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High-Volume Invasive, Therapeutic Ambulatory Surgeries Performed in Hospital-Owned Facilities, 2016

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Highlights

- In 2016, 13.6 million major ambulatory surgeries were performed in hospital-owned facilities.
- Lens and cataract procedures were the most common types of major ambulatory surgeries, accounting for 9.9 percent of all major ambulatory surgeries.
- Six surgeries related to the musculoskeletal system, including muscle, tendon, and soft tissue operating room procedures, constituted 21.8 of all major ambulatory surgeries.
- For 11 out of the 20 top major ambulatory surgeries, patients aged 45–64 years accounted for a higher percentage of surgeries than did any other age group.
- The rate of top 20 major ambulatory surgeries was higher for females than for males.
- In 2016, 47.1 percent of the 20 most common major ambulatory surgeries performed in hospital-owned facilities were billed to private insurance, and 31.1 percent were billed to Medicare.
- Most of the top 20 major ambulatory surgeries were performed in facilities owned by hospitals in the South and the Midwest and in urban areas.
- Large hospitals (300+ beds) and private not-for-profit hospitals accounted for the highest percentages of the top 20 major ambulatory surgeries in 2016.

Introduction

A growing proportion of all surgeries at U.S. community hospitals are performed in the ambulatory setting,[1] with the aggregate share of hospital outpatient services revenue increasing from 30 percent in 1995 to 48 percent in 2016.[2] The shift to the outpatient setting has been particularly pronounced for certain surgeries, including cataract surgery[3] and gynecologic procedures such as hysterectomies.[4]

Ambulatory surgery is more commonly performed in the treatment of certain body systems. In 2014, for example, the majority of eye; ear, mouth, nose, and throat; male genital; endocrine; and skin surgeries were conducted in the outpatient setting.[5] Patient

* The information in this Statistical Brief was revised using an updated version of the 2016 Nationwide Ambulatory Surgery Sample (NASS). One update involved a change to the census region assigned to a subset of hospitals in the sample, which affected the distributions by census region reported in Table 4. This change also affected the encounter weights used to produce national estimates, resulting in minor changes to the other percentages and rates reported in this Statistical Brief. A second update to the NASS applied a preliminary version of v2019.2 of the HCUP Surgery Flag Software for Services and Procedures that included narrow surgeries identified in the following ranges of CPT codes: surgical (10004-69990), emerging technology (0100T-0588T), and cardiac-related medical (92920-93986). Combined, these updates affected the rank order of 4 of the 20 top ambulatory major surgeries reported in this Statistical Brief: bunionectomy or repair of toe deformities; operating room (OR) procedures of mouth, nose, and throat, excluding tonsils and teeth; vascular stents and OR procedures, other than head or neck; and laminectomy, excision intervertebral disc. This version of the Statistical Brief also reflects a change to the hospital size distributions reported in Table 5. The percentages reported in the previous version represented small, medium, and large bed size categories that were dependent on hospital region, location, and teaching status. This revision reports percentages based on absolute number of hospital beds.

[1] American Hospital Association. Utilization and Volume. In: Trend Watch Chartbook 2018, Trends Affecting Hospitals and Health Systems; Chapter 3. www.aha.org/system/files/2018-07/2018-aha-chartbook.pdf. Accessed July 11, 2019.

[2] American Hospital Association. Utilization and Volume. In: Trend Watch Chartbook 2018, Trends Affecting Hospitals and Health Systems; Chapter 4. www.aha.org/system/files/2018-07/2018-aha-chartbook.pdf. Accessed July 24, 2019.

[3] Stagg BC, Talwar N, Mattox C, Lee PP, Stein JD. Trends in use of ambulatory surgery centers for cataract surgery in the United States, 2001-2014. JAMA Ophthalmology. 2018;136(1);53–60.

[4] Doll KM, Dusetzina SB, Robinson W. Trends in inpatient and outpatient hysterectomy and oophorectomy rates among commercially insured women in the United States, 2000-2014. JAMA Surgery. 2016;151(9):876–7.

[5] Steiner CA, Karaca Z, Moore BJ, Imshaug MC, Pickens G. Surgeries in Hospital-Based Ambulatory Surgery and Hospital Inpatient Settings, 2014. HCUP Statistical Brief #223. May 2017. Agency for Healthcare Research and Quality, Rockville, MD. https://hcup-us.ahrq.gov/reports/statbriefs/sb223-Ambulatory-Inpatient-Surgeries-2014.pdf. Accessed July 11, 2019.

characteristics, such as type of insurance coverage, may also play an important role in determining whether a procedure will be performed in the outpatient setting.[6]

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents statistics on the 20 most common major ambulatory surgeries performed in hospital-owned facilities using the 2016 Nationwide Ambulatory Surgery Sample (NASS). The distribution of these surgeries by select patient and hospital characteristics is presented. Differences greater than 10 percent between estimates are noted in the text.

The NASS is the largest all-payer ambulatory surgery database that has been constructed in the United States. It tracks information about major ambulatory surgery encounters in hospital-owned facilities across the country. The database provides information on patient characteristics, clinical diagnostic and surgical procedure codes, total charges and expected source of payment, and facility characteristics. Major ambulatory surgeries are defined as selected invasive, therapeutic surgical procedures that typically require the use of an operating room and require regional anesthesia, general anesthesia, or sedation (i.e., surgeries flagged as "narrow" in the HCUP Surgery Flag Software[7]). Procedures intended primarily for diagnostic purposes are excluded.[8]

[6] Case C, Johantgen M, Steiner C. Outpatient mastectomy: clinical, payer, and geographic influences. Health Services Research. 2001;36(5):869–84.

[7] Agency for Healthcare Research and Quality. Surgery Flag Software for Services and Procedures. Healthcare Cost and Utilization Project (HCUP). Last modified August 7, 2019. www.hcup-us.ahrq.gov/toolssoftware/surgeryflags_svcproc/surgeryflagssvc_proc.jsp. Accessed August 13, 2020. The 2016 NASS applied a preliminary version of v2019.2 that included narrow surgeries identified in the following ranges of CPT codes: surgical (10004-69990), emerging technology (0100T-0588T), and cardiac-related medical (92920-93986).

[8] The NASS sample is limited to 77 Clinical Classifications Software for Services and Procedures categories representing major surgeries with relatively high procedure volumes, a substantial share of procedures occurring in the hospital outpatient setting, and reliable reporting from hospitals.

Findings

Common invasive, therapeutic ambulatory surgeries, 2016
Table 1 presents the 20 major ambulatory surgeries most frequently performed in hospital-owned facilities in 2016. Frequencies, percentages of all major ambulatory surgeries, and population rates are provided.

Table 1. The 20 most common major ambulatory surgeries performed in hospital-owned facilities, 2016

Rank	All-listed CCS procedure group	No. of major ambulatory surgeries	Major ambulatory surgeries, %	Rate per 100,000 population
All-listed procedures		**13,644,800**	**100.0**	**4,223**
1	Lens and cataract procedures	1,340,100	9.9	415
2	Muscle, tendon, and soft tissue OR procedures	1,009,600	7.4	313
3	Cholecystectomy and common duct exploration	635,600	4.7	197
4	Incision or fusion of joint, destruction of joint lesion	603,100	4.4	187
5	Inguinal and femoral hernia repair	496,100	3.6	154
6	OR procedures of skin and breast, including plastic procedures on breast	488,400	3.6	151
7	Excision of semilunar cartilage of knee	485,500	3.6	150
8	Tonsillectomy and/or adenoidectomy	485,300	3.6	150
9	Repair of diaphragmatic, incisional, and umbilical hernia	456,500	3.4	141
10	Decompression peripheral nerve	410,900	3.0	127
11	Myringotomy	373,400	2.7	116
12	Hysterectomy, abdominal and vaginal	368,300	2.7	114
13	Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	338,400	2.5	105
14	Lumpectomy, quadrantectomy of breast	333,300	2.4	103
15	Non-fracture, non-arthroplasty OR procedures on the bone	319,500	2.3	99
16	Partial excision bone	286,000	2.1	89
17	Bunionectomy or repair of toe deformities	275,100	2.0	85
18	OR procedures of mouth, nose, and throat, excluding tonsils and teeth	269,300	2.0	83
19	Vascular stents and OR procedures, other than head or neck	253,800	1.9	79
20	Laminectomy, excision intervertebral disc	249,100	1.8	77
Top 20 major ambulatory surgeries		**9,477,200**	**69.7**	**2,933**

Abbreviations: CCS, Clinical Classifications Software; OR, operating room

Notes: Totals were rounded to the nearest hundred. Percentages were calculated on the basis of nonrounded values. Procedures are grouped using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications Software for Services and Procedures. Totals represent number of surgeries rather than number of encounters. A single encounter could involve more than one surgery. The 9.5 million top surgeries represent 7.7 million encounters, 1.3 million of which involved more than one top surgery.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Ambulatory Surgery Sample (NASS), 2016

- **More than 13.6 million major ambulatory surgeries were performed in hospital-owned facilities in 2016—a rate of 4,223 surgeries per 100,000 population.**

  The most common ambulatory procedure group was lens and cataract procedures, accounting for 10 percent of all major ambulatory surgeries.

- **The 20 most common major ambulatory surgeries accounted for 70 percent of all major ambulatory procedures performed in hospital-owned facilities.**

  Six surgeries related to the musculoskeletal system—muscle, tendon and soft tissue operating room (OR) procedures; incision or fusion of joint, destruction of joint lesion; excision of semilunar cartilage of knee; non-fracture, non-arthroplasty OR procedures on the bone; partial excision bone; and bunionectomy or repair of toe deformities—constituted 21.8 percent of all major ambulatory surgeries.

  Three surgeries related to the digestive system—cholecystectomy; inguinal and femoral hernia repair; and repair of diaphragmatic, incisional, and umbilical hernia—made up 11.7 percent of all major ambulatory surgeries.

Patient characteristics associated with common invasive, therapeutic ambulatory surgeries, 2016
Table 2 presents the distribution of the 20 major ambulatory surgeries most frequently performed in hospital-owned facilities by patient sex and age group in 2016.

Table 2. The 20 most common major ambulatory surgeries performed in hospital-owned facilities, by patient sex and age group, 2016

Rank	All-listed CCS procedure group	Sex, %		Age group, %				
		Female	Male	0–17 years	18–44 years	45–64 Years	65–84 years	85+ years
1	Lens and cataract procedures	58.8	41.1	0.4	1.3	22.1	70.0	6.3
2	Muscle, tendon, and soft tissue OR procedures	51.1	48.9	5.3	20.1	48.9	24.8	0.9
3	Cholecystectomy and common duct exploration	73.8	26.1	2.3	43.4	36.2	17.2	0.9
4	Incision or fusion of joint, destruction of joint lesion	50.8	49.1	6.2	32.0	44.8	16.6	0.4
5	Inguinal and femoral hernia repair	9.6	90.4	9.3	17.6	38.4	31.7	3.0
6	OR procedures of skin and breast, including plastic procedures on breast	87.6	12.2	4.7	36.5	45.5	13.1	0.2
7	Excision of semilunar cartilage of knee	47.6	52.4	6.1	26.5	50.2	16.9	0.3
8	Tonsillectomy and/or adenoidectomy	51.9	48.0	80.0	17.2	2.3	0.4	0.0
9	Repair of diaphragmatic, incisional, and umbilical hernia	44.7	55.2	6.0	27.6	44.7	20.9	0.8
10	Decompression peripheral nerve	60.2	39.8	0.8	21.5	47.7	27.2	2.7
11	Myringotomy	41.9	58.1	92.4	3.0	2.7	1.6	0.2
12	Hysterectomy, abdominal and vaginal	99.8	0.0	0.0	44.1	44.8	10.8	0.3
13	Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	38.1	61.9	0.3	3.4	20.4	57.9	18.0
14	Lumpectomy, quadrantectomy of breast	98.0	1.8	1.9	19.4	43.7	32.7	2.4
15	Non-fracture, non-arthroplasty OR procedures on the bone	55.2	44.7	18.0	30.8	33.8	16.4	0.9
16	Partial excision bone	52.4	47.6	5.2	19.2	50.4	24.3	0.8
17	Bunionectomy or repair of toe deformities	78.2	21.8	2.4	16.3	49.0	31.3	1.0
18	OR procedures of mouth, nose, and throat, excluding tonsils and teeth	47.6	52.4	16.7	35.4	32.2	14.8	0.9
19	Vascular stents and OR procedures, other than head or neck	43.0	57.0	0.7	4.6	34.4	53.0	7.3
20	Laminectomy, excision intervertebral disc	43.1	56.9	0.3	25.2	42.2	30.8	1.4
Top 20 major ambulatory surgeries		**56.5**	**43.4**	**11.7**	**21.1**	**36.0**	**28.7**	**2.5**

Abbreviations: CCS, Clinical Classifications Software; OR, operating room

Note: Patient sex was missing for less than 0.22 percent of procedures in each CCS category reported above, and patient age was missing for less than 0.12 percent of procedures in each category.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Ambulatory Surgery Sample (NASS), 2016

- **Females accounted for more than half of the top 20 major ambulatory surgeries performed in hospital-owned facilities in 2016.**

  Females accounted for 56.5 percent of the 20 most common major ambulatory surgeries overall. Compared with males, females accounted for a higher percentage of 8 out of the 20 top major surgeries. These included one exclusively female procedure (hysterectomy), one almost exclusively female procedure (lumpectomy, quadrantectomy of breast: 98.0 percent female), and four other surgeries for which female patients constituted at least 60 percent of procedures: OR procedures of skin and breast (87.6 percent female), cholecystectomy and common duct exploration (73.8 percent), bunionectomy or repair of toe deformities (78.2 percent), and decompression peripheral nerve (60.2 percent).

  Compared with female patients, male patients constituted a higher percentage of 6 of the 20 top surgeries, accounting for 90.4 percent of inguinal and femoral hernia repair procedures and for 61.9 percent of cardiac pacemaker or cardioverter/defibrillator procedures.

  For the remaining six top major ambulatory surgeries, male and female patients accounted for a similar percentage of surgeries (range 47.6–52.4 percent female).

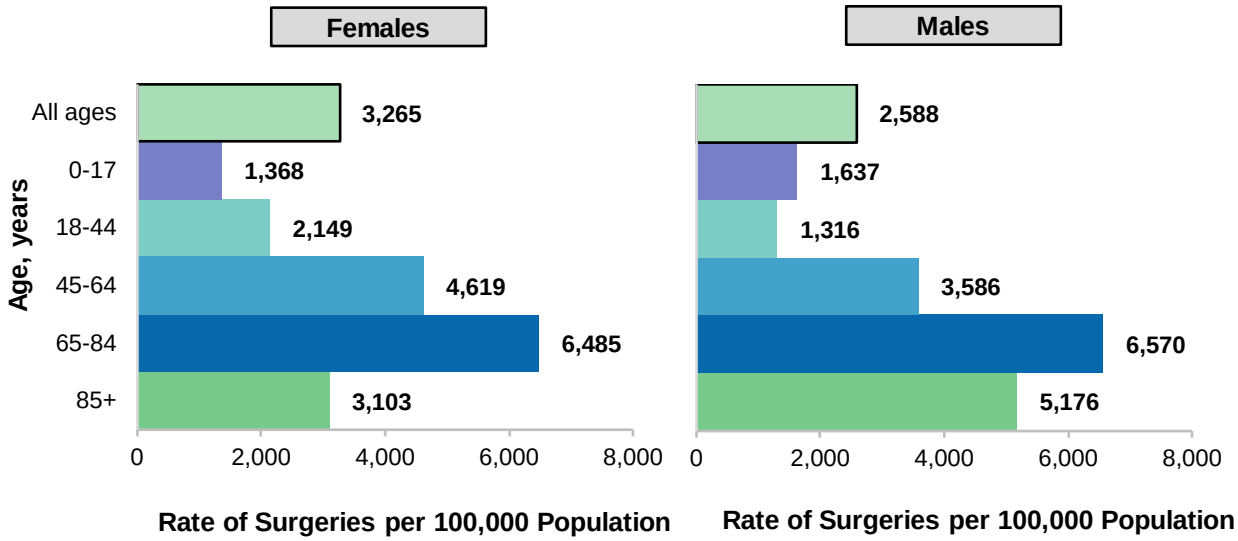
- **Patients aged 45–84 years accounted for 65 percent of the 20 most common major ambulatory surgeries in 2016.**

  For 11 out of the 20 top major ambulatory surgeries, patients aged 45–64 years accounted for a higher percentage of surgeries than any other age group (range 38.4–50.4 percent, depending on the procedure). Patients aged 65–84 years accounted for the majority of lens and cataract procedures (70.0 percent), cardiac pacemaker or cardioverter/defibrillator procedures (57.9 percent), and vascular stents and OR procedures, other than head or neck (53.0 percent).

  Three of the top procedures were more common among younger patients. Patients aged 18–44 underwent more cholecystectomies than any other age group—accounting for 43.4 percent of these surgeries. Patients aged 17 years or younger accounted for the majority of tonsillectomies (80.0 percent) and myringotomies (92.4 percent).

Figure 1 presents the overall rate per 100,000 population for the 20 most common major ambulatory surgeries conducted in hospital-owned facilities, by sex and age group, in 2016.

Figure 1. Female and male population rates for the 20 most common major ambulatory surgeries performed in hospital-owned facilities, by age group, 2016



Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Ambulatory Surgery Sample (NASS), 2016

- **For females, the rate of major ambulatory surgeries increased with age with one exception.**

  For females in 2016, the highest rate of surgeries was among females aged 65–84 years (6,485 per 100,000 population), whereas the lowest rate was among females aged 17 years or younger (1,368 per 100,000 population.

- **Among males, those aged 65–84 years had the highest rate of major ambulatory surgeries, followed by those aged 85 years and older.**

  In 2016, the rate for the top 20 major ambulatory surgeries among males aged 65–84 years (6,570 per 100,000 population) was nearly 5 times the rate among males aged 18–44 years (1,316 per 100,000 population).

- **Overall, the rate of major ambulatory surgeries was higher for females than for males in 2016.**

  Among females, the rate of the 20 most common major ambulatory surgeries was 3,265 per 100,000 population. The rate among males was only 2,588 per 100,000 population.

- **Males in the youngest and oldest age groups (≤17 years and 85+ years) had higher rates of major ambulatory surgery compared with females in the same age groups.**

  Among those aged 17 years and younger, the rate of major ambulatory surgeries was 1,637 per 100,000 males and 1,368 per 100,000 females. Among those aged 85 years and older, the rate was 5,176 per 100,000 males and 3,103 per 100,000 females.

  Among individuals aged 18–44 and 45–64 years, the rate of the 20 most common major ambulatory surgeries was higher among females than among males.

  The rate of major ambulatory surgeries was similar among females and males aged 65–84 years.

Table 3 presents the distribution of the 20 major ambulatory surgeries most frequently performed in hospital-owned facilities by primary expected payer in 2016.

Table 3. The 20 most common major ambulatory surgeries performed in hospital-owned facilities, by primary expected payer, 2016

Rank	All-listed CCS procedure group	Primary expected payer, %				
		Medicare	Medicaid	Private	Self-pay/ no charge	Other
1	Lens and cataract procedures	68.3	5.0	23.1	1.4	1.9
2	Muscle, tendon, and soft tissue OR procedures	27.2	12.5	49.6	1.7	8.8
3	Cholecystectomy and common duct exploration	20.6	17.4	56.2	3.2	2.5
4	Incision or fusion of joint, destruction of joint lesion	19.7	12.4	55.6	1.4	10.8
5	Inguinal and femoral hernia repair	32.1	12.2	48.0	2.6	5.0
6	OR procedures of skin and breast, including plastic procedures on breast	12.9	10.2	52.1	20.6	3.8
7	Excision of semilunar cartilage of knee	18.6	11.6	60.2	1.4	8.1
8	Tonsillectomy and/or adenoidectomy	1.0	40.0	54.5	0.8	3.6
9	Repair of diaphragmatic, incisional, and umbilical hernia	23.6	15.1	55.2	2.1	3.9
10	Decompression peripheral nerve	33.2	14.5	44.0	1.4	6.7
11	Myringotomy	2.5	41.4	51.6	0.7	3.7
12	Hysterectomy, abdominal and vaginal	12.9	13.1	69.3	1.9	2.7
13	Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	73.8	4.1	18.3	0.8	1.5
14	Lumpectomy, quadrantectomy of breast	34.0	10.4	51.5	1.8	2.1
15	Non-fracture, non-arthroplasty OR procedures on the bone	20.2	19.0	50.5	3.0	7.1
16	Partial excision bone	28.3	11.6	50.4	1.2	8.3
17	Bunionectomy or repair of toe deformities	33.4	10.5	52.4	0.9	2.6
18	OR procedures of mouth, nose, and throat, excluding tonsils and teeth	16.0	16.4	62.2	1.9	3.5
19	Vascular stents and OR procedures, other than head or neck	66.2	8.2	21.4	1.3	1.8
20	Laminectomy, excision intervertebral disc	33.1	7.0	51.9	1.1	6.8
Top 20 major ambulatory surgeries		**31.1**	**14.0**	**47.1**	**2.6**	**4.9**

Abbreviations: CCS, Clinical Classifications Software; OR, operating room

Notes: Self-pay/no charge includes self-pay, no charge, charity, and no expected payment. Payer information was missing for less than 0.7 percent of procedures in each CCS category reported above, with the exception of insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator (1.5 percent missing); and vascular stents and OR procedures, other than head or neck (1.3 percent missing).

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Ambulatory Surgery Sample (NASS), 2016

- **In 2016, nearly half of the 20 most common major ambulatory surgeries performed in hospital-owned facilities were billed to private insurance, and nearly one-third were billed to Medicare.**

  Private insurance was the most common expected payer for the top 20 major ambulatory surgeries combined (47.1 percent of all top surgeries), followed by Medicare (31.1 percent).

  Private insurance was also the most common expected payer for 17 of the top 20 surgeries, accounting for more than 60 percent of hysterectomies (69.3 percent); OR procedures of mouth, nose, and throat, excluding tonsils and teeth (62.2 percent); and excision of semilunar cartilage of knee (60.2 percent).

  Medicare was the primary expected payer for the vast majority of cardiac pacemaker or cardioverter/defibrillator procedures (73.8 percent); lens and cataract procedures (68.3 percent); and vascular stents and OR procedures, other than head or neck (66.2 percent).

- **Approximately 40 percent of myringotomies and tonsillectomies were billed to Medicaid in 2016.**

  Overall, only 14.0 percent of the top 20 major ambulatory surgeries were billed to Medicaid. However, Medicaid was the primary expected payer for 41.4 percent of myringotomy surgeries and 40.0 percent of tonsillectomy and/or adenoidectomy surgeries.

- **More than one-fifth of OR procedures of skin and breast were billed to self-pay/no charge.**

  Although self-pay/no charge[9] accounted for a very small percentage of the top 20 major ambulatory surgeries overall (2.6 percent), it was the primary expected payer for 20.4 percent of skin and breast OR procedures, which included plastic procedures on breast.

[9] Self-pay/no charge includes self-pay, no charge, charity, and no expected payment.

Hospital characteristics associated with common invasive, therapeutic ambulatory surgeries, 2016
Tables 4 and 5 present the distribution of the 20 major ambulatory surgeries most frequently performed in hospital-owned facilities in 2016 by select hospital characteristics.

Table 4. The 20 most common major ambulatory surgeries performed in hospital-owned facilities, by hospital location, 2016

Rank	All-listed CCS procedure group	Census region, %				Urban-rural, %	
		Northeast	Midwest	South	West	Urban	Rural
1	Lens and cataract procedures	17.3	30.3	33.6	18.9	74.4	25.6
2	Muscle, tendon, and soft tissue OR procedures	19.0	26.4	34.0	20.6	83.4	16.6
3	Cholecystectomy and common duct exploration	15.8	25.1	41.2	17.9	78.8	21.2
4	Incision or fusion of joint, destruction of joint lesion	20.4	25.2	34.1	20.3	84.0	16.0
5	Inguinal and femoral hernia repair	20.1	23.7	34.3	21.9	85.6	14.4
6	OR procedures of skin and breast, including plastic procedures on breast	17.3	21.7	40.9	20.1	95.3	4.7
7	Excision of semilunar cartilage of knee	19.6	26.5	33.6	20.3	80.7	19.3
8	Tonsillectomy and/or adenoidectomy	16.8	26.6	40.7	15.9	84.9	15.1
9	Repair of diaphragmatic, incisional, and umbilical hernia	17.9	25.5	37.9	18.7	85.2	14.8
10	Decompression peripheral nerve	20.0	30.8	32.7	16.5	78.1	21.9
11	Myringotomy	16.2	28.6	44.1	11.1	84.1	15.9
12	Hysterectomy, abdominal and vaginal	12.9	24.7	43.9	18.5	88.6	11.4
13	Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	18.2	25.9	40.6	15.3	93.4	6.6
14	Lumpectomy, quadrantectomy of breast	21.1	23.0	36.3	19.6	90.6	9.4
15	Non-fracture, non-arthroplasty OR procedures on the bone	16.6	25.4	36.1	21.9	88.9	11.1
16	Partial excision bone	17.7	28.5	36.3	17.6	83.0	17.0
17	Bunionectomy or repair of toe deformities	21.2	28.8	30.9	19.2	86.0	14.0
18	OR procedures of mouth, nose, and throat, excluding tonsils and teeth	14.5	20.3	47.0	18.2	91.2	8.8
19	Vascular stents and OR procedures, other than head or neck	16.8	29.0	41.7	12.5	91.8	8.2
20	Laminectomy, excision intervertebral disc	19.4	24.2	40.1	16.3	94.4	5.6
Top 20 major ambulatory surgeries		**18.0**	**26.4**	**37.1**	**18.5**	**84.2**	**15.8**

Abbreviations: CCS, Clinical Classifications Software; OR, operating room

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Ambulatory Surgery Sample (NASS), 2016

- **In 2016, more than 60 percent of the top 20 major ambulatory procedures were performed in facilities owned by hospitals in the South or the Midwest.**

  Overall, 37.1 percent of the top ambulatory surgeries took place in facilities owned by hospitals in the South and 26.4 percent took place in facilities owned by hospitals in the Midwest. A smaller percentage of surgeries were conducted in facilities owned by hospitals in the West and Northeast (18.5 and 18.0 percent, respectively). With some variation, this general pattern of higher percentages in the Midwest and South was consistent across specific procedure categories.

- **More than 80 percent of the most common major ambulatory procedures were performed in facilities owned by urban hospitals.**

  The vast majority (84.2 percent) of top ambulatory surgeries took place in facilities owned by urban hospitals. This percentage was more than 93 percent for OR procedures of skin and breast (95.3 percent); laminectomy, excision intervertebral disc (94.4 percent); and cardiac pacemaker or cardioverter/defibrillator procedures (93.4 percent).

Table 5. The 20 most common major ambulatory surgeries performed in hospital-owned facilities, by hospital size, ownership, and teaching status, 2016

Rank	All-listed CCS procedure group	Hospital size, %			Hospital ownership, %			Teaching hospital, %
		<100 beds	100–299 beds	300+ beds	Public	Not-for-profit	For-profit	
1	Lens and cataract procedures	27.2	34.5	38.3	16.1	74.6	9.4	52.9
2	Muscle, tendon, and soft tissue OR procedures	20.0	35.4	44.6	12.3	77.0	10.6	60.6
3	Cholecystectomy and common duct exploration	20.9	39.5	39.6	11.5	74.7	13.8	52.8
4	Incision or fusion of joint, destruction of joint lesion	20.5	36.8	42.6	11.2	77.5	11.3	60.0
5	Inguinal and femoral hernia repair	17.1	36.6	46.3	11.0	76.8	12.2	60.0
6	OR procedures of skin and breast, including plastic procedures on breast	9.1	30.8	60.0	9.7	79.4	10.9	73.9
7	Excision of semilunar cartilage of knee	23.3	38.6	38.0	10.6	76.7	12.7	55.0
8	Tonsillectomy and/or adenoidectomy	15.6	34.4	50.1	10.2	78.7	11.1	66.2
9	Repair of diaphragmatic, incisional, and umbilical hernia	17.7	37.1	45.2	10.8	75.9	13.3	58.4
10	Decompression peripheral nerve	22.7	36.2	41.1	12.9	77.1	10.0	56.5
11	Myringotomy	16.7	34.5	48.8	10.5	76.9	12.6	65.1
12	Hysterectomy, abdominal and vaginal	11.3	36.3	52.5	9.5	75.0	15.6	63.9
13	Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	3.8	31.6	64.6	7.6	77.6	14.8	72.5
14	Lumpectomy, quadrantectomy of breast	9.8	35.2	55.0	9.9	79.3	10.8	67.5
15	Non-fracture, non-arthroplasty OR procedures on the bone	14.1	31.6	54.4	13.0	76.6	10.4	70.2
16	Partial excision bone	21.9	36.0	42.2	11.5	77.8	10.7	57.9
17	Bunionectomy or repair of toe deformities	19.8	39.2	41.0	9.8	78.1	12.1	56.9
18	OR procedures of mouth, nose, and throat, excluding tonsils and teeth	10.2	35.0	54.8	18.2	72.2	9.5	69.6
19	Vascular stents and OR procedures, other than head or neck	4.5	36.1	59.4	8.7	77.0	14.3	67.3
20	Laminectomy, excision intervertebral disc	8.3	33.8	58.0	7.6	78.6	13.7	70.7
Top 20 major ambulatory surgeries		**17.8**	**35.5**	**46.7**	**11.7**	**76.6**	**11.6**	**61.1**

Abbreviations: CCS, Clinical Classifications Software; OR, operating room

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), Nationwide Ambulatory Surgery Sample (NASS), 2016

- **In 2016, nearly half of the 20 most common major ambulatory surgeries performed in hospital-owned facilities were in facilities owned by hospitals with 300 or more beds.**

  Overall, most of the top ambulatory surgeries were performed in facilities owned by large hospitals (300+ beds; 46.7 percent), followed by facilities owned by medium hospitals (100–299 beds; 35.5 percent), and facilities owned by small hospitals (<100 beds; 17.8 percent). This general pattern held constant across nearly all specific procedure categories.

  For the majority of the top 20 surgeries, facilities owned by small hospitals accounted for between 10 and 28 percent of surgeries. However, for two procedure groups on the list—(1) cardiac pacemaker or cardioverter/defibrillator procedures and (2) vascular stents and OR procedures other than head or neck—less than 5 percent of procedures were performed in these types of facilities.

- **The vast majority of the 20 most common major ambulatory surgeries in 2016 were performed in facilities owned by private not-for-profit hospitals.**

  Overall, most of the top ambulatory surgeries were performed in facilities owned by private not-for-profit hospitals (76.6 percent), with smaller percentages performed in facilities owned by public and private for-profit hospitals (11.7 and 11.6 percent, respectively). This general pattern held constant across specific procedure categories.

- **More than 60 percent of the top major ambulatory surgeries were performed in facilities owned by teaching hospitals.**

  For each of the 20 most common procedure categories, more than half of surgeries (between 52.8 and 73.9 percent) took place in facilities owned by teaching hospitals. For four of the top procedures—OR procedures of skin and breast (73.9 percent); cardiac pacemaker or cardioverter/defibrillator procedures (72.5 percent); laminectomy, excision intervertebral disc (70.7 percent); and non-fracture, non-arthroplasty OR procedures on the bone (70.2 percent)—more than 70 percent of surgeries took place in facilities owned by teaching hospitals.

About Statistical Briefs

Healthcare Cost and Utilization Project (HCUP) Statistical Briefs provide basic descriptive statistics on a variety of topics using HCUP administrative health care data. Topics include hospital inpatient, ambulatory surgery, and emergency department use and costs, quality of care, access to care, medical conditions, procedures, and patient populations, among other topics. The reports are intended to generate hypotheses that can be further explored in other research; the reports are not designed to answer in-depth research questions using multivariate methods.

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2016 Nationwide Ambulatory Surgery Sample (NASS). Supplemental sources included 2016 population denominator data for use with HCUP databases, derived from information available from the U.S. Census Bureau.[10]

Definitions

Procedures, Current Procedural Terminology (CPT®), and Clinical Classifications Software (CCS) for Services and Procedures
All-listed procedures include all procedures performed during the hospital stay or outpatient visit, whether for definitive treatment or for diagnostic or exploratory purposes.

CPT assigns numeric codes to procedures. There are approximately 9,600 CPT procedure codes.

CCS – Services and Procedures provides a method for classifying CPT and Healthcare Common Procedure Coding System codes into clinically meaningful procedure categories.[11] This clinical grouper makes it easier to quickly understand patterns of procedure use.

Encounters included in HCUP Nationwide Ambulatory Surgery Sample
The Nationwide Ambulatory Surgery Sample (NASS) is limited to encounters with at least one "in-scope" ambulatory surgery on the record, performed at hospital-owned facilities. *In-scope procedures* are defined as major surgeries (invasive, therapeutic procedures that typically require the use of an operating room and require regional anesthesia, general anesthesia or sedation, flagged as "narrow" surgeries in the HCUP Surgery Flag Software[12]) belonging to a subset of CCS procedure groups with relatively high procedure volume, a substantial share of procedures performed in the hospital outpatient setting, and evidence of reliable reporting from hospitals in the Ambulatory Surgery and Services Databases (SASD).

Types of hospitals included in HCUP Nationwide Ambulatory Surgery Sample
The NASS is based on data from hospital-owned ambulatory surgery facilities. The designation of a facility as hospital-owned is specific to its financial relationship with a hospital that provides inpatient care and is not related to its physical location. Ambulatory surgery performed in hospital-owned facilities may be performed within the hospital, in a facility attached to the hospital, or in a facility physically separated from the hospital. The NASS is further limited to ambulatory surgeries performed at facilities owned by community hospitals. Community hospitals are defined as short-term, non-Federal, general, and other specialty hospitals, excluding hospital units of other institutions (e.g., prisons). The NASS is also limited

[10] Barrett M, Coffey R, Levit K. Population Denominator Data for Use with the HCUP Databases (Updated with 2016 Population Data). HCUP Methods Series Report #2017-04. October 17, 2017. U.S. Agency for Healthcare Research and Quality. www.hcup-us.ahrq.gov/reports/methods/2017-04.pdf. Accessed January 4, 2019.
[11] Agency for Healthcare Research and Quality. HCUP Clinical Classifications Software (CCS) for Services and Procedures. Healthcare Cost and Utilization Project (HCUP). Agency for Healthcare Research and Quality. Updated May 2018. https://www.hcup-us.ahrq.gov/toolssoftware/ccs_svcsproc/ccssvcproc.jsp. Accessed July 23, 2019.
[12] Agency for Healthcare Research and Quality. Surgery Flag Software for Services and Procedures. Healthcare Cost and Utilization Project (HCUP). Last modified August 7, 2019. www.hcup-us.ahrq.gov/toolssoftware/surgeryflags_svcproc/surgeryflagssvc_proc.jsp. Accessed August 13, 2020. The 2016 NASS applied a preliminary version of v2019.2 that included narrow surgeries identified in the following ranges of CPT codes: surgical (10004-69990), emerging technology (0100T-0588T), and cardiac-related medical (92920-93986).

to community hospitals providing general medical and surgical services to adults and children, thus excluding certain types of specialty hospitals.

Unit of analysis
The unit of analysis is the ambulatory surgery, not a person or patient or an encounter. If a person has multiple ambulatory surgeries in 1 year—whether these surgeries are performed during the same encounter or during multiple encounters—the surgeries are counted as separate and unique surgeries.

Hospital location
The classification of whether a hospital is in a metropolitan area (*urban*) or nonmetropolitan area (*rural*) is assigned from the American Hospital Association (AHA) Annual Survey and is based on the Core Based Statistical Area (CBSA) definition of rurality developed by the Office of Management and Budget. Hospitals located in counties with a CBSA type of "Division" or "Metropolitan" were considered urban, and hospitals with a CBSA type of "Rural" or "Micropolitan" were classified as rural. The CBSA classification released in 2011 was based on the 2000 Census; the CBSA classification released in 2014 was based on the 2010 Census.

Expected payer
To make coding uniform across all HCUP data sources, the primary expected payer for the hospital stay combines detailed categories into general groups:

- Medicare: includes fee-for-service and managed care Medicare
- Medicaid: includes fee-for-service and managed care Medicaid
- Private Insurance: includes commercial nongovernmental payers, regardless of the type of plan (e.g., private health maintenance organizations [HMOs], preferred provider organizations [PPOs])
- Self-pay/no charge: includes self-pay, no charge, charity, and no expected payment
- Other payers: includes other Federal and local government programs (e.g., TRICARE, CHAMPVA, Indian Health Service, Black Lung, Title V) and Workers' Compensation

Ambulatory encounter data billed to the State Children's Health Insurance Program (SCHIP) may be classified as Medicaid or Other, depending on the structure of the State program. Because most State data do not identify SCHIP as a separate expected payer, it is not possible to present this information separately.

For this Statistical Brief, when more than one payer is listed for a hospital discharge, the primary payer is used.

Region
Region is one of the four regions defined by the U.S. Census Bureau:

- Northeast: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania
- Midwest: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas
- South: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas
- West: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital

care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska Department of Health and Social Services
Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Delaware Division of Public Health
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi State Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Office of Health Analytics
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Department of Health and Human Resources, West Virginia Health Care Authority

Wisconsin Department of Health Services
Wyoming Hospital Association

About the NASS

The HCUP Nationwide Ambulatory Surgery Sample (NASS) is a calendar-year encounter-level database constructed using records from the HCUP State Ambulatory Surgery and Services Databases (SASD). The NASS is the largest all-payer ambulatory surgery database that has been constructed in the United States. Unweighted, the 2016 NASS contains approximately 7.6 million major ambulatory surgery encounters each year. Weighted, it estimates approximately 10.6 million major ambulatory surgery encounters in the United States. The NASS tracks information about major ambulatory surgery encounters in hospital-owned facilities across the country and provides information on patient characteristics, clinical diagnostic and surgical procedure codes, total charges and expected source of payment, and facility characteristics. Major ambulatory surgeries are defined as selected invasive, therapeutic surgical procedures that typically require the use of an operating room and require regional anesthesia, general anesthesia, or sedation. (These surgeries are flagged as "narrow" in the HCUP Surgery Flag Software.[13]) Procedures intended primarily for diagnostic purposes are excluded. The 2016 NASS is an approximate 63 percent sample of the universe hospital-owned facilities and an approximate 72 percent sample of the universe ambulatory surgery encounters. Weights are included for the calculation of national estimates of ambulatory surgeries.

For More Information

For other information on ambulatory surgeries and other procedures, refer to the HCUP Statistical Briefs located at https://www.hcup-us.ahrq.gov/reports/statbriefs/sb_procedures.jsp.

For additional HCUP statistics, visit:

- HCUP Fast Stats at www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for health care information topics
- HCUPnet, HCUP's interactive query system, at www.hcupnet.ahrq.gov/

For more information about HCUP, visit www.hcup-us.ahrq.gov/.

For a detailed description of HCUP and more information on the design of the Nationwide Ambulatory Surgery Sample (NASS), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the Nationwide Ambulatory Surgery Sample (NASS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated August 2019. https://www.hcup-us.ahrq.gov/nassoverview.jsp. Accessed September 18, 2019.

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[13] Agency for Healthcare Research and Quality. Surgery Flag Software for Services and Procedures. Healthcare Cost and Utilization Project (HCUP). Last modified August 7, 2019. www.hcup-us.ahrq.gov/toolssoftware/surgeryflags_svcproc/surgeryflagssvc_proc.jsp. Accessed August 13, 2020. The 2016 NASS applied a preliminary version of v2019.2 that included narrow surgeries identified in the following ranges of CPT codes: surgical (10004-69990), emerging technology (0100T-0588T), and cardiac-related medical (92920-93986).

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AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

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