

# Alignment With Market Forces: The “Re-Whithering” of Infectious Diseases

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Given constant emergence of new infectious threats, infectious diseases (ID) should be one of the most attractive medical specialties to students and trainees. Yet, ID Fellowship programs continue to not fill in the match, and ID remains among the lowest paid specialties. Approximately 35 years after Dr. Petersdorf first asked the question, we find ourselves once again wondering, “Whither Infectious Diseases?” To answer this question, and align with predominant US market forces, ID experts should push for the following: (1) restrictions regarding utilization of ID diagnostics and antimicrobial agents; (2) pay-for-performance measures regarding antimicrobial prescribing rates; and (3) healthcare reform as called for by the American College of Physicians to move away from fee-for-service medicine. Einstein said, “Continuing to do the same thing over and over and expecting a different result is the definition of insanity.” We must move towards alignment with market forces, to benefit our patients, society, and our colleagues.

**Keywords.** cognitive encounters; fee-for-service; infectious diseases; market forces; US healthcare.

The last several decades have continually reminded the world of how important infectious diseases (ID) remain to the health and welfare of people all over the planet. Anthrax scared Americans in 2001. Severe acute respiratory syndrome (SARS) terrified the world in 2003. In 2004, West Nile virus became a global problem, from seemingly out of nowhere. In the first decade of the 21st century, ID experts brought forth astounding advances in diagnostics and therapeutics that converted human immunodeficiency virus (HIV)/acquired immune deficiency syndrome from a death sentence to a manageable, chronic disease. Meanwhile, the world was in the midst of a burgeoning crisis of rising antibiotic

resistance and a collapse of new antibiotic development.

In the years that followed, the 2009 H1N1 influenza pandemic struck. New therapies became available that made hepatitis C virus curable. Ebola once again terrified the world in 2014, followed by the Zika scare in 2015. Moreover, years of intensive ID effort on the antibiotic resistance front have begun to pay off, with promising very recent declines in antibiotic resistance rates, combined with a surge of new antibiotics becoming available [1–3].

And then of course, the once-in-a-century global coronavirus 2019 (COVID-19) pandemic struck [4–6]. Within weeks, diagnostics became available for SARS coronavirus 2, within months therapeutics began to become available, and we anticipate a vaccine within 1 to 2 years. Infectious diseases experts once again became media celebrities.

## WHERE ARE WE NOW?

History has shown us that new infectious threats continually emerge, and successes have continually followed. Surely then, the ID community must be now basking in the glow of recognition and the public need for top talent to come into the ID

field. Indeed, some might speculate that the COVID-19 pandemic alone would lure top talent into the field, as HIV did 30 years earlier—Or not.

After decades of failed efforts to change, ID remains very near the bottom of the remuneration ladder amongst physicians [7]. This poor remuneration is in an era of ever-worsening, crushing medical student debt, the average of which has doubled since 2000 [8]. Indeed, ID practitioners are 1 of only 2 subspecialties remunerated below general internists in the United States [8], raising the obvious question—why should top talent choose to spend 2 or more additional years in training to end up making less money? Whether students and residents are interested in the concepts of ID or not, the ratio of debt to income for ID relative to other specialties is a substantial deterrent to top talent entering the field [9]. In 2019, despite years of effort to reverse the trend, more than one third of US ID Fellowships did not fill, and 20% did not match any candidates at all [10]. What has gone wrong?

## ALIGN WITH MARKET FORCES

The answer is very simple. The field of ID has never adapted to the reality of market forces.

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In 1977, Dr. Robert Petersdorf, legendary ID physician and luminary of Internal Medicine, published an article in the *New England Journal of Medicine* in which he predicted the end of ID as a specialty. His exact quote was, “Even with my personal loyalty to Infectious Diseases, I cannot conceive of the need for 309 more infectious disease experts [ie, graduating fellows] unless they spend their time culturing each other” [11].

Nearly a decade later, Dr. Petersdorf expanded on this theme in an incredibly prescient keynote lecture at the annual meeting of the Infectious Diseases Society of America titled, “Whither Infectious Diseases? Memories, manpower, and money” [12]. He said, “in a fee-for-service environment...Infectious disease practitioners have difficulty in making a living. There are few or no procedures. There is a lot of uncompensated phone time, and there is the need to visit several hospitals and spend a good deal of time traveling. In academic medical centers, infectious disease divisions are almost invariably loss leaders, and I know of few that are not heavily supported by university salaries, hospital salaries, and grants. Infectious disease divisions do not earn enough in practice to make a go of it and also require subsidies from the higher-earning divisions in their parent departments” [12].

These realities called out by Dr. Petersdorf 34 years ago remain just as true today, leading us to again ask in 2020, whither infectious diseases?

Some years ago, Drs. Liise-Anne Pirofski and Arturo Casadevall pointed out to me another flash of insight. One of the predominant handicaps of the ID clinical specialty is that there is nothing we do that no one else can do. Only Oncologists prescribe cancer chemotherapy. Only Cardiologists do cardiac cath. Only Surgeons take patients to the operating room. What is it that only ID practitioners do?

We know antibiotics better than anyone, but anyone, up to and including the nurse practitioner at the walk-in

clinic in the pharmacy on the corner, can prescribe them. We understand how to establish a microbial etiology of infections, and distinguish them from colonization, but there is little financial pressure on health systems to value this skill. We know HIV care better than anyone, but HIV Fellows can be generalists, not subspecialists. Viral pandemics may be infections, but they hit Emergency Medicine, hospitalists, critical care doctors, and primary care doctors harder than they hit the ID specialists. There are no diagnostic tests or therapeutic options that only we can prescribe. Add to this realization the fact that in a fee-for-service environment, the operating budgets of hospitals are highly dependent on high margin procedures [13–15], not cognitive encounters.

Infectious diseases practitioners may be better at diagnosing and treating infections than those who practice other specialties, but to what financial advantage to healthcare systems that hang on by their fingernails with operating margins under 2% [16, 17]? Health systems have little room for expansion of costs into low return-on-investment service lines. How can the advantages ID experts bring be monetized to justify higher ID salaries?

I am the Chief Medical Officer of a large public hospital. Like my colleagues in the C suite, I am responsible for ensuring that our hospital stays as close to within budget as is humanly possible [18]. Running deeply in the red threatens hospital closure, harming the hundreds of thousands of patients per year we serve, and putting out of work 10 000 people. So, even though I am an ID expert and love my clinical and research work, is it realistic to think that I can artificially inflate ID salaries at my hospital above the level the market will bear? No, it is not. And if you cannot convince me to do that, good luck convincing anyone else. Infectious diseases practitioners simply do not bring in revenue in a way that makes them a priority to health system operating margins in a fee-for-service environment.

The encounter-based, fee-for-service healthcare payment model inherently cripples cognitive specialties’ remuneration relative to proceduralists. Cognitive services will never compete with the value that procedural encounters bring in a fee-for-service healthcare system. Market forces are intrinsically against us. Dr. Petersdorf understood this nearly 35 years ago.

For years, ID representatives have lobbied for better reimbursement for ID practitioners through the Medicare Relative Value Scale (RVS) Update Committee (RUC). These efforts are meritorious and should and will continue. Nevertheless, they would be likely much more effective if the lobbying efforts were backed by and aligned with market forces. For example, only an Orthopedic Surgeon can implant an artificial hip; they have a monopoly, with no competition. If their reimbursement fell such that the specialty became less attractive, and the number of trained Orthopedic Surgeons fell, patients would demand access, and the imbalance of supply-demand for hip surgeries would intrinsically drive up reimbursement. However, all licensed practitioners function as competition for ID. If the number of ID specialists decline, we may argue that quality of care will decline, but there will be plenty of other practitioners who can do what the ID practitioners can do. There is no market-forces alignment with lobbying for higher RVU reimbursement. It is just an argument of merit and quality, with no economic market force behind it.

Are there data that support this assertion? Absolutely. A recent analysis underscored how few ID specialists there are across the United States to handle the COVID-19 pandemic [19]. Years of lobbying for RVU increases have not led to changes in relative reimbursement or reversed the decline in fellowship applicants and trained ID physicians. In the absence of ID specialists, many other types of providers care for patients with COVID-19. The COVID-19 pandemic has not led to reversal of the problem, but rather it further exposed this inequity.

What we must do is change the interaction between our specialty and the healthcare system such that ID work becomes aligned with market forces. There are practical solutions at hand, but they will require legal and/or regulatory changes. Therefore, they will require a shift in emphasis of our specialty lobbying efforts. These solutions would allow our specialty to work in concert with market forces rather than against them.

### **A CHANGE IN DISCOURSE: PROPOSED SOLUTIONS**

First, ID practitioners have unique expertise in the diagnosis and treatment of infections, which can lead to less antimicrobial resistance and superinfections, better outcomes, and lower cost for patients and health systems. Unfortunately, that unique expertise is hard to monetize. Anyone can read the result of a diagnostic or antimicrobial susceptibility study in the electronic medical record. In addition, anyone can prescribe an antimicrobial agent. However, only an expert understands whether further diagnostics (eg, molecular studies) are necessary to benefit the patient and/or public health. It also takes an expert to know specifically what to prescribe and, perhaps more importantly, when not too. Nevertheless, nothing stops nonexperts from doing this work now, leaving ID practitioners unable to monetize that hard-earned expertise.

Granting the ability to any licensed practitioner, with no specialty training, to interpret complex diagnostic or susceptibility results, or prescribe powerful, new antimicrobial agents, seems antithetical to health of the public [20]. Only those who have undergone specialized ID training, whether by accredited training or certification course, should be allowed (eg, via law, regulation, or medical staff credentialing) to interpret diagnostic/susceptibility results or prescribe newly approved antimicrobial agents [20–22]. This change would have the potential to improve prescriptions, decrease antibiotic abuse, diminish selective pressure

driving antibiotic resistance, and decrease cost. All of this would be of great advantage to our patients and to public health. It would also have the effect of finally granting to ID practitioners alignment with market forces, by providing us something that only we can do, much as oncologists and proceduralists have long had.

Second, we must push to mandate public reporting of antimicrobial prescriptions at the system level and linking pay for performance measures to such reporting [21, 22]. Systems that use at the highest end of antimicrobial agents, adjusted for disease severity, should receive payment penalties, whereas systems at the lower end receive payment bonuses. This construct is built upon the success of infection prevention, in which public reporting and pay-for-performance measures have successfully driven down hospital-acquired infection rates. As national-level financial penalties and rewards come into play, they will motivate health system C-suites to prioritize hiring and funding ID experts to lead and staff antibiotic stewardship programs to improve the financial situation of the health systems [18]. We would finally achieve true alignment with ID expertise and market forces governing health system operating margins. Moreover, society would benefit from diminished selective pressure driving resistance, prolonging the efficacy of life-saving therapies (including future biological therapies such as phage or immune modulatory therapy).

Third, we should be pushing for true reform to the payment structure of our healthcare system. The US healthcare system is by far the most expensive in the world, by any measure, and for that cost it delivers bad outcomes, including higher mortality rates and shorter life spans than peer nations [23]. The fee-for-service basis of payment is a core driver of this high cost and bad value. Paying for each episode of care, and in particular paying more for expensive, potentially dangerous procedures, encourages excess care delivery, which drives the operating

margins of healthcare delivery entities [23]. Expensive, high volume, dangerous procedural-based, fee-for-service encounters may be bankrupting the United States as a whole, but they make money for hospitals and health systems. That market force discrepancy between societal and health system advantage is not in the best interests of patients, doctors, or society as a whole.

In contrast, payments that are made for population-based healthcare favor judicious use of resources to maximize benefit to society. Cognitive specialists become the gatekeepers of precious limited resources available for healthcare in the latter model. Therefore, in the reformed model, cognitive specialists who keep people from becoming sick and minimize waste and harm become more valuable to healthcare payers than those who conduct expensive procedures on patients who are already sick.

The American College of Physicians has recently called for fundamental healthcare reform in the United States based on just this principle [24–27]. Our specialty has been unfortunately silent in the aftermath of this call for change, to our own detriment.

### **CONCLUSIONS**

Infectious diseases will always plague the world. The question is, how will our subspecialty evolve over time when our work and remuneration are in opposition to the predominant fee-for-service market forces that govern US healthcare? Years of pressing for incremental tweaks to physician reimbursement in this system have thus far not worked to change the equation. After so many years of effort, continuing to lobby without alignment with market forces seems unlikely to change reimbursement. If we want to fundamentally change the equation of ID practitioner value in the US healthcare system, we need to change ID work and remuneration to become aligned with market forces.

This situation can be remedied with advocacy and lobbying, and it must be. Furthermore, once having mustered the political will to do so, the case should be easy to make to the public, because it is clearly in the public's and our patients' best interest to have ID experts as the stewards of infectious-related diagnostic and therapeutic modalities. We can limit waste and improve precision, which improve patient and population outcomes, and at lower cost to the system at large. However, thus far, we have lacked the will to make this case. It is time to do so.

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