Practice Management 2022: Managing Change, Achieving Excellence

Not So Easy: Cost Analysis of Staffing Models of Anesthesia Care

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In our previous *ASA Monitor* article, we showed that moving from anesthesiologist-only care to the anesthesia care team may not result in a significant reduction in staffing costs and actually increase the cost (*ASA Newsletter* 2010;74:30-51). In the intervening decade, the cost analysis of one's staffing model and hypothetical changes in the model continue to be a challenge for anesthesiologists and anesthesiology leaders. Unfortunately, basic errors or omissions in the analysis can lead to erroneous conclusions that can ruin a well-functioning facility for many years. Therefore, in this article, we discuss the issues that need to be considered when doing a cost analysis as well as updating our previous evaluation of moving from anesthesiologist-only to anesthesia care team staffing. A discussion of how to determine the best staffing model is beyond this article (*ASA Monitor* 2022;86:14-5; *ASA Newsletter* 2013;77:10-3).

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Table 1: Cost Analysis: Cost Minimization vs. Cost Benefit/Effective

	Cost Minimization Analysis	Cost Benefit/ Effective Analysis
What Kind of Anesthesiology Group Are You?	Provide OR Care Only	• Pre-Operative Optimization • OR and Non-OR Care • Specialty Care • Acute Pain • Post-Op Care and Planning • Physician Leadership on Hospital Committees • Medical Direction • Education • Quality Program
Endpoint	Same Endpoint	Different Endpoint
Valuation	Only Costs, Minimize	Both Benefits and Costs
Complexity	Simple	Complex

Anesthesia is the practice of medicine and physician-led anesthesia care

The World Health Organization and World Federation of Societies of Anaesthesiologists recognize that anesthesia is the practice of medicine: "Wherever and whenever possible, anesthesia should be provided, led or overseen by an anesthesiologist. When anesthesia is provided by non-anesthesiologists, these providers should be directed and supervised by anesthesiologists" (*Can J Anaesth* 2018;65:698-708). The ASA Statement on Physician-Led Anesthesia Care defines what an anesthesiologist at a minimum must do in order to provide this type of care (asamonitor.pub/3veXRql). With this background, this article will only discuss staffing models that are consistent with anesthesiologist-led care. Although there are clinical situations where the anesthesiologist can meet this standard and still cover more than four cases, these situations are not typical. Therefore, we have limited the maximum number of sites that can be covered by one anesthesiologist to four.

Financial equation of anesthesia business

In the most basic terms, the financial equation of any anesthesia business is the following:

Gross revenue + [facility support] = staffing costs + benefits + overhead

In the analysis below, we will only be discussing staffing costs and not the other factors. The implications are that even if two groups have the same staffing costs, the other factors may result in a better financial situation for one group over the other group, leading to lower facility support.

Cost analysis

A cost analysis between two products or processes is generally done in one of two ways: Cost minimization versus cost benefit (or cost effectiveness) (*Anesthesiology* 1997;86:1197-205) (Table 1). If the anesthesiology group is successful in communicating a value proposition their group has to offer, then the facility leadership will do a cost-benefit analysis (*Anesthesiol Clin* 2018;36:227-39). Unfortunately, facility leadership is often focused only on cost-minimization analysis to reduce the line item of facility support. Because annual compensation for nurse anesthetists (CRNAs) is about half that of anesthesiologists, they believe the way to reduce facility support is to hire more CRNAs and fewer anesthesiologists. Aside from the fact that a CRNA cannot provide the same services or expertise the anesthesiologist can (part of the value proposition), relying simply on annual compensation without considering the actual hours worked for that compensation is a major problem. In the rest of this article, we will only look at a cost minimization analysis.

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Pitfalls of comparing annual compensations

In survey data of compensation, one needs to consider what the typical

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Table 2: Comparison of Hourly Cost, 2021-2022 Data

Clinician	Reported Average Yearly Salary*	Average Clinical Hours Worked	Regular Hourly Cost**	% CRNA Hourly Cost/ Physician Cost
Nurse Anesthetist (CRNA)	$202,000	40	$115	n/a
Private Practice Anesthesiologist	$440,000	55	$160	72%
Academic Anesthesiologist, all ranks	$380,000	55	$136	83%

Comparing compensation between nurse anesthetists and physician anesthesiologists must consider average hours worked since the average workweek differs between groups. *Compensation without benefits – see text for references. **40 hours day shift, 15 hours overtime at 1.5 times the hourly rate, and 44 weeks per year for all clinicians.

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Cost Analysis of Staffing Models

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hours worked per week (or per year) are for that compensation. The CRNA salary compensation is based on a 40-hour regular week, meaning if the CRNA works more than 40 hours, later in the evening, night, or weekends, a premium must be paid over the typical compensation. In contrast, a typical anesthesiologist works around 55 hours a week clinically, including evenings, calls, and weekends. To compare the hours worked, one needs to convert the extra 15 hours worked by the anesthesiologist to "regular" hours, typically done by multiplying these hours by 1.5. This would mean that the physician works the equivalent of 62.5 regular hours while the CRNA works 40 regular hours. Further, to calculate an hourly cost, one needs to multiply these weekly hours worked by weeks worked per year. When we use 44 weeks/year, the yearly regular hours are 2,750 hours for the anesthesiologist and 1,760 hours for the CRNA. For yearly compensation, we used current median compensation: CRNA $202,000, private practice anesthesiologist $440,000, and academic anesthesiologist (all ranks) $375,000 (asamonitor.pub/3peshFw; asamonitor.pub/3HcK6uF; asamonitor.pub/3LZ8yDn; Society of Academic Associations of Anesthesiology and Perioperative Medicine - 2021 Annual Financial and Compensation Survey [login required]). The hourly cost per clinician works out to be $115/hour for a CRNA, $136/hour for an academic anesthesiologist, and $160/hour for a private practice anesthesiologist (Table 2). Therefore, the initial CEO's comparison of annual compensation showed that a CRNA is paid at 46% of the private practice anesthesiologist, but the hourly cost is that CRNA costs 72% of the private practice anesthesiologist and 83% of an academic anesthesiologist!

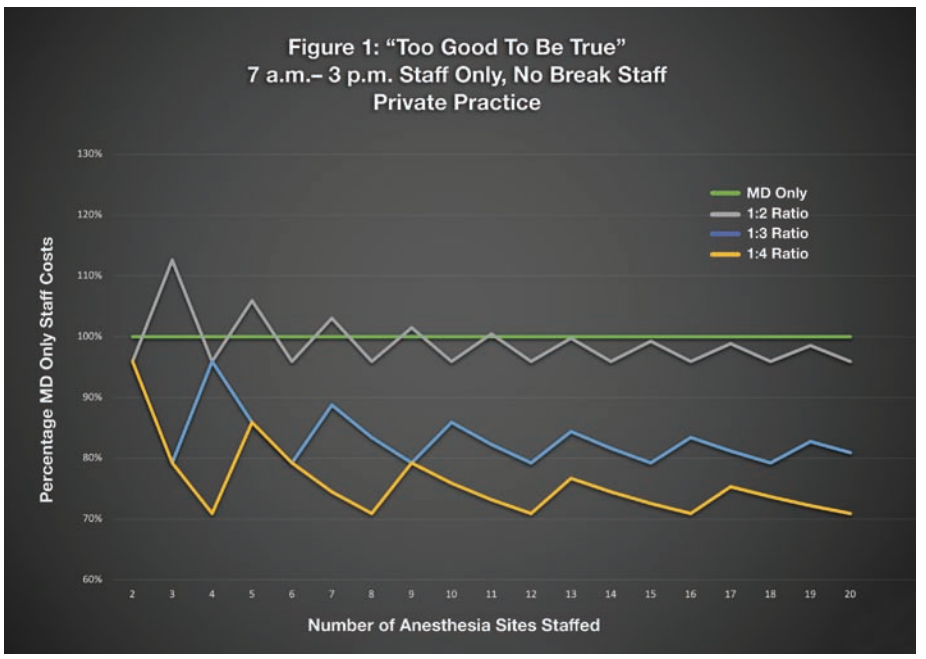

Figure 1: "Too Good to Be True." 7 a.m. to 3 p.m. only (No sites running after 3 p.m.). No break staff. Anesthesia care team costs normalized to physician only (MD-only). Spikes in costs are when the number of sites cannot be divided by the staffing ratio. No break staff can lead to erroneous cost comparisons.

Illustration of staffing costs: comparing anesthesiologist-only vs. anesthesia care team

For illustration purposes, Figures 1-4 compare a private practice anesthesiologist-only staffing model to an anesthesia care team model consisting of private practice anesthesiologists and CRNAs. The above yearly median compensation was used. We normalized the costs to the anesthesiologist-only cost.

In Figure 1, all sites are covered only from 7 a.m. to 3 p.m. with no cases ongoing after 3 p.m. Since all sites are eight-hour shifts, each 40-hour CRNA can cover each site five days/week. Overall, the anesthesia care team model of 1:3 or 1:4 appear to be less costly while 1:2 is about the same as anesthesiologist-only. The "spikes" in the anesthesia care team lines result when the number of rooms cannot be perfectly divided by the staffing ratio. The other important factor to consider is that in these models, *all* the cases must be done at 3 p.m.

Figure 1 is actually incomplete because one of the "hidden costs" when moving to higher-ratio staffing models is not included – the need for break staff. These break staff arrive later in the day to provide breaks to the CRNAs in the OR. For these illustrations, we assumed the break staff would work 11 a.m. to 7 p.m. (eight-hour shift), although other shifts could be used. For the staffing models, we use one break staff per four to six sites (average five sites) based on number of lunch breaks one can give in a reasonable time.

In Figure 2, the staffing model is the same as Figure 1 but now there are break staff included. Since there is a break staff for about every five sites and that staff works till 7 p.m., this model only requires 80% of the sites to finish by 3 p.m. and the other 20% by 7 p.m. In this figure, a 1:2 ratio is more costly than anesthesiologist-only, and the 1:3 only provides minimal cost reductions.

In Figure 3, all sites are now covered for 10 hours, 7 a.m. to 5 p.m. Unlike Figures 1 and 2, each 40-hour CRNA cannot cover five days/week. Although we could have staffed with 50-hour CRNA, the less costly option is to hire more CRNAs. One needs 1.25 40-hour CRNAs to staff five days a week. The results show cost savings only occur at the 1:4 ratio.

Figure 4 illustrates why break staff need to be included in the cost analysis. The figure shows Figure 3 conditions for a 1:3 ratio with and without break staff.

These figures are the least complex staffing model. The reality is that most staffing models are more complex and nuanced – such as having some anesthesiologist-only sites, having different shifts for CRNAs because not all sites are staffed

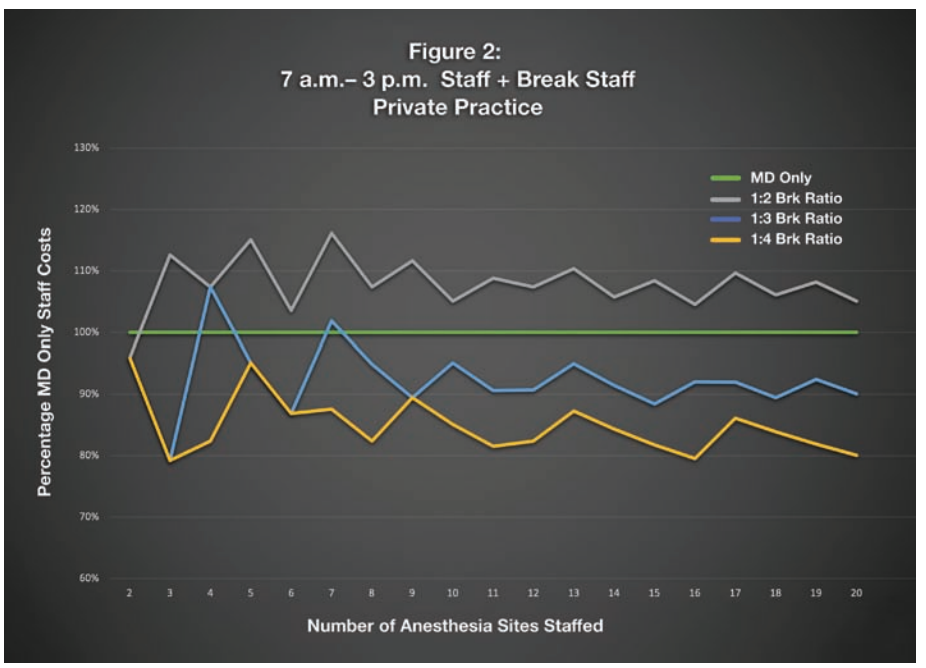

Figure 2: 7 a.m. to 3 p.m. only but with break staff included. Same as Figure 1 but one break staff included every 4-6 sites (average five sites). Cost savings for anesthesia care team model occurs in 1:3 or 1:4. 80% of sites must be done by 3 p.m. Anesthesia care team costs normalized to physician-only (MD-only). Spikes in costs are when the number of sites cannot be divided by the staffing ratio.

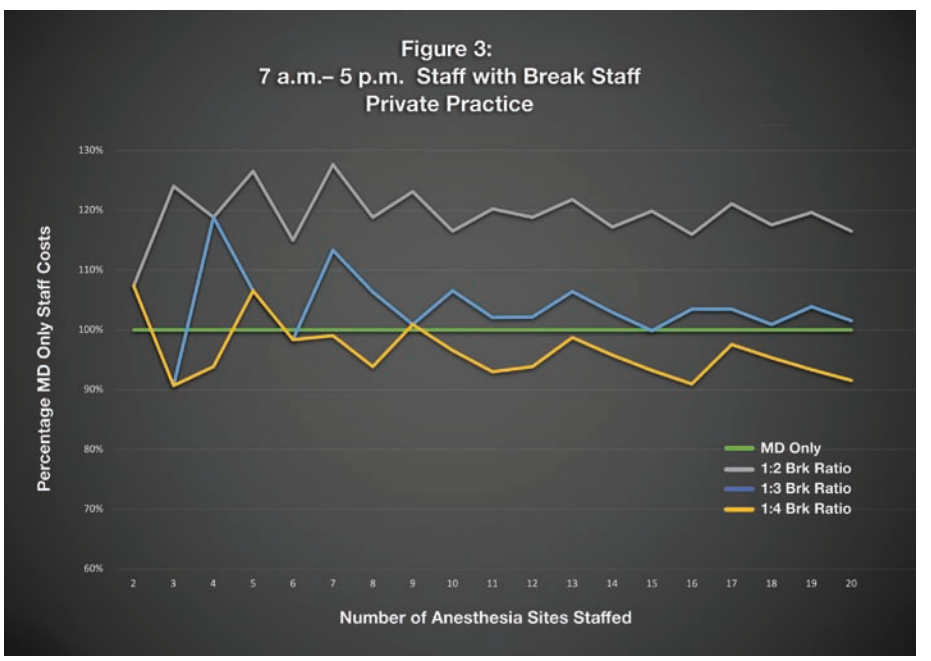

Figure 3: 7 a.m. to 5 p.m. with break staff included. Because one needs 1.25 CRNAs per site to cover the 10-hour shifts, the cost savings for anesthesia care team model is further reduced. Anesthesia care team costs normalized to physician-only (MD-only). Spikes in costs are when the number of sites cannot be divided by the staffing ratio.

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the same hours, and limitations due to geographical location, types of procedures, specialty care needs, and nonclinical commitments (e.g., group or facility leadership). In addition, the staffing ratio is not a static number, but can vary within a facility and will definitely vary throughout any workday. The two models shown assume no late-hour costs or on-call costs. Finally, the figures were based on private practice anesthesiologists' compensation. If the lower academic anesthesiologist compensation is used, then the anesthesia care team costs would be even more unfavorable.

It is important that even though we used CRNAs in the models – mostly due to the readily available compensation data – anecdotally, the compensation for certified anesthesiologist assistants (CAAs) are similar to CRNAs and would have resulted in similar findings.

Using only cost-minimization analysis, it is evident that moving to higher staffing ratios may not reduce costs as expected, in particular if no break staff is included in the initial analysis. Further, the figures illustrate that staffing ratios have the lowest costs when the ratios perfectly match the room numbers, but even in a 1:3 ratio and with six sites, this may not occur due to either geographical limitations or a lower ratio needed for best care. From these results, it should not be surprising that some staffing companies touting lower costs rely on higher staffing ratios than 1:4 and may not be providing physician-led care. For most groups, the ultimate make-up of anesthesia staff is very dependent on who is available and can be hired. Finally, the complete evaluation of any staffing model needs to be cost-benefit and include the financial equation for anesthesia care noted. ■

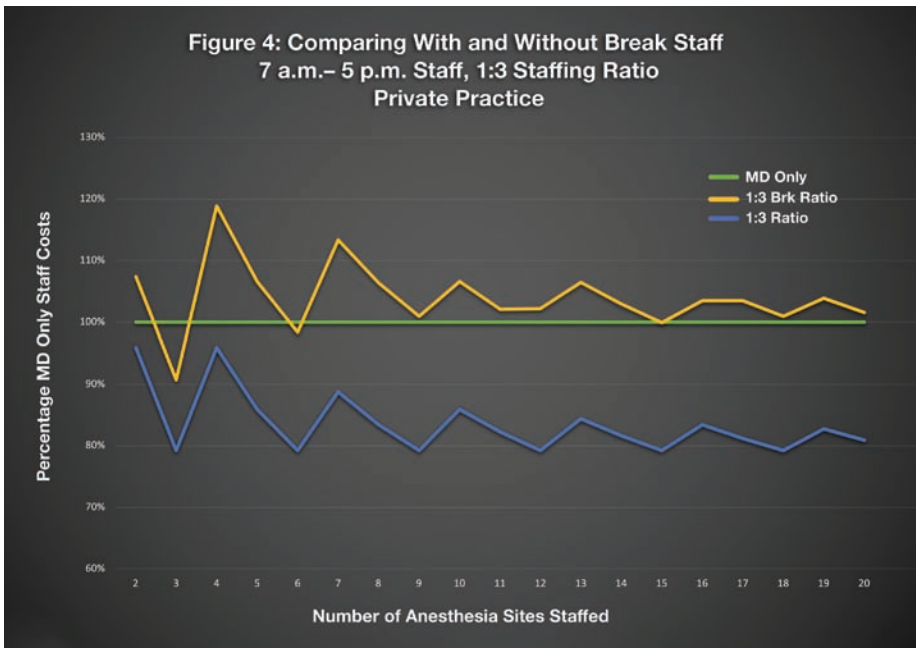

Figure 4: Comparing with or without break staff. Not including break staff into the costs can lead to erroneous business decisions. Anesthesia care team costs normalized to physician-only (MD-only). Spikes in costs are when the number of sites cannot be divided by the staffing ratio.

Disclosure: *Dr. Abouleish is a consultant for ECG Consulting Group, Inc.*

The Anesthesia 'Employed' Model: Is This Our Destiny?

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Over the past three decades we have witnessed huge shifts in anesthesia practice and our delivery models. We have also seen dramatic changes in the way anesthesiologists practice. Modes have run the gamut from solo, to group, private, academic, employed, and every combination imaginable. No matter the model, what has always remained at the top of our priorities has been the ability to provide safe, comprehensive, and physician-directed anesthetic care. All of these models have the potential to be consistent with that aim. As a disclaimer, this article does not promote one model over another, but simply attempts to provide a comprehensive explanation.

A primer on the subject would focus on the economics of anesthesia practice and its changing payment methodologies and how this has led to shifts in practice models. The small private practice, or solo model, has become a mode of the past; while a few of these still exist, they are rare. The large private practices have also morphed and evolved. While 30 years ago it was unheard of to have a group provide anesthesia care across state lines, today it is the norm. Originally, large private practice groups provided ownership and equity to its physician members, but that is rarely the case today. Most of these

groups have been acquired by private equity firms and no longer offer true partnership. Employment models can take many forms, and some would argue that working for a private group or an academic center is nothing more than employment. For the sake of this discussion, we will consider the "employed model" to represent a hospital, health care system, or ambulatory surgery center (ASC) hiring its own anesthesia staff.

For those who have been in practice for several decades, you will recall a time when hospital employment was not unheard of. When anesthesia payments were more favorable, hospital administrations wanted to share in the "profits" to be made by hiring their own anesthesia providers. This phase didn't last very long for a variety of reasons, and many of those employed models morphed into contracts with nationally recognized anesthesia practices. Employed models proved to be expensive and costly to hospitals. Perceived "control" of their providers was not as easy and straightforward as administrations hoped. There was much more upside for an administration dealing with a recognized private practice provider who could handle recruitment, daily operations, attention to metrics, HR issues, etc. Hospitals maintained leverage over these contracts through the constant threat of renegotiation and RFPs.

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So what's changed? Why the swing back to an increasing employment model?

Ever-growing subsidies

One of the key factors in the move back toward hospital employment has been the sheer economics of the industry. Contracts with groups of any size have necessitated larger and ever-growing subsidies. Depending on the location of the hospital and the payer mix, these contract subsidies have become staggering. As health care entities spend more on subsidies, their relationship with providers becomes very close to an employment model. When administrators begin to examine their contracts with private groups, the cost of those contract subsidies, and the limitations of a contract itself, it begins to make sense to them to shift the model and eliminate the perceived "middle man," the group itself. What is often overlooked, however, are the intangibles many large groups provide. Those extras are easily ignored or

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