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Procedures in U.S. Hospitals, 2003



Agency for Healthcare Research and Quality

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Procedures in U.S. Hospitals, 2003

Chaya T. Merrill, M.P.H. ■ Anne Elixhauser, Ph.D.



FACTS ON:

- OVERVIEW OF HOSPITALS
- COMMON PROCEDURES
- GENDER AND AGE CHARACTERISTICS
- HIGH-VOLUME PROVIDERS
- HOSPITAL CHARGES
- LENGTH OF STAY
- PAYERS OF CARE
- IN-HOSPITAL MORTALITY
- PATIENT SAFETY INDICATORS

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HCUP Fact Book Series

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2. *Procedures in U.S. Hospitals, 1997* (AHRQ Pub. No. 01-0016)
3. *Care of Women in U.S. Hospitals, 2000* (AHRQ Pub. No. 02-0044)
4. *Care of Children and Adolescents in U.S. Hospitals, 2000* (AHRQ Pub. No. 04-0004)
5. *Preventable Hospitalizations: A Window Into Primary and Preventive Care, 2000* (AHRQ Pub. No. 04-0056)
6. *Hospitalization in the United States, 2002* (AHRQ Pub. No. 05-0056)

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Executive Summary

The United States spends approximately one-third of every health care dollar on hospital care, making hospitalizations the single most expensive component of the health care system. In 2003, U.S. hospitals reported more than 38 million hospital discharges. Over 60 percent of these discharges involved some type of procedure, and many individuals experienced more than 1 procedure during their stay. Procedures are defined as any diagnostic or therapeutic interventions (invasive or noninvasive) that appear on the discharge record of a hospitalized patient. Understanding the characteristics of hospital procedures is integral to reducing costs and improving the overall quality of hospital care.

Procedures in U.S. Hospitals, 2003 summarizes information about hospital procedures from the Nationwide Inpatient Sample (NIS), an all-payer hospital database maintained by the Agency for Healthcare Research and Quality (AHRQ). This report updates an earlier Fact Book that described hospital procedures in 1997.

THIS FACT BOOK DESCRIBES:

- How many procedures did patients receive per hospital stay?
- What were the most common procedures?
- How did procedures vary by body system, age, and gender?
- What share of the Nation's hospitals were high-volume providers?
- What procedures were associated with the highest charges and the longest lengths of stay?
- Who was billed for hospital care?
- Which procedures were associated with the highest in-hospital mortality?
- How did selected procedure-based patient safety quality indicators change from 1997 to 2003?

The most common principal procedures in U.S. hospitals were those that assisted with delivery and C-sections, followed closely by circumcisions.

HOW MANY PROCEDURES DID PATIENTS RECEIVE PER HOSPITAL STAY?

Close to 60 percent of all patients received a procedure during their hospital stay. The 40 percent of patients who did not undergo a procedure typically consisted of newborn infants or medical patients who are hospitalized for medical (versus surgical) reasons, such as stabilization medication, and observation.

Similar to the pattern observed in 1997, patients who received at least 1 procedure averaged 2 procedures during their hospital stay. Approximately 20 percent of hospitalizations in 2003 included 3 or more procedures. About 30 percent of hospital stays involved at least 1 major therapeutic procedure performed in the operating room.

WHAT WERE THE MOST COMMON PROCEDURES?

Overall, the top 10 procedures performed in the United States remained consistent between 1997 and 2003, with 9 of 10 unchanged. The most common procedures performed in U.S. hospitals continued to be related to pregnancy and childbirth. In 2003, vaccinations were added to this list, replacing episiotomies as a top 10 procedure.

Similar to the pattern observed in 1997, cardiovascular procedures continued to be performed most often during U.S. hospitalizations. In fact, excluding pregnancy- and childbirth-related procedures, 3 of the 10 most frequently performed procedures in 2003 were related to the heart. While most cardiovascular procedures increased in frequency, coronary artery bypass graft (CABG) and extracorporeal circulation to open heart procedures decreased by 19 percent each. Another notable difference from 1997 was a 64-percent increase in blood transfusions.

HOW DID PROCEDURES VARY BY BODY SYSTEM, AGE, AND GENDER?

Body System

The most common procedures by body system remained consistent from 1997 to 2003. Cardiovascular, obstetrical, and digestive procedures continued to be performed most frequently. Cardiovascular procedures were the most common of all procedures, occurring in 13 percent of all hospitalizations. Obstetrical and digestive procedures remained the next most common procedures by body system, with both occurring in 11 percent of all hospital stays in 1997 and 2003.

Age

Blood transfusions were among the top 10 procedures performed in each age group, occurring in 77 percent more hospitalizations than in 1997. This increase in the prevalence of transfusions was accompanied by a similar increase (78 percent) in hospital admissions for anemia.

The top procedures in each age group were:

<1 year	Circumcision and vaccinations
1–17 years	Appendectomies and diagnostic spinal taps
18–44 years	Obstetrical procedures and hysterectomies
45–64 years	Diagnostic cardiac catheterization and blood transfusions
65–79 years	Diagnostic cardiac catheterization and blood transfusions
80+ years	Blood transfusions and upper gastrointestinal (GI) endoscopy.

Gender

The most common procedures for men and women remained stable from 1997 to 2003. Males and females, on average, received an equal number of procedures: 2 per hospitalization. In 2003, 7 of the top 10 procedures performed in U.S. hospitals were identical for males and females.

Three of the top 10 procedures most commonly performed during hospital stays for females were cholecystectomy (removal of the gall bladder) and 2 operations of the female reproductive system—hysterectomy and oophorectomy (removal of the ovaries). Most of these hysterectomies and oophorectomies were for non-cancerous conditions.

Three procedures that were experienced most frequently by males were less common among women: laminectomy (back surgery) and 2 heart-related procedures—percutaneous coronary angioplasty (PTCA) and CABG.

Cesarean sections increased by 33 percent between 1997 and 2003, while episiotomies decreased by 41 percent.



Blood transfusions were performed during nearly 2 million hospital stays, or 5 percent of all hospitalizations. This represented a 64-percent increase from 1997 to 2003.



Hysterectomies and oophorectomies (removal of ovaries) were among the top 10 procedures for women.



Laminectomy, PTCA, and CABG were among the top 10 procedures for men.

WHAT SHARE OF THE NATION'S HOSPITALS WERE HIGH-VOLUME PROVIDERS FOR SPECIFIC PROCEDURES?

Research suggests that for some procedures, in-hospital mortality is lower at hospitals that perform a high volume of these procedures.¹ This Fact Book examines the percentage of the Nation's hospitals that were considered high-volume providers in 1997 as compared with 2003. Ten procedures are specifically examined in this report: abdominal

aortic aneurysm, carotid endarterectomy, lower extremity arterial bypass, CABG, PTCA, heart transplantation, pediatric heart surgery, pancreatic cancer surgery, esophageal cancer surgery, and cerebral aneurysm surgery.

For the majority of these procedures, the percentage of hospitals serving as high-volume providers did not change significantly in 2003. However, fewer hospitals were considered high-volume providers for CABG and abdominal aortic aneurysm. The number of high-volume hospitals increased for pancreatic cancer.

The percentage of patients receiving procedures in high-volume hospitals decreased the most for CABG—from 63 percent to 41 percent. In 2003, 45,000 more patients underwent CABG nationwide in a low-volume hospital, as compared with 1997.

WHAT PROCEDURES WERE ASSOCIATED WITH THE HIGHEST CHARGES AND LONGEST LENGTHS OF STAY?

Hospital charges are the amount the hospital bills for the entire inpatient stay and do not include most professional (physician) fees. Note that charges reflect the total hospital charge for a hospitalization, not the charge for a particular procedure; thus, a relatively inexpensive procedure can be associated with an expensive hospital stay if the stay itself incurs high charges.

In 2003, the mean charge for a hospital stay was \$19,700, with an average length of stay of 5 days. Three of the 10 most expensive stays were related to organ transplantation (bone marrow, kidney, and “other” organ transplantations). The most expensive hospitalizations involved “other” organ transplantations of the lung, heart, spleen, intestine, liver, and pancreas—with a mean charge of more than \$275,600. In terms of length of hospitalization, procedures involving bone marrow and other organ transplant continued to be associated with some of the longest hospital stays.

The percentage of patients receiving CABG in high-volume hospitals decreased—from 63 percent to 41 percent—with 45,000 more patients having CABG procedures in low-volume hospitals in 2003 than in 1997.

WHO WAS BILLED FOR HOSPITAL CARE?

HCUP data capture information on patients regardless of who pays for their care. In 2003, public programs (Medicare and Medicaid) were billed for 58 percent of all hospital stays; private insurance was billed for 35 percent of stays; and 5 percent of stays were uninsured. Other payer sources were billed for approximately 3 percent of all hospital stays in U.S. community hospitals.

Medicare

Medicare, the federally sponsored health care program for the elderly and disabled, served approximately 40 million individuals, most of whom were 65 years of age and older.² Eight of the 10 most common procedures billed to Medicare were the same from 1997 to 2003. Two new additions included procedures related to cardiac pacemakers and arthroplasty of the knee, replacing computerized tomography (CT) scan of the head and physical therapy services. Four of the top procedures billed to Medicare involved the cardiovascular system. In 2003, blood transfusions surpassed diagnostic cardiac catheterizations as the most common procedures performed during stays billed to Medicare.

Medicaid

Medicaid, the Federal- and State-government sponsored health care program for low-income Americans, served about 36 million individuals in 2003.² Nine of the top 10 procedures billed to Medicaid remained unchanged from 1997. In 2003, hearing examinations replaced episiotomies as a top 10 procedure. Six of the top 10 procedures were related to pregnancy and childbirth. Nearly half of all hospital stays involving vaccinations were billed to Medicaid, as compared with 31 percent in 1997. (These vaccinations typically consisted of hepatitis vaccines given to infants at birth.) After excluding pregnancy- and childbirth-related procedures, vaccinations emerged as the most common procedure billed to Medicaid, and 3 additional diagnostic

Summary

procedures entered the realm of the top 10 procedures billed to this program: upper GI endoscopy, diagnostic cardiac catheterization, and diagnostic spinal tap.

Private Insurance

Nearly 200 million individuals were privately insured through commercial insurance plans, including employer-sponsored health plans and self-purchased plans.² Eight of the 10 most commonly billed procedures to private insurers remained the same between 1997 and 2003. In 2003, blood transfusions and vaccinations replaced episiotomies and oophorectomies as the most frequent procedures billed to commercial insurers. Six out of 10 procedures billed to private insurers were related to pregnancy and childbirth. After pregnancy- and childbirth-related procedures were excluded, oophorectomy emerged as a top 10 procedure, with about 330,000 billed to private insurers in 2003.

Uninsured

About 45 million Americans had no health insurance in 2003; however, only 5 percent of hospitalized patients were uninsured at the time of discharge from the hospital.² Eight of the most common procedures in uninsured hospitalizations were unchanged since 1997. In 2003, blood transfusions and appendectomies replaced fetal monitoring and CT scans of the head as top 10 procedures. The percentage of hospital stays involving procedures for alcohol and drug rehabilitation/detoxification that were not covered by insurance remained high, at 20 percent in 2003.

Four out of 10 procedures billed to Medicare involved the cardiovascular system.



Six out of 10 stays billed to Medicaid and private insurers involved procedures related to pregnancy and childbirth.



Twenty percent of hospital stays involving procedures for alcohol and drug rehabilitation/detoxification were uninsured.

WHAT PROCEDURES WERE ASSOCIATED WITH THE HIGHEST IN-HOSPITAL MORTALITY?

The procedures involved in hospital stays that resulted in death remained largely unchanged since 1997. As in 1997, hospital stays involving a conversion of cardiac rhythm most commonly ended in in-hospital death; these stays had a 39-percent mortality rate.

HOW DID PATIENT SAFETY INDICATORS CHANGE FROM 1997 TO 2003?

Patient safety indicators identify hospitalizations during which a potentially avoidable safety event occurs. This Fact Book presents comparisons of how U.S. hospitals performed in 2003 versus 1997 on 4 indicators.

- *Complications of anesthesia* remained stable at 8 complications per 10,000 surgical discharges.
- *Postoperative respiratory failure* increased dramatically from 2.3 to 4.6 cases per 1,000 elective-surgery discharges, a 100-percent increase.
- *Postoperative sepsis* increased from 8.5 to 12.5 cases per 1,000 elective-surgery discharges of longer than 3 days, a 46-percent increase.
- *Birth trauma* decreased from 16.1 to 6.5 injuries to neonates per 1,000 live births, a 60-percent decrease.

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Foreword

The mission of the Agency for Healthcare Research and Quality is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. To help fulfill this mission, AHRQ develops a number of databases, including those of the powerful Healthcare Cost and Utilization Project (HCUP). HCUP is a Federal-State-Industry partnership designed to build a standardized, multi-State health data system; HCUP features databases, software tools, and statistical reports to inform policymakers, health system leaders, and researchers.

For data to be useful, they must be disseminated in a timely, accessible way. To meet this objective, AHRQ launched HCUPnet, an interactive, Internet-based tool for identifying, tracking, analyzing, and comparing statistics on hospital utilization, outcomes, and charges (<http://hcup.ahrq.gov/HCUPnet.asp>). The online, menu-driven HCUPnet guides users in tailoring specific queries about hospital care; with a click of a button, users receive answers within seconds.

In addition, AHRQ produces the HCUP Fact Books to highlight statistics about hospital care in an easy-to-use, readily accessible format. Each Fact Book provides information about specific aspects of hospital care—the single largest component of the U.S. health care dollar. These national estimates are benchmarks against which States and others can compare their own data.

This Fact Book provides critical information about hospital procedures for policymakers and researchers interested in improving the quality and efficiency of the U.S. health care system. It is an update to the second HCUP Fact Book, which presented characteristics of hospital procedures in 1997. This report offers insights into characteristics of hospital procedures during 2003 and is useful for researchers interested in understanding how these recent patterns compare with 1997 data. Efforts have been made to retain the general content of the initial *Procedures in U.S. Hospitals, 1997* Fact Book to allow for easy comparison of 1997 with 2003 data.



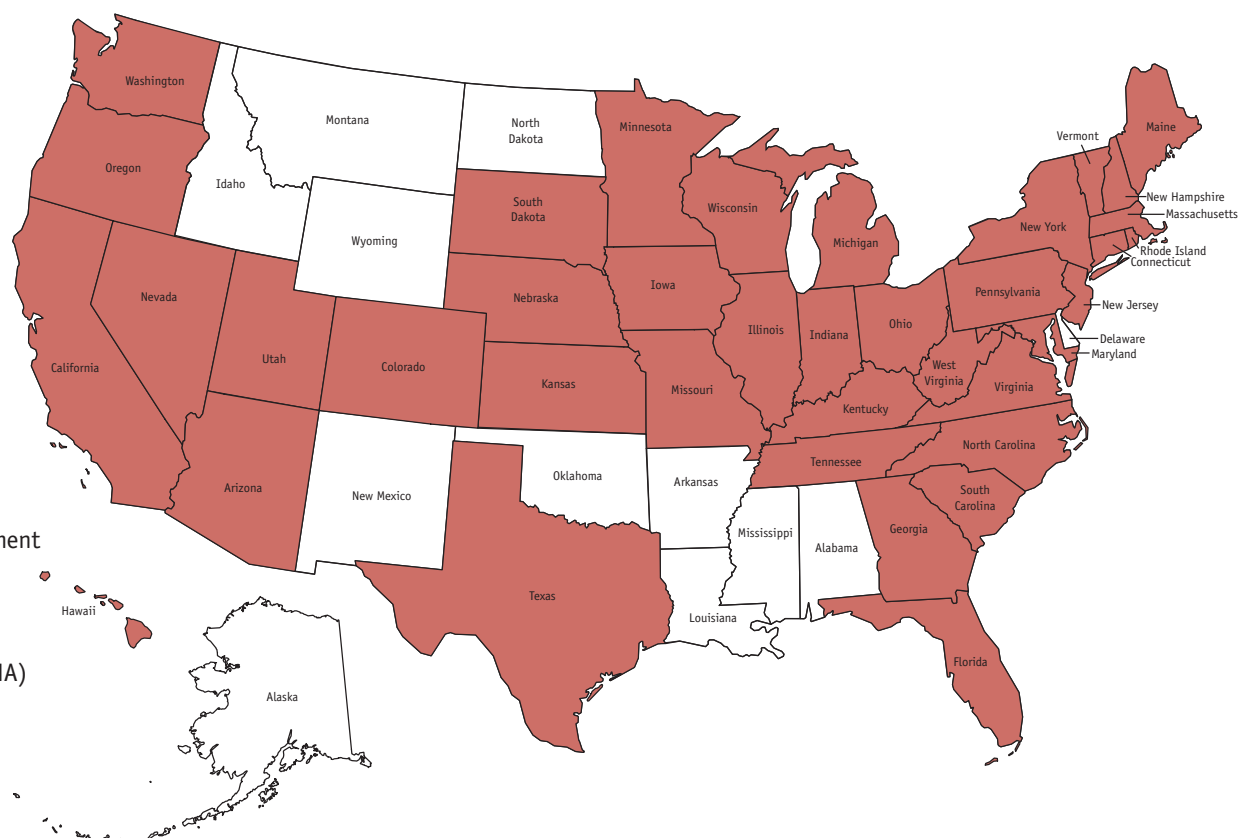
AHRQ welcomes questions and comments from readers of this report who are interested in obtaining more information about hospital procedures in the United States. We also invite you to tell us how you are using this Fact Book and other HCUP data and tools, and to share suggestions on how HCUP products 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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HCUP is based on data collected by individual State Partner organizations (including State departments of health, hospital associations, and private agencies). These organizations provide the data to AHRQ where the data are converted to uniform data products. Without the following Partner organizations, HCUP and the Nationwide Inpatient Sample (NIS) would not be possible:

Arizona Department of Health Services
California Office of Statewide Health Planning & Development
Colorado Health & Hospital Association
Connecticut Integrated Health Information (Chime, Inc.)
Florida Agency for Health Care Administration
Georgia An Association of Hospitals & Health Systems (GHA)
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital & Health Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Department for Public Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Division of Health Care Finance and Policy
Michigan Health & Hospital Association
Minnesota Hospital Association
Missouri Hospital Industry Data Institute
Nebraska Hospital Association
Nevada Nevada Department of Human Resources
New Hampshire Department of Health & Human Services
New Jersey Department of Health and Senior Services
New York State Department of Health
North Carolina Department of Health and Human Services
Ohio Hospital Association



Oregon Association of Hospitals and Health Systems and Office of Oregon Health Policy and Research
Rhode Island Department of Health
Pennsylvania Health Care Cost Containment Council
South Carolina State Budget and Control Board
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 Health Care Authority
Wisconsin Department of Health and Family Services

Introduction

In 1999, AHRQ launched an initiative to provide timely data regarding hospital care in the United States by producing a series of easily accessible Fact Books that summarize several aspects of hospitalizations. The first published Fact Book, *Hospitalization in the United States, 1997*, provided a general overview of hospitalizations. The second Fact Book, *Procedures in U.S. Hospitals, 1997*, provided an overview of the types of procedures being performed in U.S. community hospitals.

Procedures in U.S. Hospitals, 2003 updates the second Fact Book. Similar to the 1997 version, this report draws from the Nationwide Inpatient Sample (NIS), a database maintained by AHRQ, to provide comprehensive information about procedures in U.S. community hospitals. Findings are based on “all-listed” procedures on each HCUP discharge record—and are not limited to the principal procedure code. AHRQ has attempted to maintain the general content of the earlier report to allow easy comparison between 1997 and 2003 information. This report answers these central questions:

- How many procedures did patients receive per hospital stay?
- What were the most common procedures?
- How did procedures vary by body system, age, and gender?
- What share of the Nation’s hospitals were high-volume providers?
- Which procedures were associated with the highest charges and longest lengths of stay?
- Who was billed for hospital care?
- Which procedures were associated with the highest in-hospital mortality?
- How did selected procedure-based patient safety indicators change from 1997 to 2003?



Findings from this report indicate that many aspects of hospitalizations have remained stable since 1997, but there are key exceptions.

The following pages provide a rich depiction of hospital procedures in 2003. Information on data sources and methods are available at the end of this document. An appendix provides descriptive information about specific hospital procedures according to six key characteristics: number of discharges with the procedure, percent of all procedures, percent of discharges with the procedure, mean length of stay for hospitalizations with the specific procedure, mean charges for hospitalizations with the procedure, and in-hospital mortality for hospitalizations with the procedure.

A complete medical dictionary containing terms used in this Fact Book is available at <http://www.nlm.nih.gov/medlineplus/mpldictionary.html>.

Overview of hospitals and hospital procedures in the United States

The following tables and charts provide an overview of the types of U.S. hospitals in 2003 as defined by the American Hospital Association (AHA). The AHA defines community hospitals as all non-Federal, short-term (or acute care), general and specialty hospitals whose facilities and services are available to the public.³ Community hospitals include obstetric-gynecologic, short-term rehabilitation, orthopedic, cancer, pediatric, and non-Federal public hospitals and academic medical centers. This Fact Book presents information pertaining to procedures recorded in hospital discharge records in U.S. community hospitals. Because this report offers comparisons of 1997 with 2003 hospital procedures, information about hospitals in 1997 is also presented.

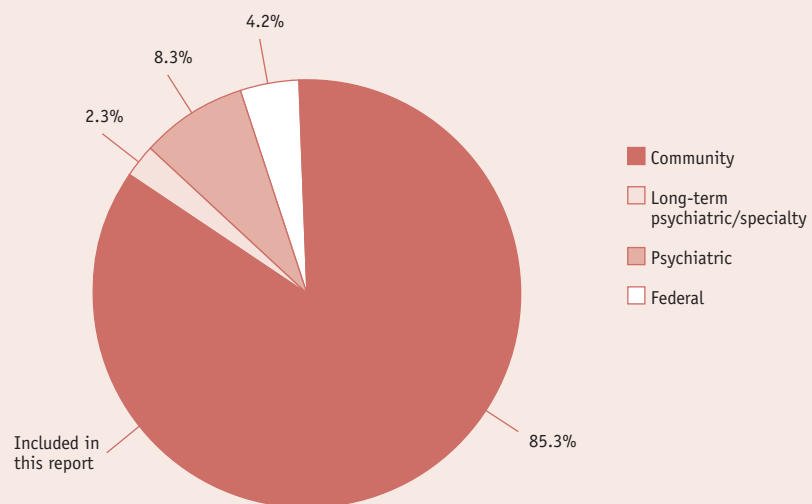
Additionally, national estimates of general characteristics for community hospitals and hospital procedures for 1997 and 2003 follow.



AHA HOSPITAL CATEGORIES	1997	2003
Total number of all U.S. registered hospitals	6,097	5,764
Number of U.S. community hospitals	5,057	4,895
Non-government not-for-profit community hospitals	3,000	2,984
Investor-owned (for-profit) community hospitals	797	790
State and local government community hospitals	1,260	1,121

Source: American Hospital Association.

Types of U.S. Hospitals, 2003



CHARACTERISTICS OF U.S. COMMUNITY HOSPITALS

	1997	2003
Total discharges	34,680,000	38,221,000
Discharges per 100,000 population ^{4,5}	12,720	13,174
Total number of procedures	42,500,000	47,055,000
Average number of procedures per discharge	2.3	2.0
Percent of discharges with at least 1 procedure	61.1	61.2
Total (aggregate) charges ⁶	\$493 billion ^a	\$754 billion
Mean charges per stay	\$14,200	\$19,700
Percentage of discharges by the type of hospital:		
Metropolitan hospitals	84.1	84.8
Teaching hospitals	46.6	44.2
Non-Federal hospitals	13.8	11.8
Private not-for-profit hospitals	74.6	77.8
Private for-profit hospitals	11.5	10.5

^aInformation presented for 1997 charges has been adjusted for inflation; figures are presented in 2003 dollars.

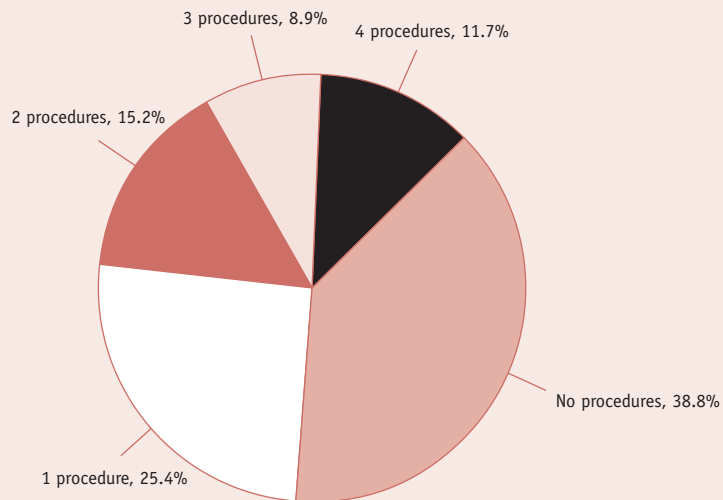
Source: HCUP Nationwide Inpatient Sample.

How many procedures did patients receive per hospital stay?

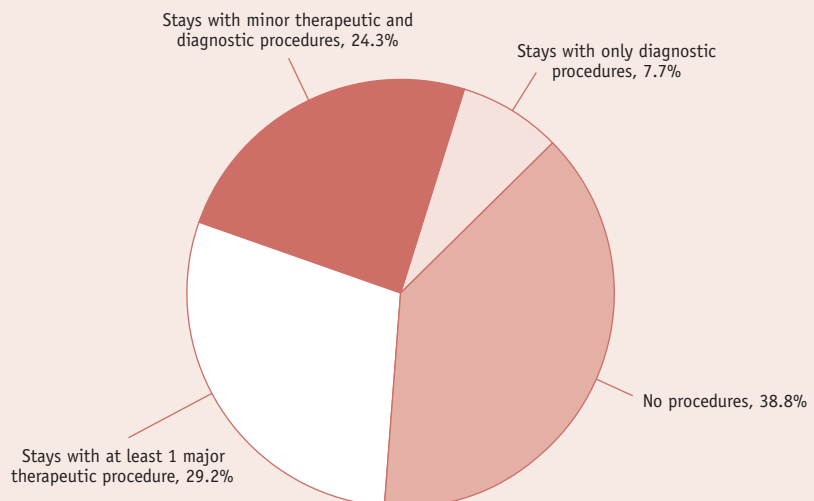


- In 2003, U.S. hospitals reported more than 38 million hospital stays; over 60 percent of these stays involved at least 1 hospital procedure. More than 47 million hospital procedures were performed, with patients receiving an average of 2 procedures during their inpatient stay.
 - Nearly 40 percent of patients did not receive a procedure during their hospitalization. This situation occurred most commonly among newborn infants or medical patients. The category “medical patients” includes individuals with conditions such as pneumonia, congestive heart failure, depression, and chronic obstructive pulmonary disease, who are hospitalized for medical (versus surgical) reasons, such as stabilization, medication, and observation.
 - Approximately 20 percent of hospitalizations involved 3 or more procedures.
- Procedures can be classified into 1 of 4 broad categories: minor diagnostic, minor therapeutic, major diagnostic, and major therapeutic. About 30 percent of hospital stays involved at least 1 major therapeutic procedure, while another 24 percent included minor therapeutic and diagnostic procedures.
 - Eight percent of stays included only diagnostic procedures.

How Many Procedures Did Patients Receive per Hospital Stay?



Types of Procedures Performed During Hospital Stays: Therapeutic Versus Diagnostic



What were the most common procedures?

- Overall, little change occurred in the top 10 procedures performed in U.S. hospitals since 1997—9 of the top 10 procedures remained the same. In 2003, vaccinations were added to this list, replacing episiotomies as a top 10 procedure.
- Many pregnancy- and childbirth-related procedures were among the most common procedures. These included procedures to assist delivery, repair of current obstetric laceration, circumcision, cesarean section (C-section), and fetal monitoring.
- A 33-percent increase in C-sections was observed since 1997. Simultaneously, hospitals experienced a 41-percent decrease in episiotomies from 1997 to 2003.

ALL-LISTED PROCEDURES, 2003	TOTAL NUMBER OF DISCHARGES IN THIS PROCEDURE CATEGORY (in thousands)	PERCENTAGE OF DISCHARGES IN THIS PROCEDURE CATEGORY
1. Blood transfusion	1,977	5.2
2. Medical induction, manually assisted delivery, and other procedures to assist delivery	1,946	5.1
3. Diagnostic cardiac catheterization, coronary arteriography	1,717	4.5
4. Repair of current obstetric laceration	1,261	3.3
5. Upper gastrointestinal endoscopy, biopsy	1,242	3.3
6. Circumcision	1,195	3.1
7. Cesarean section	1,171	3.1
8. Respiratory intubation and mechanical ventilation	1,128	3.0
9. Fetal monitoring	913	2.4
10. Prophylactic vaccinations and inoculations	857	2.2

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

- As reported in *Hospitalizations in the United States, 2002*, cardiovascular diseases continued to be a common reason for hospitalization. Five of the top 10 conditions for hospitalization related to the heart: coronary atherosclerosis (hardening of the heart arteries and other heart disease), congestive heart failure, chest pain, heart attack, and irregular heart beat.
- Once pregnancy- and childbirth-related procedures were excluded, 3 of the 10 most common procedures in 2003 were related to the cardiovascular system: diagnostic cardiac catheterization, PTCA, and echocardiogram.
- Overall, cardiovascular procedures increased in frequency; however, CABG and extracorporeal circulation auxiliary to open heart procedures each decreased by 19 percent since 1997.

- In 2003, blood transfusions were performed in 5 percent of discharges, representing nearly 2 million hospitalizations. This reflects a 64-percent increase in the percentage of blood transfusions performed from 1997, when these procedures occurred in over 1 million hospitalizations and represented only 3 percent of discharges.
- One of the most common non-pregnancy-related procedures in 2003 is performed only on women: hysterectomy. Most hysterectomies were performed for non-cancerous conditions, such as fibroid tumors, endometriosis, and menstrual disorders.

ALL-LISTED PROCEDURES
(EXCLUDING PREGNANCY- AND CHILDBIRTH-RELATED PROCEDURES), 2003

TOTAL NUMBER OF DISCHARGES IN THIS
PROCEDURE CATEGORY (in thousands)

PERCENTAGE OF DISCHARGES IN THIS
PROCEDURE CATEGORY

1. Blood transfusion

1,920

5.0

2. Diagnostic cardiac catheterization, coronary arteriography

1,715

4.5

3. Upper gastrointestinal endoscopy, biopsy

1,240

3.2

4. Respiratory intubation and mechanical ventilation

996

2.6

5. Percutaneous coronary angioplasty (PTCA)

800

2.1

6. Hemodialysis

660

1.7

7. Diagnostic ultrasound of heart (echocardiogram)

645

1.7

8. Colonoscopy and biopsy

635

1.7

9. Hysterectomy, abdominal and vaginal

597

1.6

10. Laminectomy, excision intervertebral disc

505

1.3

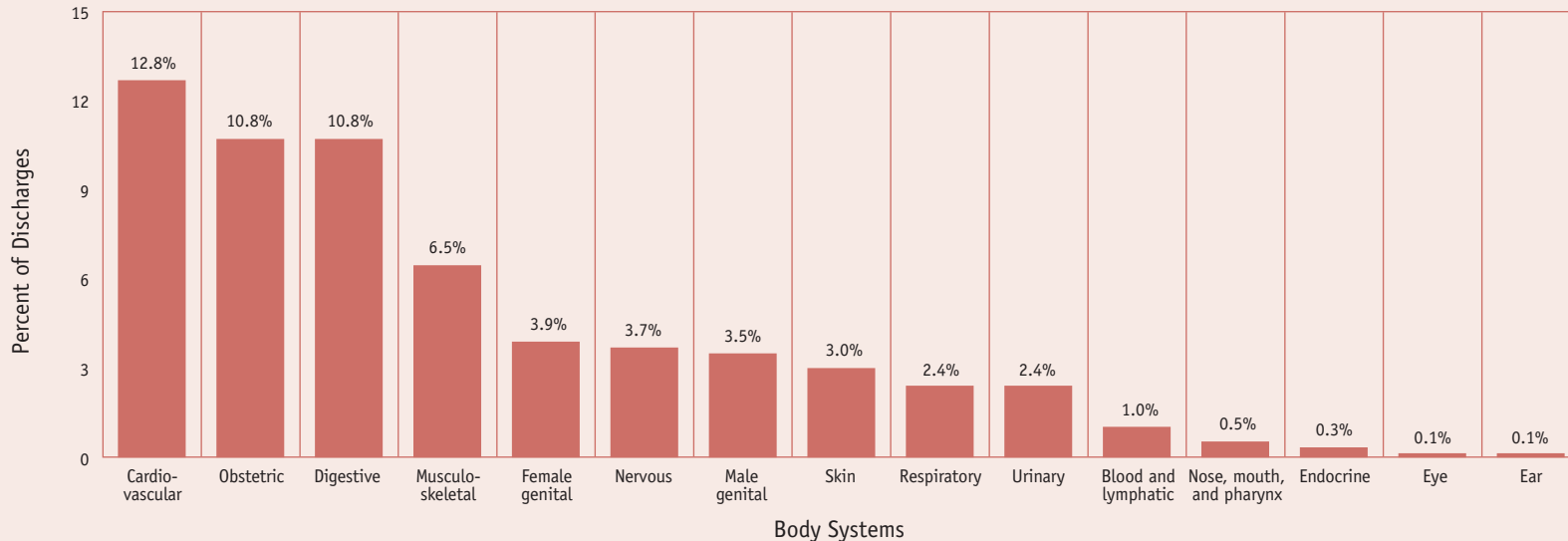
Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

What types of procedures did patients receive, by body system?

- Procedures classified by body system¹ remained relatively stable since 1997: cardiovascular, obstetrical, and digestive procedures continued to be performed most frequently.
- Cardiovascular procedures were performed during 13 percent of hospital stays. This reflects a slight increase from 1997, when these procedures were performed in about 11 percent of hospitalizations.
- Obstetric and digestive procedures each continued to be performed in about 1 in 11 hospital stays.

¹Information regarding procedures by body systems is based on groupings of Clinical Classifications Software (CCS) categories.

What Types of Procedures Did Patients Receive, by Body System?



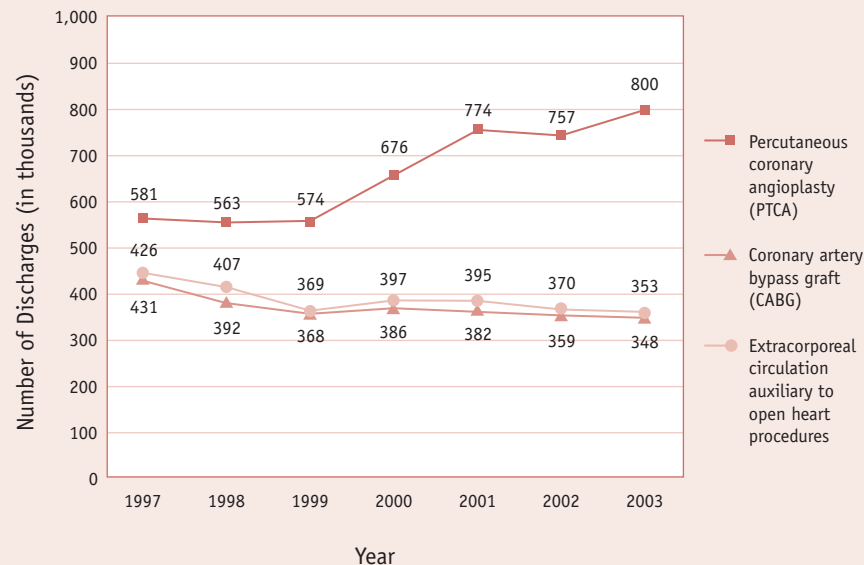
Note: Miscellaneous minor diagnostic and therapeutic procedures are excluded. Patients can have procedures in multiple systems; thus, the sum of the percentages does not equal 100.

Three body systems accounted for the largest number of hospital procedures: cardiovascular, obstetric, and digestive procedures. Within each of these systems, patterns of specific procedure use changed over time.

Cardiovascular Procedures

- Since 1997, high-volume cardiac procedures, such as PTCA, were performed more frequently during U.S. hospital stays. However, 2 cardiac procedures were performed much less often in 2003: CABG and extracorporeal circulation auxiliary to open heart procedures.

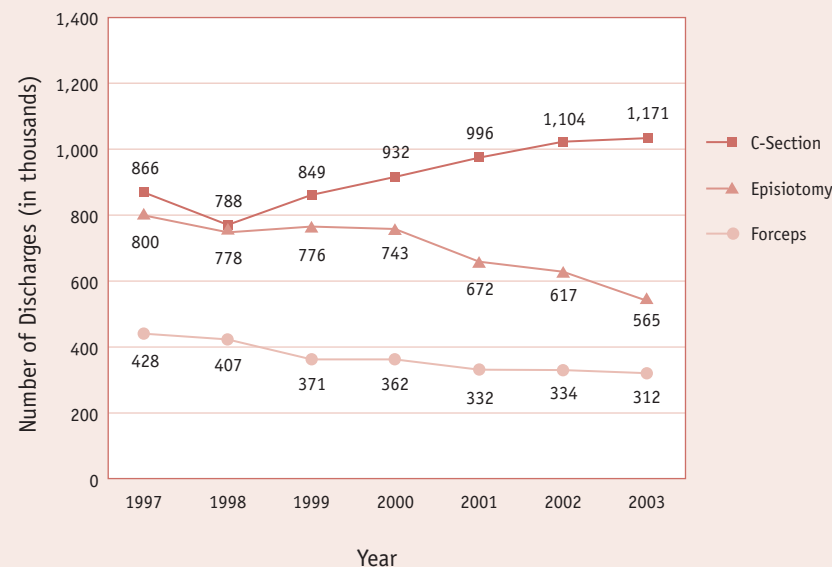
Cardiovascular Procedures, 1997–2003



Obstetric Procedures

- Between 1997 and 2003, the volume of C-sections increased by 46 percent while the volume of episiotomies decreased by 35 percent.
- The frequency of forceps procedures decreased by more than 27 percent during this same period.

Obstetric Procedures, 1997–2003

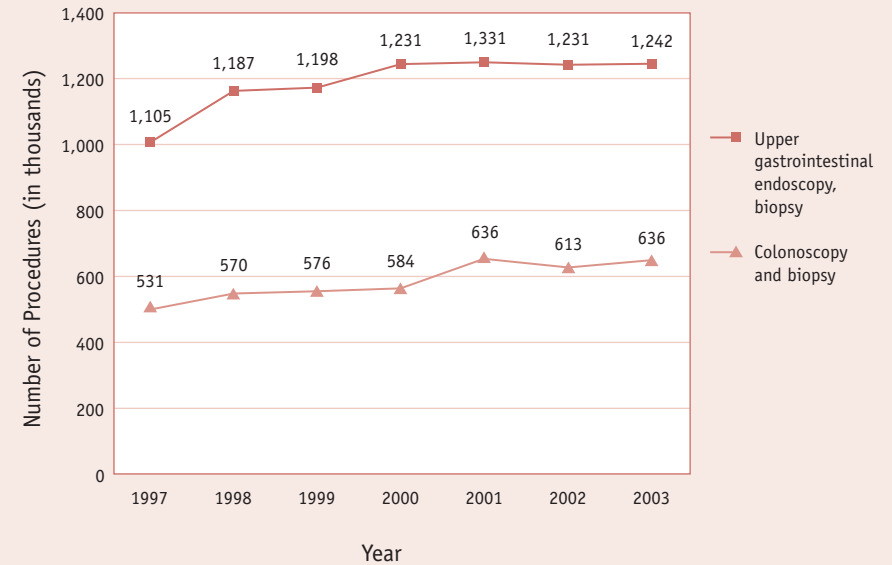


Common Procedures

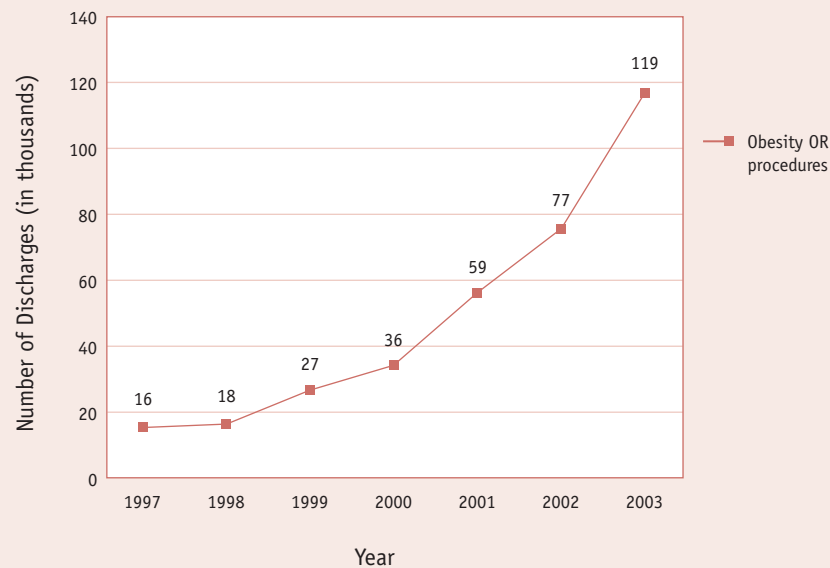
Digestive Procedures

- The digestive procedures reflecting the greatest increase since 1997 were colonoscopies and upper GI endoscopies; these increased by 20 percent and 12 percent, respectively.
- Obesity-related operating room (OR) procedures, such as gastric bypass surgeries, increased by 645 percent since 1997 (based on Diagnosis Related Group [DRG] code 288).

Digestive Procedures, 1997–2003



Obesity Operating Room Procedures, 1997–2003



What were the most common medical and surgical procedures for various age groups?

- In 2003, blood transfusions were among the top 10 procedures performed in all age groups, occurring in 77 percent more hospitalizations than in 1997. During this 7-year period, the number of transfusions for patients 45 to 64 years of age nearly doubled. The largest increase in the percentage of hospital stays involving a blood transfusion—nearly 70 percent—occurred for individuals age 65 and older. This increase in transfusions was accompanied by a 78-percent increase in the number of hospitalizations for anemia in 2003.
- Similar to the pattern in 1997, respiratory intubation was also among the top 10 procedures for all age groups. But unlike blood transfusions, the number of intubations decreased over the 7-year period for each age group.
- The 2 most common procedures for children under 1 year of age remained the same in 2003: circumcisions and vaccinations. Circumcisions continued to be performed on 1.2 million infant

boys. Vaccinations continued to be the second most common procedure with a 40-percent increase in the percentage of inpatient vaccinations performed in young children across the 7-year period. The vast majority of these consisted of hepatitis B vaccines given to infants at birth.

- Similar to 1997, appendectomy was the most common procedure for children ages 1–17; it was performed in 5 percent of all hospitalizations in this age group. Other top procedures included diagnostic spinal taps, blood transfusions, cancer chemotherapy, and respiratory intubation.
- When obstetrical procedures were included, 44 percent of procedures performed on all patients 18 to 44 years of age were related to pregnancy and childbirth (data not shown).
- After pregnancy- and childbirth-related procedures were excluded, hysterectomy emerged as the most common procedure and accounted for 5 percent of hospitalizations for patients ages 18–44, while oophorectomy accounted for another 3 percent. The percentage of cholecystectomies performed as inpatient procedures for this age group remained about the same, despite the move toward laparoscopic cholecystectomies that are often performed in outpatient settings.
- Three of the top 10 procedures for individuals ages 45–64 involved the cardiovascular system: diagnostic cardiac catheterization, PTCA, and echocardiogram.
- In 2003, several heart-related procedures continued to be among the most frequent procedures performed on patients ages 65–79: diagnostic cardiac catheterization, PTCA, echocardiogram, and CABG.
- For individuals 80 years of age and older, 3 diagnostic procedures were among the top 10 most frequent procedures, comprising 12 percent of procedures in this age group: upper GI endoscopy, diagnostic cardiac catheterization, and echocardiogram. Cardiovascular procedures were performed in another 9 percent of hospitalizations.

Gender and Age Characteristics

ALL-LISTED PROCEDURES BY AGE GROUP (EXCLUDING PREGNANCY- AND CHILDBIRTH-RELATED PROCEDURES), 2003	AGE GROUP					
	< 1 YEAR	1-17 YEARS	18-44 YEARS	45-64 YEARS	65-79 YEARS	80+ YEARS
NUMBER OF ALL-LISTED PROCEDURES, IN THOUSANDS (percentage of discharges with this procedure)						
Circumcision	1,190 (25.3)					
Prophylactic vaccinations and inoculations	814 (17.3)					
Hearing examinations	431 (9.1)					
Respiratory intubation and mechanical ventilation	169 (3.6)	34 (2.1)	138 (2.5)	282 (3.4)	319 (4.1)	181 (3.4)
Diagnostic spinal tap	101 (2.2)	46 (2.8)				
Enteral and parenteral nutrition	85 (1.8)	17 (1.1)				
Blood transfusion	35 (0.7)	41 (2.5)	203 (3.6)	492 (5.9)	666 (8.5)	501 (9.4)
Diagnostic ultrasound of heart (echocardiogram)	21 (0.4)			193 (2.3)	227 (2.9)	145 (2.7)
Diagnostic ultrasound of head and neck	14 (0.3)					
Tracheoscopy and laryngoscopy with biopsy	13 (.3)					
Appendectomy		82 (5.0)	170 (3.0)			
Cancer chemotherapy		35 (2.1)				
Treatment, fracture or dislocation of hip and femur		20 (1.3)				132 (2.5)
Treatment, fracture or dislocation of lower extremity (other than hip or femur)		19 (1.1)				
Upper gastrointestinal endoscopy, biopsy		16 (1.0)	179 (3.2)	350 (4.2)	401 (5.1)	290 (5.4)
Tonsillectomy and/or adenoidectomy		16 (1.0)				
Hysterectomy, abdominal and vaginal			294 (5.2)	249 (3.0)		
Alcohol and drug rehabilitation/detoxification			181 (3.2)			
Oophorectomy, unilateral and bilateral			179 (3.2)	221 (2.7)		
Laminectomy, excision intervertebral disc			156 (2.8)	217 (2.6)		
Cholecystectomy and common duct exploration			150 (2.7)			
Diagnostic cardiac catheterization, coronary arteriography			127 (2.3)	730 (8.8)	658 (8.3)	194 (3.6)
Percutaneous coronary angioplasty (PTCA)				353 (4.2)	312 (4.0)	

ALL-LISTED PROCEDURES BY AGE GROUP

(EXCLUDING PREGNANCY- AND CHILDBIRTH-RELATED PROCEDURES), 2003

AGE GROUP

< 1 YEAR 1-17 YEARS 18-44 YEARS 45-64 YEARS 65-79 YEARS 80+ YEARS

NUMBER OF ALL-LISTED PROCEDURES, IN THOUSANDS
(percentage of discharges with this procedure)

	< 1 YEAR	1-17 YEARS	18-44 YEARS	45-64 YEARS	65-79 YEARS	80+ YEARS
Hemodialysis				243 (2.9)	235 (3.0)	
Colonoscopy and biopsy					219 (2.8)	163 (3.0)
Arthroplasty knee					208 (2.6)	
Coronary artery bypass graft (CABG)					162 (2.1)	
Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator						118 (2.2)
Hip replacement, total and partial						103 (1.9)
Physical therapy exercises, manipulation, and other procedures						100 (1.9)

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.



How did procedures received by males and females compare?

- On average, women and men received an equal number of procedures: 2 per hospital stay.
- Excluding procedures related to pregnancy and childbirth, 7 of the top 10 procedures were the same for males and females. Of the 3 remaining, the most common procedures for women included cholecystectomy (removal of gall bladder) and 2 operations of the female reproductive system (hysterectomies and oophorectomies).
- Three of the most common procedures received by males that were received less frequently by females included laminectomy (back surgery) and 2 cardiovascular procedures (PTCA and CABG).
- Although the prevalence of colon cancer is equal in women and men, nearly 60 percent of the 636,000 in-hospital colonoscopies performed in 2003 were for women.



Gender and Age Characteristics

ALL-LISTED PROCEDURES (EXCLUDING PREGNANCY- AND CHILDBIRTH-RELATED PROCEDURES), 2003	TOTAL NUMBER OF MALE DISCHARGES IN THIS PROCEDURE CATEGORY, IN THOUSANDS (percentage of all male discharges)	TOTAL NUMBER OF FEMALE DISCHARGES IN THIS PROCEDURE CATEGORY, IN THOUSANDS (percentage of all female discharges)
Diagnostic cardiac catheterization, coronary arteriography	1,034 (7.7)	681 (4.3)
Blood transfusion	834 (6.2)	1,085 (6.8)
Upper gastrointestinal endoscopy, biopsy	555 (4.1)	684 (4.3)
Percutaneous coronary angioplasty (PTCA)	526 (3.9)	
Respiratory intubation and mechanical ventilation	525 (3.9)	470 (3.0)
Hemodialysis	335 (2.5)	325 (2.0)
Diagnostic ultrasound of heart (echocardiogram)	320 (2.4)	324 (2.0)
Colonoscopy and biopsy	256 (1.9)	379 (2.4)
Laminectomy, excision intervertebral disc	253 (1.9)	
Coronary artery bypass graft (CABG)	245 (1.8)	
Hysterectomy, abdominal and vaginal		596 (3.7)
Oophorectomy, unilateral and bilateral		458 (2.9)
Cholecystectomy and common duct exploration		304 (1.9)

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

What share of the Nation's hospitals were high-volume providers for specific procedures?



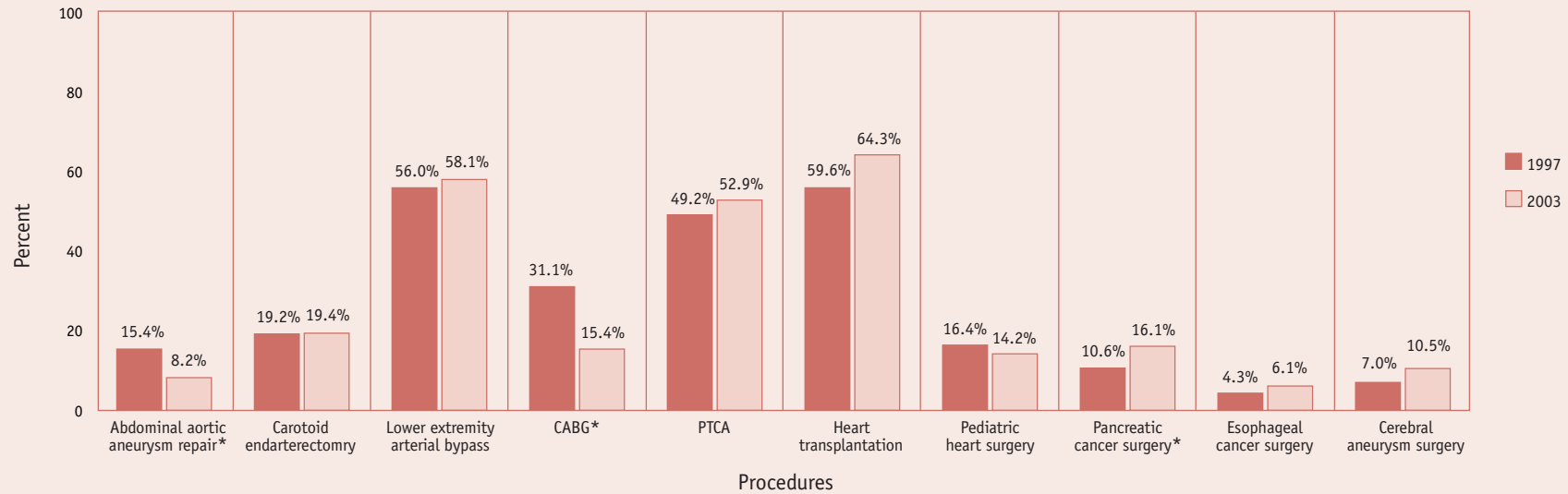
Research suggests that the outcomes of certain procedures are related to the number performed in a given hospital.ⁱ These procedures often require high-technology support, but the exact nature of this “volume-to-outcome” relationship is not well understood.

Procedures in U.S. Hospitals, 1997 (HCUP Fact Book No. 2) provided data on the Nation's share of hospitals that are high-volume providers for the 10 procedures for which this volume-outcome relationship has been shown.ⁱⁱ This Fact Book updates those statistics with 2003 data.

- For 7 of the 10 procedures, the percentage of hospitals that were considered high-volume providers did not change significantly from 1997. The percentage of hospitals considered high-volume providers decreased for CABG and abdominal aortic aneurysm and increased for pancreatic cancer.
- The largest decrease since 1997 in the percentage of hospitals serving as high-volume providers was for CABG—from 31 percent to 15 percent.
- Pancreatic surgery was the only procedure for which there was an increase in the percentage of hospitals that were considered high-volume providers.
- More than half of the hospitals that performed the following procedures continued to be high-volume providers: heart transplantation (64 percent), lower extremity arterial bypass (58 percent), and coronary angioplasty (53 percent).
- For 7 procedures, fewer than 20 percent of hospitals were high-volume providers in 2003.

ⁱⁱ See the Methods section for high-volume thresholds for each procedure.

Percentage of Hospitals That Were High-Volume Providers for Specific Procedures, 1997–2003



*Asterisk denotes a statistically significant difference between 1997 and 2003 data.



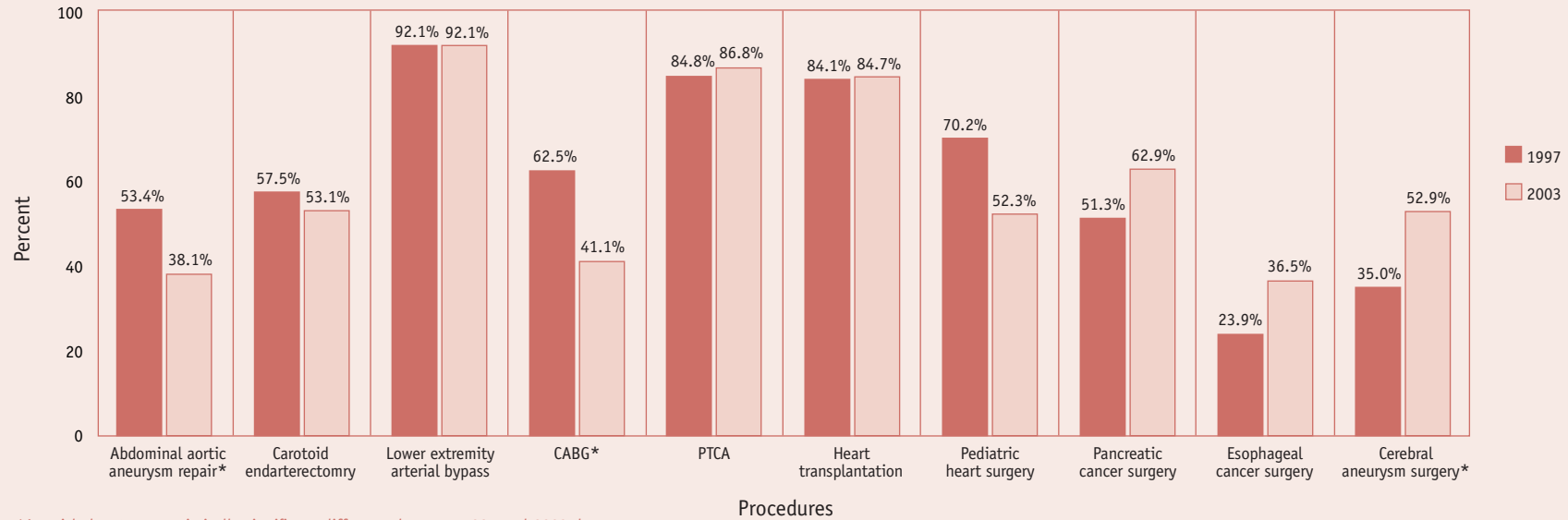
What share of patients received procedures in high-volume hospitals?



- For 7 of the 10 procedures, the percentage of patients receiving procedures in high-volume hospitals did not change significantly from 1997.
- The percentage of patients receiving procedures for cerebral aneurysms in high-volume hospitals increased by 51 percent—from 35 to 53 percent.
- Conversely, the percentage of patients receiving procedures in high-volume hospitals decreased the most for those undergoing a CABG—from 63 to 41 percent. In 2003, about 45,000 more patients nationwide had a CABG in a low-volume hospital, as compared to 1997.
- The percentage of patients undergoing an abdominal aortic aneurysm repair procedure also decreased by 29 percent during this time period.

- In 2003, more than 92 percent of patients continued to receive lower extremity arterial bypasses and 87 percent of patients underwent PTCAs in high-volume hospitals.
- The percentage of patients receiving heart transplants in high-volume hospitals in 2003 was just over 84 percent, as was the case in 1997.
- Over half of all carotid endarterectomies continued to be performed in high-volume hospitals.

Percent of Specific Procedures Performed at High-Volume Hospitals, 1997–2003



*Asterisk denotes a statistically significant difference between 1997 and 2003 data.



What procedures were associated with the highest hospital charges?

Hospital charges are the amount the hospital bills for the entire inpatient stay and do not include most professional (physician) fees. Charges represent what the hospital billed for the case, rather than the amount actually reimbursed.

It is important to note that charges reflect the total hospital charge for a hospitalization, not the charge for a particular procedure. Thus, a relatively inexpensive procedure can be associated with an expensive hospital stay if the stay itself is long and complicated. For example, procedures such as tracheostomy and Swan-Ganz catheterization are not inherently costly to perform, but they are generally performed on individuals with a critical illness who have extended stays in intensive care units.

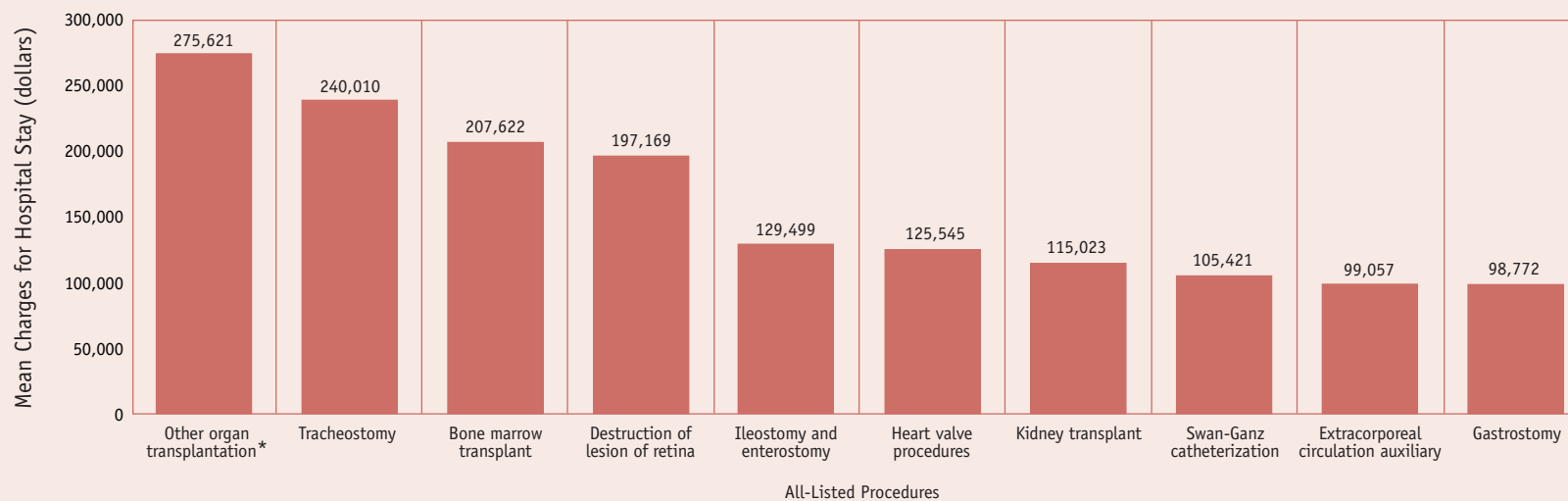


- After adjusting for inflation,⁶ the average charge for a hospital stay increased by 39 percent between 1997 and 2003, from \$14,200 to \$19,700.
- Three of the top 10 procedures associated with the most expensive hospital stays were related to transplantation: bone marrow, kidney, and other organ transplants. This final category included transplants of the lung, heart, spleen, intestine, liver, and pancreas.
- Three of the 10 most expensive stays involved procedures of the cardiovascular system: heart valve procedures, Swan-Ganz catheterization, and extracorporeal circulation auxiliary to open heart procedures.

- In both 1997 and 2003, hospital charges were highest for stays involving organ transplantations of the pancreas, liver, intestine, heart, and lung. The mean charge associated with a hospital stay that included these five transplants was \$275,600 (a 17-percent increase from 1997, after adjusting for inflation). Hospital stays in which a tracheostomy was performed were nearly as expensive, with a mean charge of \$240,000 (a 23-percent increase from 1997, after adjusting for inflation).
- Two new procedures, extracorporeal circulation auxiliary to open heart procedures and gastrostomy, were associated with the top 10 most expensive stays in 2003. The mean charges for these procedures were \$99,100 and \$98,800, respectively.
- The costliest hospitalizations were not very common. Collectively, the 10 most expensive hospital stays represented less than 3 percent of all discharges.



Procedures Associated With Most Costly Hospital Stays



Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure.

**Other organ transplantation" includes transplants of the lung, heart, spleen, intestine, liver, and pancreas. This category excludes kidney, bone, corneal, and bone marrow transplants.

Which procedures were associated with the longest hospital stays?



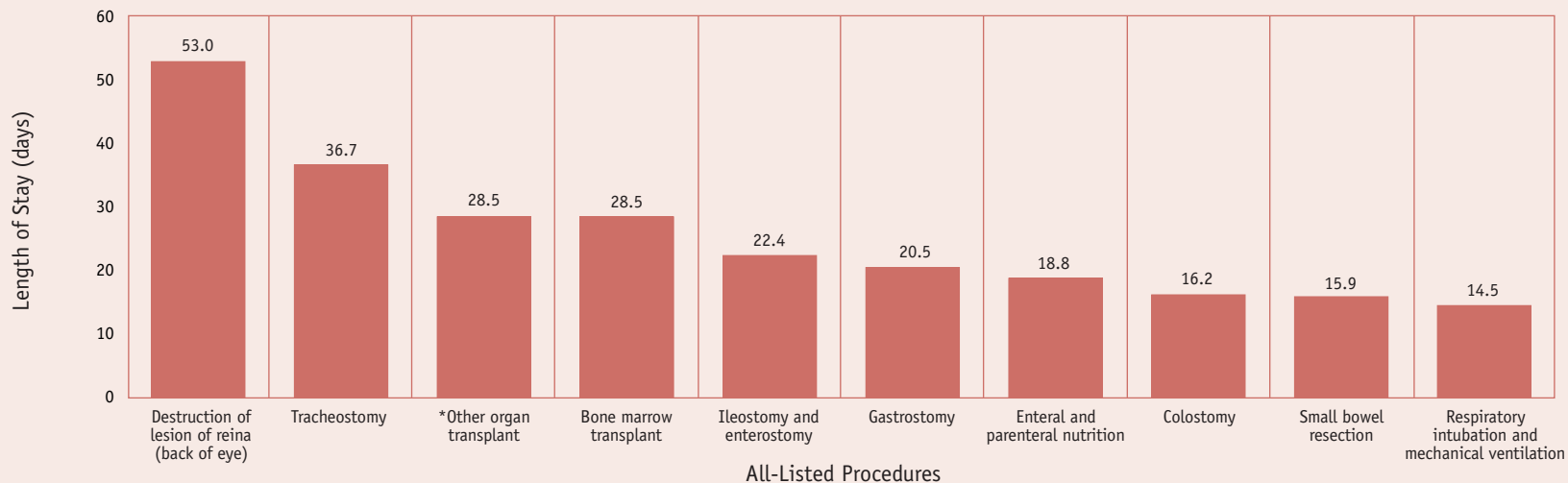
Hospital lengths of stay indicate the number of nights a patient remained in the hospital for a particular stay.

- The average length of stay for a hospitalization was 5 days.
- Hospitalizations during which destruction of lesion of retina was performed had the longest lengths of stay—53 days—representing a 115-percent increase from 1997. This relatively inexpensive procedure is generally performed during long and complicated stays for premature infants and is used to treat retinopathy of prematurity.
- In 1997, the longest length of stay was for hospitalizations during which a tracheostomy was performed, at 37 days. Tracheostomies continued to have a mean length of stay of 37 days.
- Hospital stays that involved bone marrow and other organ transplantationsⁱⁱⁱ continued to be associated with some of the longest hospital stays.

- Other procedures associated with long hospital stays are indicative of patients with serious chronic illnesses. Ileostomy, gastrostomy, and enteral and parenteral nutrition are performed for very ill patients requiring extensive care.
- Six of the procedures performed during the most costly hospital stays were also among those associated with the longest hospitalizations: destruction of lesion of retina, tracheostomy, other organ transplant, bone marrow transplant, ileostomy, and gastrostomy.
- Collectively, the 10 conditions with the longest lengths of stay represented fewer than 6 percent of all discharges.

ⁱⁱⁱ “Other organ transplantation” includes transplants of the lung, heart, spleen, intestine, liver, and pancreas. This category excludes kidney, bone, corneal, and bone marrow transplants.

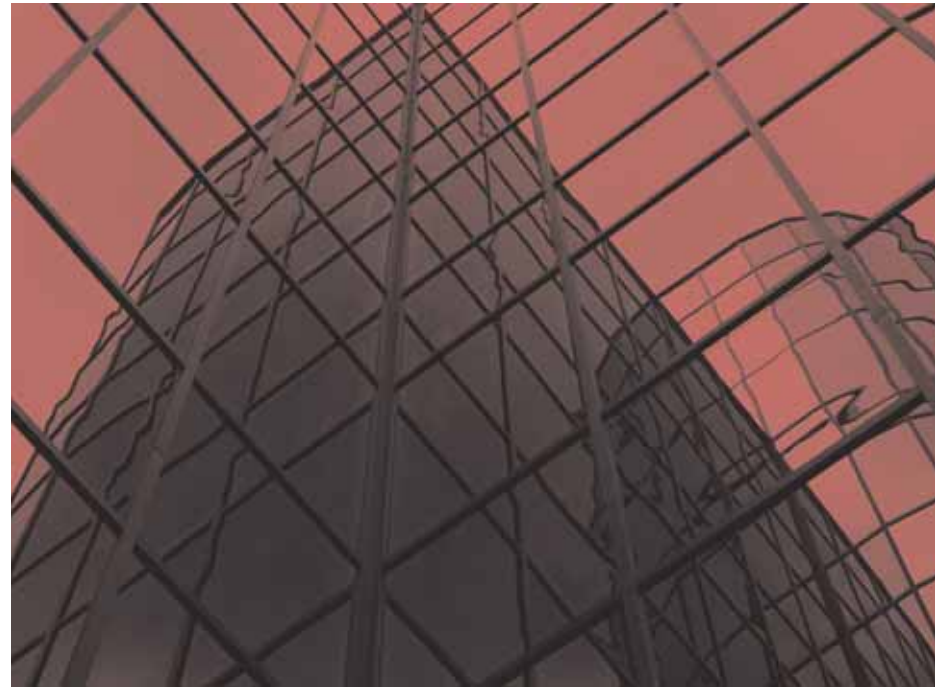
Procedures Associated With the Longest Hospital Stays



Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.
 **Other organ transplantation" includes transplants of the lung, heart, spleen, intestine, liver, and pancreas. This category excludes kidney, bone, corneal, and bone marrow transplants.



Who was billed for hospital care?



Payer data reflect the expected payer for a hospital stay. It is important to note that in the inpatient hospital setting, payers are not billed for specific procedures; rather, they are billed for a patient's full hospital stay, often based on the diagnosis related group (DRG). The DRG assignment reflects the expected consumption of hospital resources based on characteristics of each stay, such as diagnoses, procedures, age of patient, and presence of complications or comorbidities.

Payer information is presented in the following general payer categories:

- Medicare—Fee-for-service and managed care Medicare patients.
- Medicaid—Fee-for-service and managed care Medicaid patients.
- Private insurance—Blue Cross, commercial carriers, private health maintenance organizations (HMOs), and preferred provider organizations (PPOs).

- Uninsured—Insurance status of “self-pay” and “no charge.”
- Other—Workers' Compensation, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Title V, and other government programs.

Together, Medicare and Medicaid are billed for more than half (58 percent) of all hospitalizations. Private insurers are billed for 35 percent while uninsured hospitalizations account for about 5 percent of hospital stays. The remaining 3 percent of hospitalizations are billed to other insurers or the expected payer cannot be determined.

Medicare

- Medicare continues to be billed for 34 percent of all hospitalizations, with a mean charge of \$24,900.
- About 40 million individuals, or 14 percent of the U.S. population, were covered by Medicare in 2003.²
- Eight of the 10 procedures most commonly billed to Medicare remained the same from 1997 to 2003. Two new additions included procedures related to cardiac pacemaker and arthroplasty of the knee. These replaced CT scan of the head and physical therapy as top 10 procedures.

- Of hospitalizations billed to Medicare, 4 of the top 10 procedures involved the cardiovascular system. Medicare was billed for one-half to three-fourths of all hospital stays involving these cardiovascular procedures: diagnostic cardiac catheterizations, PTCA, echocardiogram, and procedures related to cardiac pacemaker or cardioverter/defibrillator.
- The percentage of hospital stays involving dialysis billed to Medicare remained about the same (65 percent in 1997 and 63 percent in 2003). These high figures are indicative of the fact that patients with end-stage renal disease are covered by Medicare, regardless of the patient's age.
- In 2003, blood transfusions surpassed diagnostic cardiac catheterizations as the most common procedures performed during stays billed to Medicare.

ALL-LISTED PROCEDURES, 2003	NUMBER OF DISCHARGES (in thousands)	MEDICARE'S SHARE OF ALL HOSPITAL STAYS (percentage)
All Medicare discharges	13,136	34.4
	TOTAL NUMBER OF DISCHARGES IN THIS PROCEDURE CATEGORY (in thousands)	MEDICARE'S SHARE OF ALL HOSPITAL STAYS FOR THIS PROCEDURE (percentage)
1. Blood transfusion	1,107	56.0
2. Diagnostic cardiac catheterization, coronary, arteriography	854	49.8
3. Upper gastrointestinal endoscopy, biopsy	670	53.9
4. Respiratory intubation and mechanical ventilation	494	43.8
5. Hemodialysis	416	62.9
6. Percutaneous coronary angioplasty (PTCA)	400	50.0
7. Colonoscopy and biopsy	362	56.9
8. Diagnostic ultrasound of heart (echocardiogram)	353	53.5
9. Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	264	73.6
10. Arthroplasty knee	249	57.5

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

Medicaid

- Medicaid was billed for 23 percent of all hospitalizations in 2003—slightly more than in 1997, when Medicaid was billed for 20 percent. The mean charge for Medicaid hospital stays was \$16,700.
- About 36 million individuals were covered by Medicaid in 2003; this figure represents 12 percent of the U.S. population.²
- Nine of the top 10 procedures billed to Medicaid did not change since 1997. The only exception was hearing examinations, which replaced episiotomies as a top 10 procedure in 2003.
- Six pregnancy- and childbirth-related procedures appeared among the top 10 procedures billed to Medicaid in 2003: medical procedures to assist delivery, C-section, repair of current obstetric laceration, circumcision, fetal monitoring, and artificial rupture of

membranes to assist delivery. This list is similar to 1997, with the exception of episiotomy dropping out of the top 10. A seventh procedure—vaccinations—was also predominantly performed on newborns. After these pregnancy- and childbirth-related procedures (including vaccinations) were excluded, blood transfusion was the most common procedure billed to Medicaid.

- When pregnancy- and childbirth-related procedures were excluded, 3 additional diagnostic procedures entered the top 10 procedures billed to Medicaid: upper GI endoscopy, diagnostic cardiac catheterization, and diagnostic spinal tap (data not shown).

ALL-LISTED PROCEDURES, 2003	NUMBER OF DISCHARGES (in thousands)	MEDICAID'S SHARE OF ALL HOSPITAL STAYS (percentage)
All Medicaid discharges	8,954	23.4
	TOTAL NUMBER OF DISCHARGES IN THIS PROCEDURE CATEGORY (in thousands)	MEDICAID'S SHARE OF ALL HOSPITAL STAYS FOR THIS PROCEDURE (percentage)
1. Medical induction, manually assisted delivery, and other procedures to assist delivery	855	43.9
2. Cesarean section	457	39.0
3. Repair of current obstetric laceration	455	36.1
4. Prophylactic vaccinations and inoculations	400	46.6
5. Circumcision	371	31.0
6. Fetal monitoring	361	39.5
7. Blood transfusion	344	17.4
8. Artificial rupture of membranes to assist delivery	321	39.8
9. Respiratory intubation and mechanical ventilation	269	23.9
10. Hearing examinations	203	46.9

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

Private Insurance

- Private insurance was billed for 35 percent of all hospitalizations, which is comparable to the 1997 figure of 37 percent. The mean charge for privately insured hospital stays was \$16,900.
- Nearly 200 million individuals, or 69 percent of the U.S. population, were covered by private insurers in 2003.²
- Eight of the 10 procedures most commonly billed to private insurers remained the same from 1997 to 2003. In 2003, blood transfusions and vaccinations replaced episiotomies and oophorectomies as top 10 procedures billed to commercial insurers.
- Of hospitalizations billed to private insurers, 6 of the top 10 procedures were for pregnancy- and childbirth-related procedures: procedures to assist delivery, circumcision, repair of current obstetric laceration, C-section, fetal monitoring, and artificial rupture of

membranes to assist delivery. A seventh procedure—vaccinations—was also performed mainly on newborns. These are the same pregnancy- and childbirth-related procedures that were commonly billed to Medicaid.

- Similar to 1997, nearly three-fourths of hysterectomies were billed to private insurers.
- Private insurers continued to be billed for just over one-third of hospital stays in which diagnostic catheterizations were performed.
- After pregnancy- and childbirth-related procedures were excluded, oophorectomy became a top 10 procedure in 2003, with about 330,000 procedures billed to private insurers (data not shown).

ALL-LISTED PROCEDURES, 2003	NUMBER OF DISCHARGES (in thousands)	PRIVATE INSURER'S SHARE OF ALL HOSPITAL STAYS (percentage)
All discharges for private insurers	13,264	34.7
	TOTAL NUMBER OF DISCHARGES IN THIS PROCEDURE CATEGORY (in thousands)	PRIVATE INSURER'S SHARE OF ALL HOSPITAL STAYS FOR THIS PROCEDURE (percentage)
1. Medical induction, manually assisted delivery, and other procedures to assist delivery	972	49.9
2. Circumcision	746	62.4
3. Repair of current obstetric laceration	733	58.1
4. Cesarean section	652	55.7
5. Diagnostic cardiac catheterization, coronary arteriography	583	33.9
6. Fetal monitoring	502	55.1
7. Hysterectomy, abdominal and vaginal	447	73.5
8. Artificial rupture of membranes to assist delivery	440	54.5
9. Blood transfusion	419	21.2
10. Prophylactic vaccinations and inoculations	399	46.6

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

Uninsured

- Uninsured hospitalizations continued to account for approximately 5 percent of all hospitalizations, with a mean charge of \$16,800.
- About 45 million individuals, or 16 percent of the U.S. population, were uninsured in 2003.²
- Eight of the most commonly performed procedures in uninsured hospitalizations remained the same from 1997 to 2003. In 2003, blood transfusions and appendectomies replaced fetal monitoring and CT scans of the head in the top 10.

- Three of the top 10 procedures being performed in uninsured hospitalizations were related to pregnancy and childbirth: procedures to assist delivery, circumcision, and repair of current obstetric laceration.
- As in 1997, more than 20 percent of hospital stays that involved procedures for alcohol and drug rehabilitation/detoxification were not covered by insurance. It is not possible to determine if this is because insurance does not cover these conditions or because these conditions occur more frequently among uninsured patients.

ALL-LISTED PROCEDURES, 2003	NUMBER OF DISCHARGES (in thousands)	ALL HOSPITAL STAYS THAT ARE UNINSURED (percentage)
All discharges for the uninsured	1,725	4.5
	TOTAL NUMBER OF DISCHARGES IN THIS PROCEDURE CATEGORY (in thousands)	ALL HOSPITAL STAYS INVOLVING THIS PROCEDURE THAT ARE UNINSURED (percentage)
1. Alcohol and drug rehabilitation/detoxification	66	21.5
2. Medical induction, manually assisted delivery, and other procedures to assist delivery	65	3.4
3. Diagnostic cardiac catheterization, coronary arteriography	64	3.8
4. Blood transfusion	60	3.0
5. Respiratory intubation and mechanical ventilation	52	4.6
6. Upper gastrointestinal endoscopy, biopsy	50	4.0
7. Circumcision	41	3.4
8. Repair of current obstetric laceration	38	3.0
9. Appendectomy	36	9.4
10. Prophylactic vaccinations and inoculations	36	4.2

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure. Miscellaneous minor diagnostic and therapeutic procedures are excluded.

Which procedures were associated with the highest in-hospital mortality?

In-hospital mortality refers to death during the hospital stay. This section examines procedures that were performed most often in those hospital stays that resulted in death.

It is important to note that in-hospital deaths are not necessarily caused by these procedures but may simply indicate severe underlying disease. In fact, many of these procedures are not inherently risky procedures, but may be associated with hospital stays that result in high mortality linked to other causes. For example, patients may be admitted to the hospital for end-of-life care, and mortality is expected to be high.

- The procedures involved in hospital stays that resulted in death remained largely unchanged since 1997. As in 1997, hospital stays involving conversion of cardiac rhythm, which indicates an unsuccessful attempt at resuscitation, most commonly ended in death. In 2003, 39 percent of hospital stays in which conversion of cardiac rhythm was performed resulted in death.
- The second most common procedure associated with high in-hospital mortality continued to be respiratory intubation and mechanical ventilation, with an in-hospital mortality rate of 29 percent. This procedure is performed in hospitalizations involving respiratory failure, myocardial infarction, stroke, pneumonia, and septicemia.
- Hospital stays that included procedures indicating the presence of organ failure and critical illness continued to have high in-hospital mortality rates. These included Swan-Ganz catheterization, tracheostomy, ileostomy and other enterostomy, and enteral and parenteral nutrition.

ALL-LISTED PROCEDURES, 2003	IN-HOSPITAL MORTALITY (percent)
1. Conversion of cardiac rhythm	39.3
2. Respiratory intubation and mechanical ventilation	28.5
3. Swan-Ganz catheterization	27.8
4. Tracheostomy, temporary and permanent	20.6
5. Injection or ligation of esophageal varices	16.2
6. Ileostomy and other enterostomy	14.1
7. Enteral and parenteral nutrition	14.0
8. Exploratory laparotomy	13.2
9. Arterial blood gases	12.1
10. Diagnostic bronchoscopy and biopsy of bronchus	11.5

Note: "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than 1 procedure.

How did selected procedure-based patient safety quality indicators change from 1997 to 2003?



AHRQ has developed an array of health care decisionmaking and research tools that can be used by program managers, researchers, and others at the Federal, State and local levels. One of these tools is the AHRQ Quality Indicators (QIs) which use hospital administrative data to highlight potential quality concerns, identify areas that need further study and investigation, and track changes over time.

The AHRQ QIs are comprised of the Inpatient Quality Indicators, Prevention Quality Indicators, and Patient Safety Indicators. This section presents selected findings from the Patient Safety Indicators that relate to procedures performed in U.S. hospitals.

Patient Safety Indicators identify hospital stays during which a potentially avoidable patient safety event occurred. Below are comparisons of how U.S. hospitals performed in 2003 relative to 1997 on four procedure-based Patient Safety Indicators.

- *Complications of anesthesia* remained stable at 8 complications per 10,000 surgical discharges.
- *Postoperative respiratory failure* increased dramatically from 2.3 to 4.6 cases per 1,000 elective-surgery discharges, a 100-percent increase.
- *Postoperative sepsis* increased from 8.5 to 12.5 cases per 1,000 elective-surgery discharges of longer than 3 days, a 46-percent increase.
- *Birth trauma* decreased from 16.1 to 6.5 injuries to neonates per 1,000 live births, a 60-percent decrease.

More information about the AHRQ QIs is available at <http://www.qualityindicators.ahrq.gov>. Detailed data on quality of care in the U.S. is available on HCUPnet (<http://hcup.ahrq.gov/HCUPnet.asp>).

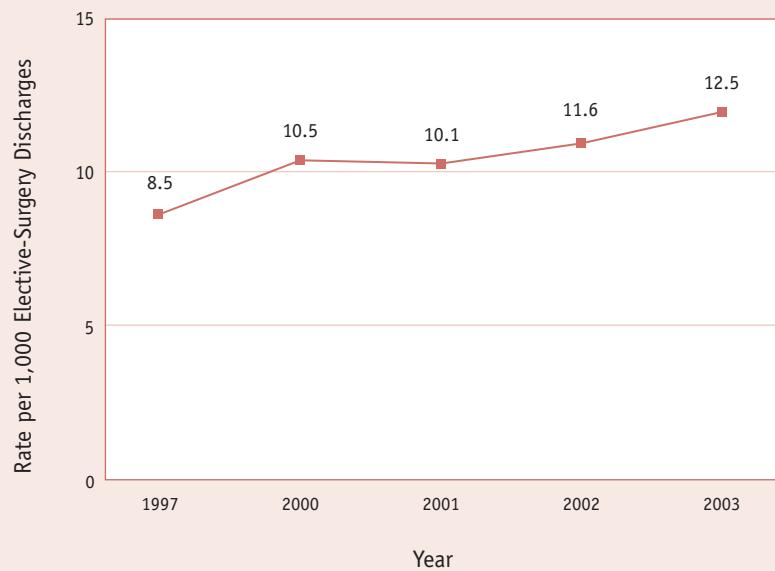
Complications of Anesthesia



Postoperative Respiratory Failure



Postoperative Sepsis



Birth Trauma—Injury to Neonate





Source of Data for This Report

The results presented in this report are drawn from the Healthcare Cost and Utilization Project (HCUP), a Federal-State-Industry partnership to build a multi-State health care data system. This partnership is sponsored by the Agency for Healthcare Research and Quality (AHRQ) and is managed by staff in AHRQ's Center for Delivery, Organization, and Markets. HCUP is based on data collected by individual State Partner organizations (including State departments of health, hospital associations, and private agencies), which then provide the data to AHRQ. HCUP would not be possible without statewide data collection projects and their partnership with AHRQ.

For the year 2003, 38 State Partner organizations contributed their data to AHRQ, where all files are validated and converted into a uniform format. The uniform HCUP databases enable comparative studies of health care services and the use and cost of hospital care, including:

- Effects of market forces on hospitals and the care they provide.
- Variations in medical practice.
- Effectiveness of medical technology and treatments.
- Use of services by special populations.

HCUP includes short-term, non-Federal, community hospitals as defined by the American Hospital Association. This definition includes general hospitals and specialty facilities, such as pediatric, obstetrics-gynecology, short-term rehabilitation, and oncology hospitals. Long-term care and psychiatric hospitals are excluded, as are substance abuse treatment facilities.



HCUP includes several sets of inpatient databases for health services research. This report is based on the 2003 Nationwide Inpatient Sample (NIS) data, which includes data from 37 of our participating Partners that supplied 2003 data to the project. The NIS is the largest all-payer inpatient care database that is publicly available in the U.S. The database contains data for nearly 8 million hospital stays from roughly 1,000 hospitals sampled to approximate a 20-percent stratified sample of U.S. community hospitals. The data are weighted to obtain estimates representing the total number of inpatient hospital discharges in the United States; in the year 2003, this figure is approximately 38 million.

Methods

This report is based on data from the HCUP Nationwide Inpatient Sample database. The NIS data are weighted to obtain estimates representing the total number of inpatient hospital discharges in the United States; in 2003, this figure totaled 38,220,659. The 2003 NIS is based on a sampling frame of 37 States compared with 22 States in the 1997 NIS. A brief discussion of selected methodological issues pertaining to this Fact Book follows.

Procedures and Clinical Classification Software (CCS)

Procedures and diagnoses are recorded within the NIS using the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). While ICD-9-CM codes may be used to provide descriptive statistics, the granular nature of ICD-9-CM reporting is difficult to summarize. Thus, for this report, the AHRQ-developed Clinical Classifications Software is applied to hospital records to aggregate ICD-9-CM procedure codes into a limited number of clinically meaningful categories for most tables. More detailed information on CCS can be downloaded from the HCUP User Support Web site at: <http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>.

Procedure Classes

The Procedure Classes tool provides an easy way to categorize ICD-9-CM procedure codes into one of four broad categories: minor diagnostic, minor therapeutic, major diagnostic, and major therapeutic. This tool was created to facilitate health services research on hospital procedures using administrative data. All ICD-9-CM procedure codes are assigned to one of the following categories:

1. Minor diagnostic—Non-operating room procedures that are diagnostic (e.g., 87.03 CT scan of head)
2. Minor therapeutic—Non-operating room procedures that are therapeutic (e.g., 02.41 Irrigate ventricular shunt)
3. Major diagnostic—All procedures considered valid operating room procedures by the DRG grouper and that are performed for diagnostic reasons (e.g., 01.14 Open brain biopsy)
4. Major therapeutic—All procedures considered valid operating room procedures by the DRG grouper and that are performed for therapeutic reasons (e.g., 39.24 Aorta-renal bypass).

More detailed information on the Procedure Classes tool can be obtained from the HCUP User Support Web site at: <http://www.hcup-us.ahrq.gov/toolssoftware/procedure/procedure.jsp>.

Unit of Analysis

For this report, the unit of analysis is the inpatient stay rather than the patient or the procedure. For example, a patient admitted 4 times to the hospital is included 4 times in the NIS data. Thus, the same individual can account for more than 1 hospital stay. Also, frequencies and rankings of procedures are based on all-listed procedure codes on a discharge record—and are not limited to the principal procedure code. Each HCUP NIS record can contain up to 15 procedure codes. This Fact Book provides information on all procedures performed during the stay. The unit of analysis remains the discharge: if a particular CCS procedure code occurs multiple times during the same discharge, it is still counted only once.

Definition of Payer

Payer is the expected payer for the hospital stay. It is important to note that charges billed to payers reflect the entire hospital stay, not a charge for a specific procedure. To make coding uniform across all HCUP data sources, the payer variable combines detailed categories into more general groups:

- Medicare includes fee-for-service and managed care Medicare patients.
- Medicaid includes fee-for-service and managed care Medicaid patients.
- Private insurance includes Blue Cross, commercial carriers, and private HMOs and PPOs.

Methods

- Uninsured includes an insurance status of “self-pay” and “no charge.”
- Other includes Workers’ Compensation, CHAMPUS, CHAMPVA, Title V, and other government programs.

Up to two payers can be coded for a hospital stay in HCUP data. When this occurs, the following hierarchy is used:

- If either payer is listed as Medicaid—payer is “Medicaid.”
- For non-Medicaid stays, if either payer is listed as Medicare—payer is “Medicare.”
- For stays that are neither Medicaid nor Medicare, if either payer is listed as private insurance—payer is “private insurance.”
- For stays that are not Medicaid, Medicare or private insurance, if either payer is some other third party payer—payer is “other.”
- For stays that have no third party payer and the payer is listed as “self-pay” or “no charge”—payer is “uninsured.”
- If no insurance information is available—payer is missing.

Charges

Data indicating “hospital charges” are the amount the hospital billed for the entire hospital stay—not for a specific procedure. These charges do not necessarily reflect reimbursements or costs and do not include professional (physician) fees. Typically, charges are higher than actual costs.

High-Volume Providers

Research indicates that hospitals that perform more than a specific number of certain procedures have fewer in-hospital deaths for those particular procedures than lower volume hospitals. This “threshold number” varies with the type of procedure. The volume thresholds used in this Fact Book are adapted from Dudley et al.¹:

PROCEDURE	THRESHOLD NUMBER OF PROCEDURES
Abdominal aortic aneurysm	32
Carotid endarterectomy	101
Lower extremity arterial bypass	20
Coronary artery bypass graft	500
Percutaneous coronary angioplasty	400
Heart transplantation	9
Pediatric heart surgery	100
Pancreatic cancer surgery	7
Esophageal cancer surgery	7
Cerebral aneurysm surgery	30

New Weights for 1997 NIS Data

In 1998, the NIS sample design was changed:

- Rehabilitation hospitals were excluded from the NIS hospital universe and sample.
- AHA hospital unit discharges were used instead of total facility discharges, which include nursing home unit discharges.

In order to facilitate analysis of trends using multiple years of NIS data, alternate weights for NIS discharge and hospital data for the 1988-1997 HCUP NIS were developed. These alternative weights were calculated in the same way as the weights for the 1998 and later years of the NIS. These new weights were applied to the 1997 data presented in this report. The NIS Trends Report includes details regarding the alternate weights and other recommendations for trends analysis:

http://www.hcup-us.ahrq.gov/reports/TrendReport2005_1.pdf.

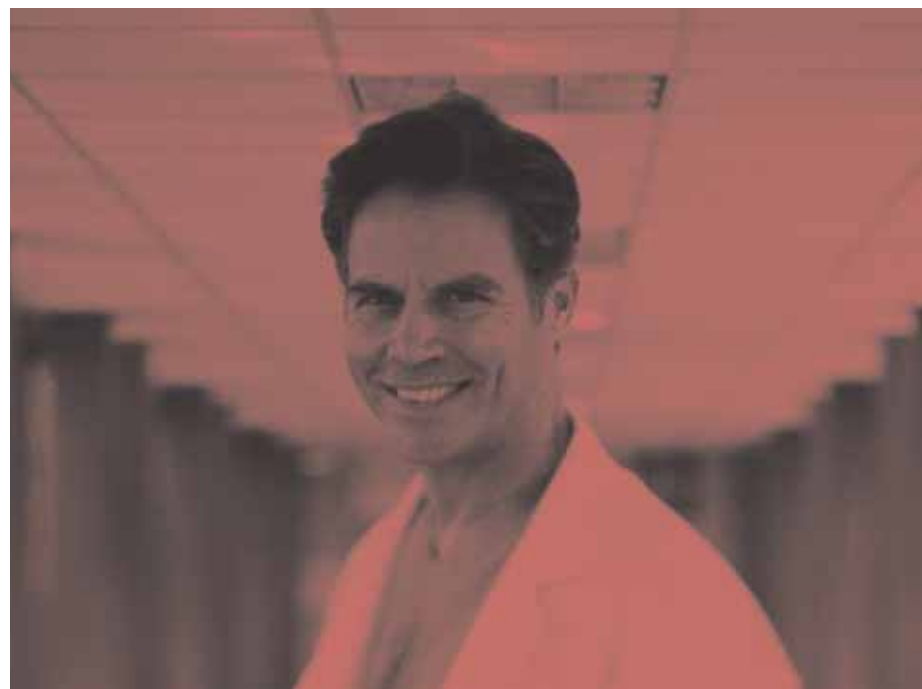
The new weights are available at: <http://www.hcup-us.ahrq.gov/db/nation/nis/trendwghts.jsp>.

Comparisons of 1997 and 2003 Hospital Procedures

Because this Fact Book updates an earlier report that described hospital procedures in 1997, this document provides many comparative statistics that reflect how hospital care has evolved from 1997 to 2003. Only statistically significant differences (p -value $\leq .05$) are presented.

References

- ¹Dudley RA, Johansen KL, Brand R, Rennie DJ, Milstein A. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. *JAMA*. 2000 Mar 1;283(9):1159–66.
- ²DeNavas-Walt C, Proctor BD, Mills RJ. *Income, Poverty, and Health insurance coverage in the United States: 2003*. Current Population Reports P60-226. Washington, DC: U.S. Census Bureau, August 2004. <http://www.census.gov/prod/2004pubs/p60-226.pdf>. (Accessed November 12, 2005).
- ³American Hospital Association. *Fast facts on U.S. hospitals from AHA hospital statistics*. http://www.aha.org/aha/resource_center/fastfacts/fast_facts_U.S._hospitals.html. (Accessed November 1, 2005).
- ⁴U.S. Census Bureau, Population Division. National intercensal estimates (1990–2000). <http://www.census.gov/popest/archives/est90intercensal/us-est90int-01.html>. (Accessed March 8, 2005).
- ⁵U.S. Census Bureau, Population Division. *National population estimates—Characteristics: Annual estimates of the population by sex and selected age groups for the United States: April 1, 2000 to July 1, 2003*. <http://www.census.gov/popest/national/asrh/NC-EST2003-as.html>. (Accessed November 10, 2005).
- ⁶U.S. Department of Labor. Bureau of Labor Statistics. *Producer price indexes*. <http://www.bls.gov/ppi/home.htm>. (Accessed November 10, 2005).



For More Information

More information regarding HCUP data is available at www.ahrq.gov/data/hcup, as well as on the HCUP User Support Web site at www.hcup-us.ahrq.gov.

Additional descriptive statistics can be viewed through HCUPnet (www.ahrq.gov/data/hcup/hcupnet.htm), a Web-based tool providing easy access to information on hospital stays.

NIS data are available for the following data years:

2003 data

2002 data

2001 data

2000 data

1999 data (PB 2002-500020)

1998 data (PB 2001-500092)

1997 data, Release 6 (PB 2000-500006)

1996 data, Release 5 (PB 99-500480)

1995 data, Release 4 (PB 98-500440)

1994 data, Release 3 (PB 97-500433)

1993 data, Release 2 (PB 96-501325)

1988–1992 data, Release 1 (PB 95-503710)

NIS data can be purchased for research through the HCUP Central Distributor sponsored by AHRQ: Social and Scientific Systems, Inc., telephone: 866-556-4287 (toll-free), fax: 301-628-3201, or e-mail: hcup@s-3.com.

Price of the data is \$322 for Release 1; \$160 per year for 1993 to 1999; and \$200 per year for 2000–2003. Prices may be higher for customers outside the United States, Canada, and Mexico.



AHRQ is always looking for ways in which AHRQ-funded research, products, and tools have changed peoples' lives, influenced clinical practice, improved policies, and affected patient outcomes. Impact case studies describe AHRQ research findings in action. These case studies have been used in testimony, budget documents, and speeches. If you are aware of any impact your research has had on health care policy, clinical practice, or patient outcomes, please let us know by using the contact information below.

Healthcare Cost and Utilization Project (HCUP)
Center for Delivery, Organization, and Markets
Agency for Healthcare Research and Quality
Phone: 866-290-HCUP (4287)
E-mail: HCUP@AHRQ.gov

Appendix: 2003 Statistics on All-listed Procedures in U.S. Hospitals

*Number of Discharges, Percent of All Procedures, Percent of Discharges With This Procedure, Mean Length of Stay, Mean Charges, and Percent Died in Hospital.**

CLINICAL CLASSIFICATIONS SOFTWARE (CCS) PROCEDURE CATEGORY AND NUMBER	NUMBER OF DISCHARGES	PERCENT OF ALL PROCEDURES	PERCENT OF DISCHARGES WITH THIS PROCEDURE	MEAN LENGTH OF STAY FOR HOSPITALIZATIONS WITH THIS PROCEDURE	MEAN CHARGES FOR HOSPITALIZATIONS WITH THIS PROCEDURE	PERCENT DIED IN THE HOSPITAL FOR HOSPITALIZATIONS WITH THIS PROCEDURE
Operations on the Nervous System						
1 Incision and excision of CNS	103,948	0.2	0.3	10.6	\$76,700	8.6%
2 Insertion, replacement, or removal of extracranial ventricular shunt	36,761	0.1	0.1	13.4	\$82,200	4.0%
3 Laminectomy, excision intervertebral disc	505,487	1.1	1.3	3.2	\$31,900	0.2%
4 Diagnostic spinal tap	361,108	0.8	0.9	8.2	\$36,400	3.2%
5 Insertion of catheter or spinal stimulator and injection into spinal canal	322,187	0.7	0.8	4.6	\$21,300	0.5%
6 Decompression peripheral nerve	14,751	0.0	0.0	4.6	\$32,300	0.6%
7 Other diagnostic nervous system procedures	26,526	0.1	0.1	13.3	\$97,700	14.1%
8 Other non-operating room or closed therapeutic nervous system procedures	53,367	0.1	0.1	6.3	\$32,600	1.1%
9 Other operating room therapeutic nervous system procedures	168,977	0.4	0.4	8.8	\$66,600	5.1%
Operations on the Endocrine System						
10 Thyroidectomy, partial or complete	61,667	0.1	0.2	2.4	\$18,900	0.3%
11 Diagnostic endocrine procedures	7,354	0.0	0.0	8.1	\$39,800	2.6%
12 Other therapeutic endocrine procedures	45,504	0.1	0.1	5.3	\$36,000	1.1%
Operations on the Eye						
13 Corneal transplant	599	0.0	0.0	4.5	\$27,500	0.0%
14 Glaucoma procedures	776	0.0	0.0	4.9	\$22,700	1.3%
15 Lens and cataract procedures	5,568	0.0	0.0	5.4	\$17,100	0.3%
16 Repair of retinal tear, detachment	3,546	0.0	0.0	9.5	\$40,600	0.5%
17 Destruction of lesion of retina and choroid	3,123	0.0	0.0	53.0	\$197,200	2.4%
18 Diagnostic procedures on eye	1,608	0.0	0.0	13.6	\$59,200	1.5%
19 Other therapeutic procedures on eyelids, conjunctiva, cornea	32,742	0.1	0.1	5.4	\$35,800	1.5%

Appendix

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20 Other intraocular therapeutic procedures	9,271	0.0	0.0	5.4	\$28,400	0.5%
21 Other extraocular muscle and orbit therapeutic procedures	7,927	0.0	0.0	6.2	\$43,300	0.9%
Operations on the Ear						
22 Tympanoplasty	1,673	0.0	0.0	2.9	\$27,300	0.0%
23 Myringotomy	10,461	0.0	0.0	6.4	\$31,600	1.6%
24 Mastoidectomy	3,187	0.0	0.0	5.4	\$41,200	1.2%
25 Diagnostic procedures on ear	1,046	0.0	0.0	8.1	\$37,000	1.3%
26 Other therapeutic ear procedures	20,392	0.0	0.1	5.6	\$33,900	1.6%
Operations on the Nose, Mouth, and Pharynx						
27 Control of epistaxis	29,863	0.1	0.1	6.3	\$30,500	4.7%
28 Plastic procedures on nose	19,481	0.0	0.1	3.8	\$28,100	0.8%
29 Dental procedures	28,589	0.1	0.1	7.9	\$41,700	1.2%
30 Tonsillectomy and/or adenoidectomy	29,206	0.1	0.1	2.2	\$14,200	0.1%
31 Diagnostic procedures on nose, mouth and pharynx	25,778	0.1	0.1	8.9	\$45,400	3.4%
32 Other non-operating room therapeutic procedures on nose, mouth and pharynx	37,597	0.1	0.1	6.0	\$37,200	1.2%
33 Other operating room therapeutic procedures on nose, mouth and pharynx	83,458	0.2	0.2	4.8	\$31,900	0.7%
Operations on the Respiratory System						
34 Tracheostomy, temporary and permanent	112,472	0.2	0.3	36.7	\$240,000	20.6%
35 Tracheoscopy and laryngoscopy with biopsy	71,024	0.2	0.2	10.4	\$50,400	4.2%
36 Lobectomy or pneumonectomy	71,502	0.2	0.2	9.5	\$55,800	3.3%
37 Diagnostic bronchoscopy and biopsy of bronchus	336,959	0.7	0.9	13.8	\$77,600	11.5%
38 Other diagnostic procedures on lung and bronchus	23,726	0.1	0.1	11.4	\$69,600	9.5%
39 Incision of pleura, thoracentesis, chest drainage	389,461	0.8	1.0	12.4	\$65,400	11.0%
40 Other diagnostic procedures of respiratory tract and mediastinum	66,775	0.1	0.2	12.2	\$65,900	5.9%
41 Other non-operating room therapeutic procedures on respiratory system	90,408	0.2	0.2	15.3	\$79,800	10.6%
42 Other operating room therapeutic procedures on respiratory system	95,228	0.2	0.2	14.1	\$92,200	7.0%
Operations on the Cardiovascular System						
43 Heart valve procedures	102,339	0.2	0.3	12.4	\$126,500	6.6%
44 Coronary artery bypass graft (CABG)	348,218	0.7	0.9	9.9	\$94,200	3.3%
45 Percutaneous coronary angioplasty (PTCA)	800,019	1.7	2.1	3.2	\$42,800	1.2%
46 Coronary thrombolysis	5,343	0.0	0.0	3.3	\$43,700	1.0%
47 Diagnostic cardiac catheterization, coronary arteriography	1,716,748	3.7	4.5	4.9	\$45,700	1.8%
48 Insertion, revision, replacement, removal of cardiac pacemaker or cardioverter/defibrillator	358,493	0.8	0.9	6.0	\$68,500	2.6%

CLINICAL CLASSIFICATIONS SOFTWARE (CCS) PROCEDURE CATEGORY AND NUMBER	NUMBER OF DISCHARGES	PERCENT OF ALL PROCEDURES	PERCENT OF DISCHARGES WITH THIS PROCEDURE	MEAN LENGTH OF STAY FOR HOSPITALIZATIONS WITH THIS PROCEDURE	MEAN CHARGES FOR HOSPITALIZATIONS WITH THIS PROCEDURE	PERCENT DIED IN THE HOSPITAL FOR HOSPITALIZATIONS WITH THIS PROCEDURE
49 Other operating room heart procedures	176,634	0.4	0.5	9.5	\$94,200	10.4%
50 Extracorporeal circulation auxiliary to open heart procedures	353,159	0.8	0.9	10.3	\$99,100	4.1%
51 Endarterectomy, vessel of head and neck	140,751	0.3	0.4	3.4	\$26,400	0.7%
52 Aortic resection, replacement or anastomosis	50,681	0.1	0.1	8.6	\$80,000	7.7%
53 Varicose vein stripping, lower limb	2,248	0.0	0.0	3.4	\$19,700	0.2%
54 Other vascular catheterization, not heart	1,478,424	3.1	3.9	13.8	\$68,800	13.0%
55 Peripheral vascular bypass	105,904	0.2	0.3	9.5	\$56,900	3.3%
56 Other vascular bypass and shunt, not heart	13,720	0.0	0.0	11.9	\$92,300	10.2%
57 Creation, revision and removal of arteriovenous fistula or vessel-to-vessel cannula for dialysis	70,126	0.2	0.2	9.3	\$51,400	2.6%
58 Hemodialysis	661,089	1.4	1.7	8.9	\$47,100	8.2%
59 Other operating room procedures on vessels of head and neck	16,653	0.0	0.0	8.5	\$78,000	6.1%
60 Embolectomy and endarterectomy of lower limbs	39,869	0.1	0.1	9.4	\$62,400	6.6%
61 Other operating room procedures on vessels other than head and neck	394,488	0.8	1.0	10.6	\$71,000	5.7%
62 Other diagnostic cardiovascular procedures	155,604	0.3	0.4	6.1	\$71,900	1.2%
63 Other non-operating room therapeutic cardiovascular procedures	987,657	2.1	2.6	5.4	\$50,300	4.1%
Operations on the Hemic and Lymphatic System						
64 Bone marrow transplant	10,690	0.0	0.0	28.5	\$207,600	7.1%
65 Bone marrow biopsy	103,420	0.2	0.3	13.9	\$72,000	6.6%
66 Procedures on spleen	29,797	0.1	0.1	11.8	\$82,700	8.5%
67 Other therapeutic procedures, hemic and lymphatic system	247,836	0.5	0.6	5.9	\$35,700	1.4%
Operations on the Digestive System						
68 Injection or ligation of esophageal varices	184	0.0	0.0	10.1	\$52,300	16.1%
69 Esophageal dilatation	41,184	0.1	0.1	7.2	\$26,700	2.2%
70 Upper gastrointestinal endoscopy, biopsy	1,242,058	2.6	3.2	7.8	\$35,200	3.1%
71 Gastrostomy, temporary and permanent	231,915	0.5	0.6	20.5	\$98,800	10.5%
72 Colostomy, temporary and permanent	53,142	0.1	0.1	16.2	\$85,100	11.0%
73 Ileostomy and other enterostomy	52,832	0.1	0.1	22.4	\$129,500	14.1%
74 Gastrectomy, partial and total	27,769	0.1	0.1	13.9	\$91,600	7.1%
75 Small bowel resection	81,409	0.2	0.2	15.9	\$82,800	9.1%
76 Colonoscopy and biopsy	636,213	1.4	1.7	7.7	\$32,000	2.2%
77 Proctoscopy and anorectal biopsy	68,258	0.2	0.2	8.3	\$36,500	2.3%
78 Colorectal resection	315,252	0.7	0.8	10.9	\$54,100	4.9%

Appendix

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79 Local excision of large intestine lesion (not endoscopic)	5,177	0.0	0.0	7.4	\$37,900	2.1%
80 Appendectomy	386,094	0.8	1.0	4.1	\$22,900	0.4%
81 Hemorrhoid procedures	15,509	0.0	0.0	3.8	\$17,900	0.5%
82 Endoscopic cannulation of pancreas (ERCP)	59,787	0.1	0.2	8.3	\$39,900	2.6%
83 Biopsy of liver	98,342	0.2	0.3	9.6	\$53,600	6.0%
84 Cholecystectomy and common duct exploration	467,103	1.0	1.2	5.6	\$32,800	1.3%
85 Inguinal and femoral hernia repair	56,122	0.1	0.1	8.0	\$35,000	1.6%
86 Other hernia repair	202,667	0.4	0.5	6.3	\$34,100	1.5%
87 Laparoscopy	94,647	0.2	0.2	4.7	\$31,500	0.9%
88 Abdominal paracentesis	170,662	0.4	0.4	10.9	\$53,000	10.2%
89 Exploratory laparotomy	40,888	0.1	0.1	10.8	\$64,000	13.2%
90 Excision, lysis peritoneal adhesions	378,762	0.8	1.0	7.7	\$38,400	2.4%
91 Peritoneal dialysis	31,081	0.1	0.1	8.4	\$40,200	5.4%
92 Other bowel diagnostic procedures	38,637	0.1	0.1	9.5	\$52,000	5.5%
93 Other non-operating room upper gastrointestinal therapeutic procedures	190,220	0.4	0.5	8.8	\$41,500	5.5%
94 Other operating room upper gastrointestinal therapeutic procedures	210,905	0.5	0.6	7.4	\$49,600	2.8%
95 Other non-operating room lower gastrointestinal therapeutic procedures	199,219	0.4	0.5	7.4	\$30,700	2.0%
96 Other operating room lower gastrointestinal therapeutic procedures	252,667	0.5	0.7	10.6	\$52,400	3.8%
97 Other gastrointestinal diagnostic procedures	56,180	0.1	0.1	9.4	\$44,700	4.1%
98 Other non-operating room gastrointestinal therapeutic procedures	174,270	0.4	0.5	8.5	\$44,000	3.4%
99 Other operating room gastrointestinal therapeutic procedures	234,583	0.5	0.6	11.6	\$67,400	5.1%
Operations on the Urinary System						
100 Endoscopy and endoscopic biopsy of the urinary tract	221,471	0.5	0.6	5.3	\$25,300	1.2%
101 Transurethral excision, drainage, or removal urinary obstruction	120,373	0.3	0.3	4.4	\$22,100	1.0%
102 Ureteral catheterization	171,875	0.4	0.4	5.3	\$28,000	1.2%
103 Nephrotomy and nephrostomy	38,849	0.1	0.1	8.1	\$42,900	3.1%
104 Nephrectomy, partial or complete	56,066	0.1	0.1	6.5	\$40,400	1.9%
105 Kidney transplant	14,278	0.0	0.0	8.9	\$115,000	1.2%
106 Genitourinary incontinence procedures	119,663	0.3	0.3	2.3	\$16,100	0.1%
107 Extracorporeal lithotripsy, urinary	13,058	0.0	0.0	3.7	\$22,300	0.2%
108 Indwelling catheter	101,578	0.2	0.3	7.0	\$28,900	8.4%
109 Procedures on the urethra	42,430	0.1	0.1	5.6	\$28,300	2.0%
110 Other diagnostic procedures of urinary tract	32,508	0.1	0.1	9.4	\$47,600	2.1%

CLINICAL CLASSIFICATIONS SOFTWARE (CCS) PROCEDURE CATEGORY AND NUMBER	NUMBER OF DISCHARGES	PERCENT OF ALL PROCEDURES	PERCENT OF DISCHARGES WITH THIS PROCEDURE	MEAN LENGTH OF STAY FOR HOSPITALIZATIONS WITH THIS PROCEDURE	MEAN CHARGES FOR HOSPITALIZATIONS WITH THIS PROCEDURE	PERCENT DIED IN THE HOSPITAL FOR HOSPITALIZATIONS WITH THIS PROCEDURE
111 Other non-operating room therapeutic procedures of urinary tract	191,461	0.4	0.5	4.4	\$17,700	0.9%
112 Other operating room therapeutic procedures of urinary tract	101,304	0.2	0.3	6.7	\$37,400	1.5%
Operations on the Male Genital Organs						
113 Transurethral prostatectomy (TURP)	106,900	0.2	0.3	3.4	\$15,600	0.3%
114 Open prostatectomy	67,943	0.1	0.2	3.4	\$21,800	0.1%
115 Circumcision	1,194,739	2.5	3.1	3.1	\$5,100	0.0%
116 Diagnostic procedures, male genital	8,828	0.0	0.0	7.8	\$32,600	2.0%
117 Other non-operating room therapeutic procedures, male genital	12,459	0.0	0.0	7.8	\$35,900	2.5%
118 Other operating room therapeutic procedures, male genital	31,840	0.1	0.1	5.4	\$28,800	1.2%
Operations on the Female Genital Organs						
119 Oophorectomy, unilateral and bilateral	469,105	1.0	1.2	3.3	\$17,800	0.2%
120 Other operations on ovary	88,490	0.2	0.2	3.1	\$17,300	0.1%
121 Ligation of fallopian tubes	318,707	0.7	0.8	2.9	\$11,200	0.0%
123 Other operations on fallopian tubes	44,171	0.1	0.1	3.0	\$16,000	0.1%
124 Hysterectomy, abdominal and vaginal	608,293	1.3	1.6	2.9	\$15,900	0.1%
125 Other excision of cervix and uterus	57,657	0.1	0.2	3.0	\$16,800	0.1%
126 Abortion (termination of pregnancy)	2,134	0.0	0.0	4.1	\$21,600	0.0%
127 Dilatation and curettage (D&C), aspiration after delivery or abortion	47,682	0.1	0.1	2.1	\$12,100	0.1%
128 Diagnostic dilatation and curettage (D&C)	31,292	0.1	0.1	3.6	\$20,000	0.3%
129 Repair of cystocele and rectocele, obliteration of vaginal vault	138,355	0.3	0.4	2.2	\$14,600	0.0%
130 Other diagnostic procedures, female organs	29,391	0.1	0.1	5.0	\$23,900	0.9%
131 Other non-operating room therapeutic procedures, female organs	24,009	0.1	0.1	5.1	\$18,700	0.4%
132 Other operating room therapeutic procedures, female organs	142,660	0.3	0.4	3.2	\$18,200	0.2%
Obstetric Procedures						
122 Removal ectopic pregnancy	20,289	0.0	0.1	2.1	\$15,400	0.1%
133 Episiotomy	564,542	1.2	1.5	2.2	\$6,900	0.0%
134 Cesarean section	1,171,423	2.5	3.1	3.7	\$12,500	0.0%
135 Forceps, vacuum, and breech delivery	311,926	0.7	0.8	2.4	\$7,600	0.0%
136 Artificial rupture of membranes to assist delivery	808,404	1.7	2.1	2.3	\$7,200	0.0%
137 Other procedures to assist delivery	1,946,475	4.1	5.1	2.3	\$7,000	0.0%
138 Diagnostic amniocentesis	17,433	0.0	0.0	8.2	\$19,200	0.1%
139 Fetal monitoring	912,540	1.9	2.4	2.7	\$8,500	0.0%

Appendix

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140 Repair of current obstetric laceration	1,260,592	2.7	3.3	2.1	\$6,500	0.0%
141 Other therapeutic obstetric procedures	132,384	0.3	0.3	2.9	\$9,200	0.0%
Operations on the Musculoskeletal System						
142 Partial excision bone	239,488	0.5	0.6	6.6	\$49,800	0.9%
143 Bunionectomy or repair of toe deformities	6,072	0.0	0.0	3.1	\$18,900	0.1%
144 Treatment, facial fracture or dislocation	31,216	0.1	0.1	5.9	\$50,000	0.5%
145 Treatment, fracture or dislocation of radius and ulna	84,196	0.2	0.2	4.5	\$32,000	0.6%
146 Treatment, fracture or dislocation of hip and femur	303,880	0.7	0.8	6.5	\$34,200	1.9%
147 Treatment, fracture or dislocation of lower extremity (other than hip or femur)	229,064	0.5	0.6	4.9	\$31,400	0.4%
148 Other fracture and dislocation procedure	142,205	0.3	0.4	5.4	\$39,800	0.8%
149 Arthroscopy	23,156	0.1	0.1	3.7	\$24,800	0.3%
150 Division of joint capsule, ligament or cartilage	14,347	0.0	0.0	3.4	\$25,800	0.2%
151 Excision of semilunar cartilage of knee	12,363	0.0	0.0	3.2	\$24,400	0.3%
152 Arthroplasty knee	433,974	0.9	1.1	4.0	\$31,800	0.2%
153 Hip replacement, total and partial	343,063	0.7	0.9	5.2	\$36,500	1.2%
154 Arthroplasty other than hip or knee	57,470	0.1	0.2	2.9	\$26,700	0.1%
155 Arthrocentesis	63,514	0.1	0.2	8.7	\$35,600	2.3%
156 Injections and aspirations of muscles, tendons, bursa, joints and soft tissue	12,223	0.0	0.0	8.5	\$31,200	1.8%
157 Amputation of lower extremity	132,866	0.3	0.3	12.4	\$53,800	4.5%
158 Spinal fusion	325,998	0.7	0.9	4.2	\$50,300	0.3%
159 Other diagnostic procedures on musculoskeletal system	58,653	0.1	0.2	9.9	\$45,900	2.5%
160 Other therapeutic procedures on muscles and tendons	223,228	0.5	0.6	7.0	\$39,900	1.6%
161 Other operating room therapeutic procedures on bone	150,038	0.3	0.4	6.1	\$43,800	1.0%
162 Other operating room therapeutic procedures on joints	118,403	0.3	0.3	6.2	\$34,600	0.8%
163 Other non-operating room therapeutic procedures on musculoskeletal system	62,105	0.1	0.2	6.3	\$42,400	0.6%
164 Other operating room therapeutic procedures on musculoskeletal system	52,569	0.1	0.1	8.5	\$49,000	1.8%
Operations on the Integumentary System						
165 Breast biopsy and other diagnostic procedures on breast	12,563	0.0	0.0	6.4	\$29,000	2.5%
166 Lumpectomy, quadrantectomy of breast	24,693	0.1	0.1	3.1	\$19,300	0.4%
167 Mastectomy	73,193	0.2	0.2	2.5	\$17,600	0.1%
168 Incision and drainage, skin and subcutaneous tissue	172,504	0.4	0.5	7.5	\$30,100	1.2%
169 Debridement of wound, infection or burn	345,350	0.7	0.9	12.1	\$51,400	3.5%

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170 Excision of skin lesion	75,065	0.2	0.2	6.4	\$29,900	1.0%
171 Suture of skin and subcutaneous tissue	178,052	0.4	0.5	5.8	\$33,700	2.2%
172 Skin graft	90,469	0.2	0.2	13.9	\$69,700	1.7%
173 Other diagnostic procedures on skin and subcutaneous tissue	29,915	0.1	0.1	13.3	\$62,200	6.2%
174 Other non-operating room therapeutic procedures on skin and breast	243,722	0.5	0.6	11.4	\$49,900	3.9%
175 Other operating room therapeutic procedures on skin and breast	100,558	0.2	0.3	3.9	\$29,400	0.4%

Miscellaneous Diagnostic and Therapeutic Procedures

176 Other organ transplantation	10,540	0.0	0.0	28.5	\$275,600	6.9%
177 Computerized axial tomography (CT) scan head	306,682	0.7	0.8	7.0	\$36,400	5.8%
178 CT scan chest	137,029	0.3	0.4	9.0	\$49,000	5.3%
179 CT scan abdomen	258,087	0.6	0.7	7.5	\$39,700	3.9%
180 Other CT scan	95,903	0.2	0.3	7.5	\$37,000	3.4%
181 Myelogram	10,834	0.0	0.0	7.5	\$32,700	0.8%
182 Mammography	2,150	0.0	0.0	8.0	\$33,700	1.6%
183 Routine chest X-ray	18,079	0.0	0.0	4.2	\$15,000	2.2%
184 Intraoperative cholangiogram	147,487	0.3	0.4	5.5	\$31,700	1.1%
185 Upper gastrointestinal X-ray	16,741	0.0	0.0	11.0	\$38,200	2.1%
186 Lower gastrointestinal X-ray	2,680	0.0	0.0	11.0	\$32,600	3.4%
187 Intravenous pyelogram	14,583	0.0	0.0	5.6	\$26,200	0.9%
188 Cerebral arteriogram	147,556	0.3	0.4	7.2	\$50,400	3.6%
189 Contrast aortogram	231,213	0.5	0.6	6.6	\$49,600	3.0%
190 Contrast arteriogram of femoral and lower extremity arteries	177,758	0.4	0.5	7.3	\$48,400	2.7%
191 Arteriogram or venogram (not heart and head)	253,908	0.5	0.7	7.6	\$50,200	3.4%
192 Diagnostic ultrasound of head and neck	73,086	0.2	0.2	11.6	\$47,500	2.6%
193 Diagnostic ultrasound of heart (echocardiogram)	660,226	1.4	1.7	8.3	\$47,500	4.4%
194 Diagnostic ultrasound of gastrointestinal tract	18,150	0.0	0.0	7.4	\$42,600	2.9%
195 Diagnostic ultrasound of urinary tract	45,731	0.1	0.1	9.4	\$46,300	4.5%
196 Diagnostic ultrasound of abdomen or retroperitoneum	101,140	0.2	0.3	8.1	\$40,500	4.4%
197 Other diagnostic ultrasound	170,982	0.4	0.4	8.4	\$38,200	3.5%
198 Magnetic resonance imaging	227,000	0.5	0.6	8.1	\$40,900	2.4%
199 Electroencephalogram (EEG)	54,347	0.1	0.1	9.5	\$45,700	7.3%
200 Nonoperative urinary system measurements	2,246	0.0	0.0	7.5	\$30,000	0.2%

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201 Cardiac stress tests	107,626	0.2	0.3	4.0	\$24,000	0.4%
202 Electrocardiogram	72,807	0.2	0.2	5.4	\$15,000	2.4%
203 Electrographic cardiac monitoring	140,650	0.3	0.4	5.1	\$19,600	4.5%
204 Swan-Ganz catheterization for monitoring	81,052	0.2	0.2	13.6	\$105,400	27.8%
205 Arterial blood gases	42,998	0.1	0.1	10.4	\$42,300	12.1%
206 Microscopic examination (bacterial smear, culture, toxicology)	16,656	0.0	0.0	7.2	\$21,500	1.1%
207 Radioisotope bone scan	22,954	0.1	0.1	10.9	\$43,500	3.9%
208 Radioisotope pulmonary scan	25,907	0.1	0.1	7.8	\$44,800	4.3%
209 Radioisotope scan and function studies	76,419	0.2	0.2	6.3	\$36,000	1.4%
210 Other radioisotope scan	8,087	0.0	0.0	12.3	\$54,400	8.0%
211 Therapeutic radiology	130,579	0.3	0.3	7.5	\$41,800	3.7%
212 Diagnostic physical therapy	48,680	0.1	0.1	10.7	\$30,200	1.5%
213 Physical therapy exercises, manipulation, and other procedures	324,512	0.7	0.8	10.7	\$36,800	1.4%
214 Traction, splints, and other wound care	113,314	0.2	0.3	6.9	\$37,600	2.0%
215 Other physical therapy and rehabilitation	241,385	0.5	0.6	12.3	\$38,200	1.3%
216 Respiratory intubation and mechanical ventilation	1,128,191	2.4	3.0	14.5	\$87,300	28.5%
217 Other respiratory therapy	315,485	0.7	0.8	7.4	\$28,300	6.3%
218 Psychological and psychiatric evaluation and therapy	129,885	0.3	0.3	12.3	\$26,700	0.2%
219 Alcohol and drug rehabilitation/detoxification	305,850	0.7	0.8	5.1	\$10,400	0.3%
220 Hearing examinations	433,012	0.9	1.1	3.4	\$6,300	0.0%
221 Nasogastric tube	104,009	0.2	0.3	8.7	\$39,300	10.8%
222 Blood transfusion	1,976,895	4.2	5.2	9.3	\$50,100	7.3%
223 Enteral and parenteral nutrition	418,414	0.9	1.1	18.8	\$87,000	14.0%
224 Cancer chemotherapy	239,816	0.5	0.6	9.2	\$50,600	3.7%
225 Conversion of cardiac rhythm	206,368	0.4	0.5	7.7	\$51,700	39.3%
226 Other diagnostic radiology and related techniques	210,231	0.5	0.6	7.4	\$33,900	2.1%
227 Other diagnostic procedures (interview, evaluation, consultation)	247,012	0.5	0.6	7.5	\$41,600	5.4%
228 Prophylactic vaccinations and inoculations	857,394	1.8	2.2	3.3	\$6,400	0.0%
229 Nonoperative removal of foreign body	21,510	0.1	0.1	5.7	\$29,400	3.4%
230 Extracorporeal shock wave lithotripsy, other than urinary	141	0.0	0.0	6.2	\$32,400	0.0%
231 Other therapeutic procedures	1,751,017	3.7	4.6	6.7	\$34,100	3.1%

