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Utilization and Associated Spending for Anesthesiologist Administered Services in Minor Hand Surgery

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Abstract

Background—Evidence is lacking to support the use of specialized anesthesia providers in minor surgical operations for patients without medical necessity. We sought to estimate the extent of potentially discretionary service use (anesthesiologist-administered anesthesia services among low-risk patients).

Methods—We performed a retrospective claims analysis using the Truven Marketscan Database to estimate the prevalence and cost of anesthesiologist-administered anesthesia services provided to patients undergoing minor hand surgery (carpal tunnel release, trigger finger release, or de Quervain release) from 2010–2015. A predictive probability model was created to estimate patient risk-status. We examined the relationship between patient risk-status and anesthesia use using multivariable regression models.

Results—Of 441,579 eligible procedures, 352,779 (80%) involved anesthesiologist-administered anesthesia services. The total proportion of estimated anesthesiologist-administered anesthesia use in low-risk patients who do not need anesthesiologist support declined over the study period (69.7% in 2010 to 65.8% in 2015). Although total payments for anesthesiologist-administered anesthesia services remained steady between 2010 and 2014, the average payment per procedure increased regardless of procedure type (from \$376.8 in 2010 to \$427.9 in 2015 for a carpal tunnel release operation). Approximately 83.7% (\$133 million) of payments to anesthesia providers is credited to services in low-risk patients.

Conclusions—Anesthesiologist-administered anesthesia services are commonly rendered to low-risk surgical patients. Existing health reform efforts do not adequately address discretionary services that can be a targeted area for cost saving. It is important to consider the implications of potentially discretionary use of specialized anesthesia providers particularly with the advancement of bundled payment models.

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Introduction

Modern healthcare reforms emphasize a value-based system and the reduction unnecessary services.^{1,2} Estimates suggest that up to one third of healthcare expenditure is wasted on care provisions that lack perspicuous value.³ In attempts to lessen the financial burden of unnecessary services, bundled payment models have been employed within the public and private sector.^{4,5} These plans provide one fee that is shared amongst providers for a single procedural episode and aim to strengthen coordinated care and improve outcomes.⁶ Nonetheless, structuring of bundles and classification of discretionary services is challenging because of limitations in current health research and policy standards. One area of concern is the potentially unnecessary provision of anesthesiologist-administered anesthesia services (AAS) for minor surgical procedures. Use of an anesthesiologist or nurse anesthetist may increase cost without proven safety or patient satisfaction benefits.⁷⁻⁹ In addition, certain common medical coverage policies in the United States (US) support reimbursement for specialized anesthesia services for minor operations in high-risk patients only.^{10,11}

Previous research indicates substantial amounts of anesthesia services are issued to patients lacking necessary indications.^{7,8} Healthy patients electing surgical interventions for minor hand disorders require only local anesthesia with or without sedation. Although all patients undergoing minor hand surgery require some form of anesthesia to comply with ethical standards,¹² there is debate regarding the necessary personnel required for anesthesia administration. As imposed by the practice guidelines for sedation and analgesia by non-anesthesiologists from the American Society of Anesthesiologists (ASA), a non-anesthesiologist may administer mild to moderate levels of sedation to low-risk patients without supervision by an anesthesiologist if he or she is comfortable and knowledgeable on anesthesia and rescue techniques.¹³ Non-anesthesiologist sedative administration is safe and obtains similar patient satisfaction-levels when compared to anesthesiologist administration.¹³⁻¹⁷ In the US, specialties such as dentistry, oral surgery, and podiatry often engage in surgeon administered local anesthesia techniques, eliminating the need for specialized anesthesia providers.^{18,19} Additionally, various minor hand procedures in Canada proceed in the office setting with surgeon-administered local anesthesia. Such practice patterns are estimated to be only one-fourth as costly as an equivalent surgery performed in an operating room using specialized anesthesia staff.²⁰ Considering the financial implications of dispensable surgical provisions, classification of discretionary anesthesiologist-administered anesthesia presents a unique opportunity for cost reduction and policy reform.

Using nationally representative insurance claims data from the MarketScan (Truven Health Analytics) databases, we aimed to describe trends of anesthesiologist-administered anesthesia practices during three common, minor surgical procedures (carpal tunnel release [CTR], trigger finger release [TFR], and de Quervain release [DQR]) between 2010–2015. We hypothesized that a substantial percentage of minor procedures are still employing potentially discretionary AAS (use of a specialized anesthesia provider in patients lacking medical necessity) marking increased healthcare costs for payers.

Materials and Methods

Data Source

We obtained data from the MarketScan Commercial Claims and Encounter Database and Medicare Supplement and Coordination of Benefits Database from 2009–2015. The MarketScan Research Database includes over 20 billion healthcare records from more than 55 million annual enrollees from private insurers, Medicare, Medicaid, and the uninsured, comprising the largest available convenience sample among proprietary databases in the US.^{21,22} Given the large sample size, these data create a nationally representative sample of patients with employer-provided health care.²² In addition, this database facilitates longitudinal tracking of both inpatient and outpatient healthcare encounters, health related expenditures, pharmacy information, and information on healthcare plans. This study was exempt from approval by our institutional review board.

Cohort Selection

We generated retrospective cohorts of all adult patients under the age of 76 who underwent CTR, TFR, or DQR procedures between January 1, 2010 and September 31, 2015 using reported *Current Procedural Terminology (CPT)* codes. The study period was selected based on availability of data and the implementation of the ICD-10 system in October, 2010. Selected procedures were chosen as examples of common ambulatory operations that can be performed in many clinical settings and require a short operative period (<1 hours). We excluded patients younger than 18 and older than 75 years old because these groups require special anesthesia considerations regardless of health status. To ensure that all examined records accurately reflected patients who underwent an operation for related diseases and not in conjunction with a larger underlying disease (i.e., distal radius fracture), only those with a primary diagnosis by *International Classification of Diseases, Ninth Revision (ICD-9)* codes in concert with an appropriate CPT code were included (See table, Supplemental Digital Content 1, which shows the Procedure and Diagnostic Codes Used for Patient Selection, Study Variables, and Logistical Models, [INSERT HYPER LINK](#)). In other words, we excluded patients who underwent one of the three minor hand procedures of interest concomitant with a larger procedure that may have warranted AAS.

Variable Selection

Relevant patient predictor variables were age, sex, ASA physical status, location, and payer type. We divided age into five groups, with boundaries corresponding to standard disease incidence rates. Location was characterized as Northeast, North Central, South, or West. Payer type was identified as either commercial provider or Medicare.

The primary outcome measure was the prevalence of AAS in minor operations. The proportion of minor hand procedures using AAS was gathered for each year to examine temporal trends. We also examined the aggregate proportion of procedures that used AAS for low-risk patients. We evaluated the relationship between AAS and patient demographic characteristics, specifically in low-risk patients. Finally, we calculated the average and aggregate payments incurred for AAS in minor hand surgeries over the study period.

Classifying AAS

We identified AAS through corresponding anesthesia CPT codes (See table, Supplemental Digital Content 1, INSERT HYPER LINK). Codes for monitored anesthesia care, general anesthesia, and regional anesthesia were chosen because each requires monitored administration from specialized anesthetic personnel. Because non-anesthesiologist administered local anesthesia is not coded or billed separately in the current CPT system,²³ claims for patients receiving local anesthesia from a non-anesthesiologist lack a linkable CPT code for anesthesia services. Thus, we define all patients who underwent a procedure with a linked anesthesia code as having received AAS. Individual operations were linked to anesthesia service records through unique patient identifiers and record date.

Estimating Physical Status

We defined medically necessary criteria for anesthesia service using existing ASA guidelines and major insurance coverage policies (See table, Supplemental Digital Content 2, which shows the Summary of Medical Indications for Anesthesia Services from a Specialized Provider, INSERT HYPER LINK).^{10,11,13} We established a binomial risk variable and grouped each patient as either low- or high-risk to match these policies. To qualify as low-risk, a patient must have had a reported ASA physical status of 1 or 2. Any patient with an ASA status of 3 or higher was considered high-risk (See table, Supplemental Digital Content 3, which show the Summary of ASA Physical Status Classification and Associated CPT-Modifier Codes, INSERT HYPER LINK). We excluded patients with Grade 6 (declared brain-dead) cases as they are irrelevant to our study.²⁴ We defined low-risk patients who underwent a procedure and had an associated anesthesia code for that operation as having received potentially discretionary AAS, because such patients lack clear medical indications for specialized anesthesia providers.

ASA physical status was reported using procedural modifier codes in 18% of relevant claims. To accommodate missing data values, we created a predictive probability model to estimate an individual's risk-status. This approach was developed by Liu et al.^{7,8} in a similar study based off of 14% of claims to approximate the probability of a patient being high-risk based on available data. Patient age, sex, comorbidities, and prior inpatient admissions were considered. In addition, we applied any codes for specified high-risk conditions (See Table, Supplemental Digital Content 2, INSERT HYPER LINK) within six months of the surgery date (0.4% of claims) as an automatic indicator of high-risk because of the elevated risk of perioperative complications from respiratory problems.^{13,25} Backward stepwise selection ($P = 0.10$) was used to select apposite variables for inclusion. Individual models were created for each procedure examined in accordance to significant variables defined during the backwards selection process (See table, Supplemental Digital Content 4, which shows the Factors Included in Logistical Models for Each Procedure, INSERT HYPER LINK). Patients with missing data were then approximated as low- or high-risk based on their predicted probability value.

Cost

We retrieved corresponding costs from the subset of payment variables available for all cases provided by the dataset. All payments are reported as gross payments to a provider for a

service. Total payment includes the amount eligible for payment under the medical plan terms after applying rules such as discounts, but before applying coordination of benefits, copayments, and deductibles. Using risk-status to define medical need, we estimated the proportionate payments for discretionary AAS utilization. Incurred costs of AAS for a single operation were estimated. All costs were adjusted to the 2015 US-dollar value using the consumer price index.

Statistical Analysis

Patient demographic data were compared between low- and high-risk patients. We used the chi-squared test to determine significance between categorical variables (age, sex, region, and insurance type) and outcomes. A standard significance level of $\alpha=0.05$ was used throughout our analyses. We examined the relationship between AAS use and patient risk-status using univariate and multivariable analysis. Separate models were created to examine the general receipt of AAS and the receipt of discretionary AAS. Results are presented as univariable odds ratios (ORs) and respective 95% confidence intervals (CI).

Results

We identified a total of 441,579 procedures that fit the inclusion criteria for this study, with a distribution of 299,259(67.8%) CTR, 117,584(26.6%) TFR, and 24,736(5.6%) DQR operations (Figure 1). Out of the total number of eligible procedures performed between 2010 and 2015, 352,779 (80%) utilized AAS. Of the combined eligible procedures, 296,968 (63.7%) utilized AAS for patients characterized as low-risk. The majority of patients in the study cohort were female (65.1%), 55 years or older (52.4%), and had commercial insurance (86.4%). Additional patient characteristics are presented in Table 1.

To assess temporal trends, unique procedural volumes and rates of AAS utilization were stratified by study year and are presented in Table 2. The total volume of procedures performed remained relatively stable over the study period. Procedural volume values for 2015 appear to drop dramatically; however, these numbers do not reflect claims past September because of changes to the coding system. Assuming that cases are spread approximately evenly throughout the year, the proportion of AAS for 2015 should be representative of the entire year. Although there was some slight fluctuation in the proportion of procedures with AAS, there was no clear upward or downward trend for any procedure type. However, out of the total number of procedures performed in a given year, the proportion of combined procedures involving potentially discretionary AAS decreased slightly from 69.7% in 2010 to 63.4% in 2014 ($p<0.05$). After controlling for patient factors, the decreased odds of receiving potentially discretionary AAS remained significant when stratified by procedure. In general, discretionary AAS use was least prominent in TFR operations.

The odds of receiving discretionary AAS were highly correlated with patient age (Table 4). Patients between the age of 65 and 75 undergoing DQR were least likely to receive AAS as a low-risk patient (OR: 0.2; CI: .01–.02). Similarly, as age increased, the odds of receiving discretionary AAS decreased in CTR and TFR recipients. Females had significantly higher

odds of receipt of discretionary AAS regardless of procedure type. ORs differed across all regions, indicating discretionary use varied by geographical area.

The total payment for AAS in the study cohort was \$158.4 million. Furthermore, approximately \$133 million (83.7%) of the total payment to anesthesia providers for AAS is credited to services in low-risk patients. Table 5 compares payments for AAS by year and procedure type. Average payments for AAS were substantially lower for TFR procedures. Although the total payments for AAS fluctuated, the average payment for AAS per individual procedure increased over time. For example, the average payment for AAS for a single CTR increased from \$376.8 in 2010 to \$427.9 in 2015. Similar trends are observed for average payments for AAS in TFR and DQR.

Discussion

In this assessment of anesthesiologist-administered anesthesia practice patterns, we quantified the prevalence and cost of AAS in patients who underwent CTR, TFR, or DQR between 2010–2015. Three main findings are evident: (1) although the rate of discretionary AAS use decreased, approximately two thirds of patients undergoing common, minor hand surgery are still receiving AAS without clear medical indications (2) younger, female patients have significantly higher odds of receiving discretionary AAS, and (3) the average cost of AAS per single procedure is increasing.

Our study shows that a marked portion of patients undergoing minor hand surgery is recipient of AAS. In fact, only 20% of examined claims lacked an identifiable link to AAS. Although coding errors in the data are inevitable, this finding may be explained by the use of surgeon-administered local anesthesia. Under medical CPT coding, local anesthesia use is classified as inherent to a procedure and not uniquely coded.²³ Declining rates of discretionary anesthesia services over time in our study suggest that surgeon-administered anesthesia techniques may be growing in popularity. However, because rates of AAS use remained relatively steady over time, it is also possible that the percentage of individuals who are high-risk and require AAS is increasing.

Existing literature illustrates the efficacy and safety of local anesthesia in variety of hand operations.^{20,26} Moreover, recent studies on common hand procedures report fewer postoperative complications with use of local or regional anesthesia when compared to general anesthesia.^{27–29} Wide awake local anesthesia no tourniquet (WALANT) is one example of a viable alternative to regional or general anesthesia for minor procedures and does not require guidance from a specialized provider.^{22,25,26} The WALANT technique is safer than other methods because it requires no sedation and patients are able to leave hospitals sooner.³⁰ Despite the added safety and cost benefits of such techniques, local anesthesia practices remain scarce in the field of hand surgery. In a recent study, Foster et al. show that only 20% of CTR procedures from their sample were performed with local anesthesia.³¹ This finding is consistent with our study. Though existing policies on the hospital- or provider-level may necessitate a specialized anesthesia provider for every surgical case, such regulations are likely increasing costs for a wide platform of discretionary procedures.

Research on foreign practice patterns reveals that only 10% of Canadian surgeons perform CTR exclusively in the presence of an anesthesia provider, whereas 43% never employ AAS.²⁰ Conversely, our findings show that approximately 80% of minor hand surgeries performed in the US between 2010 and 2015 rendered AAS. It remains unknown whether surgeon or patient preferences advance the potentially discretionary use of AAS. Ensuring patient safety and reducing adverse outcomes is a priority of the medical system, and additional study on the safety implications of surgeon administered local anesthesia across the US is needed. Feasible reduction of AAS would require appropriate education or certification programs for surgeons, which would not be without cost. Nonetheless, though Canadian practice patterns likely have evolved from a lack of available operating room allocation, their successes in cost- and resource-reduction are indicative of strong practices, which may be worth emulating in the US.

Considering the extensive knowledge and increasing popularity of the WALANT technique in a wide variety of operations,^{30–36} we suspect other confounding factors may hold a greater influence on observed practice patterns. Older patients are more likely to be considered high-risk, indicating a greater clinical need for AAS. Therefore, it is reasonable that younger patients experience greater odds of receiving AAS as a low-risk patient. Though impossible to gauge using a claims database, we suspect that women may possess a significantly greater risk of receiving AAS owing to personal preference or recurrent gender biases that present female patients as a higher risk than their male counterparts. Given that the proportion of discretionary AAS utilization decreased from 2010 to 2015, decreased proportions of payments associated with potentially discretionary AAS use were expected. This finding may reflect a growing trend towards cost-effective resource allocation. Nonetheless, increases in adjusted average payments for AAS for an individual procedure should not be ignored.

Governing payment models in the US healthcare system likely influenced the observed trends. Fee-for-service (FFS), the dominant physician payment model in the US, is criticized for discouraging the efficiencies of integrated care.^{37,38} For example, Sears et al. found that carpal tunnel syndrome patients with a FFS plan had a significantly higher probability of undergoing surgical release when controlling for all other factors.³⁹ In such models, a provider controls the service-volume basis and is rewarded for increased service volume.⁴⁰ Thus, FFS plans may encourage the use of potentially discretionary AAS in minor hand procedures. Under FFS models, higher rates of discretionary services are expected to increase provider profit.

Bundled care models are believed to discourage unnecessary services that may be promoted in FFS models. Nonetheless, providers have expressed concerns regarding effects on their personal take home incomes and impedances on clinical autonomy.³⁸ Bundled plans are gaining popularity among payers and providers. In 2013, the Centers for Medicare and Medicaid Services launched a 5 year bundled payment pilot project for joint replacement that expands to 75 geographic areas in the US.⁴¹ Furthermore, multiple payers in the private sector, such as various Blue Cross Blue Shield plans^{42–44} and the ProvenCare arrangement developed by Geisinger Health System,⁴⁵ employ a bundled system for certain medical episodes. Because the operations included in this study are high-volume, elective operations,

they are favorable candidates for bundled reimbursement plans.⁴ Yet, bundled plans require shared payments among all involved providers. Therefore, continued use of discretionary AAS may not only contribute a great cost to payers, but also impact surgeon reimbursement rates.

Our study has some limitations. Firstly, portions of ASA physical status data were missing in our original cohort. To compensate, we created unique logistical models using existing data and relevant factors to estimate physical status. This method has been modeled in past research.^{7,8} In a previous study using the American College of Surgeons National Surgical Quality Improvement Program database, researchers identified 6,749 outpatient plastic surgery patients, of which 5,412 (80%) were classified as ASA physical status class 1 or 2.⁴⁶ Because these findings depict a higher proportion of low-risk in outpatient surgery patients, we suspect our estimates are likely conservative. Secondly, we were unable to identify patient- or center-specific anesthesia recommendations. This type limitation is inherent among retrospective claims analyses that lack circumstantially relevant clinical details. Factors such as individual preferences, unique safety policies, or the use of newer sedative agents (i.e. Propofol)⁴⁷ may contribute to use of AAS. Given the lack of procedural and diagnosis codes for surgeon administered local anesthesia, we were unable to predict the potential added cost that would be supplied to the surgeon for his or her provision of anesthesia. Nonetheless, we quantified the proportion and value of payment supplied to specialized anesthesia providers that is potentially discretionary. Finally, our analysis focused on three minor hand surgical procedures, thus our results may not be generalizable to other types of ambulatory surgery. However, the included procedures were selected because of their high prevalence rate across the US and their capacity to be performed in the hospital, clinic, or office setting.⁴⁸

Although the rate of potentially discretionary AAS in minor hand surgery has decreased, excessive AAS use persists in patients that may lack appropriate clinical need. Substantial healthcare expenditure may be saved through the reduction of AAS in low-risk patients. With estimates predicting the cost of US healthcare to rise to 20.3% of the gross domestic product by 2018,⁴⁹ new avenues for cost reduction must be explored. In particular, clinical indications for AAS in minor surgical operations should be examined carefully.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Flow diagram for study sample from Marketscan databases, 2009–2015.

Note: AAS, anesthesiologist-administered anesthesia services, CTR, carpal tunnel release; TFR, trigger finger release; DQR, de Quervain release

*Procedures classified as utilizing potentially discretionary anesthesiologist-administered anesthesia

Table 1

Patient Characteristics and Univariate Analysis on Potentially Discretionary Use of Anesthesiologist-Administered Anesthesia Services*

(N=441,579)						
Age, N(%) ^a	CTR (N=299,259)		TFR (N=117,584)		DQR (N=24,736)	
		P-value		P-Value		P-Value
18–34	13564(79.2%)	<0.001	1109(67.5%)	<0.001	2245(79.2%)	<0.001
35–44	33287(75.8%)		4113(62.0%)		2682(76.6%)	
45–54	68231(72.1%)		19639(60.2%)		5511(73.1%)	
55–64	72569(68.0%)		32347(56.2%)		6265(70.6%)	
65–75	24445(66.2%)		10220(53.5%)		741(37.3%)	
Sex, N(%)						
Male	74874(69.0%)	<0.001	22809(55.2%)	<0.001	2864(67.5%)	0.001
Female	137222(72.0%)		44619(58.5%)		14580(71.1%)	
Payer Type, N(%)						
Commercial	186749(71.5%)	<0.001	56777(58.1%)	<0.001	16652(73.4%)	0.001
Medicare	25347(66.4%)		10651(53.7%)		792(38.4%)	
Region, N(%)						
Northeast	41129(69.6%)	<0.001	13393(58.7%)	<0.001	3659(71.1%)	0.001
North Central	57927(69.8%)		15751(51.5%)		3770(66.9%)	
South	81316(74.0%)		26245(63.8%)		7374(74.4%)	
West	27105(68.0%)		10501(52.1%)		2214(65.6%)	

Source: 2010–2015 Truven Health MarketScan Research Database

CTR, carpal tunnel release; DQR, de Quervain Release; TRF, trigger finger release; y, years

* Percentages and P-values calculated by univariate analysis on anesthesiologist-administered anesthesia service use among low-risk patients. P-value of <0.05 denotes significant difference in the spread of potentially discretionary anesthesiologist-administered anesthesia services among that group.

Table 2

Anesthesiologist-administered Anesthesia Service Utilization by Surgery Type, 2010–2015

	2010	2011	2012	2013	2014	2015
Total Procedure Volume, N						
CTR	54273	58940	66417	50214	48476	20939
TFR	19665	21824	25348	21222	20193	9332
DQR	4207	4467	5491	4354	4277	1940
Combined	78145	85231	97256	75790	72946	32211
Procedures with AAS, N(%)						
CTR	45550(83.9%)	49192(83.5%)	56340(84.8%)	42447(84.5%)	39889(82.3%)	18100(86.4%)
TFR	13477(68.5%)	14885(68.2%)	17704(69.8%)	14686(69.2%)	13452(66.6%)	6427(68.9%)
DQR	3517(83.6%)	3680(82.4%)	4635(84.4%)	3659(84%)	3470(81.1%)	1669(86%)
Combined	62544(80.0%)	67757(79.5%)	78679(80.9%)	60792(80.2%)	56811(77.9%)	26196(81.3%)
Procedures with potentially discretionary AAS^a, N(%)						
CTR	39734(73.2%)	41959(71.2%)	47345(71.3%)	35792(71.3%)	32566(67.2%)	14700(70.2%)
TFR	11682(59.4%)	12624(57.8%)	14794(58.4%)	12352(58.2%)	10815(53.6%)	5161(55.3%)
DQR	3071(73%)	3154(70.6%)	3950(71.9%)	3064(70.4%)	2866(67%)	1339(69%)
Combined	54487(69.7%)	57737(67.7%)	66089(68%)	51208(67.6%)	46247(63.4%)	21200(65.8%)

Source: 2010–2015 Truven Health MarketScan Research Database

^aPotentially discretionary use is defined as anesthesiologist-administered anesthesia services provided to low-risk patients. AAS, anesthesiologist-administered anesthesia services; CTR, carpal tunnel release; DQR, de Quervain Release; TFR, trigger finger release

Table 3

Odds of Receiving Potentially Discretionary Anesthesiologist-administered Anesthesia Services by Year^{*}

Year	<u>CTR</u>		<u>TFR</u>		<u>DOR</u>	
	Adjusted Odds Ratios (95% CI)	P Value	Adjusted Odds Ratios (95% CI)	P Value	Adjusted Odds Ratios (95% CI)	P Value
2010	1	-	1	-	1	-
2011	0.9 (0.9, 0.9)	<0.001	0.9 (0.9, 1)	0.01	0.9 (0.8, 1)	0.102
2012	0.9 (0.9, 0.9)	<0.001	1 (0.9, 1)	0.017	0.9 (0.9, 1)	0.209
2013	0.9 (0.9, 1)	<0.001	1 (0.9, 1)	0.275	0.9 (0.9, 1)	0.222
2014	0.8 (0.8, 0.8)	<0.001	0.8 (0.8, 0.8)	<0.001	0.8 (0.7, 0.8)	<0.001
2015	0.9 (0.8, 0.9)	<0.001	0.8 (0.8, 0.9)	<0.001	0.8 (0.7, 1)	0.007

^{*} Statistical significance at alpha=0.05

CI, Confidence Interval; CTR, Carpal Tunnel Release; DOR, de Quervain Release; TFR, Trigger Finger Release

Table 4

Multivariable Analysis on the Receipt of Potentially Discretionary Anesthesiologist-administered Anesthesia Services*

(N=441,579)						
	CTR	P Value	Adjusted Odds Ratios (95% CI)	TFR	P Value	Adjusted Odds Ratios (95% CI)
	Adjusted Odds Ratios (95% CI)	P Value	Adjusted Odds Ratios (95% CI)	TFR	P Value	Adjusted Odds Ratios (95% CI)
Age						
18-34	1	-		1	-	1
35-44	0.8 (0.8, 0.9)	<0.001	0.8 (0.7, 0.9)		<0.001	0.8 (0.7, 1)
45-54	0.7 (0.7, 0.7)	<0.001	0.7 (0.6, 0.8)		<0.001	0.7 (0.6, 0.8)
55-64	0.6 (0.5, 0.6)	<0.001	0.6 (0.6, 0.7)		<0.001	0.6 (0.6, 0.7)
65-75	0.5 (0.5, 0.6)	<0.001	0.6 (0.5, 0.6)		<0.001	0.2 (0.1, 0.2)
Sex						
Male	1	-		1	-	1
Female	1.1 (1.1, 1.1)	<0.001	1.1 (1.1, 1.2)		<0.001	1.2 (1.1, 1.3)
Region						
Northeast	1	-		1	-	1
North Central	1 (1, 1)	0.264	0.7 (0.7, 0.8)		<0.001	0.8 (0.8, 0.9)
South	1.2 (1.2, 1.3)	<0.001	1.2 (1.2, 1.3)		<0.001	1.2 (1.1, 1.3)
West	0.9 (0.9, 1)	<0.001	0.8 (0.7, 0.8)		<0.001	0.8 (0.7, 0.9)

* Statistical significance at alpha=0.05

CI, Confidence Interval; CTR, Carpal Tunnel Release; DQR, de Quervain Release; TFR, Trigger Finger Release

Table 5

Comparison of Payments for Anesthesiologist-administered Anesthesia Service Utilization During Minor Hand Surgery Procedures, 2010–2015^a

CTR	2010	2011	2012	2013	2014	2015	Total
Total payment for AAS (in million dollars)	20.4	21.7	25.2	19.4	18.7	9.0	114.6
Proportion of payment associated with potentially discretionary AAS, %	85.7%	84%	83.4%	84.5%	81%	82.4%	83.6%
Average payment for AAS per procedure (dollars)	376.8	368.9	380.1	387	386.5	427.9	382.8
TFR							
Total payment for AAS (in million dollars)	5.7	6.2	7.4	6.2	5.9	3	34.2
Proportion of payment associated with potentially discretionary AAS, %	85.1%	83.5%	83.4%	84.1%	80.8%	82.1%	83.3%
Average payment for AAS per procedure (dollars)	287.9	282.6	290.9	291.7	289.7	316.3	290.8
DQR							
Total payment for AAS (in million dollars)	1.6	1.7	2.2	1.7	1.7	0.8	9.7
Proportion of payment associated with potentially discretionary AAS, %	87.7%	86.2%	86.9%	85.3%	85%	84.3%	86.1%
Average payment for AAS per procedure (dollars)	380.8	375.3	394.6	401.5	386.1	430.9	391.3

^a All prices adjusted to the 2015 consumer price index

Source: 2010–2015 Truven Health MarketScan Research Database

AAS, anesthesiologist-administered anesthesia services; CTR, Carpal Tunnel Release; DQR, de Quervain Release; TFR, Trigger Finger Release