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Hospitalizations Related to Pressure Ulcers among Adults 18 Years and Older, 2006

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Introduction

Pressure ulcers typically result from prolonged periods of uninterrupted pressure on the skin, soft tissue, muscle, and bone. Vulnerable patients include the elderly, stroke victims, patients with diabetes, those with dementia, and people who use wheelchairs or who are bedridden—any patient with impaired mobility or sensation. Pressure ulcers cause extreme discomfort to the patient and often lead to serious, life threatening infections, which substantially increase the total cost of care.

Moreover, the presence of pressure ulcers can be indicative of the quality of care received by patients at home or in health care facilities, such as nursing homes and hospitals. Though hospital discharge data with a principal diagnosis of a pressure ulcer clearly specifies that the patient was admitted to the hospital with a pre-existing pressure ulcer, a secondary diagnosis of a pressure is more ambiguous. A secondary diagnosis may indicate that the pressure ulcer developed during the hospitalization, or it might designate the presence of a pressure ulcer before admission.

This Statistical Brief presents data from the Healthcare Cost and Utilization Project (HCUP) on patterns of utilization and costs for adult hospital stays involving the treatment of pressure ulcers in 2006.¹ Variation in the characteristics of stays principally for pressure ulcers and hospitalizations with a secondary diagnosis of pressure ulcers are compared to stays for all other conditions. Differences in utilization are illustrated according to patient age, expected primary payer, and related conditions. All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Findings

Pressure ulcers, or decubitus ulcers, are increasingly common in U.S. hospitalizations. In 2006, there were 503,300 hospital stays during which pressure ulcers were noted—a 78.9 percent increase from 1993 when there were about 281,300 hospital stays related to

¹ Unless otherwise noted, hospital stays occurring among persons less than 18 years old have been excluded from this analysis.

Highlights

- In 2006, there were 503,300 total hospital stays with pressure ulcers noted as a diagnosis—an increase of nearly 80 percent since 1993. Adult stays totaled \$11 billion in hospital costs.
- More than 90 percent of pressure ulcer-related stays among adults were for the principal treatment of other conditions, such as septicemia, pneumonia, and urinary tract infection.
- Compared to stays for all other conditions, stays related to pressure ulcers were more often discharged to a long-term care facility and more likely to result in death.
- Nearly three out of four adult patients hospitalized with a secondary pressure ulcer diagnosis (72 percent) were 65 years and older. In contrast, 56.5 percent of adult patients with a principal diagnosis of pressures ulcers were 65 or older.
- Billed for three out of four hospitalizations, Medicare was the most common payer of adult stays related to pressure ulcers.
- Paralysis and spinal cord injury were common co-existing conditions among younger adults hospitalized principally for pressure ulcers, while fluid and electrolyte disorders, nutritional disorders, diabetes without complications, and dementia were more often seen among patients 65 and older.

pressure ulcers (figure 1). During this same time period, the total number of hospitalizations increased by only 15 percent. Stays with a secondary diagnosis of pressure ulcers increased by 86.4 percent during this period, while stays principally for pressure ulcers increased by 27.2 percent. Adult hospital stays noting a diagnosis of pressure ulcers totaled \$11.0 billion in 2006.

General characteristics of hospital stays related to pressure ulcers

Table 1 compares the utilization and patient characteristics of both principal and secondary pressure ulcer hospitalizations to hospital stays for all other conditions among adults 18 years and older. In 2006, more than 90 percent of pressure ulcer-related adult hospitalizations noted pressure ulcers as the secondary diagnosis, rather than the principal reason for admission. Stays principally for pressure ulcers were slightly longer than those with a secondary pressure ulcer diagnosis (14.1 days versus 12.7 days). Furthermore, the length of stay for hospitalizations principally for pressure ulcers was nearly three times longer than hospitalizations with no diagnosis of pressure ulcers (14.1 days versus 5.0 days). Though stays principally for pressure ulcers were longer than stays with a secondary diagnosis of pressure ulcers and those with no pressure ulcer diagnosis, the average cost per day (\$1,200) was lower—nearly \$400 less than secondary pressure ulcer stays (\$1,600 per day) and \$800 less than stays for all other conditions (\$2,000 per day).

Stays related to pressure ulcers were more likely to be discharged to a long-term care facility (e.g. a skilled nursing facility, an intermediate care facility, or a nursing home), as compared to hospitalizations for all other conditions. In fact, over half of principal pressure ulcer stays (53.4 percent) and secondary pressure ulcer stays (54.5 percent) were discharged to long-term care—more than three times the rate of hospitalizations for all other conditions (16.2 percent).

As a principal diagnosis, just over half (50.3 percent) of adult patients hospitalized for pressure ulcers were male. Conversely, adult patients with a secondary diagnosis of pressure ulcers were less often male (46.9 percent), which was similar to the percentage of male stays for all other conditions (45.9 percent).

In-hospital mortality was also higher for pressure ulcer-related hospitalizations, especially among those hospitalizations with a secondary diagnosis of pressure ulcers. In-hospital death occurred in 11.6 percent of stays with pressures ulcers noted as a secondary diagnosis, as compared to 4.2 percent of stays principally for pressure ulcers and 2.6 percent of stays for all other conditions.

Differences in hospital stays related to pressure ulcers, by age

Compared to stays for all other conditions, adult patients hospitalized with pressure ulcers were older. As shown in figure 2, nearly three out of four adult stays with a secondary diagnosis of pressure ulcers occurred among patients older than 65 years old, resulting in a mean age (71.9 years) that was more than ten years older than patients hospitalized with no diagnosis of pressure ulcers. Nearly half (49.0 percent) of stays with a secondary pressure ulcer diagnosis occurred among patients aged 65 to 84 years, while this age group accounted for 37.1 percent of all non-pressure ulcer stays. Moreover, secondary pressure ulcer stays had the highest concentration of patients aged 85 years and older (23.0 percent).

Patients 65 and older accounted for 56.5 percent of adult patients with a principal diagnosis of pressures ulcers. Hospital stays principally for pressure ulcers had a mean age (65.3 years) that was nearly four years older than the mean age for patients hospitalized for all other conditions (61.5 years).

Differences in hospital stays related to pressure ulcers, by primary payer

Given the prevalence of older patients hospitalized with pressure ulcers, it is not surprising that the most common primary payer for hospitalizations related to pressure ulcers was Medicare (figure 3). In 2006, nearly three out of four hospitalizations with a pressure ulcer diagnosis were billed to Medicare, as compared to just over half of hospitalizations for all other conditions. Although patients 65 years and older accounted for about 57 percent of adult stays principally for pressure ulcers, Medicare covered 73.8 percent of these stays, suggesting that disabled individuals may account for a large share of hospitalizations with a principal diagnosis of pressure ulcers. In fact, government payers—Medicare and

Medicaid—bore the greatest burden of hospitalizations principally for pressure ulcers; Medicaid patients accounted for an additional 12.5 percent of hospitalizations with a principal diagnosis of pressure ulcers.

Patients with private insurance accounted for about ten percent of all pressure ulcer-related hospital stays, while comprising nearly 30 percent of all non-pressure ulcer stays. Only 1.4 percent of all pressure ulcer-related stays were uninsured compared with approximately six percent of adult stays for all other conditions.

Most common reasons for hospitalizations related to pressure ulcers

Table 2 shows the most common principal reasons for hospitalizations during which pressure ulcers were also present. The most common principal reasons for hospitalization among stays with secondary pressure ulcer diagnoses included septicemia (16.1 percent of all pressure ulcer-related hospitalizations had this principal diagnosis), pneumonia (6.3 percent), urinary tract infection (5.6 percent), respiratory failure (4.3 percent), and aspiration pneumonitis (3.7 percent). Of particular note is that 13.5 percent of all stays principally for septicemia had pressure ulcers noted as a co-existing condition, and 10.7 percent of all stays principally for aspiration pneumonitis had pressure ulcers noted as a secondary condition.

Among hospital stays that were principally for pressure ulcers, other concomitant conditions included anemia (31.2 percent), urinary tract infections (30.5 percent), paralysis (29.2 percent), fluid and electrolyte disorders (26.1 percent), nutritional deficiencies (23.4 percent), diabetes without complications (20.6 percent), and dementia (20.4 percent).² However, common concomitant diagnoses and their distribution varied by age (figure 4). Paralysis and spinal cord injury were prominent among younger patients, while fluid and electrolyte disorders, nutritional disorders, diabetes without complications, and dementia were more often seen among patients 65 and older.

Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2006 NIS. Historical data were drawn from the 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, and 2005 NIS.

Definitions

Diagnoses, ICD-9-CM, and Clinical Classifications Software (CCS)

The principal diagnosis is that condition established after study to be chiefly responsible for the patient's admission to the hospital. Secondary diagnoses are concomitant conditions that coexist at the time of admission or that develop during the stay.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are about 13,600 ICD-9-CM diagnosis codes.

CCS categorizes ICD-9-CM diagnoses into a manageable number of clinically meaningful categories.³ This "clinical grouper" makes it easier to quickly understand patterns of diagnoses and procedures.

Case Definition

The ICD-9-CM codes defining pressure ulcers include diagnosis codes in the following range: 707.00–707.09.

Types of hospitals included in HCUP

HCUP is based on data from community hospitals, defined as short-term, non-Federal, general and other hospitals, excluding hospital units of other institutions (e.g., prisons). HCUP data include OB-GYN, ENT,

² Because patients can have more than one concomitant, or secondary, condition, figures do not sum to 100 percent.

³ HCUP CCS. Healthcare Cost and Utilization Project (HCUP). May 2008. U.S. Agency for Healthcare Research and Quality, Rockville, MD, www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

orthopedic, cancer, pediatric, public, and academic medical hospitals. They exclude long-term care, rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals, but these types of discharges are included if they are from community hospitals.

Unit of analysis

The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in one year will be counted each time as a separate "discharge" from the hospital.

Costs and charges

Total hospital charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS).⁴ Costs will tend to reflect the actual costs of production, while charges represent what the hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used because detailed charges are not available across all HCUP States. Hospital charges reflect the amount the hospital charged for the entire hospital stay and does not include professional (physician) fees. For the purposes of this Statistical Brief, costs are reported to the nearest hundreds.

Primary payer

Payer is the expected primary payer for the hospital stay. To make coding uniform across all HCUP data sources, payer 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. Patients covered by the State Children's Health Insurance Program (SCHIP) may be included here. Because most state data do not identify SCHIP patients specifically, it is not possible to present this information separately.
- Private insurance includes Blue Cross, commercial carriers, and private HMOs and PPOs.
- Other includes Worker's Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.
- Uninsured includes an insurance status of "self-pay" and "no charge".

When more than one payer is listed for a hospital discharge, the first-listed payer is used.

Discharge status

Discharge status indicates the disposition of the patient at discharge from the hospital, and includes the following six categories: routine (to home), transfer to another short-term hospital, other transfers (including skilled nursing facility, intermediate care, and another type of facility such as a nursing home), home health care, against medical advice (AMA), or died in the hospital.

About HCUP

HCUP is a family of powerful health care databases, software tools, and products for advancing research. Sponsored by the Agency for Healthcare Research and Quality (AHRQ), HCUP includes the largest all-payer encounter-level collection of longitudinal health care data (inpatient, ambulatory surgery, and emergency department) in the United States, beginning in 1988. HCUP is a Federal-State-Industry Partnership that brings together the data collection efforts of many organizations—such as state data organizations, hospital associations, private data organizations, and the Federal government—to create a national information resource.

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

Arizona Department of Health Services

⁴ HCUP Cost-to-Charge Ratio Files (CCR). Healthcare Cost and Utilization Project (HCUP), 2001–2005. U.S. Agency for Healthcare Research and Quality, Rockville, MD, www.hcup-us.ahrq.gov/db/state/costtocharge.jsp.

Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
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 Department of Health and Human Services
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
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Rhode Island Department of Health
South Carolina State Budget & 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
Wyoming Hospital Association

About the NIS

The HCUP Nationwide Inpatient Sample (NIS) is a nationwide database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, non-rehabilitation hospitals). The NIS is a sample of hospitals and includes all patients from each hospital, regardless of payer. It is drawn from a sampling frame that contains hospitals comprising about 90 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at both the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use.

For More Information

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

For additional HCUP statistics, visit HCUPnet, our interactive query system, at www.hcup.ahrq.gov.

For information on other hospitalizations in the U.S., download *HCUP Facts and Figures: Statistics on Hospital-based Care* in the United States in 2006, located at <http://www.hcup-us.ahrq.gov/reports.jsp>.

For a detailed description of HCUP, more information on the design of the NIS, and methods to calculate estimates, please refer to the following publications:

Steiner, C., Elixhauser, A., Schnaier, J. The Healthcare Cost and Utilization Project: An Overview. *Effective Clinical Practice* 5(3):143–51, 2002.

Introduction to the HCUP Nationwide Inpatient Sample, 2006. Online. May 14, 2008. U.S. Agency for Healthcare Research and Quality.
http://www.hcup-us.ahrq.gov/db/nation/nis/2006NIS_INTRODUCTION.pdf

Houchens, R., Elixhauser, A. *Final Report on Calculating Nationwide Inpatient Sample (NIS) Variances, 2001*. HCUP Methods Series Report #2003-2. Online. June 2005 (revised June 6, 2005). U.S. Agency for Healthcare Research and Quality.
<http://www.hcup-us.ahrq.gov/reports/CalculatingNISVariances200106092005.pdf>

Houchens RL, Elixhauser A. *Using the HCUP Nationwide Inpatient Sample to Estimate Trends. (Updated for 1988–2004)*. HCUP Methods Series Report #2006-05 Online. August 18, 2006. U.S. Agency for Healthcare Research and Quality.
http://www.hcup-us.ahrq.gov/reports/2006_05_NISTrendsReport_1988-2004.pdf

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

Irene Fraser, Ph.D., Director
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Table 1. Characteristics of hospitalizations related to pressure ulcers compared to hospital stays for all other conditions among adults 18 years and older, 2006

| | Hospital stays principally for pressure ulcers | Hospital stays with a secondary diagnosis of pressure ulcers | Hospital stays for all other conditions* |
|--|--|--|--|
| Total number of hospitalizations | 44,900 | 500,700 | 27,610,400 |
| Patient characteristics | | | |
| Mean age, years | 65.3 | 71.9 | 61.5 |
| Percentage of patients male | 50.3% | 46.9% | 45.9% |
| Percentage died in hospital | 4.2% | 11.6% | 2.6% |
| Utilization characteristics | | | |
| Mean length of stay, days | 14.1 | 12.7 | 5.0 |
| Mean cost per hospitalization | \$16,800 | \$20,400 | \$9,900 |
| Mean cost per day | \$1,200 | \$1,600 | \$2,000 |
| Aggregate costs | \$752.0 million | \$10.2 billion | \$273.4 billion |
| Percentage admitted from long-term care | 5.8% | 8.0% | 1.5% |
| Percentage discharged to a long-term care facility | 53.4% | 54.5% | 16.2% |

*Stays for neonates and maternal conditions have been excluded.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2006

Table 2. Top 10 most common principal reasons for hospitalizations during which pressure ulcers were also present among adults 18 years and older, 2006*

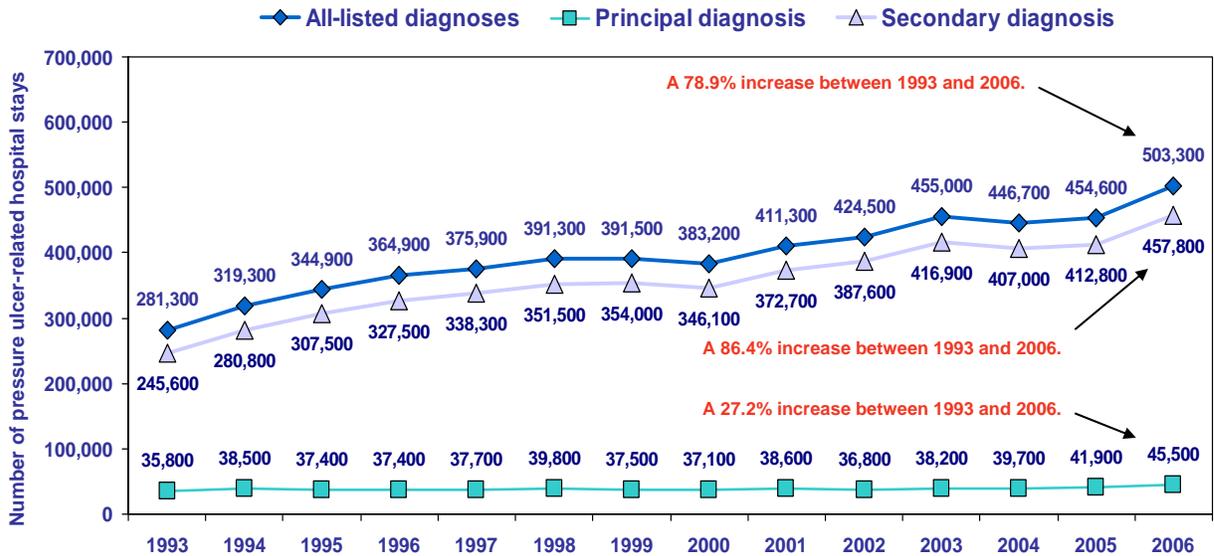
| Rank | Principal condition (CCS) | Number of hospitalizations related to pressure ulcers | Percentage of all hospitalizations related to pressure ulcers with this principal diagnosis | Percentage of hospitalizations for this condition that also include pressure ulcers |
|--|---|---|---|---|
| 1 | Septicemia (except in labor) | 80,400 | 16.1% | 13.5% |
| 2 | Pneumonia | 31,500 | 6.3% | 3.0% |
| 3 | Urinary tract infections | 28,200 | 5.6% | 5.8% |
| 4 | Rehabilitation care, fitting of prostheses, and adjustment of devices | 23,100 | 4.6% | 5.1% |
| 5 | Respiratory failure, insufficiency, arrest | 21,500 | 4.3% | 5.8% |
| 6 | Congestive heart failure, nonhypertensive | 20,800 | 4.1% | 1.9% |
| 7 | Complication of device, implant or graft | 19,300 | 3.9% | 3.2% |
| 8 | Aspiration pneumonitis, food/vomitus | 18,400 | 3.7% | 10.7% |
| 9 | Acute and unspecified renal failure | 14,700 | 2.9% | 4.3% |
| 10 | Fluid and electrolyte disorders | 12,700 | 2.5% | 3.0% |
| Total hospitalizations for top 10 principal conditions | | 270,500 | 54.0% | 4.8% |

*Pressure ulcers noted as a secondary diagnosis.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2006



Figure 1. Between 1993 and 2006, the total number of hospitalizations related to pressure ulcers increased by nearly 80 percent*

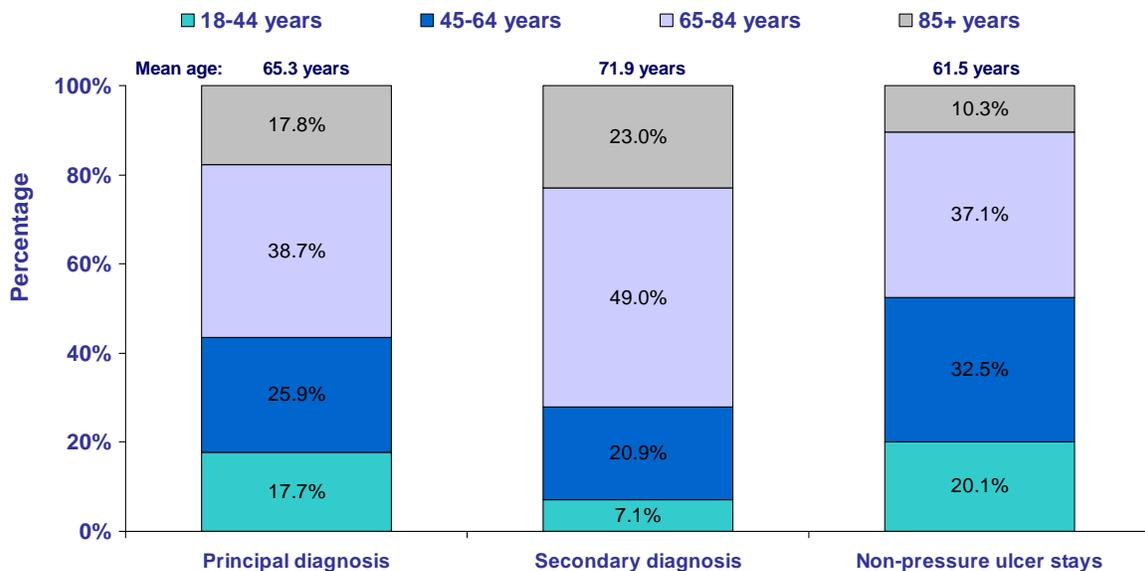


*Includes hospital stays for both adults and children less than 18 years old.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet, Nationwide Inpatient Sample, 1993-2006



Figure 2. Nearly three out of four adult patients hospitalized with a secondary pressure ulcer diagnosis were 65 years and older, 2006*

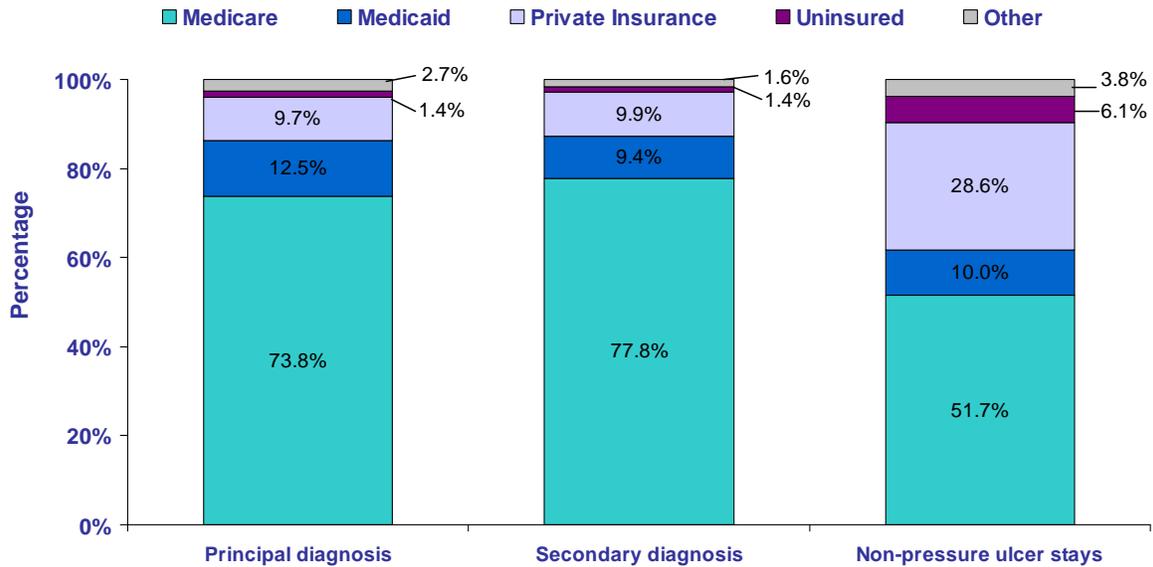


*Hospital stays occurring among persons less than 18 years old have been excluded.

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet, Nationwide Inpatient Sample, 2006



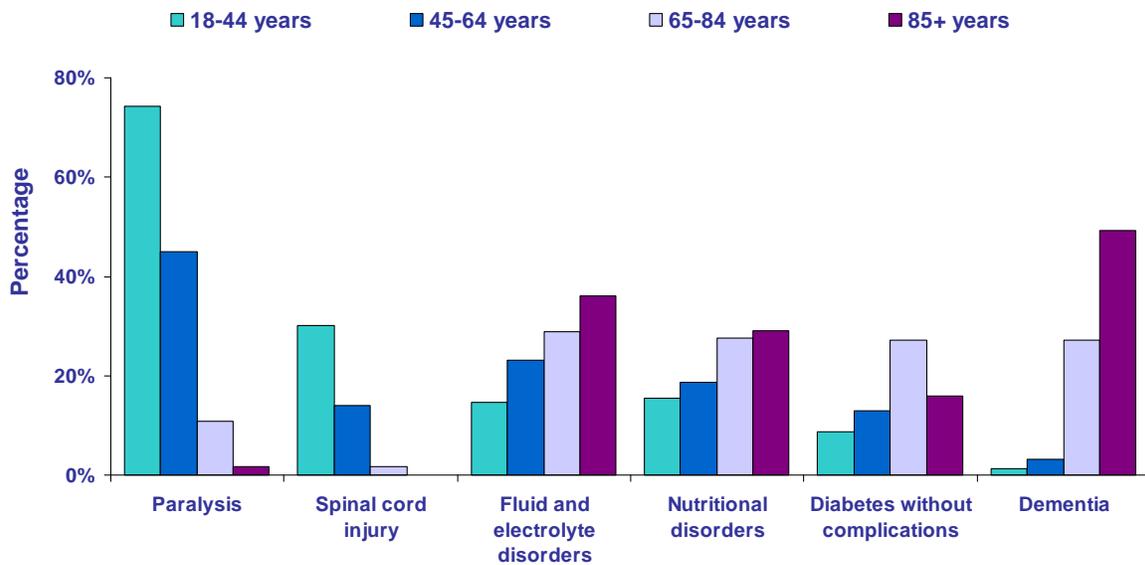
Figure 3. Medicare was the most common payer of adult hospitalizations related to pressure ulcers, 2006*



*Hospital stays occurring among persons less than 18 years old have been excluded.
 Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet , Nationwide Inpatient Sample, 2006



Figure 4. Among hospitalizations principally for pressure ulcers, common co-existing diagnoses varied by age, 2006



Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet , Nationwide Inpatient Sample, 2006