)	Birr
<i>Household Contributions to Health Expenditures</i>	765.81	million Birr

Countries such as Sierra Leone and Ethiopia are subject to impoverished conditions that make funding for the healthcare needs of its people increasingly difficult. Such countries that are characteristic of Sub-Saharan Africa depend upon generous monetary donations from external HIV/AIDS programs including, UN, UNAIDS (United Nations Joint Program for HIV/AIDS), WHO (World Health Organization), and the World Bank. Around this time frame, namely 1996, it was documented that an estimated \$300 million was accrued in donor funds for countries of this financial status (Merson 1995). The source of this funding was from countries such as the United States, Japan, European Union and organizations like the World Bank; these funds are distributed to such impoverished countries to provide a foundation for HIV/AIDS prevention via education programs and to aid in funding for antiretroviral drugs and other forms of necessary treatment (Ainsworth, Martha and Mead Over, 1997). While the magnitude of this aid seems to instill hope on the mission of containing the AIDS epidemic, it has created problems of great debt within such underdeveloped countries.

Between the years 1990-1993, an overwhelming sum of \$13.4 billion was paid by the African region to its external donors who have assisted them in funding for education and health (“Uganda the Ministry of Health Online”). In Zambia, the government spends four US dollars towards debt services for every one dollar for health services (“Uganda the Ministry of Health Online”). Similarly, Uganda spends three US dollars per person annually towards health while spending \$17 per person annually to repay debts (Mwale, Gerald, 2005). In 2000, Cameroon’s debt reached \$9597; the country spends \$659 million annually towards debt repayment, while only \$98 million has been reserved for health (“Uganda the Ministry of Health Online”). Efforts have been made to

combat this massive incurring debt as a result of receiving indispensable, large amount of donors among these African countries and countries in similar economically debilitating circumstances through the formation of Heavily Indebted Poor Countries (HIPC).

Launched by the International Monetary Fund (IMF) in conjunction with the World Bank in 1996, HIPC Initiative strives to reduce the debt of those heavily indebted poor countries ("Debt Relief Under the Heavily Indebted Poor Countries (HIPC) Initiative Factsheet", 2006). Through a recent act by the United Nations, HIPC Initiative received substantial support through the Multilateral Debt Relief Initiative. According to this proposal, there would be 100% relief on debts from those countries, eligible as HIPCs via three institutions: IMF, the World Bank, and the African Development Fund (ADF) (Merson 1995). However, despite the pure relinquishment of all incurred debts, these underdeveloped countries will continue to rely heavily on funds for healthcare from external donors with the continued rise in AIDS prevalence.

What seems logical is for national governments in Sub-Sahara Africa to allocate more funds within such countries to fund for healthcare more effectively, allowing for a still significant, but lesser degree of external monetary funds. The more spent by such national governments, the less of a debt acquired. With the outbreak of the AIDS pandemic, healthcare costs has taken on a vital dimension. With HIV/AIDS patients' need of antiretroviral drugs and other mediums of treatment, the need for more funding in terms of healthcare is necessary; by continuing to receive donations to compensate for this medicinal necessity, a greater debt will incur.

The highly active antiretroviral drug therapy consists of two NRTIs and an NNRTI. The usual component of this regimen, namely zidovudine (AZT) was reported to average \$1.50 per 100mg tablet in 1996 (Floyd and Gilks). The recommended dosage is 500mg a day, bringing the cost to \$7.50 a day. From a

monthly perspective, the cost ranges from \$225 to \$231. Because treatment consists of a combination of drugs, combination therapy reaches a staggering cost of \$7,944. Efforts in 2000 were made to reduce the costs of antiretroviral drugs. In an initiative, "Accelerating Access", UNAIDS in conjunction with a number of pharmaceutical firms including GlaxoSmithKline and Merck collaborated to offer antiretroviral drugs to poor governments at reduced costs hoping to reduce the costs to \$500 a year for a HAART regimen.

As of 2002, the cost of AZT has dropped to \$0.81 per 100mg tablet, while combination therapy, particularly 3ZT/ZDV costs \$4.26 a tablet with the total cost of ARV ranging from \$300-\$1200 a year so long as these countries increase the usage of these drugs (Sources and Prices Of Selected Drugs and Diagnostics For People Living With HIV/AIDS, 2002). However, while these figures appear to be more manageable, there still is the cost of laboratory facilities providing tests to monitor the progress of treatment, HIV counseling services, repayments of debts and a constant supply of medicines to treat opportunistic infections characteristic of HIV patients (Merson, 1995). Countries such as Tanzania, Ghana, and Nigeria with a per capita gross national product of under \$400 are able to fund for public health out of an \$8/patient-year-or less public sector health budget. This meager allocation in health funding adds to the strain in healthcare for HIV/AIDS patients.

While numerous campaigns have been launched to increase the access of ART, efforts seem to remain in vain for the foundation of health care within regions such as Sub-Sahara Africa remain dilapidated due to lack of resources. Responsibility not only falls on the generous monetary, humanitarian gestures of World Bank, United Nations, and other resources, but on the ministries of health within the governments' of these countries. This is can be illustrated in the country of Malawi. An estimated \$40 million per year to Malawi from Global Fund, a division of the United Nations, would only increase the country's per capita

health expenses by less than \$4, with the country still remaining \$10 short in per capita health expenditures of the estimated \$30 for complete health service coverage (Report On Global AIDS Epidemic: Executive Summary, 2006).

In 2001, thirty one African countries had health care expenditures per capita of \$20 or less. Such figures make it difficult to acquire the skills of doctors, nurses and other health care workers that serve as the infrastructure of a health care system (Report On Global AIDS Epidemic: Executive Summary, 2006). With about one physician for every 50,000 to 100,000 people in Malawi alone, the health care system is in desperate need of renovation (Report On Global AIDS Epidemic: Executive Summary, 2006). With World Bank and International Monetary Fund encouraging the privatization and outsourcing of healthcare services, disorganized and tainted health systems continue to oversee the health needs of civilians (Report On Global AIDS Epidemic: Executive Summary, 2006). Donor programs subject to poor organization continue to damage the healthcare system of these developing countries. In combination with the poor management of funding of donations by the national African governments and the lack of monetary support from these national governments, Sub-Sahara Africa will continue to suffer from financial instability.

Healthcare for HIV/AIDS includes, but is not limited to antiretroviral drugs, treatment centers to monitor the severity of disease and the outbreak of an opportunistic infections, and education to help increase awareness of the disease and possibly reduce transmission. If more funds were allocated towards healthcare within such regions, funding for the aforementioned treatments for HIV/AIDS would become more manageable and would have a profound affect on the infection rate in such countries. This, in turn, would produce a domino effect, stabilizing the number of individuals needing ARV.

According to the 2006 Report on the Global AIDS Epidemic released by the UNAIDS, the joint United Nations program on HIV/AIDS,

problems in low and middle-income countries such as Sub-Sahara Africa include the stigma that still exists with HIV patients. This stigma includes a misconception that merely being amongst an individual would result in contracting the disease, resulting in HIV patients becoming social pariahs. This acts as a deterrent towards a goal of universal access to antiretroviral treatment as individuals become reluctant to acknowledge their sickness and subsequently neglect treatments. Also hindering the efficacy of antiretroviral drug therapy is a need to “integrate HIV care with other health services (Report On Global AIDS Epidemic: Executive Summary, 2006).” This provides access to more comprehensive health coverage, monitoring the treatment of ART and other opportunistic infections affiliated with HIV. The problems fall under the principles of socioeconomics, governed by the economic impact on social activity. With the limited funding available to establish a legitimate healthcare infrastructure for antiretroviral treatment protocols to flourish, the road towards universal access will continue to remain a struggle.

Making strides towards universal access to antiretroviral treatment is certainly not impossible. In looking at Uganda, a member of the Heavily Indebted Poor Countries, has made great strides in seeking to control the AIDS epidemic within its country. Since its first reported cases in 1982, 1.9 million individuals are reported to have been HIV infected, with 1.4 million living with HIV (“Uganda the Ministry of Health Online”). Of its population of 24,442,084, 7% of the adult population is HIV infected (“Uganda the Ministry of Health Online”). Consequently with such an infected population, the health sector suffered from many burdens including the rise in hospital bed occupancy from 50% to 70% and an increase in drug purchase for treatment of opportunistic infections alone (“Uganda the Ministry of Health Online”). Through the acknowledgement of a government’s responsibility to service the people, various projects have been implemented. The Ministry of Health of Uganda established a Health Education Network in order to make

individuals aware and accepting of HIV ("Uganda the Ministry of Health Online"). In 1986, the country established the National AIDS Control Program (NACP) with the help of \$400,000 grant from WHO (Slutkin et al., 2006). While they did receive monetary funds from donors, the initiative taken to assume responsibility for the country's healthcare is made evident through the creation of the program.

The NACP served to: "to mount an educational campaign to inform the public on the modes of transmission and ways to avoid infection," "to reduce transmission through blood transfusion by setting up laboratories to test all blood before transfusion and to reduce transfusion to a minimum," "to advocate careful sterilization of instruments and contaminated hospital areas to assure patient and health worker safety," and "to measure the extent of the outbreak and possible co-factors by case surveillance, seroprevalence studies and operational research projects (Slutkin et al., 2006)." In addition to this program, Uganda established the AIDS Commission in 1992 as means of approaching HIV/AIDS prevention and control from a multisectoral dimension. This would entail "joint planning, joint monitoring and evaluation, and information sharing ("Uganda the Ministry of Health Online")."

It is through these sociological aspects that HIV treatment will continue to *divide* its victims, and ultimately *conquer* the helpless *unless* there is more of an effective collaborative effort from both national governments of impoverished areas such as Sub-Sahara Africa and external donors. This effort needs to be balanced amongst both entities, with national governments striving their best to secure substantial healthcare to their people.

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Four Simple Steps to Learning the Art of Whole Person Healing

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ABSTRACT: Whole Person healing is not simply administering medicine to the patient. The Whole Person healing is healing a patient as a person and not as a disease. In order to heal a patient, a doctor must build up relationship with that patient; in order to build up a relationship with that patient, a doctor must communicate with the patient. This article suggests tips to current and aspiring healthcare professionals on how to effectively communicate with a patient in an office setting.

Being sick is not a pleasant experience. Having a disease is like throwing a stone into a pond. Although the stone is thrown into “one area” of the pond, it influences the entire pond. By the same token, when a person hurts his toe, the pain does not remain only in the toe. It spreads to the body as well as the mind and heart of the person. He will be physically hurt, as well as emotionally upset and stressed. Because of the nature of disease, treating a patient is never accomplished via a prescription pad. It should be multi-faceted. Here, I would like to suggest how a physician may treat a whole person in an office setting. There are four very simple steps in the whole person healing approach.

First is greeting. Greeting a patient/parent with a welcoming smile and warm tone is the beginning of whole person healing. It establishes trust between the physician and the patient. It also elicits conversation. Especially greeting first before being greeted by the patient creates an environment in the office in which the patient can feel comfortable. If a doctor does not greet, the potential of having deeper and comfortable

conversation may be hindered; and a patient may feel uneasy. A patient always comes to the office with a problem, which usually makes him anxious or nervous about his condition. A warm greeting eases tension and anxiety. By greeting a patient the healing of the heart is already started.

Second is to call the patients by name instead of using nonspecific, non-personal terms. This is very important especially in pediatric office. As a pediatrician, I experience a lot. At the first visit, not only is it important to know their names, it is also important to learn how to pronounce them. Sometimes it is not easy to pronounce names, especially when patients come from different countries. If I don't catch a name at the first visit, it is kind of embarrassing to ask again at the next visit. However, by calling the patient by name, a doctor can make personal relationship with the patient as a person and can have an eye-to-eye contact. This gesture will help patients know and feel that the doctor is interested in helping them. Many times, a pediatrician also tends to talk with only parents, ignoring the patients because of their age. But a pediatrician should talk both with parents and with patients. That way, a doctor can build up personal relationships with patients.

Third is listening. Listening is another way of healing the heart of patient. When a patient comes to the office, he wants to talk to his doctor about a problem. But according to studies, physicians interrupt a patient after a mean time of 18 seconds and miss 94% of problems linked to psychosocial distress.(1) As soon as a patient talks, a physician interrupts and

dominates the conversation. By largely ignoring psychosocial problem, physicians collect biased and incomplete data. In the HMO health care system, where most of the care physician performs are not reimbursed, it is not easy for a doctor to listen to the patient. But by listening to the patient, the physician will be able to understand the problem and avoid unnecessary tests by narrowing down the diagnosis. By listening to the patient, the physician can also build up trust with a patient. As we know well, trust and faith are the core elements of healing. Therefore, listening is central to the physician - patient relationship.

Fourth is counseling. After listening to patients, a doctor should give them both appropriate advices and right counseling. Usually a doctor does not have a lot of time to talk with the patient. A doctor, however, must have a quality of time with the patients. In order to have a quality time, the physician should make a non-distracting and confidential environment in the office. Through this, a doctor is able to give patients both appropriate advices and right counseling.

The whole person healing is not a one time thing. It is continuous care healing. Sometimes a doctor needs to call patients by the phone, asking them how they are doing. The whole person healing is healing a patient as a person, not as a disease. Because of the nature of the person, the whole person healing must be based on relationships. In order to have good relationships with patients, a doctor must communicate with patient well. When a doctor approaches patients with such an attitude, most patients will find themselves in the land of healing.

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