

Influence of the Type of Anesthesia Provider on Costs of Labor Analgesia to the Texas Medicaid Program

Amr E. Abouleish, M.D., M.B.A.,* Donald S. Prough, M.D.,† Rakesh B. Vadhera, M.D., F.R.C.A., F.F.A.R.C.S.I.‡

Background: The Texas Medicaid Program (Medicaid) defines billable time for labor analgesia as face-to-face time; therefore, anesthesia providers determine billed time. The authors' goal was to determine the influence of anesthesia providers on labor analgesia costs billed to Medicaid.

Methods: Under the Freedom of Information Act, Medicaid provided data on claims paid for 6 months in 2001 for labor analgesia administered during the course of a vaginal delivery. Claims were either time based (codes 00946 or 00955) or a flat fee (codes 26311 or 26319). Using modifiers, the authors grouped time-based claims as either anesthesiologist group or certified registered nurse anesthetist (CRNA) group. The cost to Medicaid was based on the 2001 fee schedule. The conversion factor was \$18.21 per American Society of Anesthesiologists unit. The flat-fee reimbursement was \$152.50. CRNA services were paid at 85% of the fee schedule. Average time per time claim, percent of providers with more than 4 h of billed time, and cost per claim were determined for each group. Providers with more than 120 claims (> 20 claims/month) were considered high-volume.

Results: The database included 21,378 claims (anesthesiologist group: 12,698 claims from 219 providers; CRNA group: 8,680 claims from 117 providers). For time-based claims, the average time per case was significantly higher in the CRNA group (146 min) than in the anesthesiologist group (105 min). The CRNA group cost to Medicaid (\$225.11) was 19% more per claim than the anesthesiologist group (\$189.26). The difference in cost per claim was greater among high-volume providers—\$213.10 for the CRNA group versus \$168.76 for the anesthesiologist group. If a flat-fee program were instituted using the average cost per claim for all groups (\$203.81), the Texas Medicaid program would save more than \$500,000 annually.

Conclusions: The costs of labor analgesia billed to Texas Medicaid were 19% to 26% less per patient when provided by anesthesiologists than by CRNAs, despite lower per-unit reimbursement of CRNAs.

THE prevailing argument for the use of physician extenders has been that they are less costly and provide equivalent effectiveness and quality in primary care clinical situations and less-than-acute facilities (e.g., nursing homes).^{1,2} Most studies comparing physicians and physician extenders have examined the direct labor costs associated with the services. Few, if any, have examined the costs based on third-party payer status.

In the United States, anesthesia care is provided in

three different care models: anesthesia care personally performed by anesthesiologists (i.e., specialty-trained physicians); anesthesia care provided by physician extenders (physician-residents, certified registered nurse anesthetists [CRNAs], anesthesia assistants, or student nurse anesthetists) medically directed by anesthesiologists; and CRNA-delivered care with supervision by any physician, including the operating surgeon. Most studies have focused on labor costs and quality of care without including costs of the different models for third-party payers.³⁻¹¹

The lack of focus on payer costs may be related to the fact that, for most surgical anesthesia care, the amount billed (and amount paid by third-party payers) is not primarily determined by the anesthesia provider or the care model but rather by the duration of surgery. For anesthesia billing, the most common units billed are American Society of Anesthesiologists (ASA) units. The ASA units billed for a specific surgical procedure are the sum of the basic units, time units (time of anesthesia care), and modifier units (e.g., ASA physical class, emergency).¹² The basic units are defined by the primary surgical procedure performed and hence cannot be controlled by anesthesia providers. The time units billed are based on the actual duration of anesthesia care, customarily defined as beginning when anesthesia care is provided continuously and ending when the provider transfers care to a nonanesthesia provider (e.g., recovery room nurse). More than 90% of this time occurs when the patient is in the operating room.¹³⁻¹⁵ The majority of operating room time is time for surgical preparation and for the surgical procedure. The only time considered anesthesia control time is the induction time (patient in-room time to surgical preparation time) and emergence time (surgical close time to patient-out-of-room time).^{16,17} However, only a fraction of anesthesia control time is variable and dependent on the anesthesia provider. That component is an even smaller fraction of the total time billed. In addition, the most common modifier units billed are based on ASA physical classification (which is only partially dependent on the anesthesia provider) and emergency status (which is independent of the anesthesia provider). Further, it seems that there is no difference in reimbursement for care between each model of care. For Medicare, the total cost per ASA unit is billed is the same for all models.¹⁸ For private payers, a recent survey showed no significant difference between the models.¹⁸ Because payment per ASA unit is not different and the discretion of anesthesia providers

* Professor, † Rebecca Terry White Professor and Chair, ‡ Associate Professor.

Received from the Department of Anesthesiology, University of Texas Medical Branch, Galveston, Texas. Submitted for publication March 25, 2004. Accepted for publication June 22, 2004. Support was provided solely from institutional and/or departmental sources. Presented at the Annual Meeting of American Society of Anesthesiologists, San Francisco, California, October 14, 2003.

Address reprint requests to Dr. Abouleish: Department of Anesthesiology, University of Texas Medical Branch, Galveston, Texas 77555-0591. Address electronic mail to: aaboule@utmb.edu. Individual article reprints may be purchased through the Journal Web site, www.anesthesiology.org.

has so little influence on the amount billed per procedure, it is understandable that economic studies have focused on quantified labor costs and inferred quality of care rather than on costs to third-party payers.

In contrast to payment for surgical anesthesia, there is no universally accepted payment methodology for labor analgesia^{12,19,20} because anesthesia care does not require continuous attendance with the patient. However, it does require continuous availability. Most labor analgesia consists of epidural analgesia with or without subarachnoid injection. Methodologies for paying for epidural analgesia differ depending on the definition of billable time (*i.e.*, how much of the epidural duration can be billed and will be paid). The different billing methodologies are (1) all time from the beginning to the end of anesthesia care, which is similar to surgical anesthesia; (2) a maximum time that will be reimbursed (time is billed similar to surgical anesthesia, but an arbitrary limit [*e.g.*, 4 h] is set for payment); (3) only time spent in the patient's room (*i.e.*, face-to-face time) can be billed and is paid—all other time where the anesthesia provider is in the hospital and immediately available is not billable; (4) an incremental flat fee based on total anesthesia time (*e.g.*, 0–2 h, 2–4 h, and > 4 h); and (5) a flat fee independent of time billed. In all the methods except face-to-face time, the amount billed and paid is dependent solely on the time the patient has the epidural analgesia and not on the anesthesia provider. In contrast, in the face-to-face time methodology, the amount of time billed and paid is dependent on the anesthesia provider. For the Texas Medicaid program, the face-to-face time method is used.²¹ The purpose of this study was to evaluate the costs of epidural analgesia to the Texas Medicaid program based on the type of anesthesia provider.

Materials and Methods

Under the Freedom of Information Act, we requested data from the Texas Health and Human Services Commission (Austin, Texas) on claims paid by the Texas Medicaid program (Medicaid) for labor analgesia (specifically, epidural analgesia with vaginal delivery) for the 6-month period from July to December 2001. We requested all claims involving labor analgesia administered during the course of a vaginal delivery, as described in table 1. Two types of claims were possible: time-based (which included a modifier for type of provider) and flat-fee claims (limited to pregnancy-related diagnoses).²¹ It is important to note that the time-based codes are billed with basic units and time units, whereas the flat-fee codes are not billed using ASA units or time. In addition, for the time-based codes, modifiers included in the study are AA (personally performed by an anesthesiologist) and QZ (CRNA-provided care without medical direction by an anesthesiologist). Claims paid for labor analgesia that ended in a surgical delivery (forceps or cesarean) were excluded from the study. Claims for labor analgesia and vaginal delivery that had medical direction modifiers (QJ, QO, QQ, QX) were excluded from analysis because it was not possible to identify individual patients. Without patient identifiers, it was not possible to identify when two medical direction claims (one from the anesthesiologist and one from the CRNA) were billed for care given to one patient, and therefore, the number of deliveries for these claims could not be accurately determined. For each claim paid, data collected were the claim code, anesthesia provider modifier (if applicable), minutes billed (if applicable), and provider name and city. Patient identifiers were not included because the Texas Attorney General's Office (Austin, Texas) stated that this information was protected under state and federal statutes and not available under the Freedom of Information Act.

Table 1. Procedure Codes and Modifiers for Anesthesia Care for Labor Ending in Vaginal Delivery

2001 Current Procedural Terminology Codes		
Time-based	00946	Anesthesia at time of vaginal delivery only
	00955	Continuous epidural analgesia, during labor vaginal delivery
Flat-fee	62311	Injection, single, epidural or subarachnoid, lumbar
	62319	Injection, including catheter placement, continuous infusion or intermittent bolus, epidural or subarachnoid, lumbar
Care Model Modifiers for Time-based codes		
AA		Personally performed by an anesthesiologist
QZ		Performed by CRNA without medical direction by an anesthesiologist
QJ, QO, QQ		Medical direction by an anesthesiologist of two, three, or four concurrent procedures, respectively
QX		Performed by CRNA under medical supervision of an anesthesiologist

Under the Freedom of Information Act, claims paid by the Texas Medicaid program from July to December 2001 were requested. Claims were limited to anesthesia for labor ending in vaginal delivery. Time-based codes 00946 and 00955 were included. For the flat-fee codes 62311 and 62319, claims were limited to diagnoses related to pregnancy or delivery (ICD-9-CM 640.XX to 677.XX). Definitions of codes and modifiers from 2001 Texas Medicaid Provider Manual, Sections 34.4.3.2 and 34.4.3.13.

CRNA = certified registered nurse anesthetist.

CRNA) were billed for care given to one patient, and therefore, the number of deliveries for these claims could not be accurately determined. For each claim paid, data collected were the claim code, anesthesia provider modifier (if applicable), minutes billed (if applicable), and provider name and city. Patient identifiers were not included because the Texas Attorney General's Office (Austin, Texas) stated that this information was protected under state and federal statutes and not available under the Freedom of Information Act.

The allowable payment for each claim was calculated using the 2001 Texas Medicaid fee schedule.²¹ For the time-based codes, basic units were 5 units, and time units were 15-min intervals. Billable time was limited to time actually spent with the patient in her room, *i.e.*, face-to-face time only.²¹ The time the anesthesia provider was immediately available and required to be in the hospital during epidural analgesia was not billable. For

each ASA unit, the Medicaid conversion factor was \$18.21. § Medicaid also modifies this conversion factor depending on the anesthesia provider modifier. For AA, 100% is paid, but for QZ, 85% of the conversion factor is paid. For the flat-fee codes, Medicaid paid \$152.50 to anesthesiologists for either claim. If the provider was a CRNA, Medicaid paid the provider 85% of this amount.²¹

Data were grouped into two categories based on type of modifier: anesthesiologist-involved (anesthesiologist group) and CRNA without anesthesiologist involved (CRNA group). For the time-based claims, the AA and QZ modifiers were used to categorize the claims. Because flat-fee claims do not include the anesthesia provider modifier, these claims were grouped with the AA or QZ modifiers under the following method. If the provider name billed any time-based claims using the QZ modifier, we assumed that the provider was a CRNA and included all of the provider's flat-fee claims in the CRNA group. For providers who did not bill using QZ modifier, we assumed that service provided involved an anesthesiologist (either personally performed care or medical direction) and included the provider's flat-fee claims in the anesthesiologist group.

From the data, the allowable cost to Texas Medicaid per claim was determined for each group. The minutes billed per claim (for only time-based codes) were averaged per group as well as the number and percentage of claims with more than 4 h (240 min) of time billed. Subsequently, we calculated the impact of using the average cost per epidural as a flat-fee reimbursement to the annual Texas Medicaid budget.

For additional analysis, high-volume providers were defined as those providers who billed more than 120 claims for the 6-month study period. Data were reanalyzed using only data from high-volume providers.

Statistical Analysis

Comparisons were made using the Student unpaired *t* test and chi-square test where applicable using Microsoft Excel XP (2002; Microsoft Corporation, Redmond, WA). The level of significance was a *P* value less than 0.05.

Results

For the 6-month period of the study, Texas Medicaid paid 24,174 claims for anesthesia for labor ending in vaginal delivery. Of these, 2,160 claims had a medical direction modifier and were excluded. Of the remaining 22,014 claims, one provider, who had submitted 628 claims, was excluded because 33% of the claims included both QZ and AA modifiers. Therefore, 21,378 claims (88% of the total reported) from 336 different

Table 2. Number of Claims Paid for Labor Analgesia Ending in Vaginal Delivery by Procedure Code and Provider Type

Type of Claim	Procedure Code	Total Claims (n = 336)	Anesthesiologist (n = 219)	CRNA (n = 117)
Time based	00946	1,190	899	291
	00955	14,204	6,107	8,097
Flat fee	62311	74	54	20
	62319	5,910	5,638	272
	Total	21,378	12,698	8,680

Claims were grouped by type of provider based on AA or QZ modifier. Claims with medical direction modifiers were excluded because patient identifiers were not available to determine when two claims represented a single delivery. For each provider, if QZ modifier was used for time-based claims, flat-fee claims were categorized as the certified registered nurse anesthetist (CRNA) group.

AA = personally performed by an anesthesiologist; n = total providers per group; QZ = performed by CRNA without medical direction by an anesthesiologist.

providers were included in the study. The anesthesiologist group (219 providers) accounted for 59% of the claims (12,698 claims = 7,006 time-based claims and 5,692 flat-fee claims), whereas the CRNA group had 41% of the claims (8,680 claims = 8,388 time-based claims and 292 flat-fee claims) (table 2). When compared with the CRNA group, a significantly higher percentage of the anesthesiologist group claims were billed using the flat-fee codes (45% for the anesthesiologist group *vs.* 3% for the CRNA group).

Among the time-based codes, where minutes were billed, the CRNA group billed significantly longer time per claim than the anesthesiologist group (146 ± 78 *vs.* 105 ± 65 min, respectively; table 3). The CRNA group also had a significantly higher percentage of claims with more than 4 h billed than the anesthesiologist group (22% *vs.* 12%, respectively).

Although the anesthesiology group had more total providers, both groups had similar numbers of providers with more than 25 time-based claims (51 and 57 providers for anesthesiologist and CRNA groups, respectively). Within this subgroup of providers, the CRNA group had 10 providers who billed more than 50% of their time claims with more than 4 h of billed time. In contrast, the

Table 3. Face-to-face Time Billed for Labor Analgesia

	Anesthesiologist (n = 219)	CRNA (n = 117)	<i>P</i> Value
Total time-based claims	7,006	8,388	
Average minutes per claim, mean \pm SD	105 ± 65	146 ± 78	< 0.001
Percent claims > 4 h billed time	12%	22%	< 0.001
Number of providers > 25 time claims	51	57	
Number providers > 25 time claims with > 50% claims with > 4 h billed time	2 (4%)	10 (17%)	< 0.001

Time-based codes are 00946 and 00955.

CRNA = certified registered nurse anesthetist; n = total providers per group.

§ Texas Medicaid Program conversion factor for obstetric anesthesia is different from all other anesthesia (\$15.20/unit).

Table 4. Cost per Labor Analgesia by Type of Provider

	Anesthesiologist (n = 219)		CRNA (n = 117)	
	Time-based Claims	Flat-fee Claims	Time-based Claims	Flat-fee Claims
Number of claims	7,006	5,692	8,388	292
Fee schedule	\$18.21/unit	\$152.50/procedure	\$15.48/unit	\$129.63/procedure
Base units	5		5	
Average time units	7.03		9.76	
Total units	12.03		14.76	
Cost per claim per code	\$219.12	\$152.50	\$228.43	\$129.63
Average cost per claim		\$189.26		\$225.11

Even though certified registered nurse anesthetist (CRNA) services are reimbursed at 85% of physician services, the anesthesiologist group cost Medicaid 19% less per claim than the CRNA group. The major differences between the two groups is the amount of time units billed (based average minutes billed) and the higher use of flat-fee codes by the Anesthesiologist providers. Fee schedule from Texas Medicaid Provider Manual.

anesthesiologist group only had 2 providers in this subgroup (table 3).

Although CRNA services are reimbursed at 85% the rate of physician-provided care, the cost per epidural analgesia was 19% greater for the CRNA group than for the anesthesiologist group (\$225.11 vs. \$189.26, respectively; table 4). The differences in cost were related to the higher time billed and the lower use of the flat-fee in the CRNA group.

The overall average cost per epidural for Medicaid was \$203.81. If the Texas Medicaid program used a flat fee to pay for all labor epidural analgesia ending in vaginal delivery, a payment of \$217.03 would maintain budget neutrality. (This assumes CRNA services would continue to be paid at 85% of the physician fee schedule.) On the other hand, if the average payment of \$203.81 were used, the Texas Medicaid program would save an estimated \$500,000 annually (table 5).

Forty-seven providers (14% of all providers) were identified as high-volume providers. These high-volume providers submitted 16,059 claims, which represented 73% of the claims included in the study. In the anesthesiologist group, there were 24 high-volume providers (11%) who had 9,348 claims (74%). In the CRNA group, there were 23 high-volume providers (20%) who had 6,164 claims (71%) (table 6). The average minute-per-time-

based claim was significantly longer for the high-volume providers of the CRNA group compared with the high-volume providers of the anesthesiologist group (134 ± 64 vs. 80 ± 55 min, respectively). This difference between the high-volume subgroups was larger than when all providers were included in the comparison. The difference in cost per claim to Texas Medicaid claims was also larger. The high-volume provider CRNA subgroup cost 26% more per claim than the high-volume provider anesthesiologist subgroup (\$213.10 vs. \$168.76, respectively; table 7).

Discussion

The cost of anesthesia care for labor analgesia ending in vaginal delivery to the Texas Medicaid program was significantly greater per claim if those services were provided by CRNAs who were not medically directed by anesthesiologists, costing 19% to 26% more per claim than care provided by an anesthesiologist. This increased cost occurred despite reimbursement of CRNA services by Medicaid at 85% of the fee schedule of physician services. There were two primary reasons for the increased costs. First, the claims by CRNA providers had significantly more time per claim compared with anesthesiologist claims. Second, anesthesiologists more frequently used the flat-fee procedure code that paid less than the average time-based claim.

Table 5. Impact to Medicaid of Flat-fee Code Only Using Average Cost per Claim

	Anesthesiologist	CRNA
Fee per claim	\$203.81	\$173.24
Total claims	12,698	8,680
Total fees per group	\$2,588,000	\$1,503,700
Total fees	\$4,091,700	
Total fees actually paid*	\$4,357,100	
Net savings/6 months	\$266,500	
Annual net savings	\$533,000	

Using the average cost per claim, determined in the study to be \$203.81, and adopting a flat-fee reimbursement only for labor analgesia, the Texas Medicaid program would save more than \$500,000 annually. For a budget neutral fee (i.e., no savings), the fee per claim would be \$217.03. Certified registered nurse anesthetist (CRNA) services are paid at 85% of physician services.

* Actual paid determined from data in table 4.

Table 6. High-volume Providers (> 120 Claims) and Time per Claim

	Anesthesiologist	CRNA
Number of all providers	219	117
Number of high-volume providers	24 (11%)	23 (20%)
Total claims of all providers	12,698	8,680
Total claims of high-volume providers	9,348 (74%)	6,164 (71%)
Average min per time-based claim,*	80 ± 61	133 ± 81
	mean ± SD	

High-volume providers are defined as providers with more than 120 claims (> 20 claims/month). Although high-volume providers only account for 14% of all providers, they account for more than 70% of the claims. CRNA = certified registered nurse anesthetist.

* $P < 0.001$.

Table 7. Cost per Labor Analgesia by Type of Provider for High-volume Providers

	Anesthesiologist (n = 24)		CRNA (n = 23)	
	Time-based Claims	Flat-fee Claims	Time-based Claims	Flat-fee Claims
Number of claims	4,202	5,146	5,986	178
Fee schedule	\$18.21/unit	\$152.50/procedure	\$15.48/unit	\$129.63/procedure
Base units	5		5	
Average time units	5.36		8.93	
Total units	10.36		13.93	
Cost per claim per code	\$188.67	\$152.50	\$215.59	\$129.63
Average cost per claim		\$168.76		\$213.10

High-volume providers are defined as providers with more than 120 claims (> 20 claims/month). Similar to all providers, the anesthesiologist high-volume providers have less time billed per claim and use the flat-fee codes more often. This results in 26% less cost to Medicaid per claim as compared with the Certified registered nurse anesthetist (CRNA) high-volume providers. Fee schedule from Texas Medicaid Provider Manual.

The results illustrate several important points. First, under Texas Medicaid rules, the time billed during labor analgesia can only be face-to-face time. This definition of billable time is in direct conflict with the Texas Medicaid definition of billable time for surgical anesthesia (*i.e.*, time when anesthesia care begins to when anesthesia care ends). Because face-to-face time is largely determined at the discretion of the anesthesia provider, this study was able to evaluate the influence of costs based on the type of anesthesia provider. Unlike other studies that have tried to quantify the quality of care, productivity, or staffing costs,^{3-5,7-9,15,22-26} this study used provider-determined costs and compared costs from the perspective of a third-party payer. In contrast to other studies,^{1,2} this study showed that physician anesthesia providers (anesthesiologists) cost the payer less money per claim than the physician-extender (CRNAs).

Second, the results illustrate several problems with face-to-face billing methodology used for labor analgesia. The ASA Relative Value Guide (RVG) notes that “unlike operative anesthesia services, there is no single, widely accepted method of accounting for time for neuraxial labor analgesia.”¹² The RVG further states that charges and reimbursement policies should reflect the “intensity and time involved in performing and monitoring any neuraxial labor analgesic.” The four different methodologies listed in the RVG are (1) basic units + face-to-face time + 1 time unit/h for monitoring; (2) basic units + time units (subject to reasonable cap); (3) single flat-fee; and (4) incremental time-based flat fee. The method used by Texas Medicaid (basic units + face-to-face time only) is not listed in the RVG because it does not reimburse for immediate availability of an anesthesia provider.

In practice, the statement and the methods presented in the RVG are consistent with the billing and payment practices in the United States. Two surveys, one by the Anesthesia Answer Book in 2000 and one by the Society of Obstetric Anesthesiology and Perinatology in 1997, both found that base + time (with a cap) was used in almost 50% of the respondents.^{19,20} The next most common methods were base + face-to-face time + hourly time unit or flat fee (single or incremental). The base +

face-to-face time only was used less than 10% of the time in both surveys.

As noted above, one disadvantage of the base + face-to-face time only methodology is that the immediate availability of the provider is not recognized. Another disadvantage of the face-to-face time methodology is that the billable time is defined differently than all other anesthesia care. This unique definition requires vigilance by the provider and the billing company to calculate anesthesia billed time differently for those payers who only use face-to-face time. Without vigilance or awareness of the different payer rules, providers may be incorrectly including non-face-to-face time in the submitted claims, thus leading to false claims. In contrast, other methods of billing and paying for obstetric anesthesia have less risk of noncompliance. The flat-fee methods (single or incremental) allow for billing of time, but the payer reimburses the provider a fee for the procedure regardless of the time billed. Similarly, the method of base + time (with a cap) uses the same definition of time as surgical anesthesia but sets the maximum time that will be reimbursed. In these methods, the compliance with payer rules is easier, and there is less chance that the provider will submit a false claim.

In this study, the longer time per claim may reflect one of several possibilities. The first is that the provider has not complied with Medicaid rules for billable time of labor analgesia. That is, the provider has billed time similar to billing for surgical anesthesia (start of anesthesia care to finish of anesthesia care) and therefore has included time when the provider is not face-to-face with the patient. The second explanation of longer times per claim is that the billed time is an accurate account of time spent with the patient and the longer time was required to provide the anesthesia care. The final possibility is that the provider spent the time billed in the patient's room, but the time was not necessary to provide safe and effective anesthesia care.

The first explanation implies that some providers have submitted bills and been paid for claims that do not comply with Medicaid rules. Then, by definition, the provider has submitted and been paid for false claims.²⁷

The economic impact of this situation can be large, with the provider repaying Medicaid two to three times the amount paid to the provider as well as fines of \$5,000 to \$10,000 per claim.

Unfortunately, from the data collected, it is not possible to determine whether incorrect billing is the explanation for the longer times seen among some providers. To evaluate this, one must review the documented time on the anesthesia record. The individual records were not available for that review.

Despite not being able to review the actual medical records, one can identify unusually long times by estimating how much time a typical epidural would require if it were in place for 6 or 10 h. Based on our clinical experience, we assumed the following estimation of “reasonable” time: The provider spends 30 min with the patient at the time of insertion and induction of epidural analgesia, an additional 10 min of each subsequent hour monitoring the patient, one subsequent visit requiring 20 min, and 30 min at the time of delivery and removal of the catheter. The estimate would be 110 min (30 + 10 + 10 + 20 + 30) for a 6-h epidural and 150 min for a 10-h epidural. Although some patients require more frequent visits and others require less, we argue that the 110- to 150-min time is a generous estimate.

In evaluating longer times for providers, we recognized that providers who performed few Medicaid cases may not have been aware of the different definition for billable time. In the results (table 3), we tried to limit this possibility by looking at two different subsets of providers: providers who billed more than 25 time-based claims (> 4 claims/month) and high-volume providers (> 20 claims/month). Among providers who billed more than 25 time-based claims, we found 12 providers (10 in the CRNA group and 2 in the anesthesiologist group) who had more than 50% of time claims with more than 4 h (240 min) of billed time. Among high-volume providers (> 120 claims/6 months), we found 10 providers (9 in the CRNA group and 1 in the anesthesiologist group) with an average time per claim greater than 3 h (180 min). The median value of time per claim for these 10 high-volume providers was 242 min. In both subsets, there were more “long-time” providers in the CRNA group than in the anesthesiologist group, thus explaining why the CRNA group had a significantly longer time per claim.

The second possible reason for having longer time claims is that the billed time is an accurate record of the time the provider spent with the patient. Although we used 110–150 min of face-to-face time as a guide for a maximum time for an average epidural, there are situations when more time is spent with the patient for medical (anesthesia) reasons. Examples include, but are not limited to, inadequate block, difficult placement, replacement because of ineffective analgesia, and high sensory level of block. On the other

hand, if more than half the cases involved these aforementioned situations, the technical expertise of the provider requires evaluation.

In our study, quality measurements were not possible from the data. In a study of claims data, Silber *et al.*⁴ used Medicare data to evaluate quality of care by type of anesthesia care team. In their study, they identified and assigned discharge data by individual patient. As noted in the methodology, we were unable to access individual patient identifier information and thus could draw no conclusions relating to quality. We therefore assumed that the care provided to Texas Medicaid patients in the study was equivalent. As a result, we designed the methodology as a cost-minimization study.²⁸ In this type of study, the endpoint—labor analgesia—is considered equivalent, and therefore, only the cost to Medicaid is considered. Ultimately, we found that anesthesiologist providers cost less. However, if more time per patient was required by CRNAs because of less technical expertise and greater difficulty establishing adequate analgesia, we could speculate that the cost-effectiveness of the anesthesiologist group would be better than that of the CRNA group (*i.e.*, Medicaid would pay more to a poor quality provider than a good quality provider). Unfortunately, with only face-to-face time billable, the time that the provider is immediately available is not valued.

Finally, the third reason for longer time claims may be that the provider spent time with the patient but not for anesthesia or medical reasons. Medicaid does not define medical necessity for anesthesia time. Because availability is not billable, a provider could be motivated to visit a patient more often and spend more time per visit. In our estimate of a reasonable time for attendance with labor analgesia, we assumed one 10-min visit per hour. Even with one 20-min visit per hour, the reasonable time only increases to 140 min for a 6-h epidural and 190 min for a 10-h epidural. Another possibility is that the provider is providing medical care but not necessarily anesthesia care. For example, the CRNA may be employed by a small hospital to provide care. If the labor nurses are busy with other patients, the CRNA, a hospital employee and a registered nurse, might be asked to provide labor nursing care during these times. Because the CRNA is in the patient’s room, under Medicaid rules, the time is reimbursable as long as it is documented.

As noted above, we performed a cost-minimization study in which we assumed quality was the same in both groups. In contrast, Abenstein *et al.*¹¹ performed a cost-effectiveness study examining care team models in which quality outcomes for surgical anesthesia (not limited to labor analgesia) were estimated based on previously published studies. The resulting methodology assumed that outcomes were not the same between groups. To determine costs to third-party payers for anesthesia care based on two different care team models (CRNA *vs.* anesthesiologist), Abenstein *et al.* electroni-

Table 8. The Time-billed Code Equivalent to Flat-fee Code

	Current	Average Cost per Claim	Budget Neutral
Fee schedule	\$152.50	\$203.81	\$217.03
Fee per ASA unit	\$18.21	\$18.21	\$18.21
Total ASA units	8.37	11.19	11.92
Base units	5.00	5.00	5.00
Time units	3.37	6.19	6.92
Minutes	51.0	92.9	103.8

Estimates of the billed time needed to make the fee paid for time-based codes the same as the flat-fee codes. Fee schedule based on current Texas Medicaid fee, the average cost per claim found in this study and the budget neutral value estimated in the study. Although the fee schedule for certified registered nurse anesthetist (CRNA) services is 85% of physician services, the same time estimates apply.

ASA = American Society of Anesthesiologists.

cally surveyed anesthesia providers throughout the United States. Among commercial payers, the authors found no significant difference between the two groups with regard to payment per ASA unit. The same finding was true for charges billed to Medicare. Furthermore, it is important to note that the methodology used by Abenstein *et al.* assumed that the numbers of ASA units billed were the same in both groups (regardless of type of provider) because the study focused on surgical anesthesia. If we applied the outcome and quality methodology that was used in Abenstein *et al.* to our results, the cost effectiveness of the anesthesiology group would be higher than the CRNA group because of (1) lower costs per claim in the anesthesiology group (as noted in the present study) and (2) a lower incidence of complications (and thus fewer associated costs) resulting from anesthesiologist-provided care (as noted in the outcome studies used by Abenstein *et al.*). However, although it is tempting to extrapolate these findings to support our hypothesis, we ultimately could not use a similar methodology in our study because, as stated previously, individual patient identifier information (from which comparisons of quality could be made) could not be gathered.

Because of the increased documentation requirements for billing face-to-face time, many providers, especially in the Anesthesiologist group, chose flat-fee codes to bill for labor analgesia for a reimbursement of \$152.50. Using the conversion factor of \$18.21 per unit, the \$152.50 equals 8.37 units. For billing a time-based code with a basic unit of 5, a provider would receive equal payment using the time-based code if 3.37 time units (= 51 min) were billed (table 8). If a provider decided use flat-fee codes for short face-to-face time cases and time-based codes for longer cases, one would find the provider billing some claims using flat-fee codes and some claims using time-based codes, but with an average time significantly higher than 50 min. The opposite was seen in this study. The average time was lower in the anesthesiologist group than in the CRNA group despite the anesthesiologist

group accounting for more than 90% of the flat-fee claims billed. Therefore, the anesthesiologist groups are not selecting out the cases to bill time-based codes when longer times are documented. In fact, the data show that almost all providers billed more than 75% of their claims in one way (either time based or flat fee). Therefore, each provider seems to have made a conscious decision whether to use flat fees. One can speculate that those who have chosen flat fees have average times of 50 min or less per case. If cases happen to take more than 50 min, the provider may still choose the flat-fee codes because of the increased cost of determining the correct time and the risk of false claims that comes with billing time-based codes.

This study also estimated that a fee schedule value of \$217.03 for a flat fee would maintain a neutral Texas Medicaid budget. We also estimated an annual savings of approximately \$533,000 to Medicaid if the average cost per epidural (\$203.81) were used instead. These two flat fees would be equivalent to billing time-based codes with 104 or 93 min, respectively, of face-to-face time (table 8). For the CRNA group providers, the reimbursement would be 85% of the physician fee schedule but would still represent the same amount of time. This is similar to the maximum reasonable time we estimated above. Either of these flat fees could be viewed as favorable or unfavorable, depending on the provider's average reimbursement per claim.

In this study, we did not examine the staffing costs associated with providing the care for which Medicaid paid. Previously, Johnstone and Hosaflook⁵ showed that using Medicare rates (similar to Texas Medicaid rates) does not provide reimbursement sufficient to pay for anesthesia care at current staffing costs. After examining the costs of providing anesthesia care to labor and delivery in a busy academic center, Bell *et al.*²⁶ found in their study that the current Medicaid rates of \$204 covered only a fraction of the staffing costs. Finally, in a study of staffing costs and revenue, we showed that a payer at the Medicaid rate would not cover the hourly costs of anesthesia care.⁸ Hospitals frequently subsidize the difference between staffing costs and revenue from obstetric anesthesia by providing stipends to anesthesiology groups or by employing the anesthesia providers.²⁹

The use of the Freedom of Information Act to collect data is a powerful tool, but there are limitations and disadvantages to be considered. As noted in the methodology, the patient identifier data could not be legally included in the data collected. In our initial request, we asked that the patient identifiers be replaced by a code number that would only identify whether two claims were for the same patient but would not identify the patient. In the Texas State Attorney General's opinion (requested by the state agency supplying the information), this blinded and

coded information was not covered under the Freedom of Information Act. Therefore, it was not possible to determine the number of actual services that were provided if medical direction claims were included in the study. Fortunately, these claims accounted for less than 10% of the total data set. Further, we could not collect data reflecting complications or quality measurements because of the inability to connect the anesthesia care claim with a hospital stay and diagnosis-related groups without the patient identifiers. As we requested, the data were sent to us in electronic form (Microsoft Excel), and the agency worked with us to clarify discrepancies. Another limitation of claim data is the inability to review the actual documentation (*i.e.*, the anesthesia record or medical record).

Conclusions

Labor analgesia provided by anesthesiologists to Texas Medicaid patients cost 19% to 26% less per patient than care provided by CRNAs (without medical direction by an anesthesiologist), despite reimbursement of CRNAs at 85% of physicians' rates. The explanation for this is that CRNAs bill significantly more face-to-face time per epidural than anesthesiologists.

The authors thank Joseph Galvan, J.D. (Senior Attorney, Legal Affairs, the University of Texas Medical Branch, Galveston, Texas), for his help in preparing the Freedom of Information request, and Jordan Kicklighter, B.A. (Editor) and Christy Perry (Editor) in the Editorial Office of the Department of Anesthesiology at the University of Texas Medical Branch for preparing and editing this manuscript.

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