

There's No Time to Think -- And That's What Loses Wars

By Rohit Agrawal, Terry Rajasenan, and Fred Brown

Many have compared our collective battle against Covid-19 to a war, so perhaps it is time to look at this historic crisis that we face through that lens. A recent New York Times article noted that doctors are now being “drafted” into the E.R. [“With Virus Surge, Dermatologists and Orthopedists Are Drafted for the E.R.”*]. As an emergency physician seeing Covid-19 patients, there is a better way to help ensure more patients get seen by the limited number of physicians in the E.R., but it will require a different “battle formation” than we seem to be using – one that can balance the intense loads we never thought we would face in our lifetimes among the many people who want to help in the mission to save as many lives as possible.

It is assumed that most front line doctors will most likely be exposed to Covid-19 patients over the next year. Estimates place the chance of infection at high levels of exposure at up to 70%, with a 19% hospitalization rate, and then a 10% (or higher) mortality rate in some hospitals. At these levels, our risk of lethal exposure is 1.33%, or 1 in 75. That is essentially the same odds as putting a bullet in one of a dozen revolvers, then giving a dozen of our doctors those revolvers to play one game of Russian Roulette.

We in the profession of healthcare may well become pilots on a 1.33% mortality rate “suicide mission.” However, though that may lead to praise and glory in the history books for the fallen in our profession, it will also lead to more unnecessary loss of life of the citizen patients we have sworn to protect. A long-term erosion of our frontline doctors and nurses, as well as our invaluable support staff ready to help us get through each day, will ultimately lead to a short-staffed medical field that will result in not only more Covid-19 deaths, but also deaths in unrelated care episodes of heart attacks, strokes, motor vehicle traumas, and even infections not caused by the SARS-CoV-2 virus.

To avoid this from happening, we need only look to our own Military for a safety mechanism that originated from what has become today’s Air Force. According to the World Health Organization, the U.S. Army Air Command invented the world’s first safety checklist as a result of a bomber crash caused by human error in 1935 to prevent errors that result from oversights. The concept went on to save millions of lives around the world not only in aviation, but also in other industries including healthcare.

Patient safety expert Peter Pronovost used the Air Force predecessor’s concept of a safety checklist to save 1500 lives and \$100 million dollars (and as we have now all witnessed, the nation’s health and the economy intertwine) for bloodstream infections in a Michigan study detailed in the New England Journal of Medicine over a decade ago. He notes that to solve any

challenging disease, research has to do three things: 1. Understand the biology of the disease; 2. Develop an effective treatment for it; 3. Make sure those treatments are delivered effectively. This last point is what he noted is essential but also where too few expend the necessary time and effort, and where checklists can ensure this treatment effectiveness.

But the Air Force also learned the cause of safety errors even when using checklists, which is *task saturation* – too much to do in too little time and tasks get missed as a result. This leads to *cognitive overload*, which in turn leads to pilot errors. In fact, Air Force studies have shown that crashes of fighter jets are often not caused by mechanical error, but rather by this overload phenomenon.

Preventing deaths in a hospital, even when checklists are being used, requires both remembering what to do and then actually doing it. And in both these steps, it means we as healthcare professionals need *time to think*. When we do not have time to think – to protect the safety of our patient as well as protect our own license to practice – we actually use more resources, such as admit a patient to the hospital when we could perhaps instead treat and release them, which in today's dire situation could free up a much-needed hospital bed.

Everyone today watching the news has heard about PPE, ICU beds, and ventilators. But there is another resource during a crisis that there is not enough of, which is *cognitive bandwidth*. This is the space in our minds to think, but it is also temporal – time is needed to process that thinking through a decision tree in our head that we often must be able to navigate in less than a minute, sometimes for multiple patients in that span.

While we may be seeing only half as many patients as we used to before the Covid-19 crisis, the stress and anxiety of what we are about to face in a given shift and additional preparation that is required far exceeds the offset of decreased patient volume. There is anxiety for not just my patient, my reputation, and my license, but now also my family's and my own health and safety – and this anxiety consumes cognitive bandwidth. This means that I will have less time to think through problems as well as I could. No matter how determined anyone is, the human mind has cognitive limits, and at some point, something has got to give. How? In terms of “Failure to Rescue”, as a preventable death is known in the medical field. And this involves one or both of two safety errors, which are *failure to recognize* and *failure to act*. If we want to view the tragedy of a fighter jet plane crash to that of a hospital patient crash, we can see a key similarity – namely there was likely too much to do in too little time before everything crashed to the ground. The difference is that if we miss something that we could have prevented if only given time to think, and it leads to a patient crashing with Covid-19, the consequences could be one or more of the following:

1. Patient mortality risk (e.g., more than 50% of patients are dying on the vent)

2. Requires much more staff (e.g., goes from needing just 1 nurse per 8 patients on a hospital ward, to instead 1 nurse per patient, then also a respiratory therapist, physician intern or resident, and other code blue staff once a patient crashes)
3. Infection risk to caregivers, which can then eventually snowball to other patients or caregivers (e.g., procedures for breathing assistance, like intubation, at this late stage often trigger heavy coughing in patients, dangerous to all around)

To solve this looming hidden disaster, I and the teams I have led – who have needed to provide time-sensitive, life-saving care long before Covid-19 – have employed a type of load balancing technique, but one that does not involve moving patients and staff. Rather, it involves shifting tasks. There are two types that I employ to minimize my overload and under-load every day. There is first *time load balancing*, to shift tasks to different hours or days. For example, my preparation checklist for my Emergency Department shift done the night before includes reviewing the latest Covid-19 treatment protocols which can change daily, packing my own back-up supplies in case the hospital runs out, and remembering to remove my watch and wedding band so as to avoid another place on my body to harbor infection.

The other, *team load balancing*, is across our task force. The support team offloads tasks proactively by getting the answers to the questions I ask them to review with patients in advance, making calls to people to get information, or printing documents for quick review -- or finding someone to do the tasks if they can't. And in facilities where I am most efficient, it is because managers do task management well. We have shown in studies that task management can even be delegated to clerical staff. This also encompasses a checklist I suggest to others to make sure they always do critical tasks reliably to turn their desire to help into actions that serve everyone most effectively.

However, for *team task shifting* to work, it must be done proactively (i.e., if I have to ask, it is often too late, especially when there is a surge in the E.R.). It must rely on some form of scoring model to predict supply and demand, and the task shifting must address the concerns I have as a physician for my patient. These include time-sensitive deadlines, not having to teach support teams what to do when the world appears to be burning down around me, and once again, making sure that these important tasks can get done reliably. This last point is crucial, because in the end, I am the one responsible, and also the one who has to live with the outcome. Furthermore, it is important to remember that this offloading is the only option I have – there is no time to learn something new or get handed more checklists to review before I task saturate from checklist overload. Also realize that there are some tasks I will not give up, like the final working diagnosis or the optimal treatment plan, but there are tasks I will give up -- in fact, quite a few -- to keep me from reaching my *tipping point*. The good news is that most of these tasks can be obtained from me in advance of the onslaught I will face on a busy day.

Who can also do this for us better than anyone else is a good *task manager* – they can be the generals and strategists in every one of our battles. To prepare for what the CDC expects to be a second wave Covid-19 in the Fall of 2020, our generals need to train our entire troop force, and that means other members of the staff. But remember, if it does not alleviate load significantly, it will not get traction. Doctors and others willing to be on the frontline are a scarce resource and also a bottleneck in getting more patients evaluated for life-and-death decisions. Avoiding overload improves both learning and task execution in these decisions and actions. The support team offers a “cavalry” to the front lines.

A good task manager, also called a performance improvement coordinator, will help reduce the following for me during my day:

1. Multitasking (e.g., studies show this can reduce productivity by 25%), which at its extreme leads to decision fatigue by the end of the day, and burnout over my career
2. Interruptions (e.g., studies show this can reduce reliability by nearly 20%)
3. Anxiety (e.g., studies show that this can reduce learning / execution by 50% or more)

They accomplish this often by employing some combination of load balancing, shielding me from tasks that can be done by others without asking, and ensuring I have time to think to review my safety checklist churning in my head throughout my day, which can be all too easily crowded out in my mind by the next high risk case that walks through the door.

Put simply, with proactive load balancing by the team and thus time to think, I can better adhere to my checklists, to then ultimately minimize my failure to recognize and act.

A concept that has also been applied in the Military, and is also being advocated by The Joint Commission, is the framework of a *High Reliability Organization*. The reason that reliability is important is that if I as physician want to offload work and task shift, I need to know my team has time to think. If that is not built into the plan, then that plan is not realistic and destined to fail. To do this, a reliable team must know its members’ cognitive limits, such as how long things will take to think through properly even under dire circumstances by simple time analysis, though there are also more sophisticated techniques that we have seen work with even more accuracy by taking in multiple variables. A plan that takes those limits into account is one that has a better chance of success in any mission.

How can this be applied in this crisis? As work we have done inside Defense Department-funded projects has proven, when we can balance tasks to gain more bandwidth on the frontline, we can actually *double* the number of patients we can see, or we can cut preventable deaths by *half* – and with essentially the same staff. This is because my clinical team knows it can see that many patients safely and is not just hoping that they will make it through. The mistakes we would otherwise make -- ones that lead to much sicker patients, such as a

pneumonia that then turns into septic shock requiring resources such as a ventilator, medications, etc. -- are avoided, as is the extra work and additional people needed, if we can attain higher reliability.

None of this happens if an entire team is task saturated, or even more tragically, when only one person was overloaded but that person's error (which will haunt them for far longer than people will ever realize) leads to a patient crash that then requires many more people, much more equipment, and leads to a much greater chance of the patient not surviving. And even when it does not lead to an error, task saturation does lead to slowdowns, which worsens the time-to-treatment that leads to the window of opportunity closing on time-sensitive medications like antibiotics and antivirals. Halting the patient's decline *upstream* means less risk to the patient, and less risk to a number of caregivers.

Returning to our wartime analogies, empowering the "drafted" NYC-area physicians to work in the E.R. without addressing task saturation is charging into battle without a battle plan. One of the reasons why Napoleon was able to conquer most of Western Europe was that he was a brilliant strategist. And the reason he was known as that was because he knew the tactical capabilities and limitations better than even his commanders on the battlefield. He knew how accurate his artillery was and how far they could fire. In short, he knew the limits of his resources and planned around it. But even he lost at Waterloo due to not planning for contingencies and consequent resource limits -- that is, one of the best military thinkers lost because he did not think of and had not prepared for the timely arrival of the Prussian army.

If there is time to think through our week-to-week, hour-by-hour, and even minute-by-minute plan, even in the face of a seemingly ever-increasing load, we can still turn it around (after all, most of us in healthcare are problem-solvers that are able to act in time-sensitive situations) by mobilizing a broader team that can follow through on any checklist.

Otherwise, as battlefield commanders have noted, any battle that relies on tactical brilliance -- in this case, doctors and others on the frontlines having to overachieve beyond their limits every day for months on end -- is a flawed strategy. One that loses an otherwise winnable war.

Authors:

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* <https://www.nytimes.com/2020/04/03/nyregion/new-york-coronavirus-doctors.html>