

SECTION 3 INPATIENT HOSPITAL STAYS BY PROCEDURE

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HIGHLIGHTS

- The rate of stays with procedures remained relatively stable at about 1,300 stays per 10,000 population from 1997 to 2009.
- Blood transfusion occurred in over ten percent of all hospital stays that included a procedure and was the most frequently performed procedure in 2009. The rate of blood transfusion more than doubled from 1997 to 2009.
- Cesarean section was the most frequent major operating room procedure—performed on 1.4 million females in 2009.
- The rate of stays with knee arthroplasty increased 84 percent from 12 per 10,000 population in 1997 to 22 per 10,000 population in 2009. Knee arthroplasty was the fourteenth most common inpatient procedure in 2009.
- The rate of respiratory intubation and mechanical ventilation grew rapidly from 1997 to 2009 among 45-64 year olds (69 percent), 65-84 year olds (33 percent), and seniors 85 years and older (28 percent).
- Diagnostic cardiac catheterization and coronary arteriography was common for 45-64 year olds (638,000 procedures) and 65-84 year olds (664,000 procedures), but the rate of procedures declined about 20 percent from 1997 to 2009 in both age groups.

EXHIBIT 3.1 Most Frequent All-listed Procedures

Number of Stays, Stays per 10,000 Population, and Growth of the Most Frequent All-listed Procedures for Hospital Stays, 1997 and 2009

ALL-LISTED CCS PROCEDURES	NUMBER OF STAYS WITH THE PROCEDURE IN THOUSANDS		STAYS PER 10,000 POPULATION WITH THE PROCEDURE		CUMULATIVE GROWTH IN RATE
	1997	2009	1997	2009	1997-2009
All stays (with and without procedures)	34,679	39,435	1,278	1,284	1% ‡
All stays with any procedure	21,257	24,730	783	806	3% ‡
Percent of all stays with a procedure	61%	63%			
Blood transfusion	1,097	2,829	40	92	128%
Prophylactic vaccinations and inoculations	567	1,796	21	59	180%
Respiratory intubation and mechanical ventilation	919	1,498	34	49	44%
Diagnostic cardiac catheterization, coronary arteriography	1,461	1,476	54	48	-11% ‡
Cesarean section	800	1,382	29	45	53%
Repair of obstetric laceration	1,137	1,343	42	44	4% ‡
Upper gastrointestinal endoscopy	1,105	1,242	41	40	-1% ‡
Circumcision	1,164	1,174	43	38	-11%
Artificial rupture of membranes to assist delivery	747	932	28	30	10% ‡
Fetal monitoring	1,002	860	37	28	-24% ‡
Hemodialysis	473	837	17	27	56%
Echocardiogram	632	813	23	26	14% ‡
Percutaneous transluminal coronary angioplasty (PTCA)	581	693	21	23	5% ‡
Knee arthroplasty	329	686	12	22	84%
Enteral and parenteral nutrition	277	576	10	19	84%
Colonoscopy and biopsy	531	564	20	18	-6% ‡
Laminectomy, excision intervertebral disc	425	504	16	16	5% ‡
Hysterectomy	587	483	22	16	-27%
Incision of pleura, thoracentesis, chest drainage	349	476	13	16	20%
Cholecystectomy and common duct exploration	448	460	16	15	-9%

‡ 2009 stays per 10,000 population are not statistically different from 1997 stays per 10,000 population at $p < 0.05$.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2009.

The rate of stays with procedures remained relatively stable at about 1,300 stays per 10,000 population from 1997 to 2009. About two-thirds of hospital stays involved at least one procedure.

- Blood transfusion occurred in over ten percent of all hospital stays that included a procedure and was the most frequently performed procedure in 2009. The rate of blood transfusion more than doubled from 1997 to 2009.
- Vaccinations were the second most frequent procedure performed in 2009. The rate of stays with vaccinations, typically hepatitis B immunizations for liveborn infants, increased by 180 percent from 1997 to 2009.

- The rate of stays with cardiac catheterization, the fourth most common procedure in 2009, remained relatively stable from 1997 to 2009, at about 50 per 10,000 population.
- Cesarean section was the most frequent major operating room procedure—performed on 1.4 million females in 2009.
- The rate of stays with knee arthroplasty increased 84 percent from 12 per 10,000 population in 1997 to 22 per 10,000 population in 2009. Knee arthroplasty was the fourteenth most common inpatient procedure in 2009.

Number of Stays, Stays per 10,000 Population, and Growth of Selected All-listed Procedures for Hospital Stays, 1997 and 2009

ALL-LISTED CCS PROCEDURES	NUMBER OF STAYS WITH THE PROCEDURE IN THOUSANDS		STAYS PER 10,000 POPULATION WITH THE PROCEDURE		CUMULATIVE GROWTH IN RATE
	1997	2009	1997	2009	1997-2009
Procedures with most rapid growth in stays per population*					
Indwelling catheter	60	203	2	7	198%
Prophylactic vaccinations and inoculations	567	1,796	21	59	180%
Blood transfusion	1,097	2,829	40	92	128%
Spinal fusion	202	448	7	15	96%
Incision and drainage, skin and subcutaneous tissue	118	248	4	8	85%
Knee arthroplasty	329	686	12	22	84%
Enteral and parenteral nutrition	277	576	10	19	84%
Hemodialysis	473	837	17	27	56%
Cesarean section	800	1,382	29	45	53%
Respiratory intubation and mechanical ventilation	919	1,498	34	49	44%
Hip replacement	291	438	11	14	33%

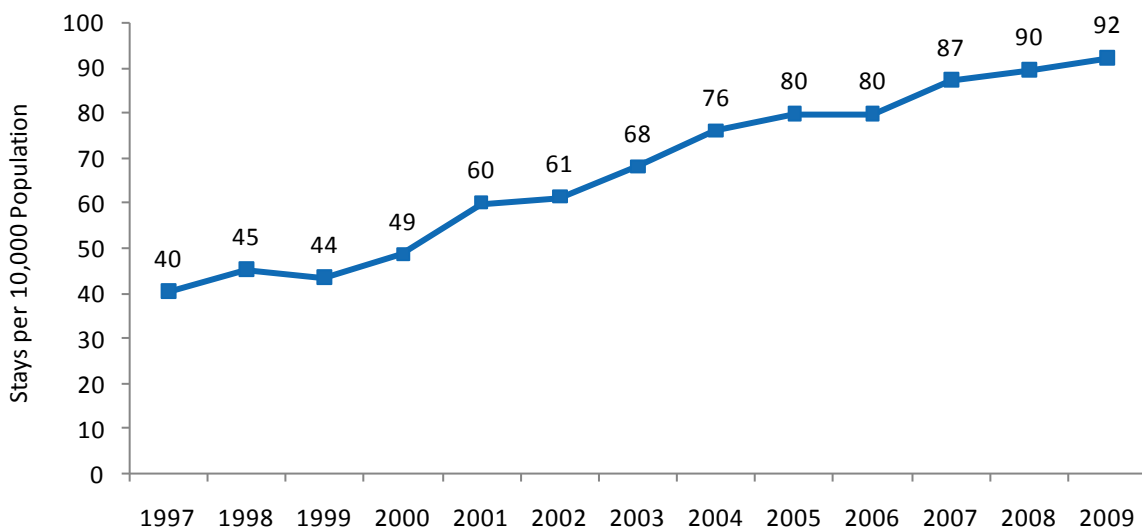
* Includes only procedures with at least 100,000 stays in either 2009 or 1997. 2009 stays per 10,000 population are statistically different from 1997 stays per 10,000 population at $p < 0.05$.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2009.

The majority of the top ten most rapidly growing all-listed procedures were also among the most frequent procedures.

- Stays with indwelling catheter approximately tripled from 1997 to 2009, increasing from 2 stays per 10,000 population in 1997 to 7 stays per population in 2009.
- The rate of hospitalizations with spinal fusion doubled from 7 stays per 10,000 population in 1997 to 15 stays per 10,000 population in 2009.
- The rate of stays with hip replacement grew 33 percent, from 11 stays per 10,000 population in 1997 to 14 stays per 10,000 population in 2009.

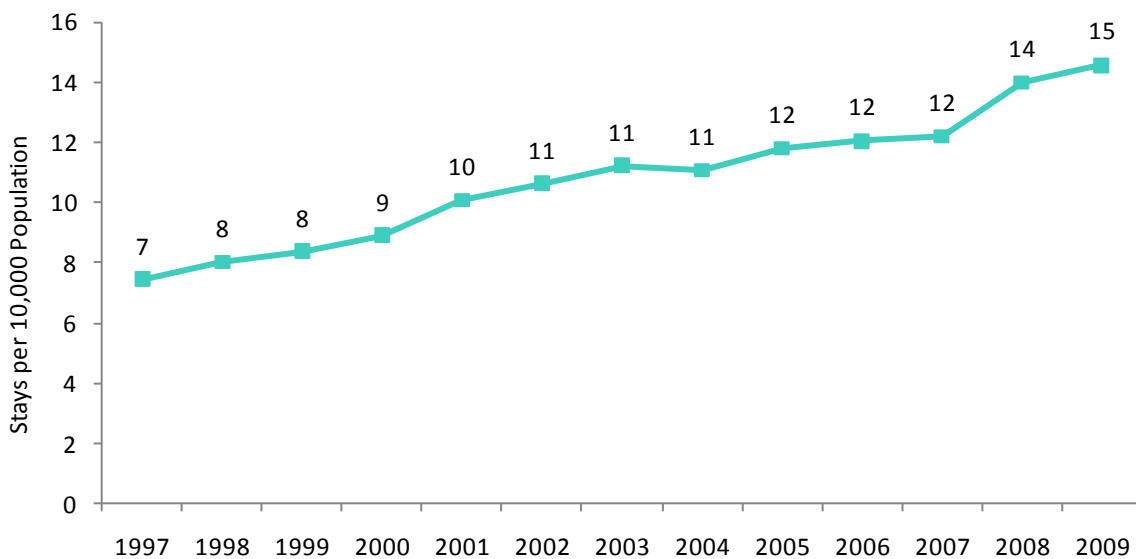
Hospital Stays per 10,000 Population with All-listed Blood Transfusion, 1997-2009



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2009.

- The rate of stays with all-listed blood transfusion has increased at a relatively steady rate from 40 stays per 10,000 population in 1997 to 92 stays per 10,000 population in 2009.

Hospital Stays per 10,000 Population with All-listed Spinal Fusion, 1997-2009



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997-2009.

- The rate of stays with all-listed spinal fusion increased at a relatively steady rate from 7 stays per 10,000 population in 1997 to 15 stays per 10,000 population in 2009.

EXHIBIT 3.2 Most Frequent All-listed Procedures by Age

Number of Stays, Stays per 10,000 Population, and Growth of the Most Frequent All-listed Procedures for Hospital Stays by Age, 1997 and 2009

AGE GROUP AND ALL-LISTED CCS PROCEDURES	NUMBER OF STAYS IN THOUSANDS		STAYS PER 10,000 POPULATION		CUMULATIVE GROWTH IN RATE
	1997	2009	1997	2009	1997-2009
All ages, total stays†	34,679	39,435	1,278	1,284	1%‡
< 1 year, total stays	4,426	4,678	11,799	10,977	-7%‡
Prophylactic vaccinations and inoculations	549	1,516	1,463	3,556	143%
Circumcision	1,159	1,170	3,089	2,746	-11%
Respiratory intubation and mechanical ventilation	163	176	434	414	-5%‡
Enteral and parenteral nutrition	39	122	104	287	176%
Diagnostic spinal tap	147	85	391	199	-49%
1-17 years, total stays	1,821	1,611	271	229	-15%‡
Appendectomy	74	84	11	12	8%‡
Repair of obstetric laceration	58	53	9	8	-13%
Blood transfusion	26	47	4	7	70%‡
Cancer chemotherapy	43	38	6	5	-15%‡
Respiratory intubation and mechanical ventilation	30	34	4	5	7%‡
18-44 years, total stays	9,444	9,922	860	874	2%‡
Cesarean section	773	1,349	70	119	69%
Repair of obstetric laceration	1,079	1,289	98	114	16%
Artificial rupture of membranes to assist delivery	706	899	64	79	23%
Fetal monitoring	952	829	87	73	-16%‡
Blood transfusion	147	332	13	29	119%
45-64 years, total stays	6,496	9,629	1,155	1,213	5%‡
Blood transfusion	247	788	44	99	126%
Diagnostic cardiac catheterization, coronary arteriography	578	638	103	80	-22%
Respiratory intubation and mechanical ventilation	186	443	33	56	69%
Upper gastrointestinal endoscopy	275	404	49	51	4%‡
Hemodialysis	154	328	27	41	51%
65-84 years, total stays	10,121	10,468	3,319	3,084	-7%
Blood transfusion	514	1,245	169	367	118%
Diagnostic cardiac catheterization, coronary arteriography	738	664	242	196	-19%
Respiratory intubation and mechanical ventilation	366	543	120	160	33%
Upper gastrointestinal endoscopy	530	494	174	145	-16%
Knee arthroplasty	201	366	66	108	63%
85+ years, total stays	2,362	3,076	6,047	5,463	-10%
Blood transfusion	138	375	353	667	89%
Upper gastrointestinal endoscopy	122	134	313	238	-24%
Respiratory intubation and mechanical ventilation	65	121	168	215	28%
Echocardiogram	65	86	165	154	-7%‡
Treatment, fracture or dislocation of hip and femur	87	86	222	153	-31%

† Includes a small number of stays (51,500 or 0.1 percent) with missing age.

‡ 2009 stays per 10,000 population are not statistically different from 1997 stays per 10,000 population at p<0.05.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1997 and 2009.

While some of the most frequent procedures varied by age group, some were common across several age groups.

- Blood transfusion was a top five procedure in all age groups except infants less than 1 year old. It was the third most common procedure for 1-17 year olds and the first for adults 45-64, 65-84, and 85 years and older. Blood transfusion was one of the fastest growing procedures from 1997 to 2009, more than doubling for patients 18-44, 45-64, and 65-84.
- Respiratory intubation and mechanical ventilation was common for all age groups except 18 to 44 year olds. The rate of respiratory intubation and mechanical ventilation grew rapidly from 1997 to 2009 among 45-64 year olds (69 percent), 65-84 year olds (33 percent), and seniors 85 years and older (28 percent).
- Diagnostic cardiac catheterization and coronary arteriography was common for 45-64 year olds (638,000 procedures) and 65-84 year olds (664,000 procedures), but the rate of procedures declined about 20 percent from 1997 to 2009 in both age groups.

For infants:

- The most common procedures performed on infants were routine procedures, such as vaccinations (performed in 3,556 stays per 10,000 infants) and circumcision (performed in 2,746 stays per 10,000 infants).
 - In 2009, 1.2 million circumcisions were completed in the hospital (55 percent of male liveborn infants).
- Procedures on infants also included those done for complex conditions affecting severely ill babies, such as respiratory intubation and mechanical ventilation (414 stays per 10,000 infants), enteral/parenteral nutrition (287 stays per 10,000 infants), and diagnostic spinal tap (199 stays per 10,000 infants).
 - The rate of enteral and parenteral nutrition, or tube feeding, during infant hospitalizations increased 176 percent whereas the rate of spinal tap procedures decreased 49 percent.

For children 1-17:

- Appendectomy was the most common procedure for 1-17 year olds, performed in 12 stays per 10,000 population in this age group.
- Other top procedures common in stays for children included repair of obstetric laceration in teen deliveries, blood transfusion, cancer chemotherapy, and respiratory intubation and mechanical ventilation.

For adults 18-44:

- Four of the top five most common procedures were related to pregnancy and childbirth for adults 18-44 years old.
 - Cesarean sections and repair of obstetric laceration were the most frequently performed procedures, performed in 119 and 114 stays per 10,000 population among this age group in 2009.
 - The rate of Cesarean sections increased by 69 percent from 1997 to 2009.
 - The rate of stays with artificial rupture of membranes to assist delivery also experienced rapid growth from 1997 to 2009 (up 23 percent), while the rate of fetal monitoring procedures remained relatively stable.
- Blood transfusion was the fifth most frequent procedure among adults 18-44 years old, and the rate of this procedure more than doubled from 1997 to 2009 (from 13 to 29 stays per 10,000 population).

For adults 45-64 and 65-84:

- In 2009, the top four most frequently performed procedures were the same for individuals 45-64 and 65-84 years old: blood transfusion, diagnostic cardiac catheterization and coronary arteriography, respiratory intubation and mechanical ventilation, and upper gastrointestinal endoscopy.
 - Blood transfusion was the leading procedure for 45-64 year olds and 65-84 year olds, and the rate of stays with this procedure more than doubled in both age groups from 1997 to 2009.

- Diagnostic cardiac catheterization and coronary arteriography was the second most common procedure performed in each of these age groups.
- Hemodialysis was a top procedure among individuals 45-64, and the rate of stays with this procedure increased by about 50 percent from 1997 to 2009 (from 27 to 41 stays per 10,000 population).
- Knee replacement was a top procedure among individuals 65-84, and the rate of stays with this procedure increased by 63 percent from 1997 to 2009 (from 66 to 108 stays per 10,000 population).

For adults 85 years and older:

- For patients 85 years and older, blood transfusion was the most common procedure, occurring in 667 stays per 10,000 population.
- Echocardiogram was the fourth most frequent procedure for patients 85 years and older (86,000 stays), and the rate of stays with this procedure remained relatively stable from 1997 to 2009 (7 percent decline).
- Treatment of a fracture or dislocation of the hip and femur was a frequent procedure performed during a hospital stay and appeared only in this age group.
 - The rate of stays for treatment of a hip fracture or dislocation declined (31 percent) from 1997 to 2009, accounting for 86,000 stays in 2009.