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Comparing Definitions of Outpatient Surgery: Implications for Quality Measurement

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Abstract

Background—Adverse event (AE) rates in outpatient surgery are inconsistently reported, partly because of the lack of a standard definition of outpatient surgery. We compared the types and rates of surgical procedures defined by two national healthcare agencies: Health Care Cost Institute (HCCI) and the Healthcare Cost and Utilization Project (HCUP) and considered implications for quality measurement.

Methods—We used HCCI and HCUP definitions to identify FY2012–14 VA outpatient surgeries.

Results—There were six times as many HCCI surgeries as HCUP (6,575,830 versus 1,086,640). Ninety-nine percent of HCUP-defined surgeries were also identified by HCCI. More HCUP surgeries had higher average Medicare Relative Value Units than HCCI surgeries [5.3 (SD=4.4) versus 1.6 (SD=2.3) RVUs].

Conclusions—Rates and types of procedures vary widely between definitions. Quality measurement using HCCI versus HCUP may produce significantly lower AE rates because many of the surgeries included reflect low complexity and potentially low risk of AEs.

Graphical Abstract

Quality measurement in outpatient surgery may be inconsistent if different definitions of outpatient surgery are used for analysis. We compared the types and rates of surgical procedures defined by two national healthcare agencies using data from the Veterans Health Administration. We found wide variation, implying that without a standard definition of outpatient surgery quality measurement will be unreliable.

Keywords

ambulatory surgery; measurement; patient safety; quality measurement; quality improvement; veterans

Background

The delivery of surgical services has undergone a tremendous shift in the past decade with increasing numbers of surgeries being performed in the outpatient setting. Although 60–80% of surgeries are now performed in the outpatient setting,(1, 2) quality measurement in this area is still evolving. For example, estimates of outpatient surgical adverse event (AE) rates vary between 1–6%, depending on the population, the surgeries examined and the types of events included.(3–6) While inpatient surgery has long been a focus of quality measurement and assessment, methods to detect AEs in outpatient surgery, including consistent definitions of which procedures qualify as surgeries, lag far behind.(7, 8)

The purposes of AE surveillance for quality measurement are to identify safety problems in the delivery of healthcare and to drive improvement.(9, 10) A well-designed quality measure should be reliable, valid, and standardized in order to be useful. With respect to AE surveillance in outpatient surgery, the lack of a standardized definition of what “counts” as outpatient surgery impedes the utility of quality measurement. Heterogeneity in the types of procedures defined as outpatient surgery in the literature make quality benchmarking a significant challenge.(11) For example, studies that include a broader range of outpatient surgeries (e.g., colonoscopies or other procedures done in clinics and/or under local anesthesia) have found AE rates ranging from 0.2 to 0.6%, (12–14) whereas studies that estimate AE rates among outpatient surgeries performed only by surgeons and only in the operating room (OR) have found higher AE rates, ranging from 0.1 to 6%.(4, 5, 15–18) Establishing a consistent definition of outpatient surgery is the first step in developing quality measures that facilitate benchmarking and patient safety improvement.

The literature documents this heterogeneity but has yet to address the scope of variation in outpatient surgery definitions. The purpose of this study was to compare the types and rates of surgical procedures defined by two national healthcare agencies: Health Care Cost Institute (HCCI) Outpatient Surgery list and the Agency for Healthcare Research and Quality (AHRQ) Surgery Flag software and how these differences might potentially affect AE rates.(19, 20) The HCCI definition categorizes outpatient encounters as surgeries based on a broad list of procedure codes. There is no restriction on whether the encounter takes

place in the OR or clinic.(19) HCCI- generated reports are widely used by researchers and policymakers to track cost and utilization trends in the private insurance market.(21)

We also examined the AHRQ Surgery Flag software, developed as part of the Healthcare Cost and Utilization Project (HCUP). AHRQ is a national leader in quality and safety measurement and issues reports using the HCUP surgery flags to track national and/or state-level surgery rates, including comparisons between the inpatient and outpatient settings.(20) HCUP defines surgery as “an invasive therapeutic surgical procedure involving incision, excision, manipulation, or suturing of tissue that penetrates or breaks the skin; typically requires use of an OR; and also requires regional anesthesia, general anesthesia, or sedation to control pain.”(22) Compared to the HCCI definition, the HCUP definition is narrower; surgeries are more likely to be performed by surgeons in the OR and involve more invasive anesthesia.

In this study, we applied both the HCCI and HCUP definitions to the same set of outpatient encounters in the Veterans Health Administration (VA) and considered which definition would be better suited to outpatient surgical quality measurement. We compared the patient and surgical characteristics of the outpatient surgeries identified using each definition and examined the cases that overlapped and those that did not. These differences in the types of surgeries included in each of the outpatient surgery definitions could potentially effect AE surveillance and quality measurement.

Methods

Data Source

We applied the two definitions of outpatient surgery to VA Fiscal Year (FY) 2012–14 outpatient data (Oct. 1, 2011 – Sept 30, 2014). Outpatient encounters were obtained from the VA Corporate Data Warehouse (CDW) for all patients treated in the 131 VA facilities with surgical programs. The VA CDW is the nationwide repository of the VA’s comprehensive electronic health record data and includes variables not available in administrative datasets. (23) Our primary data source was the CDW’s outpatient data table which we used to identify outpatient encounters that fit each definition. We supplemented these data with CDW inpatient data to exclude any outpatient encounters that occurred during an inpatient admission.

Outpatient Encounter Data

We identified outpatient surgeries from outpatient encounter data using the following steps: first, we retained the Current Procedural Terminology (CPT) code and VA clinic name/type for each outpatient encounter. The VA clinic name provides information on the type of services rendered (e.g., “patient care in OR”). Second, since each outpatient encounter could be associated with multiple CPT codes, we applied either the FY12, FY13 or FY14 CMS Relative Value Unit (RVU) software to the appropriate year of our data in order to calculate the principal CPT code for each clinical encounter as measured by the complexity of care (i.e., the highest RVU CPT).(24) Third, we then used this principal CPT code as the basis for determining whether the outpatient encounter met either of the two definitions of surgery.

Application of HCCI and HCUP Definitions

HCCI Definition: We used the HCCI list of CPT codes as well as a list of VA clinic names to identify HCCI outpatient surgeries (see Table 1). HCCI limits surgical care to the OR, the outpatient department of a hospital or an ambulatory surgical center; care in the emergency room (ER) was therefore excluded from the HCCI definition of outpatient department. Appendix 1 includes the list of location codes.

HCUP Definition: The HCUP Surgery Flags were designed to identify surgeries regardless of the care setting. We first applied the Centers for Medicaid and Medicare FY14 inpatient-only CPT code list to our data to remove surgeries that generally should only be performed in the inpatient setting but may have been miscoded in the VA outpatient data. Next, because HCUP is not constrained by setting, we used the list of clinics from the HCCI definition but included care provided in the ER (see Table 1).

The VA Boston Healthcare System Institutional Review Board approved this research.

Analyses

We compared patient demographics and comorbidities between the HCCI- and HCUP-defined surgery cohorts using the AHRQ Comorbidity software. The Comorbidity software reviews International Classification of Diseases (ICD)-9-CM inpatient and outpatient diagnosis codes from the 12-month period prior to outpatient surgery and assigns patients to the appropriate comorbidity classification.⁽²⁵⁾ To better classify the types of surgeries performed, we assigned an organ system (e.g., respiratory system) for each principal CPT code. To determine surgical complexity, we also compared average RVUs across the two cohorts and looked at what proportion of the surgeries was performed in the OR. Surgeon coauthors also reviewed the top surgeries for each definition to determine which they would consider surgeries as opposed to clinical procedures performed outside of the OR by non-surgeons. All analyses were done using SQL Server Management Studio 2014 and SAS 9.4.^(26, 27)

Results

A total of 6,584,143 outpatient encounters were identified by either HCCI or HCUP. The HCCI definition identified six times as many surgeries as the HCUP definition (6,575,830 versus 1,086,640). The HCCI and HCUP cohorts were similar on patient age, sex and comorbidities; however, patients in the HCUP cohort had a higher percentage of comorbidities, as defined by the AHRQ software, at the time of their surgery than the HCCI cohort (28.5% with comorbidities in the HCCI cohort versus 30.3% in the HCUP cohort). Interestingly though, among patients with at least one comorbidity, the average number of comorbidities was slightly higher in the HCCI cohort [3.3 (standard deviation=2.2) for HCCI and 3.2 (standard deviation=2.1) for HCUP]; the HCCI cohort also had a slightly higher prevalence of the most frequent types of comorbidities present in the Veteran population, such as hypertension (67% of HCCI cohort versus 66% of HCUP cohort) and diabetes (33% of HCCI versus 32% of HCUP – see Appendix 2 for full results). As a result of the large sample size, all comparisons were significant at $p < 0.05$.

There were differences in the organ systems associated with the HCCI versus HCUP-defined surgeries (Table 2). HCCI surgeries, compared with HCUP surgeries, included a higher proportion of surgeries on skin/soft tissue (40% versus 19%) and the digestive system (15% versus 8%), respectively. The most frequently performed surgeries in the HCUP cohort were on the eye (37% versus 7% in the HCCI cohort). There were 15,824 (0.2%) medical or imaging procedures only in the HCCI cohort and an additional 10,108 (0.1%) mediastinum procedures and microsurgies not included in the HCUP list of surgical CPT codes. Although these represented a small number in our VA population, there were 58 surgeries associated with maternity care and delivery in the HCUP cohort and none in the HCCI cohort based on HCCI's exclusion of codes in this range. In comparing the surgeries themselves, we found differences in where the surgeries were performed and in the estimated workload. Among HCCI-defined surgeries, 12% were performed in the OR, with an average RVU of 1.6 (standard deviation=2.3). In contrast, 45% of the HCUP-defined surgeries were performed in the OR, with an average RVU of 5.3 (standard deviation=4.4).

The top 20 CPT codes in the HCCI and HCUP cohorts are presented in Table 3; shaded cells indicate possible non-surgeries based on our surgeon co-author review. The surgeon coauthors concluded that nearly 50% of the HCCI cohort surgeries were likely performed by non-surgeons outside of the OR. These surgeries primarily involved skin/soft tissue procedures performed by internists or by dermatologists outside of the OR, and colonoscopies performed by gastroenterologists. Among the top 20 HCUP surgeries, the surgeon co-author review identified two nurse practitioner or internist-performed procedures (insertion of bladder catheter and insertion of intravascular cannula) and one skin/soft tissue procedure likely performed by a dermatologist outside of the OR. These accounted for less than 5% of the HCUP cohort. The procedures included in the top 20 lists comprised 59% of all HCCI-defined surgeries and 52% of the HCUP-defined surgeries.

The degree of overlap between the two cohorts is shown in the proportional Venn diagram (Figure 1): 99% of HCUP-defined surgeries overlapped with those defined by HCCI. The remaining 1% of HCUP-only surgeries was either performed in the ER or coded as one of CPT codes associated with maternal care that HCCI excluded (CPT 59000–59999). The surgeries meeting both the HCUP and HCCI definitions (i.e., the overlap group, $n=1,078,327$, 16% of all encounters) are described in Table 4. More than 30% of the surgeries identified by both definitions were on the ocular system; 16% were cataract surgeries. MOHS surgery, hernia repair, wound debridement, carpal tunnel and knee surgeries were also prevalent. The top 20 list of CPT codes accounted for 51% of outpatient surgeries in the overlap group. Forty-six percent of the surgeries were performed in the OR, with an average RVU for the overlap group of 5.4 (SD=4.4).

Discussion

This study sought to compare two commonly used definitions of outpatient surgery to describe the variation between the two, and consider implications for quality measurement specifically with respect to AE detection. Although both the HCCI and HCUP definitions identify outpatient surgery for utilization measurement and public reporting, they use very different lists of CPT codes and include care provided in different settings. Our results show

that the overlap between these definitions is remarkably low, with only 16% of 2012–14 VA outpatient encounters classified as “outpatient surgeries” by both definitions (HCCI and HCUP).

There are notable differences between how the HCCI and HCUP define outpatient surgery. The HCCI definition includes all non-maternity care procedures occurring in the outpatient setting (not the ER), whereas the HCUP definition places no restrictions on the location of care but restricts the list of eligible CPT codes to those that were likely performed by surgeons in the OR. As a result of these differences, only 12% of the HCCI-defined surgeries in our study were performed in the OR and half were most likely performed by non-surgeon providers based on our surgeon co-author review. In contrast, we found that 45% of the HCUP surgeries were performed in the OR, and only 5% were likely performed exclusively by non-surgeons. The HCUP definition by design excludes diagnostic or minor therapeutic care that necessitates only local anesthesia (e.g., diagnostic colonoscopies, nail debridement).(22) These types of minor procedures may occur at up to six times the rate of more complex outpatient procedures given our results. HCUP’s definition makes a clear distinction between clinic-based outpatient encounters with local anesthesia (i.e., minor procedures) and major surgeries; however it does not explicitly state which procedures cannot be done outpatient.

Given our findings using the two definitions of outpatient surgery, it is likely that the variation in surgery definitions is partially responsible for the variation in outpatient surgical AE rates presented in the literature. Higher AE rates are more commonly reported in studies using a narrower definition of outpatient surgery.(5, 12–14, 18) Broader definitions that include lower-risk procedures may dilute the AE rate and obscure patient safety problems. Our results reveal how a healthcare system could dramatically lower their measured AE rate by changing the denominator of outpatient surgeries from their facility to include relatively minor procedures. A broad definition of outpatient surgery may benefit providers with respect to public reporting but it compromises surveillance efforts by implying that rare AEs are even rarer. When patient risk appears to be very low, patient safety measurement, AE surveillance, and quality improvement efforts may not be prioritized. Furthermore, when outpatient surgical quality is a priority, including non-surgical procedures in the definition of outpatient surgery may spread the focus too broadly over too many provider types, types of services, and types of surgical settings to lead to meaningful improvements.

A quality measure that lacks specificity can compromise quality improvement efforts. For example, several studies have attempted to improve outpatient surgical care by applying inpatient surgical quality improvement initiatives to the outpatient setting, such as the Surgical Care Improvement Program (SCIP) and Surgical Safety Checklist.(28–30) Evidence suggests these were unsuccessful quality improvement efforts, but it is unclear whether the problem stems from how outpatient surgery was defined or how the initiatives were implemented. In both cases, these studies were based on outpatient surgical data from the National Surgical Quality Improvement Programs (NSQIP) run by the VA and the American College of Surgeons.(31–33) NSQIP primarily evaluates high-risk surgeries, such that the outpatient data is limited to a subset of hospital-based “major” outpatient surgeries performed under general, spinal, or epidural anesthesia. Based on our results,

these NSQIP-defined outpatient surgeries underestimated the volume of outpatient surgeries whether compared to HCCI and HCUP definitions. Therefore, it is possible that the effects of initiatives like SCIP and the Safety Checklist may change depending on how outpatient surgery is defined. Without an explicit definition of outpatient surgery, reproducing any quality improvement initiatives from the outpatient surgical literature may face implementation problems and the potential benefits may not be realized.

The ASC Quality Collaboration and the Ambulatory Surgery Center Association are currently collaborating on what will be the first quality initiative specifically designed for outpatient surgical care.(34) Their effort focuses on ASC safety culture and surgical team coordination, two areas that have led to better patient outcomes in inpatient surgery.(35, 36) That data collection tool captures all CPTs performed at the ASC with no inclusion/exclusion criteria.(37) The ASC Safety Program has potential to improve outpatient surgery outcomes; however, it does not establish a uniform definition of which surgeries will be included in the AE rate calculation. Our results demonstrate that without a standard definition of outpatient surgery, the variation in the types of outpatient procedures versus surgeries performed in ASCs will likely affect the reliability of the AE rate across facilities or over time.

Outpatient surgical quality measurement is still in its infancy. We studied two definitions of outpatient surgery designed for public reporting, but neither definition was designed to be the gold standard definition for quality measurement. Our findings suggest that the HCUP definition, with further input from surgeons, may be most appropriately suited for this purpose. The process of developing the HCUP Surgery Flags has high face validity; it was developed with surgical and coder expertise specifically to identify surgeries and distinguishes surgeries from minor outpatient procedures. Further, the Surgery Flags were designed to support comparisons across the inpatient and outpatient settings, enabling more comprehensive quality measurement for surgical providers working in both areas.(20) Presently, HCUP does not distinguish between surgeries that should only be performed in the inpatient setting, and the surgical community may disagree about the specific surgeries on the CPT list. An acceptable definition of outpatient surgery must achieve consensus and buy-in from the surgical community as well as quality improvement personnel.

This study has several strengths. It is the first to directly compare the variation in patient and surgical characteristics when different definitions are used to identify outpatient surgeries. Our study is based on national data from the VA CDW that have been tested for high validity and reliability.(38) These clinical data also allow us to apply explicit criteria to identify outpatient surgery beyond what can be detected through administrative data alone. However, these findings are not without limitations. Our results are partially based on CPT codes and there may be coding errors in our data. The surgeons who reviewed the results may not be representative of the wider surgical community. Lastly, we studied three years of data from the VA healthcare system; our findings may not be generalizable to other patient populations in other care delivery organizations or for other years. However, as the purpose of the study was to compare the overlap and discord across definitions within one sample population, the lack of generalizability is unlikely to change our conclusion that there is wide variation in the types of outpatient surgeries identified by the HCCI and HCUP definitions.

Development of methods to evaluate safety in the outpatient setting is an important step in assessing the quality of patient care. The HCUP Surgery Flag software has several advantages over the much broader HCCI definition of outpatient surgery; specifically, it identifies care provided primarily by surgeons, it excludes minor outpatient procedures, and it was developed with expert surgeon input. Establishing a standard definition of outpatient surgery for AE detection will facilitate more reliable measurement of quality and safety outcomes.

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Appendix

Appendix 1.

VA Clinic Names and Codes Used in HCCI and HCUP Outpatient Surgical Definitions

VA Code Number and Clinic Name	HCCI	HCUP
(130) EMERGENCY DEPARTMENT		✓
(131) URGENT CARE UNIT		✓
(153) INTERVENTIONAL RADIOGRAPHY	✓	✓
(203) AUDIOLOGY	✓	✓
(301) GENERAL INTERNAL MEDICINE	✓	✓
(302) ALLERGY IMMUNOLOGY	✓	✓
(303) CARDIOLOGY	✓	✓
(304) DERMATOLOGY	✓	✓
(305) ENDO METAB (EXCEPT DIABETES)	✓	✓
(306) DIABETES	✓	✓
(307) GASTROENTEROLOGY	✓	✓
(308) HEMATOLOGY	✓	✓
(309) HYPERTENSION	✓	✓
(310) INFECTIOUS DISEASE	✓	✓
(311) PACEMAKER	✓	✓
(312) PULMONARY/CHEST	✓	✓
(313) RENAL/NEPHROL (EXCEPT DIALYSIS)	✓	✓
(314) RHEUMATOLOGY/ARTHRITIS	✓	✓
(315) NEUROLOGY	✓	✓
(316) ONCOLOGY/TUMOR	✓	✓
(321) GI ENDOSCOPY	✓	✓
(322) COMP WOMENS PRIMARY CARE	✓	✓
(333) CARDIAC CATHETERIZATION	✓	✓

VA Code Number and Clinic Name	HCCI	HCUP
(401) GENERAL SURGERY	✓	✓
(402) CARDIAC SURGERY	✓	✓
(403) EAR, NOSE, AND THROAT	✓	✓
(404) GYNECOLOGY	✓	✓
(405) HAND SURGERY	✓	✓
(406) NEUROSURGERY	✓	✓
(407) OPHTHALMOLOGY	✓	✓
(408) OPTOMETRY	✓	✓
(409) ORTHOPEDICS	✓	✓
(410) PLASTIC SURGERY	✓	✓
(411) PODIATRY	✓	✓
(412) PROCTOLOGY	✓	✓
(413) THORACIC SURGERY	✓	✓
(414) UROLOGY CLINIC	✓	✓
(415) VASCULAR SURGERY	✓	✓
(416) PRE-SURG EVAL BY NON-MD	✓	✓
(417) PROSTHETICS ORTHOTICS	✓	✓
(418) AMPUTATION CLINIC	✓	✓
(419) ANESTHESIA PRE/POST OP CONSULT	✓	✓
(420) PAIN CLINIC	✓	✓
(421) VASCULAR LABORATORY	✓	✓
(422) CAST CLINIC	✓	✓
(426) WOMENS SURGERY	✓	✓
(427) ANESTHESIA SPECIAL PROCEDURES IN OR	✓	✓
(429) OUTPATIENT CARE IN OR	✓	✓
(430) CYSTO ROOM IN UROLOGY CLINIC	✓	✓
(431) CHEMOTHERAPY PROCEDURES UNIT-SURGERY	✓	✓
(434) NON-OR ANESTHESIA PROC	✓	✓
(435) SURGICAL PROCEDURE UNIT	✓	✓
(602) ASSIST HEMODIALYSIS	✓	✓

Notes: HCCI=Health Care Cost Institute; HCUP=Healthcare Cost and Utilization Project

Appendix 2.

Characteristics of FY12–14 VA Patients with an Outpatient Surgery Identified by HCCI or HCUP Outpatient Surgical Definitions

Patient Characteristics	HCCI	HCUP
# of Surgical Visits	6,575,830	1,086,640
# of Surgical Patients	2,121,662	657,418
Mean Age (SD)	66.5 (13)	66.2 (13.7)

Patient Characteristics	HCCI	HCUP
Males N (%)	6,131,873 (94)	1,010,866 (94)
% of Patients with Comorbidities	28.6%	30.5%
Mean Comorbidities per patient (S.D.)	3.3 (2.2)	3.2 (2.1)
Select Comorbidities N (%)		
Hypertension	1,259,485 (66.9)	218,168 (65.8)
Diabetes (uncomplicated)	627,392 (33.3)	104,385 (31.5)
Depression	404,584 (21.5)	69,705 (21)
Obesity	386,570 (20.5)	64,640 (19.5)
Chronic pulmonary disease	374,786 (19.9)	65,319 (19.7)
Congestive heart failure	116,347 (6.2)	21,543 (6.5)
Diabetes with chronic complications	202,127 (10.7)	34,096 (10.3)

Notes: HCCI=Health Care Cost Institute; HCUP=Healthcare Cost and Utilization Project

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Figure 1. Proportional Venn Diagram of the Overlap Across HCCI and HCUP Outpatient Surgical Definitions in FY12-14 VA Data

Notes: Based on the principal CPT code in the outpatient encounter (total 6,584,143 encounters; 6,575,830 HCCI and 1,086,640 HCUP)

CPT= Current Procedural Terminology; HCCI= Health Care Cost Institute; HCUP= Healthcare Cost and Utilization Project

Table 1.

Definitions of Outpatient Surgery

Definition	Criteria Used in Definition		
	Location	Procedure Type	Anesthesia Type
Health Care Cost Institute (HCCI) 2012	Outpatient section of the hospital, including the operating room, or standalone outpatient facility.	CPT codes in the following ranges: 10021–36410; 36420–58999; 60000–69990; 93501–93581; 0016T–0261T.	Not specified
HCUP Surgery Flag Software 2014	Surgery Flag Software is intended to be “setting agnostic” so no location criteria were imposed. Surgeries occurred in the outpatient section of the hospital, including the operating room, standalone outpatient facility, or the emergency room.	Expert-defined list of individual CPT codes between 10061–69960 “involving incision, excision, manipulation, or suturing of tissue that penetrates or breaks the skin.”	General, regional or monitored anesthesia

Notes: CPT= Current Procedure Terminology; HCUP=Healthcare Cost and Utilization Project

Table 2.

Characteristics of Surgeries Identified by HCCI and HCUP Outpatient Surgical Definitions in FY12–14 VA Data

CPT Codes	Organ System	HCCI N (%)	HCUP N (%)
TOTAL		6,575,830	1,086,640
<i>Surgery</i>			
10000–10022	General	8,622 (0.1)	-
10040–19499	Skin/soft tissue	2,578,934 (39.2)	203,648 (18.7)
20000–29999	Musculoskeletal	811,096 (12.3)	154,946 (14.3)
30000–32999	Respiratory	270,803 (4.1)	17,801 (1.6)
33010–37799	Cardiovascular	227,093 (3.5)	52,015 (4.8)
38100–38999	Blood/circulatory	15,957 (0.2)	2,680 (0.3)
39000–39599	Mediastinum and diaphragm	907 (0)	-
40490–49999	Digestive	989,543 (15)	85,606 (7.9)
50010–53899	Urinary	565,408 (8.6)	77,959 (7.2)
54000–55899	Male genital	110,678 (1.7)	29,039 (2.7)
56405–58999	Female genital	46,379 (0.7)	5,195 (0.5)
59000–59899	Maternity care and delivery	-	58 (0)
60000–60699	Endocrine	5,454 (0.1)	3,578 (0.3)
61000–64999	Nervous	276,408 (4.2)	37,973 (3.5)
65091–68899	Ocular	440,897 (6.7)	398,736 (36.7)
69000–69979	Auditory	211,248 (3.2)	17,406 (1.6)
69990	Microsurgery	579 (0)	-
<i>Medicine</i>			
92950–93799	Cardiovascular	10,488 (0.2)	-
0016T–0261T	Ultrasound/Imaging	5,336 (0)	-

Notes: Based on the principal CPT code in the outpatient encounter.

CPT= Current Procedural Terminology; HCCI= Health Care Cost Institute; HCUP= Healthcare Cost and Utilization Project

Table 3.

Top 20 Surgeries Identified by HCCI and HCUP Outpatient Surgical Definitions (CPT code) N, %; Shaded Cells Indicate CPTs Likely Performed by Non-Surgeons Outside the Operating Room

#	HCCI N (%)		HCUP N (%)	
	TOTAL	6,575,830	TOTAL	1,086,640
1	Debridement of nail(s) by any method(s); 6 or more (11721)	646,578 (9.8)	Cataract removal with insertion of intraocular lens implant (66984)	129,742 (11.9)
2	Drain or inject into major joint/bursa without ultrasound (20610)	428,344 (6.5)	Injection eye drug (67028)	126,692 (11.7)
3	Destruction of premalignant lesion (17000)	280,650 (4.3)	Drain or inject into intermediate joint/bursa without ultrasound (20605)	37,484 (3.5)
4	Diagnostic colonoscopy (45378)	221,869 (3.4)	Repair initial inguinal hernia, age 5 years or older; reducible (49505)	26,276 (2.4)
5	Biopsy skin lesion (11100)	199,527 (3)	Insert bladder catheter (51701)	26,122 (2.4)
6	Destruction of premalignant lesion 2-14 lesions (17003)	188,577 (2.9)	Cataract surgery complex (66982)	22,046 (2)
7	Removal impacted ear wax requiring instrumentation, unilateral (69210)	175,316 (2.7)	Carpal tunnel surgery (64721)	20,437 (1.9)
8	Colonoscopy and biopsy (45380)	168,572 (2.6)	After cataract laser surgery (66821)	20,079 (1.9)
9	Cystourethroscopy (52000)	164,820 (2.5)	Removal of nail bed (11750)	16,167 (1.5)
10	Diagnostic laryngoscopy (31575)	155,298 (2.4)	Excision, benign lesion, except skin tag, trunk, arms or legs; lesion diameter 1.1 to 2.0 cm (11402)	15,798 (1.5)
11	Endoscopy procedures on the esophagus - biopsy single/multiple (43239)	136,499 (2.1)	Application of skin substitute graft to face, neck, genitalia, hands, feet, etc. (15275)	15,031 (1.4)
12	Colonoscopy with lesion removal (45385)	135,947 (2.1)	Revise eyelashes (67820)	13,289 (1.2)
13	Ultrasound urine capacity measure (51798)	132,811 (2)	Excision, malignant lesion including margins, trunk, arms, or legs; excised diameter 1.1 to 2.0 cm (11602)	13,069 (1.2)
14	Debridement, subcutaneous tissue; first 20 sq cm or less (11042)	131,109 (2)	Insertion of intravascular cannula under hemodialysis (36810)	12,874 (1.2)
15	Cataract removal with insertion of intraocular lens implant (66984)	130,376 (2)	MOHS head, neck, hands, feet, genitalia; first stage, up to 5 tissue blocks (17311)	12,488 (1.2)
16	Injection eye drug (67028)	127,443 (1.9)	Laser surgery of eye (65855)	11,629 (1.1)
17	Paring or cutting of benign hyperkeratotic lesion (11055)	126,733 (1.9)	Revision of iris (66761)	11,534 (1.1)
18	Paring or cutting of benign hyperkeratotic lesion - 2 to 4 lesions (11056)	126,533 (1.9)	Destruction of malignant skin lesions (17262)	11,436 (1.1)
19	Trimming of non-dystrophic nails, any number (11719)	107,892 (1.6)	Knee arthroscopy/surgery (29881)	10,785 (1)
20	Place needle in vein (36000)	99,560 (1.5)	Debride infected skin (11000)	10,586 (1)

Notes: Based on the principal CPT code in the outpatient encounter. List explains 60% of all the procedures in the HCCI group and 52% in the HCUP group.

CPT= Current Procedural Terminology; HCCI= Health Care Cost Institute; HCUP= Healthcare Cost and Utilization Project

Table 4.

Top 20 Surgeries Identified by Both HCCI and HCUP Outpatient Surgical Definitions in FY12–14 VA Data

Surgery (CPT code)	HCCI & HCUP N (%)
TOTAL	1,078,327
Cataract removal with insertion of intraocular lens implant (66984)	129,741 (12)
Injection eye drug (67028)	126,685 (11.7)
Drain or inject into intermediate joint/bursa without ultrasound (20605)	36,111 (3.3)
Repair initial inguinal hernia, age 5 years or older; reducible (49505)	26,269 (2.4)
Insert bladder catheter (51701)	23,724 (2.2)
Cataract surgery complex (66982)	22,046 (2)
Carpal tunnel surgery (64721)	20,437 (1.9)
After cataract laser surgery (66821)	20,078 (1.9)
Removal of nail bed (11750)	15,991 (1.5)
Excision, benign lesion, except skin tag, trunk, arms or legs; lesion diameter 1.1 to 2.0 cm (11402)	15,793 (1.5)
Application of skin substitute graft to face, neck, genitalia, hands, feet, etc. (15275)	15,031 (1.4)
Revise eyelashes (67820)	13,288 (1.2)
Excision, malignant lesion including margins, trunk, arms, or legs; excised diameter 1.1 to 2.0 cm (11602)	13,067 (1.2)
Insertion of intravascular cannula under hemodialysis (36810)	12,874 (1.2)
MOHS head, neck, hands, feet, genitalia; first stage, up to 5 tissue blocks (17311)	12,488 (1.2)
Laser surgery of eye (65855)	11,629 (1.1)
Revision of iris (66761)	11,528 (1.1)
Destruction of malignant skin lesions (17262)	11,434 (1.1)
Knee arthroscopy/surgery (29881)	10,785 (1)
Debride infected skin (11000)	10,432 (1)

Notes: Based on the principal CPT code in the outpatient encounter. List explains 51% of all the procedures in the overlap group.

CPT= Current Procedural Terminology; HCCI= Health Care Cost Institute; HCUP= Healthcare Cost and Utilization Project