Mythbusters Episode: Economic Issues of Anesthesia Care
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“Healing is an Art, Medicine is a Science, and Healthcare is a Business”
Author Unknown

In the Discovery Channel’s “Mythbusters”, the hosts test ideas, concepts, and “myths” to see if they are true. In recent years, the program has added internet videos and myths. Often when looked at more closely, these myths are not as simple as they appeared. In the end, the hosts will rate a myth “busted”, “plausible” or “confirmed”. In this presentation I will not get to use explosives (like they do in the show) but will look in detail at four common myths about the economics of anesthesia care:

1. Focusing on turnover time will improve OR throughput.
2. Because anesthesia revenue includes time, anesthesia providers prefer longer surgeries.
3. Going from physician-only staffing to medical direction staffing will reduce staffing costs.
4. Using “per provider” (aka FTE) measurements allow for accurate benchmarking of productivity.

**Myth 1: Focusing on turnover time will improve OR throughput.**

Because surgeons and hospital administrators use “OR throughput” to really mean “do more cases”, this myth can be reworded as the common complaint, “If turnover time was shorter, we could do more cases.”

My first response to this statement is “Stop beating a dead horse!” Research has established the fact that further reducing reasonable turnover times will not increase the number of cases that can be done in a workday.(1,2) For instance, for an OR in a non-ambulatory surgical center hospital, a reasonable maximum turnover time between procedures might be 35 minutes. Reducing this number by 20% would only result in a 7-minute time saving between cases. If 3 cases were done per OR, this would mean a 14-minute saving. Compared to the average surgical duration of one’s hospital, reducing turnover time by 20% will not allow for one more surgical case to be done. Obviously, in an OR where more cases are being done in a day (e.g., 7-10 cataract or pediatric otolaryngology surgeries), reducing turnover time by 7 minutes per case may be significant. But in these specific ORs, the turnover time will already be much lower than in the rest of the ORs (e.g., 15-20 minutes) and further reduction may not be possible.

In contrast, focusing on reducing any delays—defined as a turnover time greater than the reasonable maximum turnover time—will result in large time savings. For instance, if a turnover time is 90 minutes in an OR with a the maximum time set at 35 minutes, then a 55-minute delay has occurred. Focusing on the etiologies of this type of delay could result in a reduction of 55 minutes per occurrence.

Finally, anesthesiologists should point out that they cannot bill for turnover time and therefore are also interested in decreasing it. Although decreasing the downtime will not allow an anesthesiologist to bill more per OR for that day (because of the previously mentioned inability to perform even one more case in a regular day); such efforts may result in the anesthesia provider(s) going home earlier, which can reduce overtime payments.

Traditionally, OR throughput improvement initiative has been to focus on how to have current number of people work more efficiently.(3,4) An interdisciplinary work flow assessment and redesign has been to work. It is important to note that all the efforts must include all participants, including surgeons. Further, anecdotal experience is that the initiatives work as long as there is a focus on the effort. After “people are not looking at”, old habits will come back into existence. So the major lessons from this traditional approach is that one must include everyone and that the initiative must be publicized every 3 months to remind workers that it is still important.
In additional, traditional methods have a limited potential improvement. On the other hand, three studies published in *Anesthesiology* (August 2005 issue) describe successful attempts at redesign the non-surgical time. Each study examined the movement of non-surgical time from series to parallel processing – that is moving from performing all activities in the OR where the surgery is done to performing some or all the non-surgical activity in another room while the surgery from the previous case is ongoing. In this way, turnover time activities are not reduced but done at another time. In all three studies, more staff (anesthesia and non-anesthesia) were required. This process is not new. In the past, ORs use to provide two ORs for fast surgeons – that is two complete OR teams for one surgeon. Presently, this is not as common, but with the emergence of preoperative regional block “rooms”, a form of parallel processes already exist in some OR suites. A form of parallel processing (either block room or ones described in the studies) makes economic sense if the increased costs is offset by increased revenue (i.e., more cases) (which is dependent on payer mix and staffing costs) or a reduction in overtime staffing costs.

In July 2008 *Anesthesiology*, Smith et. al. showed how parallel processing and the use of regional anesthesia successfully allowed for an increase in OR throughput over a several year period. As noted in the accompanying editorial, several important factors contributed to this success including (a) commitment of increased staff (both anesthesia and nursing, especially an extra surgical technician), (b) commitment of increased facilities (no new ORs were built, but a place to set-up the equipment for total joint replacements was provided outside the actual OR), and (c) patient selection bias (not all patients were done in the high volume rooms).

Putting all together. In 2011, a multidisciplinary group from Mayo Clinic published their experience and results at improving OR throughput. Instead just focusing on turnover time, they looked at the whole perioperative process and included all types of personnel involved. The major message is found in Table 1 of the paper that lays out the key findings, objectives, and process improvements. The key findings were (a) reduce unplanned variations in surgical volume variation, (b) streamline the preoperative process, (c) reduce non-operative time, (d) reduce redundant information collection, and (e) improve employee engagement.

In conclusion, I find the myth “Focusing on turnover time will improve OR throughput” BUSTED. The focus should be on the whole perioperative PROCESS and reducing NON-OPERATIVE time, not simply focusing on turnover time.

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**Myth 2: Because anesthesia revenue includes time, anesthesia providers prefer longer surgeries.**

Charges for anesthesia care differ from those of other medical specialties, in that time directly influences the amount charged. For instance, surgeons bill for cholecystectomies using relative value units (RVUs) independent of case duration of the surgery. In contrast, as noted above, anesthesiologists bill using ASA units, including time units. Thus, anesthesiologists do bill more for longer cases than for shorter ones.

At first glance it would appear to be in the best financial interests of an anesthesiologist to have longer cases because he or she could bill more per case. Upon further analysis, it becomes clear that longer cases are not financially beneficial. Anesthesiologists actually bill more providing care for many short cases than for a few long cases. Instead of examining billed units per case, one should evaluate the hourly billing productivity (defined as total ASA units billed per hour of care = tASA/h). This measurement is calculated by dividing the sum of total base units and total time units by the total hours of care (for 15-minute time units, hours of care will equal time units divided by 4). For instance, if one assumes that 8 billed hours of care are provided to 2 different surgeons, then the difference in hourly productivity (tASA/h) is dependent solely on the basic units billed. The basic units billed for these 8 hours is related to the number cases done and the base units per case. Therefore, for similar cases, a greater number of cases that can be done in 8 hours will result in more billed units. In other words, the shorter the case duration, the more advantageous it is for an anesthesiologist. Hence, there is actually an incentive to work faster!

In conclusion, I find the myth “Because anesthesia revenue includes time, anesthesia providers prefer longer surgeries” BUSTED! We do have an incentive to work faster and have an interest for the surgeon to work faster as well!
Myth 3: Going from physician-only staffing to medical direction staffing will reduce staffing costs

For the handout, please see our article in the December 2010 ASA Newsletter. The Newsletter is open to all at www.asahq.org and click on Newsletter Archives.

Cost benefit or Cost effective analysis should be the correct analysis, but because this type of analysis is difficult, cost minimization is usually the first type of analysis. In conclusion, I find the Myth “Going from physician-only staffing to medical direction staffing will reduce staffing costs” BUSTED in most scenarios. When hours worked is normalized for both types of providers, moving from physician-only to medical direction (that is replacing some of the physicians with CRNAs) does not always end up reducing staffing costs. In academics, a faculty anesthesiologists costs the same for clinical hourly work and faculty anesthesiologist is expected to take call, teach, and even do research.

Myth 4: Using “per provider” (aka FTE) measurements allow for accurate benchmarking of productivity.

Hospital administrators or medical school deans who make this statement are mistakenly trying to apply outpatient clinic logic to anesthesia staffing. For instance, the administrator might use 30 patients a day as a benchmark for how many patients a pediatrician should see in one day. Thus, if there are 300 patients to be seen each day, then one needs 10 pediatricians to staff the clinic each day.

Unfortunately, as anesthesiologists well know, this logic does not work for determining staffing needs for operating rooms. The primary determinants of the number of anesthesia providers needed each day for a particular department are a) the number of clinical sites or ORs to be staffed; b) the staffing ratio (i.e., concurrency); and c) the numbers of persons both on-call and post-call. What is not a direct determinant of anesthesia staffing is any type of productivity benchmark. Simply put, if the administrator wants the anesthesiology group to cover 20 ORs, then the group will need the same number of providers whether the cases finish at noon or 3 PM.

In addition, the logic applied by the administrator in this situation compares anesthesiology group productivity using “per anesthesiologist” (i.e., per FTE or full time equivalent) measurements. However using “per FTE” measurements to compare anesthesiology groups with different staffing ratios leads to inaccurate conclusions. An example in see when comparing a physician-only group and a group that uses anesthesia care team model (medical direction). When comparing tASA “per FTE”, the medical direction groups appears to be more productive. But when the comparison is done by “per OR site”, one finds that the physician-only group is identical to the medical direction group. (See Table 3)

In conclusion, I find the Myth “Using “per provider” (aka FTE) measurements allow for accurate benchmarking of productivity” BUSTED. Administrators can more meaningfully compare anesthesia care done by groups (or by hospitals in which they work) by using tASA/hr and “per OR site” measurements.

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<td>tASA = total ASA units per FTE, from MGMA 2011 Cost Survey of Anesthesia Groups</td>
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1. Dexter F, Macario A. Decrease in case duration required to complete an additional case during regularly scheduled hours in an operating room suite: a computer simulation study. Anesth Analg 1999;88:72-76.
7. Torkki PM, et al. Use of anesthesia induction rooms can increase the number of urgent orthopedic cases completed within 7 hours. Anesthesiology 2005; 103:401-405.