

Procedures in U.S. Hospitals, 1997




HCUP Fact Book No.2

Anne Elixhauser, Ph.D.
Kelly Klemstine, B.S.
Claudia Steiner, M.D., M.P.H.
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| Age and Gender | Charges | Length of Stay | In-hospital Deaths | Insurance Coverage | Volume |

Healthcare Cost and Utilization Project

A Federal-State-Industry Partnership

 Agency for Healthcare Research and Quality

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The unprecedented volume and pace of change in the U.S. health care delivery system requires new information on health care and its delivery. The mission of the Agency for Healthcare Research and Quality (AHRQ) is to provide information on the health care system—on quality, outcomes, access, cost, and utilization—that decisionmakers can use to improve health care. To help fulfill this mission, the Agency develops and sponsors a number of databases, including the powerful Healthcare Cost and Utilization Project (HCUP). HCUP is a Federal-State-industry partnership to build a standardized health data system.

Through HCUP, AHRQ has taken a lead in developing databases, software tools, and statistical reports to inform policymakers, health system leaders, and researchers at the Federal, regional, and State levels. But for data to be useful, they must be disseminated in a timely, accessible way. In 1999, AHRQ launched HCUPnet, an interactive, Internet-based tool for identifying, tracking, analyzing, and comparing statistics on hospital utilization, outcomes, and charges. Menu-driven HCUPnet guides users in tailoring specific queries about hospital care online; and, with a click of a button, users receive answers within seconds.

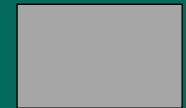
A second new way we have developed to make these data more accessible and useful is the HCUP Fact Book series—reports that provide data about hospital care in the United States in an easy-to-use, readily accessible format. Each Fact Book will provide information about specific aspects of hospital care—the single largest component of our health care dollar. The first Fact Book provided an overview of hospital stays in the United States and types of conditions that were treated.

This second Fact Book provides information on procedures performed in U.S. hospitals: What are the most common procedures? What are the characteristics of patients who receive procedures? Which procedures are associated with the longest hospital stays, the most expensive hospitalizations, and the highest in-hospital mortality? Who is billed for procedures and what types of procedures are billed to these payers? What percentage of procedures is performed in high-volume hospitals? Subsequent Fact Books will examine other topics such as hospital care for children, hospital care for women, and hospitals that serve the Medicaid and uninsured populations.

We 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 email us at hcup@ahrq.gov or send a letter to the address below.

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Foreword



Without the following State partner organizations, the Healthcare Cost and Utilization Project would not be possible:



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Arizona Department of Health Services;
California Office of Statewide Health Planning and Development;
Colorado Health and Hospital Association;
Connecticut Hospital Association (CHIME);
Florida Agency for Health Care Administration;
Georgia Hospital Association;
Hawaii Health Information Corporation;
Illinois Health Care Cost Containment Council;
Association of Iowa Hospitals and Health Systems;
Kansas Hospital Association;
Maryland Health Services Cost Review Commission;
Massachusetts Division of Health Care Finance and Policy;
Missouri Hospital Industry Data Institute;
New Jersey Department of Health and Senior Services;
New York State Department of Health;
Oregon Association of Hospitals and Health Systems and Office for Oregon Health Plan Policy and Research;
Pennsylvania Health Care Cost Containment Council;
South Carolina State Budget and Control Board;
Tennessee Hospital Association;
Utah Department of Health;
Washington State Department of Health; and
Wisconsin Department of Health and Family Services.

In May 2000, these 22 HCUP State partners and AHRQ received the Secretary of Health and Human Services' Award for Distinguished Service for "leadership, teamwork, and creative thinking in increasing availability, utility, and value of data for policy-makers and researchers concerned with hospital quality, utilization and cost."

Americans had 35 million hospital stays in 1997 and during most of these stays patients underwent some type of procedure. *Procedures* are any type of invasive or noninvasive diagnostic or therapeutic interventions that appear on the discharge records of patients who stay in the hospital. Procedures can range from major operations such as coronary artery bypass graft (CABG) surgery, to diagnostic imaging such as computerized axial tomography (CT) scans, to noninvasive treatments such as alcohol and drug detoxification. There is considerable variation in the thoroughness of coding for minor procedures, such as infusing intravenous antibiotics; so not all of these types of procedures are recorded and presented here.

Procedures on discharge records are coded using a classification system called “ICD-9-CM” which places procedures into about 3,500 different categories. For ease in reporting these statistics, this report uses Clinical Classification Software, or CCS, a clinical grouper developed at the Agency for Healthcare Research and Quality (AHRQ), that assigns ICD-9-CM codes into about 230 unique categories.

This Fact Book summarizes information from the Nationwide Inpatient Sample, or NIS, a database maintained by AHRQ that is uniquely suited to providing a comprehensive picture of hospital care in the United States. Because of its tremendous size (7.1 million records), the NIS can provide information on relatively uncommon diagnoses and procedures, as well as on subpopulations such as various age groups. The NIS covers all patients discharged from hospitals, including the uninsured, those covered by public payers such as Medicare and Medicaid, and those with private insurance. Unlike any other publicly available data source in the United States, the NIS also provides information on total hospital charges for all patients. The NIS includes short-term, non-Federal, community hospitals. General and specialty hospitals such as pediatric, obstetrics-gynecology, short-term rehabilitation, and oncology hospitals are included. Long-term and psychiatric hospitals are excluded.

This report provides information on:

■ Most common procedures, overall and by body system	pages 6-8
■ Number of procedures done per hospital stay	9
■ Most common procedures, by age group and gender	10-12
■ Procedures associated with longest hospital stays	13
■ Procedures associated with highest overall charges	14-15
■ Procedures with highest in-hospital mortality	16-17
■ Charges billed to public or private payers, or uninsured	18-23
■ Procedures done in “high-volume” hospitals	24-26

Introduction





Executive Summary

There are over 35 million hospital stays in the United States every year accounting for about 40 percent of personal health expenditures. Most of these hospital stays—over 60 percent—involve some type of procedure; and during many stays, multiple procedures are performed.

Understanding the types of procedures performed in U.S. hospitals is a foundation for assessing costs and quality of care. For example, recent studies have suggested a link between volume of procedures performed and the outcomes for certain procedures. This Fact Book provides an overview of procedures performed in U.S. hospitals and examines the most frequent procedures, those with the highest resource use, who is billed for which procedures, and the volume of procedures performed.

MOST COMMON PROCEDURES

- Procedures of the cardiovascular system are performed for 1 in 4 hospital stays. Nearly 4 million cardiac catheterizations are performed annually in U.S. hospitals—with 1 in 10 discharges receiving a cardiac catheterization.
- One in 5 discharges has procedures related to childbirth and pregnancy.
- One in 6 discharges has procedures that involve the digestive system.

AGE AND GENDER

- Appendectomy is the most common procedure for children ages 1-17 years (performed for nearly 5 percent of discharges in this age group). Other top procedures for children and adolescents include treatments for fractures (2.8 percent), cancer chemotherapy (2.8 percent), and psychiatric therapy (1.7 percent).
- Laminectomy (back surgery, 3.3 percent), hysterectomy (5.4 percent), and oophorectomy (removal of ovaries, 3.5 percent) are among the most common procedures for patients ages 18-44. These procedures are also among the top 10 most common procedures for patients 45-64 years of age.

- Alcohol and drug detoxification is one of the top procedures performed for adults ages 18-44 (performed for 4.6 percent of discharges in this age group).
- More than 20 percent of patients 45-79 years of age admitted to the hospital receive diagnostic cardiac catheterization.
- Several heart procedures are in the top 10 for adults: diagnostic cardiac catheterization, CABG, percutaneous transluminal coronary angioplasty (PTCA), extracorporeal circulation auxiliary to open heart procedures, diagnostic ultrasound of the heart, and cardiac pacemaker procedures.
- Cholecystectomy and colonoscopy are among the top 10 procedures for females but not for males. Laminectomy/excision of intervertebral disk (surgery for back pain) is among the top 10 procedures for males but not for females.
- In the 18-44 age group, about three-fourths of all hospital stays are for women. Sixty percent of these stays are for pregnancy and childbirth.
- When procedures related to pregnancy and childbirth are included, they account for 8 of the top 10 procedures performed on patients ages 18-44.

LONG-STAY AND EXPENSIVE PROCEDURES

- Organ transplantations are associated with some of the longest and most expensive hospital stays.
- Four of the top 10 most costly hospital stays are related to procedures on the cardiovascular system: heart transplantation, heart valve procedures, other operating room (OR) heart procedures, and other vascular bypass and shunt.

IN-HOSPITAL DEATHS

- Three of the top 10 procedures associated with the highest rates of in-hospital mortality are related to the respiratory system: respiratory intubation and mechanical ventilation, incision of pleura, and diagnostic bronchoscopy.
- Other procedures associated with large numbers of in-hospital deaths indicate the presence of organ failure and critical illness: Swan-Ganz catheterization, enteral and parenteral nutrition, and hemodialysis.

CHARGES

- Medicare is billed for about three-fourths of all hospital stays that involve a cardiac pacemaker or defibrillator procedure and about half of all hospital stays involving cardiac catheterization, CABG, diagnostic ultrasound of heart, and PTCA.
- Medicare is billed for over 65 percent of all hospital stays during which patients receive hemodialysis (treatment for renal failure) because treatment for end-stage renal disease is covered by Medicare, regardless of the age of the patient.
- Seven of the top 10 procedures billed to Medicaid are for pregnancy, childbirth, and newborn infant care. Medicaid is billed for about one-third of all hospital stays involving these childbirth procedures.
- Among uninsured patients, 4 of the top 10 procedures are related to pregnancy, childbirth, and newborn infant care.
- One in 6 hospital stays for alcohol and drug detoxification is uninsured.

PROCEDURES IN HIGH-VOLUME HOSPITALS

- Recent research suggests that for some procedures, postoperative mortality is lower at hospitals that perform a high volume of these procedures.
- Nearly 60 percent of hospitals that do heart transplantations are “high-volume” hospitals (based on thresholds defined in previous studies). About 55 percent of hospitals doing lower extremity arterial bypass and 50 percent of hospitals doing coronary angioplasty reach the high-volume threshold for that procedure.
- For 6 out of 10 procedures studied here, less than 20 percent of hospitals would be considered high-volume providers.
- Over 90 percent of patients receiving lower extremity arterial bypass and around 85 percent of patients receiving coronary angioplasty and heart transplantation receive these procedures in high-volume hospitals.
- About 30 percent of heart surgery for children, 38 percent of all CABG surgery, and nearly half of all patients receiving elective abdominal aortic aneurysm repair, carotid endarterectomy, and pancreatic cancer surgery receive these procedures in low-volume hospitals.
- For esophageal cancer surgery and cerebral aneurysm repair, most patients receive their procedures at low-volume hospitals.



What are the most common procedures performed in U.S. hospitals?

- Nearly 4 million cardiac catheterizations are performed in U.S. hospitals. About 1 in 10 hospitalized patients receives a cardiac catheterization.
- Four of the top procedures are related to the heart: diagnostic cardiac catheterization, CABG, diagnostic ultrasound of the heart, and PTCA. This reflects the high burden of cardiovascular disease in the Nation.
- Four of the most frequent procedures are related to pregnancy and childbirth: procedures to assist delivery, circumcision, repair of obstetric laceration, and fetal monitoring.
- About 1 in 25 patients receives respiratory intubation and mechanical ventilation—procedures generally provided to critically ill patients in the intensive care unit. These patients include newborns in respiratory distress and adults with respiratory failure, pneumonia, myocardial infarction, and stroke.
- Five of the top procedures are diagnostic: diagnostic cardiac catheterization, upper gastrointestinal endoscopy and biopsy, diagnostic ultrasound of heart, CT scan of head, and colonoscopy and biopsy.
- Laminectomy/excision of intervertebral disk (surgery for back pain) accounts for over a half million hospital discharges per year.

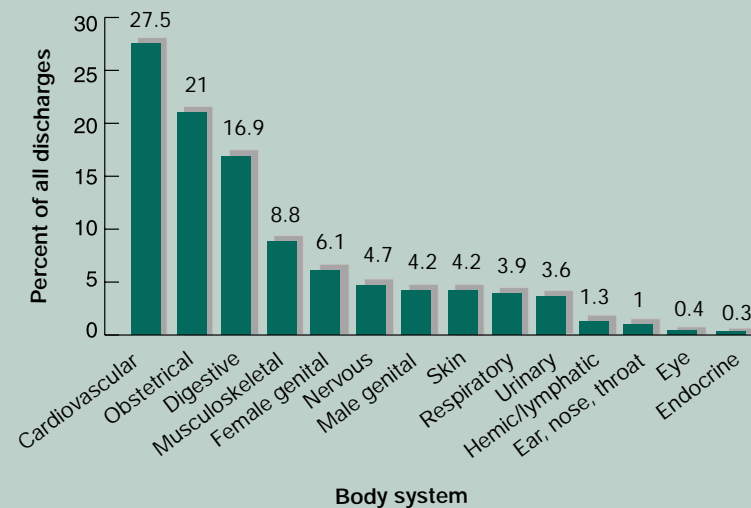
MOST COMMON PROCEDURES

All-listed procedures*	Total number of discharges with this procedure category (in thousands)	Percent of discharges with this procedure category
1. Diagnostic cardiac catheterization, coronary arteriography	3,868	10.9
2. Manually assisted delivery, medical induction and other procedures to assist delivery	2,055	5.8
3. Respiratory intubation and mechanical ventilation	1,361	3.8
4. Blood transfusion	1,259	3.6
5. Circumcision of infant	1,186	3.4
6. Repair of current obstetric laceration following delivery	1,184	3.3
7. Fetal monitoring	1,180	3.3
8. Upper gastrointestinal endoscopy, biopsy	1,168	3.3
9. Coronary artery bypass graft (CABG)	739	2.1
10. Diagnostic ultrasound of heart (echocardiogram)	641	1.8
11. Percutaneous transluminal coronary angioplasty (PTCA)	608	1.7
12. Hysterectomy	594	1.7
13. Computerized axial tomography (CT) scan, head	578	1.6
14. Colonoscopy and biopsy	564	1.6
15. Laminectomy/excision of intervertebral disk	529	1.5

* The term “All-listed procedures” refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

- Over 1 in 4 hospital stays has procedures that involve the cardiovascular system.
- One in 5 discharges has procedures related to pregnancy and childbirth.
- About 1 in 6 discharges has procedures that involve the digestive system.

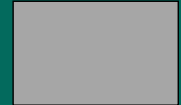
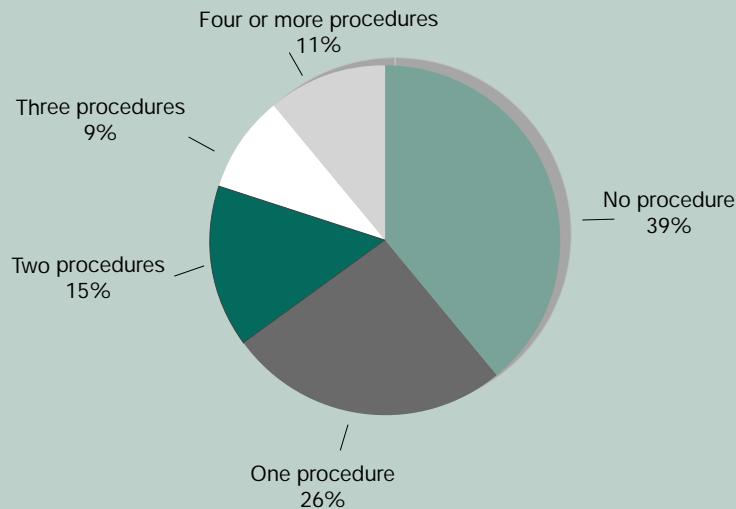
What type of procedures do patients receive, by body system?

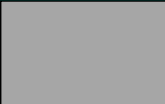


Note: Excludes miscellaneous minor diagnostic and therapeutic procedures. Patients can have procedures in multiple systems; thus the sum of the percents does not equal 100.

- Three of 5 patients in U.S. hospitals receive at least one procedure during their hospital stay. One in 5 receives three or more.
- Patients who receive at least one procedure average 2.3 procedures during their hospital stay (data not shown).
- Patients who receive no procedure are most commonly newborn infants or medical patients—patients with conditions such as pneumonia, congestive heart failure, depression, and chronic obstructive pulmonary disease—who are in the hospital for medical reasons such as stabilization, medication, and observation.

How many procedures do patients receive per hospital stay?





What are the most common medical and surgical procedures in various age groups?

- Appendectomy is the most common procedure for children ages 1-17, performed for nearly 5 percent of all hospitalized children. Other top procedures include treatments for fractures, cancer chemotherapy, and psychiatric therapy.
- Laminectomy (back surgery), hysterectomy and oophorectomy (removal of ovaries) are among the most common procedures for patients ages 18-64. About 3 percent of all hospital stays in this age group involve laminectomy. Over 5 percent of all hospital stays for patients ages 18-44 are for hysterectomy.
- Alcohol and drug detoxification is one of the top procedures performed for adults 18-44 years of age. Nearly 5 percent of all hospital stays in this age group involve alcohol and drug detoxification.
- More than 20 percent of patients 45-79 years of age admitted to the hospital receive diagnostic cardiac catheterization.
- Several heart procedures are in the top 10 for adults: diagnostic cardiac catheterization, CABG, PTCA, extracorporeal circulation auxiliary to open heart procedures, diagnostic ultrasound of the heart, and cardiac pacemaker procedures.
- About 6 percent of stays for infants and for adults ages 65-79 involve mechanical ventilation.
- Three percent of hospital stays for patients 80 and older are for the treatment of hip fractures. Colonoscopy is performed during about 3 percent of all hospital stays among patients 65 and older.
- When obstetrical procedures are included, 8 of the top 10 procedures performed on all patients 18-44 (male and female) are related to pregnancy and childbirth (data not shown). About 74 percent of all hospital stays in this age group are for women, and 60 percent of these stays are for pregnancy and childbirth.

MOST COMMON PROCEDURES BY AGE GROUP

All-listed procedures* by age group	< 1 yr	1-17 yr	18-44 yr	45-64 yr	65-79 yr	80+ yr
	Number of discharges with this procedure category in thousands (Percent of discharges)					
Respiratory intubation and mechanical ventilation	258 (5.7)	46 (2.9)	180 (3.3)	321 (4.9)	500 (6.2)	253 (5.3)
Blood transfusion	30 (0.6)	32 (1.9)	154 (2.9)	296 (4.5)	463 (5.8)	300 (6.3)
Diagnostic ultrasound of heart (echocardiogram)	20 (0.5)				246 (3.1)	139 (2.9)
Circumcision	1,181 (26.2)					
Prophylactic vaccinations and inoculations(e.g., hepatitis B)	557 (12.4)					
Enteral and parenteral nutrition	41 (0.9)					
Ophthalmologic and otologic diagnosis and treatment	25 (0.6)					
Diagnostic ultrasound of head and neck	22 (0.5)					
Tracheoscopy and laryngoscopy with biopsy	20 (0.5)					
Diagnostic spinal tap	152 (3.4)	45 (2.8)				
Respiratory therapy		50 (3.1)				
Cancer chemotherapy		45 (2.8)				
Psychological and psychiatric evaluation and therapy		28 (1.7)				
Treatment, fracture or dislocation of lower extremity		23 (1.4)				
Treatment, fracture or dislocation of hip and femur		22 (1.4)				145 (3.0)
Computerized axial tomography (CT) scan, head		31 (1.9)				146 (3.1)
Appendectomy		75 (4.6)	156 (2.9)			
Cholecystectomy and common duct exploration			143 (2.7)			
Alcohol and drug rehabilitation/detoxification			247 (4.6)			
Laminectomy/excision of intervertebral disk			179 (3.3)	193 (2.9)		
Hysterectomy			291 (5.4)	226 (3.4)		
Oophorectomy (removal of ovaries)			188 (3.5)	213 (3.2)		
Diagnostic cardiac catheterization, coronary arteriography			269 (5.0)	1,541 (23.3)	1,688 (21.1)	353 (7.4)
Upper gastrointestinal endoscopy, biopsy			161 (3.0)	292 (4.4)	428 (5.3)	264 (5.5)
Coronary artery bypass graft (CABG)				282 (4.3)	383 (4.8)	
Percutaneous transluminal coronary angioplasty (PTCA)				258 (3.9)	261 (3.3)	
Extracorporeal circulation auxiliary to open heart procedures				183 (2.8)	256 (3.2)	
Cardiac pacemaker or cardioverter/defibrillator procedure					221 (2.8)	162 (3.4)
Colonoscopy and biopsy					217 (2.7)	154 (3.2)
Physical therapy exercises, manipulation, and other procedures						131 (2.8)

* The term "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

Note: Excludes procedures related to pregnancy and childbirth.

How do procedures received by males and females compare?

- Two of the top 10 procedures for females are procedures of the reproductive system: hysterectomy and oophorectomy (removal of ovaries).
- Four of the top 10 procedures for males pertain to the cardiovascular system—three are therapeutic and one is diagnostic. In contrast, two of the top 10 procedures for females pertain to the cardiovascular system—both are diagnostic.
- Cholecystectomy and colonoscopy are among the top 10 procedures for females but not for males.
- Laminectomy/excision of intervertebral disk—surgery for back pain—is a top 10 procedure for males but not for females.

TOP 10 PROCEDURES BY GENDER

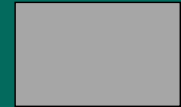
All-listed procedures*	Total number of male discharges with this procedure category, in thousands (Percent of male discharges)	Total number of female discharges with this procedure category, in thousands (Percent of female discharges)
No procedure	5,012 (40.0)	6,266 (43.1)
Diagnostic cardiac catheterization, coronary arteriography	2,337 (18.6)	1,531 (10.5)
Respiratory intubation and mechanical ventilation	723 (5.8)	638 (4.4)
Blood transfusion	569 (4.5)	690 (4.8)
Upper gastrointestinal endoscopy, biopsy	557 (4.4)	611 (4.2)
Coronary artery bypass graft (CABG)	524 (4.2)	
Percutaneous transluminal coronary angioplasty (PTCA)	398 (3.2)	
Extracorporeal circulation auxiliary to open heart procedures	348 (2.8)	
Laminectomy/excision of intervertebral disk	287 (2.3)	
Diagnostic ultrasound of heart (echocardiogram)	315 (2.5)	326 (2.3)
Cholecystectomy and common duct exploration		324 (2.2)
Oophorectomy (removal of ovaries)		477 (3.3)
Colonoscopy and biopsy		330 (2.3)
Hysterectomy		594 (4.1)

* The term “All-listed procedures” refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

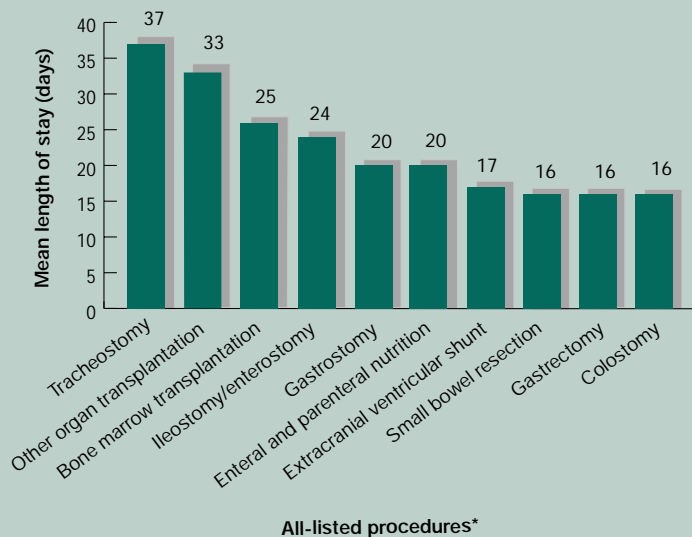
Note: Excludes procedures related to pregnancy and childbirth.

- Bone marrow and other organ transplantations (e.g., liver, heart) are 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/parenteral nutrition are performed for very ill patients requiring extensive care. Tracheostomy is performed for patients who are often dependent on mechanical ventilation or have need for other types of extended care.
- The hospitalizations with the longest lengths of stay are not very common. Collectively, these 10 procedures represent less than 2 percent of all hospital stays.

Which procedures are associated with the longest hospital stays?



PROCEDURES ASSOCIATED WITH LONGEST HOSPITAL STAYS



* The term “All-listed procedures” refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

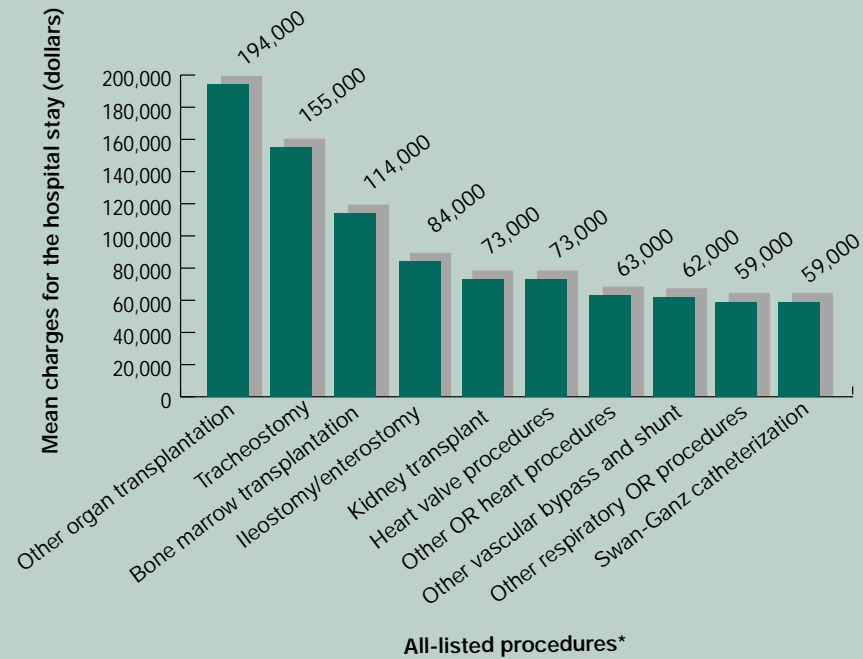
Note: Includes procedures that occurred in at least 5,000 discharges.



Which procedures are associated with the most costly hospital stays?

- Four of the top 10 most costly hospital stays are related to procedures on the cardiovascular system:
 - heart transplantation (part of other organ transplantation)
 - heart valve procedures
 - other operating room (OR) heart procedures (e.g., implant of pulsation balloon, pericardiectomy)
 - other vascular bypass and shunt (e.g., intra-abdominal venous shunt, aorta-renal bypass, aorta-subclavian-carotid bypass)
- Bone marrow and organ transplantations (e.g., heart, liver, kidney) are associated with some of the most expensive hospital stays.
- Some procedures are not in themselves costly but are associated with critical illness and expensive care, for example, a long stay in an intensive care unit. These include:
 - tracheostomy
 - Swan-Ganz catheterization
 - other OR respiratory procedures (e.g., reopening of recent thoracotomy site, decortication of lung, scarification of pleura)
- Four of the procedures performed during the most expensive hospital stays also are among those with the longest lengths of hospitalization:
 - other organ transplantation (e.g., heart, liver)
 - tracheostomy
 - bone marrow transplantation
 - ileostomy/enterostomy

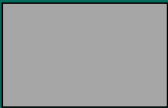
PROCEDURES ASSOCIATED WITH MOST COSTLY HOSPITAL STAYS



* The term “All-listed procedures” refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

Note: Includes procedures that occurred in at least 5,000 discharges.

- The most common procedure performed during hospital stays that end in death is conversion of cardiac rhythm, which indicates an unsuccessful attempt at resuscitation.
- The second most common procedure associated with high in-hospital mortality is respiratory intubation and mechanical ventilation. This procedure is done for critical conditions such as respiratory failure, myocardial infarction, stroke, pneumonia, and septicemia.



Which procedures are performed most often during hospital stays that end in death?

- Procedures that indicate the presence of organ failure and critical illness include Swan-Ganz catheterization, enteral and parenteral nutrition, hemodialysis, and blood transfusions.
- It is important to note that these top 10 procedures are markers of severe underlying disease and are not the cause of death.

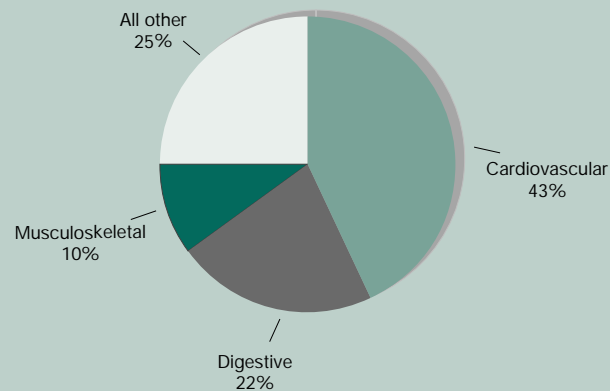
PROCEDURES ASSOCIATED WITH HIGHEST INPATIENT MORTALITY

All-listed procedures*	In-hospital mortality (in percent)
1. Conversion of cardiac rhythm	39.2
2. Respiratory intubation and mechanical ventilation	31.1
3. Swan-Ganz catheterization for monitoring heart function	25.2
4. Enteral and parenteral nutrition	16.9
5. Incision of pleura, thoracentesis, chest drainage	12.7
6. Diagnostic bronchoscopy and biopsy of bronchus	12.7
7. Blood transfusion	9.1
8. Hemodialysis	8.7
9. Computerized axial tomography (CT) scan, head	7.0
10. Upper gastrointestinal endoscopy, biopsy	4.2

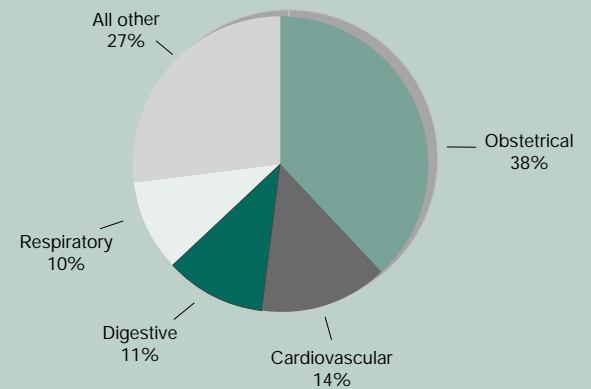
* The term "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

What are the differences in how procedures are billed, by body system?

MEDICARE



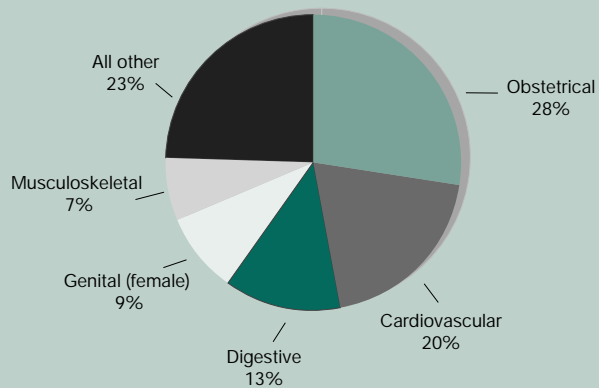
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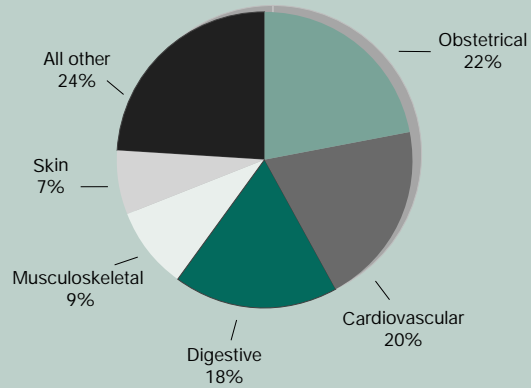
NOTE: Percentages of 6 percent or less are not shown separately.

- Obstetrical procedures comprise 38 percent of all procedures billed to Medicaid, 28 percent of those billed to private insurers, and 22 percent of those performed during uninsured hospital stays.
- Cardiovascular procedures account for more than 2 in 5 of all procedures billed to Medicare, 1 in 7 of those billed to Medicaid, and 1 in 5 of those billed to private insurers or uninsured.
- Procedures of the digestive system are the second most common category of procedures for Medicare patients, performed on more than 1 in 5 patients.

PRIVATELY INSURED



UNINSURED



What are the most common procedures for hospital stays billed to Medicare?

- Five out of the top 10 procedures billed to Medicare are related to the heart: diagnostic cardiac catheterization, CABG, cardiac pacemaker or cardioverter/defibrillator procedure, diagnostic ultrasound of heart, and PTCA.
- Medicare is billed for about three-fourths of all hospital stays that involve a cardiac pacemaker or defibrillator procedure.
- Medicare is billed for over 65 percent of all hospital stays that involve hemodialysis (treatment for renal failure) because treatment for end-stage renal disease is covered by Medicare, regardless of the patient's age.
- Medicare is billed for roughly half of all hospital stays involving cardiac catheterization, blood transfusion, upper gastrointestinal endoscopy, CABG, diagnostic ultrasound of heart, and PTCA.

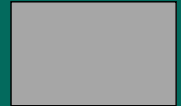
MEDICARE

All-listed procedures*	Total number of discharges with this procedure category (in thousands)	Medicare's share of hospital stays with this procedure (in percent)
1. Diagnostic cardiac catheterization, coronary arteriography	1,954	50.5
2. Respiratory intubation and mechanical ventilation	701	44.8
3. Blood transfusion	696	53.7
4. Upper gastrointestinal endoscopy, biopsy	651	55.7
5. Coronary artery bypass graft (CABG)	395	53.4
6. Cardiac pacemaker or cardioverter/defibrillator procedure	349	75.1
7. Colonoscopy and biopsy	343	60.7
8. Diagnostic ultrasound of heart (echocardiogram)	339	51.9
9. Hemodialysis	338	65.5
10. Percutaneous transluminal coronary angioplasty (PTCA)	296	48.7

* The term "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

- Seven of the top 10 procedures billed to Medicaid are for pregnancy, childbirth, and newborn infant care. Overall, Medicaid is billed for about one-third of all hospital stays involving these childbirth procedures.
- Medicaid is billed for 1 in 5 hospital stays involving respiratory intubation and mechanical ventilation.
- Medicaid’s share of hospital stays involving diagnostic cardiac catheterization—7.2 percent—is less than half its share of stays requiring blood transfusions—15.2 percent.

What are the most common procedures for hospital stays billed to Medicaid?



MEDICAID

All-listed procedures*

	Total number of discharges with this procedure category (in thousands)	Medicaid’s share of hospital stays with this procedure (in percent)
1. Procedures to assist delivery	752	36.6
2. Fetal monitoring	438	37.2
3. Repair of current obstetric laceration	372	31.4
4. Circumcision of infant	321	27.0
5. Respiratory intubation and mechanical ventilation	319	20.4
6. Diagnostic cardiac catheterization, coronary arteriography	277	7.2
7. Cesarean section	264	32.4
8. Artificial rupture of membranes to assist delivery	261	34.2
9. Episiotomy	252	28.5
10. Blood transfusion	197	15.2

* The term “All-listed procedures” refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

What are the most common procedures for hospital stays billed to private insurers?

■ Seven of the top 10 procedures billed to private insurers are related to pregnancy, childbirth, and newborn infant care. Private payers are billed for over half of these types of procedures.

■ Private insurers are billed for just over a third of hospital stays in which diagnostic cardiac catheterization is performed, indicating that government (i.e., Medicare) bears the largest burden of paying for this most common procedure.

■ Private insurers are billed for 7 in 10 hospital stays for hysterectomy.

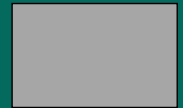
PRIVATELY INSURED

All-listed procedures*	Total number of discharges with this procedure category (in thousands)	Private insurer's share of hospital stays with this procedure (in percent)
1. Diagnostic cardiac catheterization, coronary arteriography	1,409	36.4
2. Procedures to assist delivery	1,130	55.0
3. Circumcision of infant	771	65.0
4. Repair of current obstetric laceration	721	60.9
5. Fetal monitoring	639	54.2
6. Episiotomy	566	64.0
7. Cesarean section	496	60.9
8. Artificial rupture of membranes to assist delivery	434	57.0
9. Hysterectomy	431	71.9
10. Respiratory intubation and mechanical ventilation	423	27.1

* The term "All-listed procedures" refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

- Among uninsured patients, 4 of the top 10 procedures are related to pregnancy, childbirth, and newborn infant care: procedures to assist delivery, fetal monitoring, repair of current obstetric laceration, and circumcision.
- Seventeen percent of hospital stays for alcohol and drug detoxification are not covered by insurance.

What are the most common procedures for uninsured hospital stays?



UNINSURED

All-listed procedures*	Total number of discharges with this procedure category (in thousands)	Percent of hospital stays with this procedure that are uninsured
1. Diagnostic cardiac catheterization, coronary arteriography	123	3.2
2. Procedures to assist delivery	83	4.1
3. Respiratory intubation and mechanical ventilation	73	4.7
4. Alcohol and drug rehabilitation/detoxification	63	17.0
5. Fetal monitoring	54	4.5
6. Repair of current obstetric laceration	45	3.8
7. Circumcision of infant	45	3.8
8. Upper gastrointestinal endoscopy, biopsy	44	3.7
9. Blood transfusion	41	3.2
10. Computerized axial tomography (CT) scan, head	37	6.4

* The term “All-listed procedures” refers to all procedures performed during a hospital stay; patients often receive more than one procedure.

Do patients in hospitals that do higher numbers of certain procedures have lower mortality rates?

Recent research* suggests that the outcomes, or results, of certain procedures are related to how many of them are performed in a hospital. These procedures often require high-technology support; but the exact nature of this “volume-to-outcome” relationship is not well understood.

- Hospitals that perform more than a specific number of certain procedures have fewer in-hospital deaths for those particular procedures. This “threshold number” varies with the type of procedure.
- For example, hospitals where at least 500 CABG procedures are performed each year have significantly lower mortality rates for CABG than hospitals performing fewer than 500. Hospitals doing nine or more heart transplantations annually have fewer in-hospital deaths for this procedure than hospitals doing fewer than nine.

Ten procedures with evidence of a volume-to-outcome link

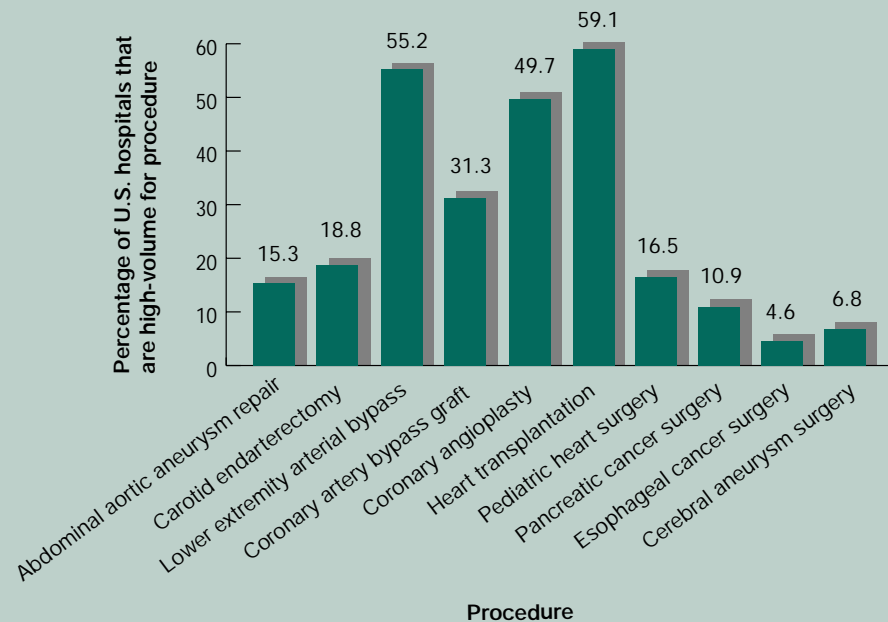
Procedure-specific volume threshold: A low-volume hospital performs fewer than—

Elective abdominal aortic aneurysm repair	32
Carotid endarterectomy	101
Lower extremity arterial bypass	20
Coronary artery bypass graft	500
Coronary angioplasty	400
Heart transplantation	9
Pediatric heart surgery	100
Pancreatic cancer surgery	7
Esophageal cancer surgery	7
Cerebral aneurysm surgery	30

* Adapted from Dudley R, Johansen K, Brand R, et al. Selective referral to high-volume hospitals: estimating potentially avoidable deaths. JAMA. 2000 Mar 1;283(9):1159-66.

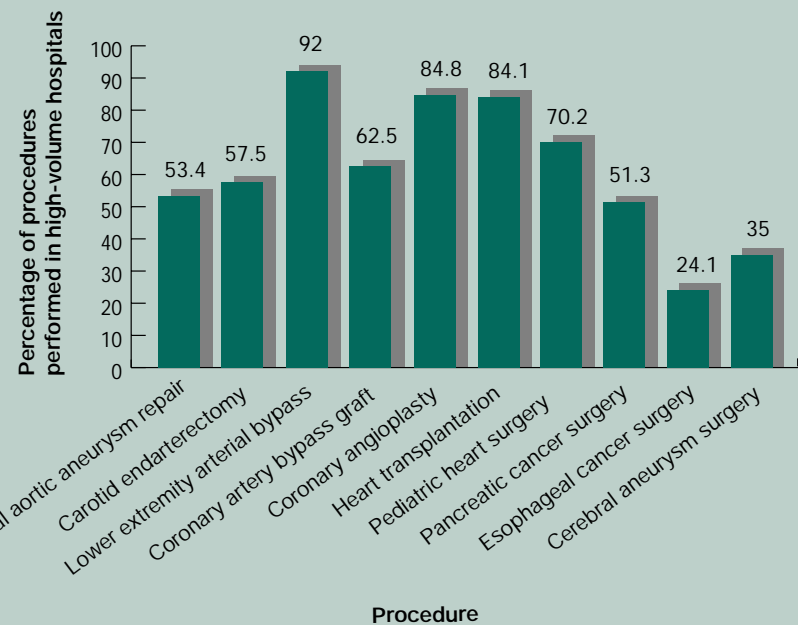
- About 60 percent of hospitals that do heart transplantations, 55 percent of those that do lower extremity arterial bypass, and half of those that do coronary angioplasty are high-volume providers.
- Only about one-third of hospitals that perform coronary artery bypass graft surgery are high-volume providers.
- Fewer than 1 in 5 hospitals doing carotid endarterectomy and 1 in 6 performing pediatric heart surgery and abdominal aortic aneurysm repair are high-volume hospitals.
- Roughly 1 in 10 hospitals performing pancreatic cancer surgery, 1 in 15 doing cerebral aneurysm surgery, and 1 in 20 doing esophageal cancer surgery are high-volume providers.

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



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

- Over 90 percent of patients receiving lower extremity arterial bypass and about 85 percent of patients undergoing coronary angioplasty and heart transplantations receive them in high-volume hospitals.
- Just over 70 percent of heart surgery procedures for children are performed in high-volume hospitals.
- Less than two-thirds of coronary artery bypass graft surgeries are done in high-volume hospitals.
- Over half of all abdominal aortic aneurysm repair, carotid endarterectomy, and pancreatic cancer surgeries are done in high-volume hospitals.
- Only a fourth of surgical procedures for esophageal cancer and just over a third of those for cerebral aneurysm repair are done in high-volume hospitals.



The data 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 and is managed by staff in AHRQ's Center for Organization and Delivery Studies. HCUP is based on data collected by individual States and forwarded to AHRQ by the States. HCUP would not be possible without State data collection projects and their partnership with AHRQ.

For 1997, 22 State organizations contributed their data to AHRQ where all data are edited and transformed into a uniform format. The uniform data in HCUP databases make possible comparative studies of health care services and the use and cost of hospital care, including:

- the effects of market forces on hospitals and the care they provide,
- variations in medical practice,
- the effectiveness of medical technology and treatments, and
- use of services by special populations.

HCUP includes short-term, non-Federal, community hospitals (general and specialty hospitals such as pediatric, obstetrics-gynecology, short-term rehabilitation, and oncology hospitals are included). Long-term care and psychiatric hospitals are excluded.

HCUP includes two sets of inpatient databases for health services research. The State Inpatient Databases (SID) for 1997 cover inpatient care in community hospitals in 22 States and include nearly 60 percent of all hospital discharges in the United States. The Nationwide Inpatient Sample includes all discharges from a sample of about 1,000 hospitals drawn from the SID, adjusted to approximate a national sample.

This report is based on data from the NIS. The NIS approximates a 20-percent sample of U.S. community hospitals, as defined by the American Hospital Association (AHA). The NIS for 1997 includes information from 7.1 million discharges that were weighted to obtain estimates that represent the total number of inpatient hospital discharges in the United States (35.4 million).

Source of Data for This Report





Methods

The Clinical Classifications Software (CCS), developed by AHRQ, has been used throughout this Fact Book to aggregate procedure codes into a limited number of categories. Procedures recorded on hospital discharge records are coded using the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM), Fifth Edition. Although ICD-9-CM may be used to provide descriptive statistics, aggregating similar diagnoses or procedures into clinically meaningful categories, such as the CCS, can be more helpful. More information on CCS can be downloaded from AHRQ's Web site (www.ahrq.gov/data/hcup).

Frequencies and rankings of procedures are based on all-listed procedures; that is, all procedures listed on the discharge record. The unit of analysis is the inpatient stay, rather than the patient or procedure. All discharges have been weighted to produce national estimates.

Total charges in HCUP data are the amount the hospital charged or billed for the entire hospital stay and do not reflect charges for the individual procedures. Charges do not necessarily reflect reimbursements or costs and are generally higher than costs. Hospital charges do include professional (physician) fees. Charge data were present for 98 percent of all discharges.

Because the NIS is limited to inpatient hospital data, procedures performed in outpatient or ambulatory care settings are not reflected here.

Many medical terms are used throughout this report. For help in understanding these terms, refer to the Glossary.

Abdominal aortic aneurysm- a distended and weakened area in the wall of the abdominal aorta, more common in those who suffer from atherosclerosis

Abdominal cavity- the part of the body between the bottom of the ribs and the top of the thighs, containing most of the digestive and urinary systems along with some reproductive organs

Adenoidectomy- the surgical removal of the adenoid glands

Angioplasty- the use of surgery to make a damaged blood vessel function properly again; may involve widening or reconstructing the blood vessel

Aorta- the main artery in the body, carrying oxygenated blood from the heart to other arteries in the body

Appendectomy- surgical removal of the appendix to treat appendicitis

Appendicitis- inflammation of the appendix

Appendix- a short, tubelike structure that branches off the large intestine; does not have any known function

Arteriography- roentgenography of arteries after injection of radiopaque material into the blood stream

Artery- a large blood vessel that carries blood from the heart to tissues and organs in the body

Arthroplasty- the surgical repair of a joint

Biopsy- a procedure that involves obtaining a tissue specimen for microscopic analysis to establish a precise diagnosis

Blood transfusion- the transfer of blood or any of its parts to a person who has lost blood due to an injury, disease, or operation

Bone marrow- the fatty yellow or red tissue inside bones that is responsible for producing blood cells

Bone marrow transplant- a surgical procedure in which defective or cancerous bone marrow is replaced with healthy marrow, either from the patient or a donor

Bronchoscopy- an examination used for inspection of the interior of the tracheo-bronchial tree, performance of endobronchial diagnostic tests, taking of specimens for biopsy and culture and removal of foreign bodies

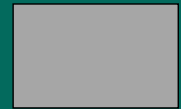
Breech birth- childbirth in which the baby is turned around in the uterus and emerges head-last instead of head-first

Bypass- a surgical technique in which the flow of blood or another body fluid is redirected around a blockage

Cardiovascular system- the heart and blood vessels that are responsible for circulating blood throughout the body

Cardioverter/defibrillator- a device which delivers a measured electrical shock to arrest fibrillation of the heart (ventricle)

Glossary



Catheter- a hollow, flexible tube inserted into the body to put in or take out fluid, or to open up or close blood vessels

Catheterization- a technique in which a hollow, flexible tube is used to drain body fluids (such as urine), to introduce fluids into the body, or to examine or widen a narrowed vein or artery

Cerebral aneurysm- a dilated and weakened portion of a cerebral blood vessel that is prone to rupture

Cesarean section- an operation performed to remove a fetus by cutting into the uterus, usually through the abdominal wall

Chemotherapy- the treatment of infections or cancer with drugs that act on disease-producing organisms or cancerous tissue; may also affect normal cells

Circumcision- the surgical removal of the foreskin of the penis

Cholecystectomy- the surgical removal of the gallbladder

Colonoscopy- investigation of the inside of the colon using a long, flexible fiberoptic tube

Coronary- describes structures that encircle another structure (such as the coronary arteries, which circle the heart); commonly used to refer to a coronary thrombosis or a heart attack

Coronary arteries- the arteries that branch off from the aorta and supply oxygen-rich blood to the heart muscle

Coronary artery bypass graft (CABG) surgery- an operation in which a piece of vein or artery is used to bypass a blockage in a coronary artery; performed to prevent myocardial infarction (heart attack) and relieve angina pectoris (chest pain due to reduced blood flow to heart muscles)

CT scanning- computerized axial tomography, a procedure that uses X-rays and computers to create cross-sectional images of the body to diagnose and monitor disease

Detoxification- treatment given either to fight a person's dependence on alcohol or other drugs or to rid the body of a poisonous substance and its effects

Echocardiogram- an image of the heart that is created by high-frequency (ultrasound) sound waves

Electroencephalography- a procedure for recording the electrical impulses of brain activity

Embolism- the blockage of a blood vessel by an embolus - something previously circulating in the blood (such as a blood clot, gas bubble, tissue, bacteria, bone marrow, cholesterol, fat, etc.)

Endocrine system- the system of glands that release their secretions (hormones) directly into the circulatory system

Endoscopy- the visual inspection of any cavity of the body by means of an endoscope

Enteral- a method of nutrient delivery where fluid is given directly into the gastrointestinal tract

Enterostomy- creation of an artificial external opening or fistula in the intestines

Episiotomy- a surgical procedure in which an incision is made in the tissue between the vagina and anus to prevent tearing of this tissue during childbirth

Excision- the surgical removal of diseased tissue

Extracorporeal circulation- diversion of blood flow through a circuit located outside the body but continuous with the bodily circulation

Fallopian tube- either of two long, slender ducts connecting a woman's uterus to her ovaries, where eggs are transported from the ovaries to the uterus and sperm may fertilize an egg

Femoral hernia- a common type of groin hernia which occurs most often in obese females

Femur- the bone located between the hip and the knee; the thighbone

Fetal monitoring- the use of an instrument to record or listen to a fetus' heartbeat during pregnancy and labor

Fetus- the term used to refer to an unborn child from 8 weeks after fertilization to birth

Fibrillation- rapid, inefficient contraction of muscle fibers of the heart caused by disruption of nerve impulses

Forceps delivery- the use of an instrument that cups the baby's head (called an obstetric forceps) to help deliver a baby

Foreign body- an object in an organ or body cavity that is not normally present

Fracture- a bone break

Gastrectomy- surgical removal of all or part of the stomach

Gastrointestinal tract- the part of the digestive system that includes the mouth, esophagus, stomach, and intestines

Gastrostomy- the surgical creation of an opening in the abdominal wall into the stomach for drainage or a feeding tube

Graft- healthy tissue that is used to replace diseased or defective tissue

Heart valve- the structure at each exit of the four chambers of the heart that allows blood to exit but not to flow back in

Hemodialysis- a method used to treat kidney failure, in which blood is passed through a machine that purifies it and returns it to the body

Hysterectomy- surgical removal of the uterus

Ileostomy- a surgical procedure in which the lower part of the small intestine (the ileum) is cut and brought to an opening in the abdominal wall, where feces can be passed out of the body

Ileum- the lowest section of the small intestine, which attaches to the large intestine

Induction of labor- the use of artificial means to start the process of childbirth

Inguinal hernia- the bulging of a portion of the intestines or abdominal tissue into the muscles of the groin (the area just below the abdomen)

Inoculation- introduction of material (usually a vaccine) into the tissues

Intervertebral disks- broad, flat cartilage structures containing a gel-like fluid that cushion and separate vertebrae

Intubation- the passage of a tube into an organ or body structure; commonly used to refer to the passage of a tube down the windpipe for artificial respiration

Kidney- one of two organs that are part of the urinary tract; responsible for filtering the blood and removing waste products and excess water as urine

Laceration- a torn or ragged wound

Laminectomy- a surgical procedure that removes part of a vertebra to relieve pressure on the spinal cord or a nerve branching from the spinal cord

Laparoscope- a viewing instrument used to examine and treat disorders in the abdominal cavity; consists of a long tube with an eyepiece, a lens, and often a camera, which allows the image to be viewed on a monitor

Laparoscopic cholecystectomy- surgical removal of the gallbladder using a laparoscope

Lesion- an abnormality of structure or function in the body

Ligation- the process of closing a blood vessel or duct by tying it off

Liver- the largest organ in the body, producing many essential chemicals and regulating the levels of most vital substances in the blood

Lymphatic system- the tissues and organs (including the bone marrow, spleen, thymus and lymph nodes) that produce and store cells that fight infection and the network of vessels that carry lymph

Mortality- the death rate, measured as the number of deaths per a certain population; may describe the population as a whole, or a specific group within a population (such as infant mortality or in-hospital mortality)

Musculoskeletal system- all the muscles, bones, and cartilage of the body collectively

Myringotomy- a surgical opening in the eardrum that allows for drainage

Nerve- a bundle of fibers that transmit electrical messages between the brain and areas of the body; these messages convey sensory or motor function information

Obstetrics- a branch of medicine dealing with the care of women during pregnancy, childbirth, and the period during which they recover from childbirth

Oophorectomy- the surgical removal of one or both ovaries; used to treat the growth of ovarian cysts or tumors

Open heart surgery- any operation in which the heart is stopped temporarily and a machine is used to take over its function of pumping blood throughout the body

Ophthalmology- the area of medicine dealing with the eye

Otologic surgical procedures- surgery performed on the external, middle, or internal ear

Ovaries- two almond-shaped glands located at the opening of the fallopian tubes on both sides of the uterus; produce eggs and the sex hormones estrogen and progesterone

Pacemaker- a small electronic device that is surgically implanted to stimulate the heart muscle to provide a normal heartbeat

Parenteral- not through the alimentary canal but rather by injection through some other route, as subcutaneous, intramuscular, intraorbital, intracapsular, intraspinal, intrasternal, intravenous, etc.

Percutaneous- performed through the skin, as injection of radiopaque material in radiological examination or the removal of tissue for biopsy accomplished by a needle

Pharynx- the throat; the tube connecting the back of the mouth and nose to the esophagus and windpipe

Phototherapy- treatment with light; for example, a newborn with jaundice may be put under light

Physical therapy- the treatment of injuries or disorders using physical methods, such as exercise, massage, or the application of heat

Pleura- the serous membranes covering the lungs (visceral pleura) and lining the inner aspect of the pleural cavity (parietal pleura)

Prophylactic- anything used to prevent disease

Psychological- relating to the mind and the processes of the mind

PTCA- Percutaneous transluminal coronary angioplasty, dilation of an occluded coronary artery (or arteries) by means of a balloon catheter to restore myocardial blood supply

Rehabilitation- treatment for an injury or illness aimed at restoring physical abilities

Resection- partial or complete surgical removal of a diseased organ or structure

Respiration- the process by which oxygen is taken in and used by tissues in the body and carbon dioxide is released

Respiratory system- the organs that carry out the process of respiration

Retina- a membrane lining the inside of the back of the eye that contains light-sensitive nerve cells that convert focused light into nerve impulses, making vision possible

Screening- the testing of an otherwise healthy person in order to diagnose disorders at an early stage

Spleen- an organ located in the upper left abdomen behind the ribs that removes and destroys old red blood cells and helps fight infection

Spinal tap- another term for a lumbar puncture

Swan-Ganz catheter- a special haemodynamic monitoring device (long thin catheter) that is introduced into a large vein (in the neck, chest or groin) and advanced through the right heart to the pulmonary artery

Thoracentesis- a medical procedure that involves the removal of fluid from the chest cavity using a hollow bore needle

Tonsillectomy- surgical removal of the tonsils, usually to treat tonsillitis

Tracheostomy- the surgical creation of an artificial airway in the trachea (windpipe) on the anterior surface of the neck

Transplant- transferring a healthy tissue or organ to replace a damaged tissue or organ; also refers to the tissue or organ transplanted

Transurethral prostatectomy- removal of cancerous tissue from the prostate gland using a resectoscope (a long, narrow instrument passed up the urethra), which allows the surgeon to simultaneously view the prostate and cut away the cancerous tissue

Tubal ligation- a procedure in which the fallopian tubes are cut and tied off; usually a permanent form of sterilization

Ultrasound scanning- an imaging procedure used to examine internal organs in which high-frequency sound waves are passed into the body, reflected back, and used to build an image

Urethra- the tube by which urine is released from the bladder

Uterus- the hollow female reproductive organ in which a fertilized egg is implanted and a fetus develops

Vaccination- a form of immunization in which killed or weakened microorganisms are placed into the body, where antibodies against them are developed; if the same types of microorganisms enter the body again, they will be destroyed by the antibodies

Vaccine- a preparation of weakened microorganisms given to create resistance to a certain disease

Vacuum extraction- a technique used to facilitate childbirth using a suction device to help move the baby through the birth canal

Valve- a structure that allows fluid flow in only one direction

Vascular- pertaining to blood vessels

Vein- a blood vessel that carries blood toward the heart

Ventilation- the process through which oxygen and carbon dioxide are exchanged between the lungs and the air; also refers to the use of a machine to carry out this process in someone who cannot breathe on his or her own

Ventricle- a small cavity or chamber; there are four ventricles in the brain that circulate cerebrospinal fluid through it, and two in the heart that pump blood throughout the body

Sources:

Young, T. American Medical Association medical glossary (http://www.ama-assn.org/insight/gen_hlth/glossary/)

Dark, G. On-line medical dictionary (<http://www.graylab.ac.uk/omd/>)

More information on HCUP data and the CCS can be obtained at www.ahrq.gov/data/hcup.

Additional descriptive statistics can be viewed through HCUPnet, an Internet-based tool providing easy access to information on hospital stays. HCUPnet is available at www.ahrq.gov/data/hcup/hcupnet.htm.

NIS data can be purchased for research through the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: 1-800-553-6847 or 703-605-6000; www.ntis.gov/fcpc). Following is a list of products currently available:

- Release 6, 1997 data (PB2000-500006)
- Release 5, 1996 data (PB 99-500480)
- Release 4, 1995 data (PB 98-500440)
- Release 3, 1994 data (PB 97-500433)
- Release 2, 1993 data (PB 96-501325)
- Release 1, 1988-1992 data (PB 95-503710)

Price for Release 1 is \$322; price for Releases 2 through 6 is \$160 per year. All prices may be higher for customers outside the United States, Canada, and Mexico.

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