Burnout, shiftwork and suicide: 2022 Scott B. Frame Memorial Lecture

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Around 2010, burnout was suddenly all the rage as a topic in academic circles, including surgery. It was new, we did not know much about it, yet there was evidence that it was a real problem. I noticed this relatively early when there was not yet very much literature on this topic.

Now one thing I have learnt is that, if you want to succeed early in your career, it helps to find your niche in subjects most others are not interested in. I also happened to have a fairly unique background feature: I have been meditating in the insight meditation tradition since I was 11 years old, as part of my anchoring spiritual practice. It occurred to me that maybe this practice that I found so meaningful could help with burnout; it helps keep me sane, after all, so perhaps it might help others too. There were already data showing that meditation could be beneficial for stress and anxiety, so it was not an entirely crazy concept. If you are going to put in effort and energy, it pays to target the largest audience you can; accordingly, I submitted a proposal for a panel at the American College of Surgeons Clinical Congress, and somewhat to my surprise, it was accepted. We had an excellent session exploring different ways to tackle burnout; several people learned meditation that day, and we all had a great time—but of course burnout did not go away![1]

We were young and naive; most of us were focused on finding individual solutions to burnout, along the lines of mindfulness, yoga, healthy eating, and exercise. These activities are great of course; however, burnout is a systemic problem—a problem inherent in the very methods with which we "do" health care. Therefore, it requires systemic, not individual, solutions. By 2016 to 2018, there was a body of literature showing that institutions that focused on systemic rather than individual solutions were more successful at reducing burnout among their members.

So, it was back to the drawing board. This time, my focus was on finding a better, less exhausting way for us to function as trauma surgeons. I decided to experiment with a shift work model since there was ample precedent in many fields, particularly emergency medicine and nursing, showing feasibility. There seemed no reason to reinvent the wheel, so the model we use is a standard 12-hour shift model running 7 AM to 7 PM and vice versa—very well established, straightforward, and already in use for trauma coverage by locum companies and a few academic centers at the time, although it certainly was not widespread. We paired that with the concept of having surgeons dedicated exclusively to acute care surgery: covering trauma, emergency general surgery, and surgical critical care, as defined at a consensus meeting of American College of Surgery, Eastern Association for the Surgery of Trauma, Western Trauma Association, and American Association for the Surgery of Trauma in 2003.[2] There was already some literature showing the benefits of an American College of Surgery model by this time, so it seemed a natural combination and an opportunity to further establish acute care surgery as a legitimate subspecialty. The final essential piece was a dedicated operating room that would be available to this team of surgeons 24/7, because it was important to me that, if we were going to work in shifts, the night shift had to count as much as the day shift. This was the skeleton of the model we developed.

Interestingly, there is a lot of literature on shift work; however, the problem is that it compares shift work to regular day jobs, not 24-hour call—since no one but physicians thinks that 24-hour call is a great idea! A few have looked at physiologic markers of stress in physicians doing overnight call. Dr. Jamie Coleman looked at the effects of overnight call on acute care surgeons; she showed the magnitude of physiologic stress entailed and demonstrated that full recovery did not occur till the third postcall day.[3] The same year, we learned that interns taking overnight call actually had shortening of the telomeres on their DNA—a change associated with reduced longevity.[4] "The way we have always done it" was not looking good at all.

Despite the literature mentioned, the reason I made the final decision to switch to shift work was a far more fundamental concept, based on principles of equity, justice, and fairness—values that have always been personally important. It comes down to the belief that surgeons should be paid fairly for the work we do and that continually adding on extra unpaid labor was neither feasible nor right. Call is not call when it is a full-time job. Call is when you are at home, and you may get an occasional call to increase pain medication, and every few days you have to come into the hospital to do an operation—that is call. Call is not call when you are working continually; that is the definition of a full-time job.

As the daughter of two accountants, I was fully aware that, for this new model to be sustainable, it had to be financially feasible. There was no reason to imagine that, at a busy trauma center, the volume of work that surgeons do after hours, be it operating or at the bedside of a critically ill intensive care unit patient, would not be at least revenue neutral, if not profitable, which should enable us to treat it as the full-time job that it is. In addition, keeping a level 1 or 2 trauma center open is a desirable goal for many hospitals, and high level care requires corresponding financial investment.

As always, the devil is in the details. Here are a few tips on how to make shift work "work," learnt the hard way. First, hire a nonsurgeon to do the call schedule. It is a general principle that

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you should never pay your highest-paid employee to do a job that a less expensive individual could do. It makes no sense to take a surgeon who should be worth $250 to 300 an hour and have him/her play with Excel spreadsheets. I promise that there are many people who would be happy to do that job at a significantly lower rate, so please give those people the job instead, offload your surgeons, and make everyone happy. Obviously, doing a schedule is not a full-time job, so what I do is pay our best administrative assistant an extra stipend—because it absolutely is a lot of work and should be compensated fairly—to do this every month. Paying an uninvolved person to do the job has two additional benefits: it helps ensure fairness, and it also forces you to create clear, transparent ground rules. For example, we were committed to being fair—that is the foundational principle of why we moved to shift work in the first place, after all—and we wanted to be fair about the things people cared about. Weekends off, for example—people really care about that. So, we ensure that each quarter—a month is too small a unit of time to do this—everyone has the same number of weekends off. If one person is over or under, we correct that the next quarter, so that over the period of a year, everyone does the same amount of weekends. Ditto for major holidays like Christmas—we divide these equally among ourselves. Similarly, for nights—since as chair I have an additional "day job" almost every day of the month, my colleagues graciously indulge my working very few nights; other than that, the ratio of days: nights is evenly allocated. Try to be flexible and personalize where you can—some feel better if they work all their nights in one row and then completely switch over; others prefer to limit to stretches of three to four nights. This is a fairly easy thing to accommodate. We have a written policy spelling out how we decide who gets to go for conferences if multiple people request off at the same time: rather than go by seniority, we allocate first priority to podium presentation, second to poster, and so on, so it is according to how much representation it affords the department as a whole. This was decided by team consensus, not dictated, so everyone has already bought in to the concept—another key ingredient for success. It is absolutely worth taking the time and trouble to develop these ground rules as policy beforehand (and then revise as necessary), rather than trying to figure everything out on the fly.

You must be willing to endure trial and error if you embark on this type of venture. The first month we tried this, we practically killed the two surgeons taking most of the shifts—we messed it up terribly! Fortunately, they were good-hearted about it, and we immediately started revising the formula—and we changed and kept changing it till we worked our way to a much better process. Now, many years into it, we are pretty good, and everything is going smoothly; however, we still tweak the rules and make small modifications often.

So, did all this make a difference? If you recall, we did not do this to improve patient outcomes—that was not a primary motivator; however, I realized that this was probably one of the easiest measures to quantify, so we looked at some of the most diagnoses and procedures performed by acute care surgeons—appendectomy and cholecystectomy—and compared clinical outcomes, cost, and length of stay. Not surprisingly, given that we run 24/7 now and patients go straight from emergency department to operating room to recovery to home, we had a much shorter length of stay, which led to lower cost with equivalent clinical outcomes—in fact, a slightly decreased perforation rate!—for appendectomy. We found similar results with acute biliary disorders—cholecystitis, choledocholithiasis, and biliary pancreatitis[5]: equivalent to improved outcomes, with lower cost as a result of reduced time from consult to operation to discharge. Part of the cost savings also came from standardizing our process, for example, having one shared case card for operating room supplies. By having all surgeons on the team agree to use a lower-cost option, such as Endoloop and energy device versus stapler for appendectomy as an example, we were able to reduce cost. An additional benefit was reduced variability, which meant that the circulating nurse had to leave the room for supplies less often, which resulted in greater efficiency.

What was more interesting to us was the effect on surgeons—after all, that was our primary motivator. One of my colleagues, Dr. Ronaghan, had the brilliant idea to measure the impact of shifts versus call using an eye tracking device used to measure concussion and brain injury.[6] We measured eye movements of surgeons at all levels—attendings, residents, and even a few students—before and after either a 12-hour day or night shift, or 24-hour call. We found that whether you did night shift or day shift, there was no discernible drop in focus—which surprised me, frankly. However, after 24-hour call, we found that subjects at all levels dropped two full grades, which is pretty scary, since it basically means we are working while mildly concussed!

The surgeons on the team were interviewed for a newspaper article on this shift work model last year, and every single one of them expressed overwhelming positivity.[7] Several noted that they no longer felt so bone-tired all the time; as a result, they had higher energy and focus and were able to have more meaningful interactions with patients. One said that exhaustion was no longer a necessary cost of doing the job he loved. Several years after we stabilized the model for faculty, we switched our residents on trauma call to 12-hour shifts as well; they report similar positive impact on their lives. The proof is in the pudding: during the first COVID wave, we were short-staffed, and I asked if the team would consider going back to 24-hour call temporarily; they unanimously refused and said we would find some other way to make it work instead. Put simply, nobody wants to go back to how it used to be, even temporarily.

An important caveat: I have never, and will never, position shift work as a panacea for burnout; it is not. Poorly constructed shift work can even be worse than reasonable 24-hour call! This model is merely one tool that might help sustain our profession, if done correctly and when patient volume justifies it. My question to you all—and I leave it as an open question—is this: can we let go of clinging to the image of being one of the brave, the few, the strong, who work in grueling conditions for unrealistic hours, and instead be open to exploring new ways to do the job we love—and continue to do it well?

I am now going to take a sharp right turn and switch topics entirely. I ask your forgiveness because it is going to be quite uncomfortable. That is not my desire, but that is the necessity.

Not very long ago at all, I lost a friend—a dear friend. My friend was a trauma surgeon. He was a phenomenal educator—far better than I will ever be. He taught residents; he taught me. He was the best colleague—always the one to volunteer to help before you even asked. He was a warm, quirky, brilliant, and an amazing human being. I lost my friend to suicide; he shot himself.

You are probably already aware that suicide risk is higher for physicians than nonphysicians, especially in women. You may have heard the statistic that we lose 300 physicians to suicide each year—an entire medical school's worth. What you may not know is 90% of completed suicides are a result of substance abuse, mental illness, or both, and both these diagnoses are significantly more common in physicians than nonphysicians.[8–10] Since physicians tend to succeed at most things we do, we also have higher completion rates for suicide.

So given all that, it was interesting that, in the weeks after his death, I noticed that people who knew him only slightly would often offer condolences that immediately assumed burnout or the pandemic was primarily responsible for his death. I found it intriguing that, when there are good data on the underlying reasons for most suicides and no proven causality between burnout and suicide risk (although with depression as an intermediary, there may be an effect), people were still automatically jumping to that explanation. It made me curious why we seem to want to talk about burnout, instead of substance abuse: alcohol addiction; benzodiazepine, narcotic, and antipsychotropic drug addiction. Every single one of those is more common among physicians than the general population and statistically more likely to lead to suicide. Why do not we ever seem to talk about that?

Stigma. Even mentioning "substance abuse" triggers a slight flinch, a cringe, does it not? We do not want to talk about it. It is so much easier to talk about burnout; it is so much easier to blame the pandemic—because these are all legitimate serious problems while also being problems over which we have almost no control, for which we therefore cannot be blamed. It is so much easier to talk about burnout than about our friend who is struggling with the demons of alcoholism; that is much harder to talk about, and that is why we are talking about it today.

Because of stigma, the vast majority of physicians and trainees who suffer from depression and suicidality neither seek nor receive treatment.[10] Physicians who die by suicide are less likely to have received mental health treatment than nonphysicians, despite being of higher income and education, with greater access to health insurance and mental health resources than almost any other cohort on the planet. Substance abuse and depression are both treatable and often curable diseases, and we are not even getting proper treatment. Instead, physicians often self-treat, which can take the form of obtaining opioids to treat alcohol withdrawal for example—thus adding a new addiction to the existing one.

So how do we do better? Every one of us should be trained, at least a little, to recognize the signs of substance abuse, depression, and suicidality in ourselves and others. We need to know our local mental health resources: how to access the physician impairment/rehabilitation program and know the person who leads it—they can be an immensely helpful resource. The American Medical Association has useful information on their page, including how to handle a suicide among your team, which I recommend leaders read before you need it, because I can promise you, when something tragic like this happens, you do not have the time to look it up.[11]

A modifiable risk factor that should resonate with trauma surgeons is handgun ownership. If there is a gun in the house, men are 8 times and women 35 times more likely to die by suicide.[12] Of all gun deaths in the United States, 60% are from suicide.[13] Handguns are the method of choice for over half of all completed suicides, for both physicians and nonphysicians. The use of guns is particularly problematic because of their high lethality; they result in a 90% completion rate, which is significantly higher than by any other means.

Suicide is an impulsive act. It is carried in on the wings of a much longer battle, yet the act itself is the briefest impulse—to the extent that one in four deliberates for *less than 5 minutes* before attempting suicide, half for under 20 minutes, and almost everyone for more than an hour![14–16] Because it is such a short-lived impulse (after all, the only reason we know is because sufficient people survived, recovered, and did well enough for long enough to participate in this research), it is preventable.

One common misconception is that, after a suicide, many people instantly feel guilt about what they did, or did not, do. The missed text, the invitation to coffee they did not make—it is very common to guilt ourselves into thinking this mattered, when there is no evidence to suggest it would. This unnecessary weight is one we do not need to bear. It comes from not understanding how suicide, depression, and substance abuse work and the very human tendency to center ourselves in the narrative—to make this about us, when in fact, it is not.

The best resource I found specific to preventing suicide is the American Psychiatry Association webpage for patients and families.[17] It tells you to ask about suicide and ask about a plan. There is plenty of evidence this will *not* trigger the suicide; on the contrary, it allows them to unburden. Stay close, do not leave them alone; remove access to lethal weapons, and get them to a safe place.

All of this is uncomfortable; it violates social norms and boundaries. Do it anyway. As trauma surgeons, we save lives all day, every day. Perhaps if we just expand our circle of knowledge, compassion, and skill just a little bit wider, we can save the lives of our friends and colleagues as well.

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