The nonpharmacologic basis of therapeutics

To get to the next level in interprofessional patient care, pharmacists need to recognize the social and interpersonal aspects of medical decision making.

Conan MacDougall

I’d like to start off by saying I’m very honored to receive the Albert B. Prescott Award for this year. To be recognized among the other distinguished recipients is very humbling. I’ve given a lot of presentations, but never an award acceptance speech like this. So I tried to apply the principles I’ve learned in giving other presentations. First, know your audience. What do they know? What are they expecting coming into the talk? What level of knowledge do they already possess? It’s much harder to pin down this group than say, third-year student pharmacists at the University of California, San Francisco (UCSF) or even clinicians attending an infectious diseases conference. But I can imagine that you’re going to want to hear about leadership, or education, or both, since this award is given by the Pharmacy Leadership & Education Institute. Second, be prepared. So I read all of the Prescott acceptance speeches for the last few years. There were many visionary speeches about the future of pharmacy or what it takes to be a leader. Well, I’ve never been too good about predictions. In college, we had to turn in an assignment over e-mail and I thought, “This will never last.” Now e-mail runs my life. And I’ve never really considered myself to be a leader in the traditional sense. So I’ll adapt a third piece of advice often given to writers—“write what you know”—and talk a little bit about the challenges I see in my daily work as a clinician in infectious diseases and a teacher of student pharmacists, and from there perhaps draw out some broader implications for the future of pharmacy education and practice. Wait, didn’t I say I wouldn’t talk about the future of pharmacy? Well, I guess it’s just too tempting to give your opinion on such things when given such a platform!

Many of you are aware that antibiotic resistance represents a tremendous challenge not just within the area of infectious diseases but to the health care system as a whole. The scenario of infections untreatable with our current antibiotic armamentarium isn’t just a tactic to scare up additional research funding (although it is that), it is a reality in hospitals across the country. An oft-cited example of medicine’s hubris has been the attribution of the former Surgeon General, William Stewart, of the statement in 1967 that “it is time to close the book on infectious diseases.” Although it’s not clear that he ever actually said such a thing, the sentiment reflected the optimism of the time that advances in sanitation, vaccination, and antibiotic development meant that medicine could divert its attention to the other diseases people now lived long enough to die from, now that infectious diseases had been brought under “control.”

So how did we get from such an optimistic moment to the situation we are facing now? Well, instead of starting at the beginning of the antibiotic era, let’s start in medieval England, by discussing the grazing habits of cows. The story goes that at the time, people who owned livestock would typically have their own little plot of land to graze their cows on. The more land they had to graze, the fatter the cows and the greater the benefit to the owner. Most towns also had an area known as the commons, which was shared land where all the townsfolk could graze their cows, maybe when they were coming into town to get some mead. For every individual farmer, it was to their benefit to let their cattle graze as much as possible on the commons, since it led to bigger cattle than
he could achieve just by grazing on his own land. This rational decision on the part of each farmer would inevitably lead to over-grazing and the depletion of the commons for the entire group.

The name given to this scenario (which may or may not be entirely historically accurate) is the “Tragedy of the Commons." It is in a class of problems known as a “social trap," where there is exploitation of a common finite resource without a technical solution. For the individual, especially over short time periods, the benefits of exploiting the resource are greater than the costs, but for the group, and eventually the individual, the exploitation leads to depletion of the resource. The problem of antimicrobial use and resistance can be viewed as a social trap. Antimicrobial efficacy, that is the absence of resistance, is a shared resource that is valuable to each of us. Value is both in the direct curative benefits of the drugs and the indirect benefits of a reduction in perceived risk by patients and providers. Unfortunately, antimicrobials are unique among drug classes in that use in any one patient incrementally diminishes the value for other patients via contributing to antimicrobial resistance, creating a tension between the individual and the community.

This tension is illustrated well in a study by Metlay et al. They surveyed infectious diseases and internal medicine physicians about their attitudes about antimicrobial resistance and antimicrobial prescribing. The vast majority agreed with the statements that “antimicrobial resistance is a major public health concern” and that “over-prescribing of antimicrobials is a major cause of resistance.” Interestingly, 80% of clinicians shifted responsibility to the patient, agreeing that “patient demand is the major reason physicians prescribe unnecessary antibiotics.” The kicker, of course, is that only about a third of physicians agreed that “I prescribe antimicrobials more than I should.” A majority of physicians also agreed with the statement, “Before prescribing an antibiotic, I weigh the potential benefit to the patient against the potential harm to society.” However it didn’t seem to be weighted too heavily, because when asked to rank seven factors that influenced their choice of antimicrobials for a hypothetical patient with pneumonia, “risk of contributing to the problem of antimicrobial resistance” ranked last, behind “ease of use” and “cost.” The lesson isn’t that physicians don’t recognize the problem or their role in it, but that their obligation to the patient in front of them heavily influences their decision making. Put in a more cynical manner, physicians worry about being sued by a patient if they don’t prescribe a broad-spectrum enough antibiotic for the patient’s infection, but they don’t worry about being sued when a patient they’re not treating acquires a drug-resistant infection from the patient that they unnecessarily treated. In any case, these data make it clear that simply appealing to clinicians’ rationality isn’t going to be enough to make a substantial change in their behavior.

I mentioned that a social trap is a scenario without a “technical solution.” If some super-fertilizer allowed the grass on the commons to grow back every night, that would be a technical solution. For decades the problem of antimicrobial resistance did not rise to the level of a social trap because the regular introduction of new antimicrobials active against drug-resistant organisms was the technical solution that allowed clinicians to escape the social trap. Unfortunately, the pace of drug development in antimicrobials other than antiretrovirals has ground nearly to a halt. Pharmaceutical companies accurately perceive a much greater return on investment for drugs that patients will take for the rest of their lives rather than for 1 to 2 weeks. An alternative technical solution would be the introduction of new diagnostic technologies. Most use of antimicrobials is empiric; that is, it is done in the absence of knowledge of the infecting pathogen (assuming the patient actually has such an infection). Unfortunately, much of our laboratory diagnostics for infectious diseases are still using modified 1880’s technology (for example, the revolutionary staining process of Dr. Hans Christian Gram, which allows us to narrow down the organism identification to about a thousand different possibilities). Physicians are making prescribing decisions based on incomplete information and, in that context, will generally err on the side of reducing risk by treating conditions that may not be infections or by using broader-spectrum agents. The challenge is that we know that as humans we’re not always good about making judgments about risk. Moreover, prescribing decisions incorporating risk are affected not...

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only by knowledge but by attitudes as well. Among European countries, there is huge variation in antimicrobial use, despite the presence of national health care systems in most. A recent study demonstrated that the proportion of inhabitants who had received antibiotics for a cold, flu, or sore throat in the last year ranged across the countries from 11% to 81%. When these proportions were correlated with a validated measure of national cultural norms, strong associations between antibiotic use and with the cultural dimensions of uncertainty avoidance and masculinity—almost half of the variability in prescribing was associated with these factors.

So what have we learned? As we have plateaued in our ability to invent new technical solutions, we cannot hope to preserve a shared resource and simultaneously offer every clinician and patient absolute certainty that their condition will be treated. We have to make some value judgments, not just scientific judgments. We have to understand the motivation as well as the medical evidence. Clinicians recognize the potential societal impacts of their decisions, but their focus is on treating the individual patient. They perceive that patients expect certain prescribing behaviors and that patient expectations are highly influential. And their tolerance for risk can be influenced by cultural factors that they themselves may not be fully aware of. This is the context that is too often ignored: the nonpharmacologic basis of therapeutics. We need to recognize it and embrace its challenges.

I occasionally host discussions with representatives of the pharmaceutical industry regarding their products. Without fail, they spend the first 5 minutes asking me about my family, my child, my favorite sports team, etc. Little do they know I have little patience for this small talk; but on average, this approach is successful in establishing a connection that can wield on average, this approach is successful in

The title of this talk, “The Nonpharmacologic Basis of Therapeutics,” is taken from an excellent article by Avorn and Solomon in the *Annals of Internal Medicine*. The authors discuss the issue of antimicrobial resistance and describe their approach of “academic detailing,” an approach that co-opts the techniques of the pharmaceutical industry to guide clinicians toward evidence-based, cost-effective therapies. The “detailers” are selected based on not just their knowledge of the topic but their interpersonal skills. At UCSF, I teach students both in the classroom and on inpatient rotations. The highest-performing students on clerkship are those who have a strong knowledge base and who can intuitively navigate the interpersonal relationships that being a part of an interdisciplinary health care team entails. Many students that perform exceedingly well in the classroom are less effective than might be expected on the wards; they have all the knowledge but can’t communicate it, in part because they don’t pick up on all the subtleties of hierarchy, responsibility, and motivation present. They make recommendations about stool softeners to attending physicians or launch into detailed explanations of ACE inhibitor pharmacology to surgical residents.

Despite the importance of understanding the nonpharmacologic basis of therapeutics, only 22 schools of pharmacy require a course in psychology for admission (an additional number require a course in psychology, sociology, or anthropology—disciplines that are similar only to each other from the perspective of people trained in biology or chemistry). Once in pharmacy school, students certainly learn about abnormal psychology, but teaching of interpersonal and health care psychology varies widely. In an era where compounding has become a niche role for pharmacists and robots and technicians physically fill prescriptions and mix chemotherapy, the effect of pharmacists on care boils down to their power to persuade others—clinicians and patients—to follow our recommendations. It’s time we acknowledge this and incorporate the teaching of the nonpharmacologic basis of therapeutics into our pharmacy curricula and professional continuing education, and give our clinicians tools to tackle the challenges in the interprofessional health care environment of the 21st century.

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References