AACD
Association of Anesthesia Clinical Directors

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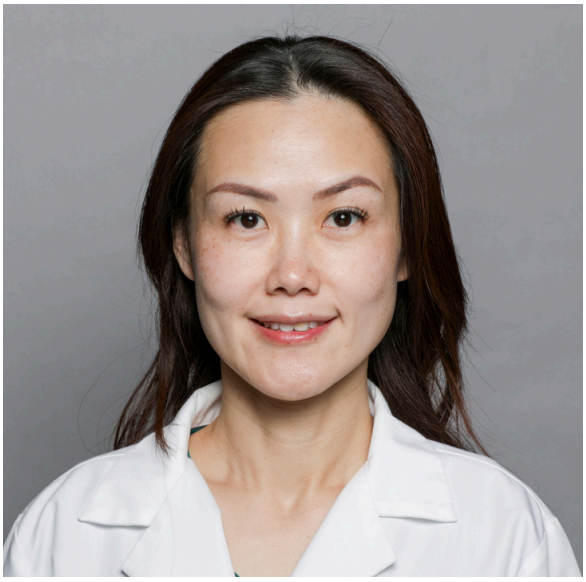
SUMMER EDITION

Newsletter

Our society provides a forum for partnership and advancement. The Association of Anesthesia Clinical Directors (AACD) recognizes that given the evolving healthcare environment in which we work, operating room (OR) efficiency, productivity, and cost containment are increasingly vital to our survival. The AACD offers physicians and other perioperative leaders with responsibilities and interest in the business aspect of OR management an opportunity to tackle common challenges, share ideas, collaborate with anesthesiologists who have similar experiences, and to ultimately create solutions.

Editors: Chinyere Archie, MBBS
Veronica Zoghbi, MD

Ask the Experts: The preceding case in an OR has just started or is about to start: Can we give a box of apple juice?



Pornswan Ngamprasertwong, MD
AACD Board of Directors

Recently, there has been ongoing debate about reducing the fasting time for clear liquids before anesthesia from two hours to one. Many pediatric hospitals in the U.S. have begun adopting this practice. Another modification sometimes used is allowing a limited volume of clear liquid after the patient arrives in the preoperative area, provided they are evaluated for delayed gastric emptying and the procedure is expected to start more than an hour after ingestion. However, the principal variability is not in gastric emptying, but rather in surgical times.[1-3] In healthy patients, the standard deviation of emptying times for clear liquids is several minutes (e.g., 4.1).[4] In contrast, standard deviations of surgical times are for many procedures >10-fold greater. Whether the guideline used is two hours, one hour, or one hour with a volume restriction, applying such a guideline in practice for the to-follow patient depends on forecasting the earliest that the case reasonably (e.g., ≥5% probability)[1–3] could start.

Franklin Dexter, MD, PhD, FASA
'Ask the Experts' Host

The decision about a box of apple juice has, in practice, little to do with clearance; rather, it is principally about forecasting the probability ≥5% that the case starts within one hour. Many common pediatric surgical procedures, such as adenoidectomy and tonsillectomy, are brief. For example, at the Cincinnati Children's Hospital, the mean ± SD of the in-OR to out-of-OR time for tonsillectomy and adenoidectomy (T&A) is 38±19 minutes. Furthermore, the standard deviation is relatively homogeneous among the otolaryngologists. Using Excel, we first convert the 38±19 minutes to the sample mean and standard deviation in the log scale.5 The μ = LN(38 / SQRT(1 + (19/38)^2)) = 3.5260. The σ = SQRT(LN(1 + (19/38)^2)) = 0.4724. Then, the estimated probability of the case finishing within 60 minutes = LOGNORM.DIST(60, 3.5260, 0.4724, TRUE) = 89%. Therefore, juice should not be given to the next patient.

Because the cases are brief, suppose that the patient scheduled for the 4th case of the day in the room has just arrived while the patient for the 2nd is currently being wheeled to the OR. Might the patient for the 4th case be given juice? This depends on the probability distribution of the times to complete two cases and the frequencies of cases being canceled or moved among ORs. The coefficient of variation for the tonsillectomy and adenoidectomy cases is large, >50%. However, because brief (<1 hour), the standard deviation is sufficiently small that there is considerable advantage for the ENT service to move cases among ORs. At the Cincinnati Children's Hospital, among our 40 ENT cases per day, roughly 2 per day are moved among ORs. In addition, there is a 3% cancellation rate on the day of surgery. Then, the probability of a case being canceled or moved equals approximately 2/40 + 3% = 5% + 3% = 8%. Therefore, there will always be a >5% chance that a case can start early. Thus, the answer will always be "No," do not give the apple juice.

No calculation or consideration of fasting times is relevant.

Therefore, the issues of gastric emptying time for clear liquids are applicable in practice essentially only for the cases that are to follow, when the preceding case is of long duration, and after the preceding case has started (i.e., will not cancel). These calculations can also be performed as conditional probabilities, the probability that the earliest the case might start conditional on its being ongoing for a specific number of minutes and/or incorporating milestones (e.g., incision has been made).[5–8] The mathematical models are well developed and implemented at multiple hospitals because they apply equally to the different problems initiated by the cases with the longest case durations.[1–3,5–8]

For clinical directors, consider the decision whether to give apple juice by considering four specific examples with progressively larger mean durations.[1,5,8]

- The mean and standard deviation for circumcision at Cincinnati Children's Hospital is 59±16 minutes. Non-ENT cases are very rarely moved to another OR due to surgeon availability. The prior case has just started. Then, the estimated μ = LN(59 / SQRT(1 + (16/59)^2)) = 4.0421. The σ = SQRT(LN(1 + (16/59)^2)) = 0.2664. The estimated probability of the following case to start within one hour equals 58%, where 58% = LOGNORM.DIST(60, 4.0421, 0.2664, TRUE). Juice would not be provided to the child.

- The mean and standard deviation for strabismus surgery at Cincinnati Children's Hospital is 87±32 minutes. The estimated μ = LN(87 / SQRT(1 + (32/87)^2)) = 4.4025. The σ = SQRT(LN(1 + (32/87)^2)) = 0.3562. If, once again, such a preceding case has just started, the probability of the next case to start within an hour would be approximately 19%, where 19% = LOGNORM.DIST(60, 4.4025, 0.3562, TRUE). Again, juice would not be provided.

- For moderate dental restoration, there were N=431 cases, the mean and standard deviation 95±35 minutes. The estimated μ = LN(95 / SQRT(1 + (35/95)^2)) = 4.4902. The σ = SQRT(LN(1 + (35/95)^2)) = 0.3568. The probability of the case finishing within one hour would be approximately 13%, where 13% = LOGNORM.DIST(60, 4.4902, 0.3568, TRUE). Thus, juice would have substantive risk of causing delay.

- Finally, suppose that the preceding case just started was extensive dental rehabilitation. Among the historical N=173 cases, the time was 142±55 minutes. Then, the estimated μ = LN(142 / SQRT(1 + (55/142)^2)) = 4.8859. The estimated σ = SQRT(LN(1 + (55/142)^2)) = 0.3739. Finally, the estimated probability of finishing within an hour would be less than 5%, specifically approximately 2% = LOGNORM.DIST(60, 4.8859, 0.3739, TRUE).

One lesson of these four scenarios is that, in most practical situations, the next case in an operating room has a greater than 5% chance of starting within one hour. Given the variability of surgical times, only when the preceding case has estimated duration >2 hours might there be a substantive <5% chance of finishing within 1 hour. Another lesson is that although some operating room management decisions are related to complex adaptive systems, many are not (e.g., scenarios 1-4). When addressing operational decisions (e.g., those related to case duration prediction), do the literature search to find the relevant math and then someone needs to apply it to the specific decision.

In summary, updating fasting guidelines on the day of surgery generally has a small potential to reduce fasting times to be within an hour. On the other hand, this does not mean that fasting from the night before is a good idea. This mathematics was understood 25 years ago,[1] which was what prompted our development of techniques for best choosing fasting times in advance, not based on midnight but rather estimated start times, incorporating probabilities of preceding cases being cancelled or cases moved among rooms.[2,3]

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Positive Disruption in Anesthesia

Shannon E. Meron, MD

In my most recent article on Doximity, one of several social media sites tailored specifically toward physicians, I discussed the value of the availability of medical care at all hours, and how the fee-for-service compensation schema of the current healthcare complex doesn't assign value to that availability at all. Added to that is the fact that across local systems, increased availability puts added pressure on the doctors that are supposed to be available at the expense of their own personal lives. Juxtaposed against many other factors that have shifted in the last fifty years of modern medicine, and increasing amounts of uncompensated availability is a powerful factor contributing to the epidemic of burnout and workforce attrition.

It is one thing to be available to help someone in need at all hours in the context of a meaningful relationship. That's one of the responsibilities of marriage, and family, and parenting, and often even deep friendship. It's quite another to be expected to sacrifice the primacy of those intimate relationships to assist a stranger at the behest of an increasingly industrialized and corporatized hospital network. Some say this factor is what differentiates our work as a calling, rather than a job. I think it is one of several factors, including but not limited to the fact that what we are often available for in the middle of the night is participation in an attempt to save lives, which by necessity also means bearing witness to the myriad ways in which people suffer and die. Sometimes all we can do, when the futility of our medical interventions becomes manifest, is watch and endure and console and in doing so ameliorate some small amount of suffering, if not of our patient any longer, perhaps of the loved ones who've been called with unimaginable, tragic news.

In the article, I concluded with a conversation that I had with several friends and colleagues about the joy they were rediscovering in their work practicing as locums anesthesiologists. I surmised that one of the reasons might be that availability is overtly compensated on the

locums market. Whereas in a group or a department, call (off-hours availability) is just “part of the job” (in other words, uncompensated) no locums physician would dream of taking call “for free”. Thus one can make the same money working fewer overall hours, contributing to better work-life balance. The most upvoted comment asked the audience to “imagine what would happen if just 50% of hospital-based doctors quit and signed up for locums. Hospitals would come to the negotiating table immediately. No Union could ever get similar results.”

There is an oft repeated axiom that systems are perfectly designed for the outcomes they produce. In the U.S. healthcare system, that is maximization of delivery. Increasingly rising volume has come at the cost of providers, whose numbers have not risen at a pace to keep up with the increased demands for care. Attempts have been made to modify the systemic output for quality or necessity, often by the payers in the insurance marketplace (including the federal government), but as arguably well-intentioned as those efforts might be, they too become mechanisms for abuse with profit as a motive.

To a certain extent, that is because the most effective modifiers of care delivery exist within the therapeutic relationship, something that has been eroded by efforts to scale up the unscalable: human connection. If humans were machines, the same input would equal similar or identical outputs and scale would produce economies as it does in other industries. As it is, biological systems are profoundly complex, which is why every study to isolate this nutritional supplement for its cardioprotective or immunogenic or other isolated theoretical benefit proves less effective than that nutrient in situ in a diet of primarily unadulterated foodstuffs, amplified in its effectiveness if supported by lifestyle modifications like exercise and adequate sleep. As it turns out, the social-emotional context of care delivery matters too, much more than the hardcore scientific rationalists among us have been willing to admit.

Stay tuned for our next installment, where Dr. Meron delves further into the complexities of our responsibilities. Consider engaging further and sharing your thoughts here in our newsletter as well.

Is 'Executive' Leadership the only True Type of Leadership?

Zachary Deutch, MD

A constant refrain in our specialty, reinforced by the ASA, is the need for individual anesthesiologists to be perioperative leaders. Taking initiative can occur on a small scale, simply by being a commanding presence and staunch patient advocate in the operating room (i.e. "be the leader of your OR"). However, leadership in anesthesiology is more commonly referenced in a broader sense, touching on roles like expert perioperative consultant, learned academic thought leader and/or educator, private practice entrepreneur, and (most pertinent to AACD members and to this article) operational/efficiency guru. These roles are laudable and valuable, but skepticism is in order.

In the American medical system, I believe it impossible to be an effective leader unless EXECUTIVE AUTHORITY is bestowed.

Otherwise, "leadership" is a barren concept – in the perioperative arena, one must have the latitude to get things done in order to do literally anything.

Historically, there has been a dichotomous structure to perioperative and procedural operations. In the typical academic setting, most (if not all) physicians, whether proceduralists or anesthesiologists, are employed by the medical school/hospital system and report to a department chair and Dean. Organizational leaders advance through and are chosen from these ranks. In contrast, in a traditional private practice model, the facility or system contracts with an outside entity to provide anesthesia services and neither directly pays nor employs these clinicians. Since there has been and continues to be much evolution in American medicine, the distinctions above are no longer black and white and much overlap exists. The classifications of "private" and "academic" do not have the same meanings of decades past.

Given this, the important qualifier for anesthesia practices is not how they self-identify. It is the question: am I, or my organization, empowered to make decisions and effect real change at the facility where we work? In a large academic center (or hospital-employed model), the Medical Director of the Operating Room (a.k.a. Director of Perioperative Services, depending on local nomenclature and structure) is often an anesthesiologist. This person is usually given a broad range of responsibilities with corresponding authority. Medical directors' duties include creation and policing of block time, managing OR and out-of-OR expansion(s), hiring/recruiting of OR staff, and dealing with interpersonal issues and conflict among perioperative personnel (whether RNs, surgical technologists or physicians).

In a "private" setting, an anesthesia practice, being a separate contracted entity, is not by definition involved in any of these administrative aspects, unless it is specifically requested by the health system. So, a group's sole responsibility is often just to uphold a service agreement dictating the number of anesthetizing locations, the daily hours of operation, and call responsibilities. This scenario removes anesthesiologists from anything but granular decision-making and focuses them solely on daily logistics and immediate care delivery (i.e. "getting through the schedule").

Whether an anesthesiologist works for a national company, a physician-owned group, a medical system, a medical school, or himself/herself is beside the point. So, what is the point? Simply this -- does a person, persons, or organization who provides anesthesia care have executive authority inside a particular operating room and facility? Consider these illustrative scenarios:

Health system wants to start doing elective cases on weekends – does this make sense and, if so, how will it be covered and compensated?

Should a facility purchase a second surgical robot, and if so, what room should it go into?

A Joint Commission site visit is imminent and internal (pre) surveyors have a list of concerns for anesthesia team, including the securing of medicines/carts and timing of signatures and orders in the EMR

How much of an OR schedule should be blocked, vs. left as open booking?

A new facility is being built, and the OR layouts and staffing plans are being formulated

Some patient groups (e.g. total joints, vascular) are 100% required to get PCP and/or cardiology clearance, while others are not, and confusion and frustration reigns among surgeons

Pharmacy has no effective oversight on maintaining the OR formulary, and makes unilateral decisions

If an anesthesia practice and/or its designee as chief has little to no input, the issues listed above will nevertheless be resolved – by non-experts -- potentially to great detriment. The disenfranchisement of anesthesiologists clearly creates a difficult-to-impossible scenario in which to exercise leadership and to effectively advocate for patients.

I have had the experience of working in hospitals where the physical plant, perioperative workflow, medication, airway equipment, and a variety of other crucial elements had all been pre-decided and it became my role to just "deal." I have also had the rewarding experience of enjoying the executive authority as Director of Perioperative Services. In this capacity, I planned procedural rooms' layout, oversaw block scheduling and room utilization, and recruited, hired (and fired) perioperative staff, among other important duties. Under those conditions, I could effectively lead – my opinion was valued by my health care organization, which had in turn empowered me.

In closing, I suggest a decreased focus on exhorting (possibly even shaming) physicians to develop leadership skills that they may never be able to use. Instead, our specialty's goal should be obtaining greater levels of local control and authority in our various work environments. When anesthesiologists are seen only as a commodity and their collective professional expertise is NOT valued, the problem does not arise at the level of the individual clinician.

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