

# Anesthesiology, the Tragedy of the Commons, and Coronavirus Disease 2019

Alan P. Marco, MD, MMM

## GLOSSARY

**COVID-19** = coronavirus disease 2019; **PPE** = personal protective equipment

As leaders in perioperative service management, anesthesiologists are familiar with requests from our proceduralist colleagues to come in early or stay late to get cases done. While this is clearly desirable from the proceduralist's perspective, it ignores the cost of overuse of health system human resources and potentially contributes to burn-out.<sup>1</sup> Why, then, do reasonable people make these demands? The answer lies in the fundamental construct of the human mind.

The operating room suite, and other procedural areas, are in essence, a communal property shared by those practicing there, much like common pastures were in olden times. In most cases, the individual proceduralists do not "own" the operating room (possible exceptions being a physician-owned ambulatory surgery center or a procedure room in a surgeon's office space), and block time assignments are more akin to a license to use the commons rather than conferring ownership. In the hospital setting, proceduralists do not bear the costs of overuse like staff overtime, turnover, and recruitment. They share these costs indirectly with the many users of the surgical suite. Yet, by overutilizing this common resource, they can benefit individually. This gives rise to what is known as the tragedy of the commons where "tragedy" is "the remorseless working of things."<sup>2,3</sup>

The tragedy of the commons can be pictured in this way. Suppose there is a common pasture that all herders use. The pasture is limited in the amount of fodder it can produce because of soil quality, sun, rain, and

the like, and so it is limited in the number of cattle it can support. For each herder grazing cattle on the pasture, the positive gain of adding one more beast outweighs the potential harm of overgrazing as that harm is spread over the entire group of herders. The rational herder adds another beast to his or her herd, as does everyone else, at least until the pasture is damaged by overgrazing and unable to support anyone's cattle.

In the surgical suite, the request to stay on to do this one more add-on case now instead of waiting for an available future time is rational for the proceduralist who solely receives the benefit of an earlier case start, while sharing the risk of support staff burnout and excessive turnover, which can lead to a future staff shortage and reduction in availability, with everyone utilizing the operating rooms.

This phenomenon can also be seen with the current coronavirus disease (COVID-19) pandemic. Personal protective equipment (PPE) is in short supply worldwide, and facilities in the United States have been advised (or required in some areas) to defer elective procedures, at least in part to conserve PPE as a scarce resource.

In a free market, PPE is like the common pasture on which we can all graze. With the emergence of COVID-19, however, the "pasture" can no longer support all that is asked of it. Yet some facilities are reportedly continuing to perform elective procedures, claiming, "We have capacity and we have an outstanding supply chain and procurement team."<sup>4</sup> This depletes the common (regional or national) supply of PPE and, while appealing to the immediate self-interest of that facility, ultimately will harm all health care systems.

Similarly, using N95 respirators for all intubations, as advocated by some specialty societies, might benefit a few immediately, but could deplete the supply available for future cases—potentially even those for which an N95 respirator is clearly warranted—just as overgrazing could make the pasture unable to support cattle in the future.

From the Department of Anesthesiology, The Ohio State University, Columbus, Ohio.

Accepted for publication April 27, 2020.

Funding: None.

The author declares no conflicts of interest.

Reprints will not be available from the author.

Address correspondence to Alan P. Marco, MD, MMM, Department of Anesthesiology, The Ohio State University, 410 W 10th Ave, Columbus, OH 43210. Address e-mail to alan.marco@osumc.edu.

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DOI: 10.1213/ANE.0000000000004927

Are the people making these decisions evil, greedy, or ignorant? Or, are they responding to intrinsic neurobiological and evolutionary processes governing how humans think? It is likely that the latter plays a significant role in their decision-making. Three behavioral phenomena come into play: the tragedy of the commons, loss aversion, and time discounting.

When viewed from the tragedy of the commons perspective, these actions in contradiction to public health recommendations can be interpreted as a hospital leadership that sees a grand prairie of resources, is confident that their supply chain and staff are in abundance, and is discounting fears, rightly or wrongly, of future shortages. Just like the herder, looking out on seemingly endless green pastures, adds cattle to his or her herd never worrying about depleting the land, the rational hospital leader would want to continue to perform elective procedures because the immediate gain is greater than the future loss that would be shared by all. Additionally, that shared loss may not even occur if efforts to improve supply are successful.

Not reducing elective cases may be seen as socially irresponsible and could damage the reputation of the facility. However, it is more likely that the perceived failure of customer service (by canceling scheduled procedures) would be more harmful to its reputation. In contrast, during the COVID-19 pandemic, it is unlikely that facilities suffer reputational damage because of external factors limiting access to supplies.

People typically demonstrate loss aversion. Most prefer to avoid losses rather than receive equivalent gains—losing \$5 is more painful than the joy of finding \$5. Health system leaders would clearly see delaying elective procedures as a loss. Additionally, the majority of people exhibit “time discounting”—they value a gain received now more than the equivalent gain received later.<sup>5</sup> This is also referred to as hyperbolic discounting because the rate of the discounting changes in time. A person may choose to receive \$100 right now rather than \$120 one month from now but might reverse that choice when choosing between \$100 in a year and \$120 in 13 months even though the delay is the same.<sup>6</sup>

A hospital administrator, especially one who believes that they have a robust supply chain, might see rescheduling elective cases as a loss today with an uncertain probability of regaining that case in the future. That activates the double intrinsic behavioral pressures of loss aversion and time discounting of a future gain. Even if the facility might still capture that case in the future, because of time discounting, it would not value that future case as much as one done today.

Furthermore, since people tend to value things they have more once they have them, having elective cases booked is highly valued by hospital administrators. If

they also believe they can complete the case now and still take care of future COVID-19 patients, they will be highly motivated to continue “elective” surgery.

The decision to take the immediate gain over a potential future gain may have an evolutionary basis. Imagine an early hunter on the savanna. Would the hunter pass up the chance to take a scrawny antelope today in hopes of taking a plump one tomorrow? No, the hunter would take the immediate gain to ensure survival until tomorrow. That is similar to taking the financial gain from doing elective cases during the pandemic to ensure enough cash on hand to remain open when the crisis resolves.

The brain may be wired to maximize gains now and to discount future gains.<sup>7</sup> This might contribute to pursuing more immediate self-interest rather than longer-term group benefits. Making the decision to proceed with elective cases involves some risk. If there are future problems at the facility, either from lack of resources to perform cases or lack of revenue resulting from deferred cases, hospital leaders have assumed an unquantifiable amount of risk. Personal tolerance of this risk may affect the leader’s decision-making. Risk-seeking choices and risk-taking choices may involve distinct neural pathways that may be modifiable.<sup>8</sup>

Time discounting affects how future gains or losses are valued, and the impact of time discounting may be modulated by motivation. This phenomenon has been implicated in problematic behaviors.<sup>9</sup> Loss of reputation can influence behavior and drive people to contribute to the common good, thus avoiding the tragedy of the commons.<sup>10</sup> Because of time discounting, however, the future loss to the reputation of a facility from not cooperating with restricting cases is less valued.

Time discounting is exploited in marketing. “Limited time” offers appeal to the dual desires for immediate gain and loss aversion. “No money down” offers, where one buys now but pays later using a payment that is emotionally discounted by time, capitalize on the time discount. For the facility performing elective cases during the COVID-19 pandemic, there is the immediate gain of grazing on the commons of available cases while PPE is available. It is not surprising that some facilities choose to continue doing elective cases. This behavior was well understood as early as 1546, in the proverb “make hay while the sun shines.”<sup>11</sup>

The motivation to not heed the call to postpone elective procedures may not simply stem from greed or self-interest. There may be legitimate differences in how “elective” cases are defined. Surgical cases and other procedures have a degree of urgency that spans a wide range. The public may view “elective” as “optional,” whereas many physicians think of

“indicated” procedures that can be scheduled in days to months and so are “elective.”

Many would agree that purely cosmetic procedures are elective. Would there be as wide a consensus on cholelithiasis? That case would be elective, but carries a risk of complications such as ascending cholangitis if delayed an additional 6–8 weeks or more. That delay could convert what is often an outpatient procedure into an emergent hospital admission exposing the patient to potential nosocomial acquired COVID-19. What about an electrician who is unable to work because of a rotator cuff injury? How would an additional 6–8 weeks of delay in returning to work affect that person’s outcomes, including the economic consequences of being unable to work for an extended period of time?

Hospital leadership should also consider the psychological toll on patients and their support systems with increased anxiety, pain, and difficulties rescheduling family support that result from delaying the procedure. Finally, putting off current elective cases will result in delays of future patients’ care until the backlog is reduced.

Hospital leadership also has a legitimate concern about the financial viability of their organization. Hospitals, especially not-for-profit ones, have slim margins with median operating margins of 1.7% in 2018.<sup>12</sup> Reductions in elective cases can endanger the financial stability of the organization and potentially lead to decreases in access to health care in the future for patients in that service area.

What can be done to avoid the tragedy of the commons? Traditionally, 3 main approaches have been used: market allocation converting the resource to private property; institutionalizing collective action with rewards and punishment; governmental regulations.

In the current tragedy of performing elective procedures and depleting the common supply of PPE, market allocation does not work since some facilities may be able to simply outbid others for the scarce resource.

There is no short-term way to institutionalize rewards and punishment, as the reward for cooperation (eg, not performing elective cases) is a financial loss and punishment is unlikely. Furthermore, cooperation (delaying elective cases) invokes the issue of loss aversion and the threat of future punishment suffers from time discounting.

However, governmental action may be of use in this setting. The Defense Production Act of 1950 [50 United States Code § 2061 *et seq.*] allows the president to use broad authority to sign production contracts, prohibit hoarding and price gouging, and to establish mechanisms to allocate materials for national defense. In principle, future supplies of PPE could be steered

away from organizations that fail to cooperate with the reduction in elective cases under this authority.

However, human interactions are fraught with mistakes and misunderstandings that can be misinterpreted, resulting in everyone reverting to their own self-interest instead of cooperatively managing resources. This noisy environment of errors has been modeled and some strategies to avoid the tragedy of the commons have been developed.<sup>13</sup> Key strategies include preserving cooperation, forgiving after responding to provocation, grabbing the chance to cooperate, not being evil, and looking at the context.

While there may be ethical issues in failing to heed the directives to refrain from performing elective procedures during the current COVID-19 pandemic crisis, we should not wholesale condemn those doing so, as they may have simply made a mistake or have a misinterpretation. Modern societies should look for ways to preserve cooperation and to forgive misbehavior after appropriate responses. We may be subject to our own biology and evolution, but a hallmark of modern society is the ability to rise above our instincts and choose the right. Our efforts should not be directed at ostracizing these misguided people, but in helping them become aware of why they are behaving as they do, so they can sublimate their natural tendencies and choose a more altruistic path. ■

#### DISCLOSURES

**Name:** Alan P. Marco, MD, MMM.

**Contribution:** This author is solely responsible for this manuscript.

**This manuscript was handled by:** Nancy Borkowski, DBA, CPA, FACHE, FHFMA.

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