Doing No Harm

 *It takes a wise doctor to know when not to prescribe*. Gracian, The Art of Worldly Wisdom 1647

The first rule of the Hippocratic Oath is to First Do No Harm, or as Gracian says, to “know when not to prescribe”. The fable of the 3 doctors from the Introduction, relies on the good reputation of Dr. One who keeps his patients well, and the bad reputation of Dr. Three who makes his patients worse. The goal of this chapter is to illustrate how doing no **harm *is not as straight forward as it seems, and, in fact, can be devilishly difficult.***

Case Study

This story was published in the San Francisco Chronicle[[1]](#endnote-1) with a backdrop of coronavirus pandemic. It is the story of Oakland A’s baseball player Micah Bowie. He had issues with back pain and retired in 2008. Treatments were apparently ineffective and led to the Chronicle story. I will quote heavily from the article here.

*Frequent back pain became all the more pronounced when he retired in 2008*. *As he became more incapacitated and treatments less effective, Bowie and his wife, Keeley, began investigating back surgery or stem-cell treatment for tears associated with his L4-5 and L5-S1 vertebrae. He was told he’d need a double-disk fusion procedure and might be looking at a lifetime of repeat surgeries.*

*That’s when doctors presented the idea of a spinal-cord stimulator, an internal device that interrupts pain signals from nerves. A week’s trial run went well, so Bowie elected to have the device implanted in August 2016…”*

***Iatrogenics*** (from the Greek meaning “caused by the healer”) is when a treatment causes more harm than benefit. The concept of **iatrogenic,** a type of well-meaning harm, has recently been applied to decision making in general. There are flaws in framing decisions that are universal and go beyond choosing a medical course of action. Fortunately, some of the smartest thinkers of our time have devoted thought to these pitfalls and how to address them.

We will also be considering the conundrum addressed by David Epstein in his seminal work called “When the Evidence Says No, but the Doctors Say Yes.”

**Principles of Decision Making or Why It Is So Hard To “Do No Harm”**

**Inversion or Avoidance of Negatives**.

 [Charlie Munger](https://fs.blog/charlie-munger/), the business partner of Warren Buffett and Vice Chairman of Berkshire Hathaway, is famous for his quote--presumably tongue in cheek-- “All I want to know is where I’m going to die, so I’ll never go there.” What he is getting at here, is that avoiding the bad is often more powerful than seeking good. In decision making a**voiding stupidity is easier than seeking brilliance.** The parallel in medicine is **avoiding harm is easier seeking a brilliant solution**. After all, the incidence of problems caused by medical intervention, or iatrogenesis is somewhere between the 3rdand 7th leading cause of death in the U.S.[[2]](#endnote-2) To stay firmly in the realm of Dr. One and stay away from Dr. Three, we need to avoid as well as treat.

**The Power of Avoidance as a Public Health Principle**

 In 2014, two researchers at Brigham Young University surveyed Americans and found that typical adults attributed about 80 percent of the increase in life expectancy since the mid-1800s to modern medicine**.** “The public grossly overestimates how much of our increased life expectancy should be attributed to medical care,” they wrote, “and is largely unaware of the critical role played by public health and improved social conditions.” [[3]](#endnote-3)

**“The public grossly overestimates how much of our increased life expectancy should be attributed to medical care,” they wrote, “and is largely unaware of the critical role played by public health and improved social conditions.”**

By implementing basic sanitation and addressing poverty life expectancy increased dramatically, though this increase is often attributed to “Modern Medicine”. This perception, they continued, might hinder funding for public health, and it “may also contribute to overfunding the medical sector of the economy and impede efforts to contain health care costs.”[[4]](#endnote-4)

**The Power of Avoidance as Personal Health Principle**

*A team led by researchers at Massachusetts General Hospital*[*pooled*](http://www.nejm.org/doi/full/10.1056/NEJMoa1605086#t=article)*data from tens of thousands of people in four separate health studies from 1987 to 2008****. They found that simple, moderate lifestyle changes dramatically reduced the risk of heart disease, the most prolific killer in the country, responsible for***[***one in every four***](https://wonder.cdc.gov/ucd-icd10.html)***deaths.***

 *People deemed at high familial risk of heart disease cut their risk in half if they satisfied three of the following four criteria: didn’t smoke (even if they smoked in the past); weren’t obese (although they could be overweight); exercised once a week; ate more real food and less processed food.[[5]](#endnote-5)*

***They found that simple, moderate lifestyle changes dramatically reduced the risk of heart disease, the most prolific killer in the country, responsible for***[***one in every four***](https://wonder.cdc.gov/ucd-icd10.html)***deaths***

*Back to Bowie.*

*A month later, [Bowie] says he awoke to horrible pain and struggled to breathe, starting a long string of ambulance trips and hospital stays with trips to see back experts, none of whom could determine what was happening because they were unaware of issues with the medical device.*

“*The worst part was that no one believed me,” said Bowie, 45. “It was a nightmare scenario.”*

**More is Not Always More**

 This is a corollary of Avoidance and is an especially hard one to “get”. It has multiple manifestations.

**Bias Towards Action** **and Treatment**

To, again, paraphrase Charlie Munger, the bias towards action he calls [do something syndrome](https://www.farnamstreetblog.com/2015/06/do-something-syndrome/).[[6]](#endnote-6)

Nassim Talib, author and thinker[[7]](#endnote-7) calls people **interventionistas** who come armed with solutions to solve first order problems without considering the long-term effects[[8]](#endnote-8). Naive interventionists, or the interventionista, often deny that natural homeostatic mechanisms are sufficient, and insist that “something needs to be done” — yet often the best course of action is minimal action, just as Hippocrates reminds us. Talib also admonishes that we must also recognize that some systems self-correct; [this is the very essence of homeostasis](https://www.farnamstreetblog.com/2016/06/why-do-we-backslide-on-our-goals/). (We discussed homeostasis in the Introduction.)

 A simple rule for the decision-maker is that intervention needs to prove its benefits and those benefits need to be orders of magnitude higher than the non-interventionist path. This is a reframe of the crucial calculation of “risk/benefit” that doctors face daily. When the benefits become orders of magnitude higher than doing nothing, should we act. So car crashes, cancer, accidents, appendectomy all require decisive first order action. But many of the most common ailments require prudence and thought, it can be counterproductive to be pressured to treat. “*It takes a wise doctor to know when not to prescribe*” as Gracian says. It goes against instinct not to treat, but **in not** considering 2nd and 3rd order consequences, you can make things worse and slip into Dr. Three territory

In modern medicine More Is Not Always More has some additional features. A few follow.

**Cool Toys.**

Advanced medical devices, or “cool toys” are a particularly pernicious problem. Why do regular surgery when you can use a cool robot? Why use flashcard drills when you can use a cool Anesthesiology “state of the art” simulator? Or as a patient, don’t you want that latest procedure that uses the latest device? Isn’t that the best? There was a joke in Med School, that half the world needs vitamins and the other half takes them. The same might be said for treatments and procedures. But like fancy weapon systems that always, somehow, get used whether they are “overkill” or not, the most sophisticated solutions seek a use. Unfortunately, in looking for a use, this can also lead to “overkill”. We will see that when it comes to medical interventions, be it pills or surgeries or procedures, you actually want other people to get them first and be the final “guinea pigs” in the clinical trials. A wait of 7 years from a new treatment option’s release is the rule of thumb.

**Smartest doctors**

It is almost taken as a given, that the more healthcare and the more specialized the care, the better the outcome. But to quote Dr. Rita Redberg from UCSF,"Right now, people think that if a little health care is good, then more health care is better, which is not always the case." Dr. Rita Redberg[[9]](#endnote-9)

*"Right now, people think that if a little health care is good, then more health care is better, which is not always the case." Dr. Rita Redberg*

How could it not be? Smarter is better. Isn’t it? Obviously, there will always be a place of importance for the smartest people with the best training. But what constitutes smartness? Is it the wisdom of the wise doctor who doesn’t treat, or is it the one with the best degree? Keep in mind that the outcomes for patients in areas with high prevalence of specialists have no better healthcare outcomes[[10]](#endnote-10). “Dumb” or uncool solutions like providing adequate good food in food deserts[[11]](#endnote-11), and clean air and water are not valued as highly[[12]](#endnote-12).

**Cool research/No Retesting**

 Within the academic publishing world, there is a bias towards positive, exciting research, which leads to new treatments. ***“Break throughs” are sought above all***. Unfortunately, there is little appetite or money to rerun experiments, to ensure that the initial results were valid. There were recent high-profile cases where the drug industry ran experiments and then buried the trials where the results were negative. They only published the positive studies, apparently oblivious to the fact that this is not how science works. John Oliver did a brilliant, and laugh-out-loud segment on this in his show called Scientific Studies. [[13]](#endnote-13) The reluctance to do independent confirmation of studies can lead to a phenomenon called **Once the Train Has Left the Station,** a term I first heard coined by Rita Redberg.It means that once a treatment is accepted, even if the scientific proof is iffy or nonexistent, it can be exceptionally difficult to stop its usage. [[14]](#endnote-14)

Back to Bowie

*X-rays determined that the battery from the device, which is supposed to sit in a subcutaneous pocket, had migrated, ripping through his liver, diaphragm and right lung. Parts of Bowie’s lungs had to be removed and his diaphragm repaired, but doctors refused to consider that the device was the source of Bowie’s breathing issues even while moving the battery to Bowie’s hip. His condition continued to deteriorate, his oxygen saturation dropped perilously low. Bowie was frequently hypoxic, his neurological function impaired, and his liver, heart, kidney and adrenal glands incurred damage*.

A few more pitfalls to consider that can lead us into Dr. #3 territory.

**Inadequate Mental Models.**

It is difficult to think in second and third order consequences if your mental model is deficient or defective. Instead of seeing the actual reality of the body as a sophisticated system of multiple feedbacks that can lead to homeostasis it is often considered a machine whose individual parts need fixing, or **Man As Machine** mental model. This model can lead to fallacies of diagnosis and treatment options. The most basic is that **the machine needs something done to it**, otherwise it will not get better. But the another is that remedies that seem logical according to the Man as Machine model do not work as intended. This pitfall we call **bioplausibility.**

But another problem of this Man As Machine model is that since it ignores the power of homeostatic feedback systems that can react to subtle inputs, it is difficult for us to believe that small changes, or minor treatments can be “enough”. Physical therapy, acupuncture, dietary changes, sleeping habits, hardly seem up to the task of a problem considered “serious”.

**Incentives and Credit and Blame**

These will be considered together since they are interrelated. Here, a doctor’s thinking can become hopelessly derailed because of multiple perverse incentives.

**Bias towards action with little downside to treatment** occurs quite a bit and will be discussed later.

**Pressure from Patients** can be a subtle and not so subtle pressure. They hear about a treatment or see one advertised and want it even if it might not be appropriate for them. Patients also have a pronounced bias towards action in general.

**Follow the Money** This admonition, usually applied in the context of rooting out criminal activity, can be useful in evaluating medications, procedures and surgeries. Not to mention that in much of our current system, to treat is to make money. As Sinclair Lewis said, “It is difficult to get a man to understand something when his salary depends upon his not understanding it.” In this context, it is difficult to get a surgeon to stop doing a useless procedure when he makes his money doing it

**Shared credit and blame.** If multiple treating doctors are involved, in the end no one is really in charge, and no one is accountable. Complicating accountability is the following.

**Distance from consequences of treatment**

We see this, as above, in **sharing credit/blame with other practitioners**, but there can also be **distance imposed by time**, or when **the problem is multifactorial.**

To expand on these topics a bit more before returning to Bowie, we turn to David Epstein’s seminal article. Epstein covers a few treatments that have little scientific evidence but are in broad use. They illustrate the faulty decision making that can lead to unnecessary and possibly dangerous treatment

**When the evidence says no, but the Doctors Say Yes[[15]](#endnote-15)**

“***“****Years after research contradicts common practices, patients continue to demand them and doctors continue to deliver. The result is an* ***epidemic of unnecessary and unhelpful treatment****…When you visit a doctor, you probably assume the treatment you receive is backed by evidence from medical research. Surely, the drug you’re prescribed or the surgery you’ll undergo wouldn’t be so common if it didn’t work, right?” David Epstein[[16]](#endnote-16).*

Let us consider his article with our pitfalls in mind.

**Inversion or Avoidance of Negatives**

 “*Some of the*[*most widely prescribed*](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1285093/)*medications do little of anything meaningful, good or bad, for most people who take them. So rather than waiting to prescribe or doing nothing, treatments are prescribed that do not confer huge improvements****, rather they do nothing or worse*.” --**Epstein

But useless treatment is compounded by the fact that doctors will often not be faulted for taking this course (**credit and blame**). And if you add in **follow the money** (they will be leaving money on the table by not doing the procedure) it is a recipe for over treatment and sometimes disaster. Despite evidence to the contrary, they are more likely to be blamed for NOT treating. As a result, it is easier to be a Dr. Three than a Doctor One in this scenario.

**More is Not Always More**

**Bias towards Action** .

“*A procedure known as arthroscopic partial meniscectomy, a procedure for knee pain that aims to clean out damaged tissue, accounts for*[*roughly*](http://www.nejm.org/doi/full/10.1056/nejmoa1301408#t=article)*a half-million procedures per year at a cost of around*[*$4 billion*](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4583596/#r4)*.”* –Epstein

[In recent years](http://www.briancolemd.com/wp-content/themes/ypo-theme/pdf/trends-in-meniscus-repair-and-meniscectomy-in-the-united-states.pdf), arthroscopic partial meniscectomy has been one of [the most popular](http://www.nejm.org/doi/full/10.1056/NEJMoa1305189#t=article) surgical procedures [in the hemisphere](http://www.ideal-collaboration.net/2014/01/finnish-research-questions-indications-for-knee-surgery/). And a burgeoning body of evidence says that it does not work for the most common varieties of knee pain. Studies show that patients have the same relief whether they get surgery or not as long as they get physical therapy. Another extremely rare type of study was done where patients received “sham surgery” where the patient went to the OR, had incisions, but no work was done on the meniscus. A year later, there was no difference in the results except that patients who had the real surgery were ***more likely to develop osteo arthritis***. “Though arthroscopic partial meniscectomy is exceedingly safe, surgery plus physical therapy has a greater risk of side effects than just physical therapy. ”…

*“How can a procedure so contraindicated by research be so common?” asks Epstein*.

Epstein interviewed the surgeons. “Most of my colleagues,” Christoforetti says, “will say: ‘Look, save yourself the headache, just do the surgery [**bias towards action**]. None of us are going to be upset with you for doing the surgery [**no downside to treatment**]. Your bank account’s not going to be upset with you for doing the surgery [**follow the money**]. Just do the surgery**.**

***Look, save yourself the headache, just do the surgery. None of us are going to be upset with you for doing the surgery. Your bank account’s not going to be upset with you for doing the surgery. Just do the surgery.***

**Cool Research/No retesting**

*“According to Vinay Prasad, an oncologist and one of the authors of the Mayo Clinic Proceedings paper, medicine is quick to adopt practices based on shaky evidence but slow to drop them once they’ve been blown up by solid proof.” –*Epstein *(Dr. Rita Redberg’s “Once the Train has Left the Station” phenomenon.)* As a young doctor, Prasad had an experience that left him determined to banish ineffective procedures. He coauthored a [2015 book](https://www.amazon.com/Ending-Medical-Reversal-Improving-Outcomes/dp/1421417723), “Ending Medical Reversal,” a call to raise the evidence bar for adopting new medical standards*.* ***“We have a culture where we reward discovery; we don’t reward replication,”*** *Prasad says, referring to the process of retesting initial scientific findings to make sure they’re valid.”* New positive research is more exciting. Retesting initial scientific finds has low status. But considering the huge incentives for positive research both at the University level and funded by Pharma, retesting is now more crucial than ever.

**Inadequate Medical Models: Biological Plausibility**

In Epstein’s article he discusses the rampant and wanton use of cardiac stents whether they were appropriate or not. He tells the tale of 2 different patients who were candidates for cardiac stents. One patient did due diligence and refused stent placement. The other had a needless stent and it ended up costing him his life. Steven Nissen, chairman of cardiovascular medicine at the Cleveland Clinic, says the situation with stents, at least, is [now] improving. As a previous president of the American College of Cardiology, he helped create guidelines for determining when a stable patient might be a reasonable candidate for a stent and thanks to such guidelines, the frequency of clearly inappropriate stent placement [declined](https://www.ncbi.nlm.nih.gov/pubmed/26551163) significantly between 2010 and 2014 (Epstein’s article was written in 2017). Nissen thinks **removing financial incentives** can also help change behavior. “I have a dozen or so cardiologists, and they get the exact same salary whether they put in a stent or don’t,” Nissen says, “and I think that’s made a difference and kept our rates of unnecessary procedures low [f**ollow the money**].”

Dr. David L. Brown, a professor in the cardiovascular division of the Washington University School of Medicine in St. Louis. is part of the RightCare Alliance, a collaboration between health-care professionals and community groups that seeks to counter a trend: increasing medical costs without increasing patient benefits. As Brown put it, RightCare is “bringing medicine back into balance, where everybody gets the treatment they need, and nobody gets the treatment they don’t need.”

Brown found that stents for stable patients prevent zero heart attacks and extend the lives of patients a grand total of not at all. In general, Brown says, “nobody that’s not having a heart attack needs a stent.”

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A focus group of cardiologists in 2007, were presented with the data showing that stents did not help except in acute cases. They said that they were aware of the data but **would still send the patient for a stent**. The rationales varied, but cardiologists felt they could better defend themselves in a lawsuit if a patient did get a stent and then died, rather than if they did not get a stent and died [**Bias Towards Action with little downside to treatment**]. “In California,” one said, “if this person had an event within two years, the doctor who didn’t intervene would be successfully sued.” And there was one more powerful and ubiquitous reason. Despite the data, cardiologists couldn’t believe that stents did not help**: Stenting just made so much sense**.(**Inadequate Medical Models, Bioplausibility**) A patient has chest pain, a doctor sees a blockage, how can opening the blockage not make a difference? If you see the body as web of interacting feedback systems instead of a plumbing problem, you might come to a different conclusion.

Back to Bowie

*“Doctors don’t look at internal injuries and look for trauma. They look for disease,” Bowie said. “We were asking them over and over, ‘Look, can you look for altered anatomy?’ just begging them. My wife had a husband who was degrading, going from fighting through anything as an athlete, to lying in bed crying in a ball all day long. It was horrible for her and my kids to watch.”*

*MLB [Major League Baseball} helped Bowie get into the Mayo Clinic, and there were high hopes about the visit, especially when a thoracic surgeon discovered that Bowie’s lungs had electrical burns.*

*… “You’re being shocked to death,” he told Bowie, and the medical team members told the Bowie family they could not treat the problem. “They said, ‘Go home and die,’” Bowie said. “That was a rough moment. People in the Commissioner’s Office were in contact daily, saying, ‘Micah, do we have any good news? What are they saying?’ And all of a sudden, we say, ‘They’re not going to treat me,’ and everyone in the office was crying. We’re crying.”*

*Bowie’s daughter, Brayden, insisted he come home to spend time with her before his death, but St. Louis surgeon Dr. Michael Brunt, who’d repaired Bowie’s groin injury in 2007, texted him and asked him to stop by on his way back to Texas. When the Bowies pulled up to Barnes-Jewish Hospital, they discovered Bowie had been admitted to the surgical wing, and at long last, the spinal-cord simulator was removed. “They stopped it from electrically killing me,” Bowie said.*

*Bowie, who since has heard stories about other significant device failures, was left with just 8% of his lung capacity and deals with frequent non-pulmonary edema, similar to COVID-19 patients… baseball player for the Oakland A’s Micah Bowie[[17]](#endnote-17)*

This a heartbreaking and maddening case. Here is a prominent guy, a pro baseball player with back pain. He has deterioration of L4 and L5 vertebrae. The options in front of him, according to the article are surgery[[18]](#endnote-18) and likely repeated surgeries for life. The x-rays were probably dramatically bad, and at this point, spinal cord stimulation was considered to be a less invasive approach than repeated surgeries. Fair enough. But his distressing case illustrates the entrenched prevailing counterforces that could tip into Dr. Three. The doctors who cared for him were doing what they could in a bad situation. Our task here is to look at the mental models and “common wisdom” working against them.

Avoidance.

I think you can see that in this case, it would have next to impossible not to do something. The first strike against him, was that he was a person of prominence. He was a pro baseball player. This puts added onus on the doctors because of the added reputational impact of treating him. This can easily tip decision makers into the Do Something Syndrome. In addition, he had pain. Pain confers great urgency because of the suffering involved. Strike 2. Strike 3 was that he was in San Francisco, lots of smart doctors, cool toys and options.

More is Not Always More.

 In this case, the “more” did **not** include the most invasive surgery, which would have been spinal surgery. But it did include the most recent, the most specialized, the smartest. It is very likely that if the doctors had recommended a pause, acupuncture, physical therapy, a vacation, Bowie would have felt that he was not being listened to. He needed HELP, like BIG HELP. This was no time for small measures and allowing homeostasis to play a role. So, in a sense, to be a Dr. One in this case would likely be ineffectual and the doctor would miss out since Bowie would seek help elsewhere.

**Cool toys**

 Spine stimulators are sophisticated and modern. They use high end implantable batteries and require fluoroscopy to implant them. Their purpose is to hijack the pain fibers occupying the nerve endings with a benign stimulation --a concept called “gating”--so that the pain is no longer perceived. Sometimes this works. And sometimes it does not. And some of the effect turns out to be “supra spinal” which means mental[[19]](#endnote-19) Unfortunately, in his case the cutting-edge battery that ran his stimulator migrated into his lung. Because this was a new device, the doctors were unfamiliar and had no idea how to deal with it. This led to prolonged burning of his lungs, and almost total spinning out of control, ie death. .

**Follow the Money**

 Needless to say, any of the options in front of him were going to cost. As it turned out he was bankrupted by the process, assets gone as they spent more than $400,000 on medical bills and care. The League helped him, which was a feel-good story, except of course, not really. I hope the reader can see from this story that the mismanagement here cannot be laid at the feet of the profit motive alone. However, in the U.S today, back surgery costs between 65K to 200K depending on the case and where you live. Spinal cord stimulators are quoted to cost $57,896 with yearly maintenance somewhere between 5 and 21K depending on complications.

 **Inadequate Mental Models/ Biological Plausibility**

 Bowie probably had a dramatic and definite problem that you can see on X-ray. Once something is seen on X-ray, it is often considered by the patient, and sadly the doctor too, to be beyond the body’s ability to repair it. And, of course, for many ailments the presence of a mass or tear or break on x-ray, does make the diagnosis more serious. **Not with back pain though**. Back pain is common enough that we have decades of experience with treatment, imaging and diagnosis. For this reason, the National Institute for Health and Care Excellence (NICE) in Britain did away with ordering back x-raysfor pain **since they had no correlation with pain or disability**. And even though it has been shown repeatedly in studies that back pain is multifactorial i.e. that there are lots of factors affecting it including mental state, depression and stress, problematic x-rays can tilt you into Dr. Three’s office and you never look back.

**Cool research**

 Bowie has “since heard of other significant device failures”. This is the problem with new therapies of any kind. They really are not fully tested until let loose on the public.

 **Incentives Credit and Blame**

 Because of the layers of treatment Bowie received, there appeared to be no single decision maker. This became problematic as the case went bad. No one wants to take responsibility. As the saying goes “Success has many fathers, failure is an orphan.”

**Smartest Doctors**

In the last-ditch effort to seek treatment at Mayo clinic (**Smartest Doctors**), the Mayo doctors were out of their depth faced with a new device (**cool toys**) that was causing a novel type of injury. He was spinning out of control and they did not want to be involved (**credit and blame**) so they basically advised him to get his affairs in order, ie get ready to die.

 Bowie found someone to take control and accountability, his previous doctor who had done his knee surgery He didn’t have the expertise (not smartest perhaps), but he was willing to take charge and take a chance and ended up saving Bowie’s life.

In sum, we can see that to be a Doctor One is not all that easy. It requires wisdom, and an imperviousness to pressures.

**Avoidance**

This is clearly one of the pillars of staying healthy, ie to avoid needless harm. It might have been easier to be a Doctor One in ancient times. Not because there were fewer remedies, but because of accountability, credit and blame. Also, presumably, doctors were not looking for “scalability” as sought by Big Pharma, or the medical device industry. We cannot know for sure, but because this teaching still exists we can surmise that doctors garnered recognition if their patients remained well and were able to withstand illness and injury. One of the vexing things about public health measures as mentioned above like sanitation, or personal health measures like diet and exercise, is that they are so uncool. No one gets to ride in on a white, preferably robotic, horse and save the day.

**More Is Not Always More**

The inverse is that it is difficult for us to believe that small changes, or minor treatments can be “enough”. Especially when it comes to pain or serious diagnoses. No! This pain is really really bad! I need it cut out! I need strong medication! I need the latest and the greatest! This is all too natural. Pain hurts and is depressing and debilitating and can hurt like hell, and serious diagnoses are terrifying. But the fact of the matter is, when it comes to, for example, low back pain, we have to remember very firmly that we need balance, we need small stressors, and it all spins together. As human beings this does not seem rational, it doesn’t seem proportional. But we need to abandon that expectation of proportionality. Sometimes, small things are called for. Sometimes, what is even called for is nothing. This is probably one of the hardest of the mental models to embrace.

**Inadequate Medical Models and Bioplausibility**

One of the solutions in helping doctors and patients better evaluate the true impact of any given treatment is a simple graphic tool showing benefit versus harm. If we could have this analysis of treatment, especially for costly treatment with a high risk/benefit quotient, it would be tremendously helpful to doctors and patients. The following graphic shows how many are likely to be harmed, (in red) versus how many helped (green) versus no particular effect (gray).



Source: Adapted from a Waitemata District Health Board handout, based on data from Glass et. al. BMJ (2005) “Sedative hypnotics in older people with insomnia: meta-analysis of risks and benefits”

But what if…

This discussion can make us uncomfortable, and even make us cringe. We know doctors work their hearts out and we do not want to blame them. They do heroic work and face profound challenges. I trained and practiced Anesthesiology and am Boarded in Pediatrics so I am not talking about the real problems in decision making casually. Indeed, it is the opposite. Decision making is hard enough, and when faced with all the pitfalls above, you can see how it can be nigh on impossible to do well. But we must keep in mind what the real goal is. The goal is to keep healthy and reduce harms. As we can see there are huge and powerful forces that work against that very principle. So, in the case of Bowie, what if he had had acupuncture, and massage, and gradual physical therapy and stress reduction or a vacation? What if the thinking and mental models allowed for this to be a valid choice? In Bowie’s case we will never know. But his case and cases like it, perhaps open up our thinking to consider, if not embrace, other mental models. As in the Introduction, it is my hope that by introducing these ancient principles through the modern eyes of science, these ideas will become familiar, feasible, and above all ***useful to the reader***.

Our journey continues by looking more closely at the science behind our fascinating and every vigilant, immune system and how ancient practice can help it along in its tireless activity.

1. Sf chronicle article [↑](#endnote-ref-1)
2. Iatrogenic illness in the US incidence [↑](#endnote-ref-2)
3. Find citation [↑](#endnote-ref-3)
4. But consider the $6.3 billion 21st Century Cures Act, which recently passed Congress to widespread acclaim. Who can argue with a law created in part to bolster cancer research? Among others, the heads of the American Academy of Family Physicians and the American Public Health Association. They [argue](https://www.bloomberg.com/news/articles/2016-11-28/funding-for-cures-bill-remains-sticking-point-for-health-groups) against the new law because it will take $3.5 billion away from public-health efforts in order to fund research on new medical technology and drugs, including former Vice President Joe Biden’s “[cancer moonshot](https://www.nytimes.com/2015/01/29/opinion/moonshot-medicine-will-let-us-down.html).” The new law takes money from programs — like vaccination and smoking-cessation efforts — that are known to prevent disease and moves it to work that might, eventually, treat disease. The bill will also allow the FDA to approve new uses for drugs based on observational studies or even “summary-level reviews” of data submitted by pharmaceutical companies. Prasad has been a particularly [trenchant and public critic](https://twitter.com/VinayPrasad82/status/804148473142460416?lang=en), tweeting that “the only people who don’t like the bill are people who study drug approval, safety, and who aren’t paid by Pharma.” [↑](#endnote-ref-4)
5. epstein [↑](#endnote-ref-5)
6. https://fs.blog/2015/06/do-something-syndrome/ [↑](#endnote-ref-6)
7. Nassim Talib, antifragile, black swans [↑](#endnote-ref-7)
8. . We are thinking in first order consequences. You fix the part. You kill the infecting bacteria, you kill the tumor. It makes sense according to our model, but as we now know, killing bacteria wantonly also destroys our natural bacteria that we rely on for multiple physiological functions. Using antibiotics wantonly leads to resistance in the bacteria which leads to ever stronger antibiotics. We now see antibiotics in the ground water so they are having effects on multiple systems, fish, etc.. So those are the first, second and third order consequences of giving anti-biotics as one example Bisphophonates made sense, so did statisn. emotherapy kills the cancer cells, but wreaks havoc on the rest of the body too. Life saving to be sure, but the risk benefit needs to be taken into account. [↑](#endnote-ref-8)
9. https://ucsfhealthcardiology.ucsf.edu/facstaff/spotlight/redberg [↑](#endnote-ref-9)
10. <https://ksparrowmd.com/overtreatment-is-taking-a-harmful-toll/> [↑](#endnote-ref-10)
11. **Public health problems diet.** I remember attending a conference once where a presenter showed the prevalence of adult onset diabetes in the eastern U.S. She was touting a diabetes solution, showing the market. It looked familiar to me, and I realized that it was identical to the map of poverty. So, low income=diabetes. You can’t help but wonder if that same amount of money used to give healthy food to people would do more. But it wouldn’t be cool, and there would be no money in it. [↑](#endnote-ref-11)
12. . [↑](#endnote-ref-12)
13. John Oliver segment [↑](#endnote-ref-13)
14. *…* Striking the right balance between innovation and regulation is incredibly difficult, but once remedies are in use — even in the face of contrary evidence — they tend to persist. A 2007 Journal of the American Medical Association [paper](https://jamanetwork.com/journals/jama/fullarticle/209653) coauthored by John Ioannidis — a Stanford University medical researcher and statistician who rose to prominence exposing poor-quality medical science — found that it took 10 years for large swaths of the medical community to stop referencing popular practices after their efficacy was unequivocally vanquished by science *An offshoot of this phenomenon is once someone is taking a medication, it can be challenging to get them off. An example of an accepted medication is Atenolol .****Atenolol did not reduce any more heart attacks or deaths than using no treatment whatsoever; patients on atenolol just had better blood-pressure numbers when they died.*  Epstein is points out that it took almost 20 years to stop prescribing something that did not good at all.**  [↑](#endnote-ref-14)
15. https://www.propublica.org/article/when-evidence-says-no-but-doctors-say-yes [↑](#endnote-ref-15)
16. https://www.propublica.org/article/when-evidence-says-no-but-doctors-say-yes [↑](#endnote-ref-16)
17. <https://www.sfchronicle.com/athletics/article/A-s-Gone-By-Reliever-Micah-Bowie-deals-with-15214077.php>. [↑](#endnote-ref-17)
18. Dhillon KS. Spinal Fusion for Chronic Low Back Pain: A 'Magic Bullet' or Wishful Thinking?. *Malays Orthop J*. 2016;10(1):61-68. [↑](#endnote-ref-18)
19. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6338535/>

Sivanesan E, Maher DP, Raja SN, Linderoth B, Guan Y. Supraspinal Mechanisms of Spinal Cord Stimulation for Modulation of Pain: Five Decades of Research and Prospects for the Future. *Anesthesiology*. 2019;130(4):651-665. doi:10.1097/ALN.0000000000002353 [↑](#endnote-ref-19)