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Relative Value Guide basic units in operating room scheduling to ensure compliance with anesthesia group policies for surgical procedures performed at each anesthetizing location

Many anesthesia groups provide services in a spectrum of anesthetizing locations, including offices, free-standing ambulatory surgery centers, diagnostic clinics, and traditional hospital operating rooms. The use of a uniformly understood measure of case complexity could assist an anesthesia group in ensuring appropriate anesthesia provider expertise and equipment availability at each anesthetizing location. In this article, we show how the American Society of Anesthesiologists' Relative Value Guide (ASA RVG) basic units can be used as a criterion to establish the maximum level of complexity of cases performed at each location by an anesthesia group. By reviewing ASA RVG basic units at several anesthetizing locations in Iowa, we found that ASA RVG basic units differ among sites. The ASA RVG basic units can be used to identify cases that are seemingly unexpected for an anesthetizing location. There are several reasonable values that an anesthesia group can use for its maximum number of basic units at an anesthetizing location (eg, 6, 7, 10, or 15).

Key words: **Compliance program, operating room management, operating room information system, practice management, relative value guides.**

Introduction

The American Association of Nurse Anesthetists' (AANA) 1999 "Standards for Office Based Anesthesia Practice for the Certified Registered Nurse Anesthetist"[1] specify that nurse anesthetists should determine, for each anesthetizing location, whether the anesthetic requirements of a proposed procedure can be managed appropriately at the site. Nurse anesthetists are responsible for assessing that their facility and anesthesia-related equipment are adequate for the planned procedure.

Many anesthesia groups provide services in anesthetizing locations other than office-based practices, including free-standing ambulatory surgery centers, diagnostic clinics, and hospital-based ambulatory surgery centers. Anesthesia providers also need to evaluate the complexity of cases at these anesthetizing locations. The use of a uniformly understood measure of case complexity can assist an anesthesia group in ensuring appropriate anesthesia provider expertise and equipment availability at each anesthetizing location for the complexity of cases that are to be performed at the site.

Other organizations have published standards that require the establishment of written policies specifying the procedures and anesthesia services that may be performed at each site.[2] The American Academy of Pediatrics recommends that there be a written policy designating which procedures needing anesthesia can be performed at each facility.[3] This task is not trivial. Large anesthesia groups provide services for most[4-6] of the 5,780 Current Procedural Terminology (CPT) codes for surgical procedures with corresponding anesthesia codes. In this article, we describe and then test a simple method for choosing which procedures can be performed at each anesthetizing location.

Review of the literature

Existing standards define surgical procedure complexity, in whole or in part, by the type of anesthesia that is administered.[2,7,8] For example, according to the standards of American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF), an ambulatory surgery facility seeking inspection and accreditation by the, AAAASF, as a Class A facility would certify that anesthesia will be limited to local (Table 1).

Although these standards are easy to use, they neglect to address important differences among surgical procedures performed with general or regional anesthesia. Issues that may be important to an anesthesia group when deciding which surgical procedures its members can provide anesthesia for at each anesthetizing location include: availability of ventilators for postoperative

Table 1. Facility classification standards of American Association for Accreditation of Ambulatory Surgery Facilities[9]

Facility classification	Types of anesthesia that can be used
Class A	Local
Class B	Local, monitored anesthesia care, or regional
Class C	Local, monitored anesthesia care, regional, or general

mechanical ventilation, availability of emergency drugs, rapidity of obtaining specialized blood tests including arterial blood gases and coagulation studies, time needed to obtain a portable chest radiographs, amount and type of blood products available and the equipment needed to administer them rapidly, and postanesthesia care unit nurses' expertise with cardiopulmonary management.[10] Next, we describe a method that addresses such differences in complexity among cases performed with general and/or regional anesthesia. We also evaluate the use of the American Society of Anesthesiologists' (ASA) physical status as a criterion for case complexity.

Rationale for using ASA Relative Value Guide

The ASA Relative Value Guide (RVG) basic units can be used as the basis for establishing the maximum level of complexity of surgical procedures for which an anesthesia group will provide anesthesia at an anesthetizing location.[11] Basic units measure the usual work of providing anesthesia care for a procedure excluding time. The ASA RVG basic units have at least 4 desirable features for this application.

1. The ASA RVG offers an existing, comprehensive list of surgical procedures for which an anesthesia group will provide anesthesia at each anesthetizing location. Extensive meetings and negotiations are not required at each site to create criteria. The ASA RVG basic units have face validity as a measure of case complexity. For example, knee arthroscopy has 3 units; renal transplant, 10 units; heart transplant, 20 units; and liver transplant, 30 units.

2. Updates of the ASA RVG basic units are published annually to reflect changes in medical and surgical practice. Updates are performed automatically by someone other than the anesthesia group, thereby minimizing the group's costs.

3. Suppose that a surgeon schedules a procedure at an anesthetizing location that is more complex than the maximum permitted by the anesthesia group's policy for the site. If the surgeon and patient arrive on the day of surgery for the case, the anesthetist may feel performance pressure and proceed with the case despite (or because he or she did not recall) the written policy. Thus, an anesthesia group must ensure its providers' compliance with its written policy, not just audit compliance retrospectively and then "discover" a violation. One straightforward way to ensure that policy virtually is never violated is to "teach" an anesthetizing location's scheduling information system to monitor the complexity of cases as each surgical case is scheduled. Each surgical CPT code has a specified number of ASA RVG basic units. This "look-up" table of ASA RVG basic units for each surgical CPT code can be stored in the operating room information system. When a case is booked, the operating room information system uses the case's scheduled procedure(s) to obtain its ASA RVG basic units and compares them with the maximum permitted by the group's policy for the anesthetizing location. If the maximum is exceeded, the information system can immediately prompt the scheduler and surgeon (again, as the case is being scheduled), thereby ensuring 100% compliance with the anesthesia group's policy. Since the ASA RVG is used widely for purposes of billing for anesthesia services, this use of the ASA RVG would not require that any additional data be collected solely to ensure compliance with the anesthesia group's policy.

4. It seems unrealistically challenging to expect all anesthesia providers in large anesthesia groups, serving multiple anesthetizing locations and providing anesthesia for more than 5,000 different surgical procedures,[4-6,12] to keep track of a group's written policies as to which surgical procedures can be performed at which sites. Simply excluding cases based on the type of procedure is impractical. The precise reason is that there are so many different procedures for which a policy would have to be negotiated. If the ASA RVG is used as the basis for the maximum level of complexity of surgical procedures that an anesthesia group provides anesthesia for at an anesthetizing location, the anesthesia group need only make 1 decision: the maximum ASA RVG basic units to use. In contrast, between 1994 and 1996, more than 24,000 different procedures or combinations of procedures (based on CPT code) involving an anesthesia provider were performed in US ambulatory surgery centers. This number would be even higher if inpatient cases were added.

Methods

We reviewed ASA RVG basic units at several anesthetizing locations in Iowa. We used the data to ask 2 questions. First, can ASA RVG basic units be used successfully to identify cases that are unusual for an anesthetizing location? Second, can an alternative criterion, namely ASA physical status, be used to identify cases that are unusual for an anesthetizing location?

Results

Characteristics of the anesthetizing locations are provided in Table 2. Patients' ASA physical status could not reliably be used to identify cases that were unusual for a site. The ASA RVG basic units differed among anesthetizing locations (Table 3). This result shows that ASA RVG basic units can be used to iden-

Table 2. Demographics of the cases performed at several anesthetizing locations in Iowa during 1998

Anesthetizing location	No. cases	Anesthesia time (min)		ASA physical status
		Median ± standard deviation	Median ± quartile deviation*	Median ± quartile deviation*
Ambulatory surgery center	4,431	101 ± 57	90 ± 32	2 ± 0
Office-based dermatology practice	15	36 ± 12	35 ± 8	2 ± 0
Psychiatric hospital (electro-convulsive therapy)	1,109	24 ± 8	23 ± 4	2 ± 0
Office-based gastrointestinal clinic	20	107 ± 53	92 ± 39	2 ± 0
Tertiary operating room suite	11,835	213 ± 131	183 ± 75	2 ± 0.5
Imaging service	191	108 ± 49	95 ± 30	2 ± 0.5
Urology clinic within a hospital	731	110 ± 76	85 ± 45	2 ± 0
Rural hospital	172	58 ± 42	45 ± 18	2 ± 0

* We included the median ± quartile deviation for anesthesia time, because anesthesia time is such a highly skewed variable.

tify cases that are seemingly unexpected for an anesthetizing location. For example, the outlier cases at the rural site included a radical abdominal hysterectomy with lymph node dissection. The outlier cases at the hospital-based ambulatory surgery center included 2 thoracoscopies with pleurodesis and radical resection of a chest wall tumor, all requiring postoperative inpatient care.

The data presented in Table 3 suggest that the ASA RVG basic units may be insufficient to distinguish complexity among cases with 6 basic units or fewer. There are several reasonable values that an anesthesia group could use for its maximum number of basic units at an anesthetizing location (eg, 6, 7, 10, or 15).

Discussion

We investigated the use of the ASA RVG basic units to specify the maximum number of basic units considered appropriate for performing anesthesia for a surgical procedure at a specific anesthetizing location. Additional restrictions on providing anesthesia for a case also may apply. For example, children cannot be anesthetized at a location without airway equipment for pediatric patients. Age criteria (eg, no patient younger than 1

Table 3. Comparison of American Society of Anesthesiologists' Relative Value Guide basic units among the evaluated anesthetizing locations in Iowa during 1998

Anesthetizing location	No. of basic units					
	3-4	5-6	7	8-10	11-15*	20-30
Ambulatory surgery center	1,507	2,816	93	11	4	
Office-based dermatology practice	15					
Psychiatric hospital (electroconvulsive therapy)	1,109					
Office based gastrointestinal clinic	4	16				
Tertiary operating room suite	2,218	4,902	1,356	1,42	1,364	568
Imaging service			191			
Urology clinic within a hospital	365	232	131			
Rural hospital	45	117	8	1	1	

* None of the procedures performed were within 16-19 units.

year) can be combined easily with ASA RVG basic units.

With respect to patients with severe illnesses, we recommend that nurse anesthetists and anesthesiologists rely on judgment rather than combining ASA RVG basic units with ASA physical status. First, a patient's ASA physical status may not be known when a surgical case is scheduled. This differs from the ASA RVG basic units, which are known when a case is scheduled. For some classes of surgical procedures (eg, gynecological oncology) there are often differences between scheduled and actual surgical CPT codes. However, these different surgical CPT codes almost always correspond to the same number of ASA RVG basic units. Second, the interaction between ASA RVG basic units and ASA physical status in predicting the need for ventilators, blood products, etc, (see above) is unknown.

We did not consider using ASA physical status without ASA RVG basic units, because patients with physical status of III or IV can probably undergo procedures of low complexity (eg, cataract extraction with topical anesthesia) at a variety of anesthetizing locations. Our results show that ASA physical status will not work as the basis for the maximum level of case complexity at an anesthetizing location, because ASA physical status does not differ significantly among sites (see Table 2). We expected this result, in that caring for an ASA physical status IV patient undergoing trigger finger release is probably less complicated than caring for an ASA physical status I patient undergoing donor hepatectomy.

We found that 6 or fewer ASA RVG basic units could not be used to distinguish case complexity among our anesthetizing locations. This was probably because so many of the ophthalmologic cases include 6 units.

An anesthesia group could choose a maximum number of basic units from among the 4 values that differentiated among sites (6, 7, 10, or 15). For example, radical retropubic prostatectomy is among the surgical procedures with 7 ASA RVG basic units. Since such patients may require transfusion and postoperative ventilation, and they can develop disseminated intravascular coagulation, a maximum of 6 ASA RVG basic units may be appropriate for anesthetizing locations without ventilators for postoperative mechanical ventilation and the laboratory and blood supplies required to treat disseminated intravascular coagulation.

If an anesthesia group has a policy for the maximum level of complexity of surgical procedures for which they will perform anesthesia at an anesthetizing location, they also need a method to ensure 100% compliance with this policy. "Systems level" solutions do not involve creating a policy and educating anesthesia group members on details of the policy. Rather, a system should be put into place that ensures that compliance is always achieved. This objective can be realized by making operating room scheduling software more sophisticated so that it checks the ASA RVG basic units when a case is scheduled.

Conclusion

In conclusion, we think that the ASA RVG basic units can serve as a convenient and rational measure of anesthetic case complexity. An anesthesia group can easily use the ASA RVG basic units as a criterion for the maximum level of complexity of surgical procedures that they will administer anesthesia for at each anesthetizing location. Because basic units can easily be incorporated into operating room information systems and are updated by the ASA, they have the advantage of being a nearly cost-free method to ensure compliance with an anesthesia group's policy for surgical procedures performed at each anesthetizing location.

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