Hospitalizations and Preventable Conditions in Adults with Spina Bifida

Brad E. Dicianno, MD

Associate Professor
University of Pittsburgh Medical Center
Dept. of PM&R

Director, Adult Spina Bifida Clinic
Director, UPMC Center for Wellness
Medical Director, Center for Assistive Technology
Assoc. Medical Director, Human Engineering Research Laboratories
About me…

- Adult Spina Bifida Clinic – 380 patients
  - PA Dept. of Health Grant
  - One of only 5-7 in U.S.
- Pediatric Spina Bifida Clinic – 800 patients
- Transition Clinic
- Center for Assistive Technology
WELL, I GUESS IT'S INEVITABLE THAT A FEW PEOPLE WILL FALL THROUGH THE CRACKS...
Objectives

• Learn potentially preventable reasons for:
  – Hospitalization
  – Death

• Make a plan to be
  – more proactive
  – less reactive
Previous studies

- **1996 - 1 acute care U.S. hospital.**
  - Admitted an ave of 3.6 x per yr
  - LOS 11.2 days
  - 47% due to potentially preventable secondary conditions:
    - UTI, kidney stones, skin breakdown, osteomyelitis
  - LOS 12.5 days

- **1999 - 1 site in UK – mortality study**
  - in many instances, the cause could not be identified
  - renal failure, cardiac complications and respiratory complications

- **2001 to 2003 – U.S. claims database**
  - paid medical and prescription drug claims
  - employer-sponsored insurance
  - Medical expenses 3 to 6 x greater
  - $13,000/yr at ages 18 to 44 yrs
  - $10,000/yr at ages 45 to 64 yrs
Hospitalizations of Adults With Spina Bifida and Congenital Spinal Cord Anomalies
Brad E. Dicianno, MD, MS, Richard Wilson, MD, MS


Objective: To examine hospital admission records from a large cohort of persons with spina bifida (SB) with a variety of inpatients to provide descriptive detail about adult hospital use for persons with SB and associated disorders in terms of primary diagnosis for hospitalization, age, sex, payer source, length of stay, and total charges.

Design: Retrospective secondary data analysis from the Nationwide Inpatient Sample (NIS) from the Healthcare Cost and Utilization Project for 2004 and 2005 of hospitalizations for adults with SB or associated spinal cord anomalies.

Setting: Records from U.S. inpatient hospital admissions.

Participants: Persons with SB age 18 years and older.

Interventions: Not applicable.

Main Outcome Measures: Diagnoses associated with hospitalizations and death.

Results: The most common primary diagnosis for hospitalization was urinary tract infection, followed by complications from devices/grafts/implants and skin wounds. Septic caused the most deaths. Approximately one third of hospitalizations were for primary diagnosis of potentially preventable conditions. Hospitalizations associated with a primary diagnosis of a potentially preventable condition occurred more often in those less than 51 years of age and in urban or rural non-teaching hospitals.

Conclusions: Reducing the number of secondary medical conditions with proactive and preventive approaches to health care could reduce the morbidity, mortality, and cost for health care for this group.

Key Words: Hospitalization; Prevention & control; Rehabilitation; Spinal dysraphism. © 2011 by the American Congress of Rehabilitation Medicine

Targeted Preventive Care May Be Needed for Adults with Congenital Spine Anomalies
Richard Wilson, MD, MS, Steven A. Lewis, MS, MBA, Brad E. Dicianno, MD, MS

Objective: To compare hospitalizations caused by spina bifida-sensitive conditions, ambulatory care-sensitive conditions in adults with spina bifida and in the general population, our aim was to provide information about whether preventive health efforts already underway in the hospitalized general population are adequate for preventive care in spina bifida and congenital spine anomalies.

Design: Retrospective secondary data analysis.

Patients (or Participants): Records of hospitalized individuals who were 18 years of age and older.

Methods: Comparison between individuals hospitalized with spina bifida and the general population using data from the California State Inpatient Database from the Healthcare Cost and Utilization Project (HCUP). The HCUP includes 2005 data.

Main Outcome Measurements: Prevalence of spina bifida-sensitive conditions and ambulatory care-sensitive conditions as reason for hospitalization and 30-day readmission.

Results: As compared with the general population, persons with spina bifida who were hospitalized in 2004 had a significantly greater number of hospitalizations, number of hospitalizations associated with both spina bifida-sensitive conditions and ambulatory care-sensitive conditions, and number of 30-day readmissions. Stratification by age shows that the admissions for spina bifida sensitive conditions were greater in persons with spina bifida than in the general population for all age groups. In contrast, only in the youngest age group did those with spina bifida experience greater hospitalizations for ambulatory care-sensitive conditions.

Conclusions: This study provides further evidence that persons with spina bifida have hospitalizations that are beyond what the general population experiences. These conditions may be potentially preventable with appropriate ambulatory care. This group also had a greater risk for readmission within 30 days of discharge from their last hospitalization. More research is needed on the efficacy of programs aimed at prevention of these conditions.

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INTRODUCTION
Spina bifida (SB) is the most common permanently disabling birth defect in the United States, now with a prevalence of more than 100,000 [1]. Advancements in medical and surgical care have allowed approximately 95% of persons with SB or congenital spinal anomalies (SBCSA) to live well into adulthood [2,3]; however, secondary medical conditions are prevalent and a significant source of morbidity and mortality.

Krämer and Goering [4] identified several potentially preventable conditions, many of which are of infectious etiology, that were responsible for almost one-half of the admissions of individuals with SBCSA in one acute care hospital. In a previous study, we evaluated hospitalizations of adults with SB across the United States and found that approximately one-third were a result of these potentially preventable conditions [5]. These SB-sensitive conditions (SBCS) included urinary tract infections (UTI), skin ulcers and infections, septicaemia, complications of surgery or medical care, pneumonia, and infective arthritis or osteomyelitis.

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Paper 1 Methods

- Retrospective data analysis
- Nationwide Inpatient Sample (NIS)
- AHRQ Healthcare Cost & Utilization Project
- 2004 and 2005
- Records from U.S. inpatient hospital admissions
- SB, age 18 + yrs
- Units are hospitalization, not individual
About the NIS

• stratified sample of hospital inpatient stays
• 20% of community hospitals in the United States
• all payer discharge data
• over 1000 hospitals
• 37 states
• nonfederal, short-term general, and specialty hospitals
• excludes short-term rehabilitation, long-term acute care, substance abuse centers, and psychiatric hospitals
Preventable or Iatrogenic Conditions

- UTI
- Indwelling urinary catheter infection
- Iatrogenic surgical or medical complications
- Pneumonia
- Pressure ulcers
- Infective arthritis/osteomyelitis
- Septicemia
Paper 1 Results

- 7670 hospitalizations
- ~37,464 hospitalizations nationally
- Average LOS 7 days
- Each stay $28,918
• Potentially preventable or iatrogenic conditions
  – 33.8% of hospitalizations
  – $364 million nationally
  – death in 35.7%
  – occurred most often under age 51 yrs
Hospitalizations
- 10% UTI
- 9% Complications from devices/grafts/implants
  - 53% shunt malfunctions and infections
  - Rest Bladder Catheters, AV fistulas, joint replacements
- 6% Wounds

Deaths
- 19% sepsis
- 9% pneumonia
- 7% respiratory failure

- 2.5% renal failure – only the 7th most common diagnosis
Top 3 reasons for hospitalization

<table>
<thead>
<tr>
<th>Age Group</th>
<th>18-35 yrs</th>
<th>36-50 yrs</th>
<th>51-64 yrs</th>
<th>65+ yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI</td>
<td></td>
<td></td>
<td>spondylosis</td>
<td>pneumonia</td>
</tr>
<tr>
<td>device complications</td>
<td></td>
<td></td>
<td>disc disease</td>
<td>anemia</td>
</tr>
<tr>
<td>wounds</td>
<td></td>
<td></td>
<td>back pain</td>
<td>CHF</td>
</tr>
</tbody>
</table>
Stroke

• 65+ yrs
  – 3% of admissions
  – 6.5% of deaths
  – (1% admissions in general pop)
• California State Inpatient Database
• Agency for Health Care Research & Quality
  – AHRQ Healthcare Cost & Utilization Project
• 2004
• all nonfederal hospital inpatient discharges
• unique patient identifiers
Paper 2 Methods

- AHRQ Ambulatory care sensitive conditions
  - Short and term complication of diabetes
  - Perforated appendix
  - COPD
  - Hypertension
  - CHF
  - Dehydration
  - Bacterial pneumonia
  - UTI
  - Angina
  - Adult asthma
  - Leg amputation
Paper 2 Results

- 995 unique people
- 1952 admissions
<table>
<thead>
<tr>
<th>Ave. # admissions</th>
<th>SB</th>
<th>General population</th>
<th>IRR (95% CI) Incidence rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave. # admissions</td>
<td>2.0</td>
<td>1.4</td>
<td>1.5 (1.5-1.6)*</td>
</tr>
<tr>
<td>30 day readmision</td>
<td>0.5</td>
<td>0.2</td>
<td>3.0 (2.5-3.5)*</td>
</tr>
<tr>
<td>Condition</td>
<td>18-39</td>
<td>40-64</td>
<td>65-74</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>UTI</td>
<td>7.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2%</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacterial pneumonia</td>
<td>1.7%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• 75 yrs+
  – 42% had 30 day readmission
Paper 3: Lymphedema

- Retrospective chart review of 240 patients
- 2005 to 2008
- 22 (9.2%) had lymphedema
  - 100 times the rate in general population
- Mean age was 35
- Lymphedema was sig associated with:
  - trauma
  - cellulitis
  - cancer
  - obesity
  - wounds
  - hypertension
  - higher lesion level
  - wheelchair use
UPMC and UPMC Health Plan

• Payer-Provider Partnership
• Hospital has its own insurance division
  – Medicare – elderly
  – Medicaid – poor
  – Special Needs plan – disabled
  – Commercial – employer sponsored
UPMC Health Plan Medical Expenses* For SB and SCI

*Allegheny, Armstrong, Beaver, Butler, Westmoreland, and Washington counties only.
FY 2010 (n = 1,579); FY 2011 (n = 1,636)
Medical Expenses* for 7 preventable conditions in SB and SCI

*Allegheny, Armstrong, Beaver, Butler, Westmoreland, and Washington counties only.
FY 2010 (n = 1,579); FY 2011 (n = 1,636)
UPMC Center for Wellness

Empowering Individuals with Spina Bifida or Spinal Cord Injuries
Wellness Program

- Payer-Provider initiative
- Full time Mobile RN
- Targeted Preventative Care
- Wellness Visit (CMS)
- Evidence Based
  - Validated Screening tools
  - Clinical practice guidelines
    - Prevention
    - Treatment algorithms/principles
Incentive Plan

$25 gift card at each step
• Develop Wellness Plan
• Meet 80% short term goals
• Meet 80% long term goals
• Meet 80% maintenance phase goals
<table>
<thead>
<tr>
<th>Module</th>
<th>Quantitative Outcome Measure or screening tool</th>
<th>Clinical Outcome Measure</th>
<th>Preventable Diagnoses (Utilization and cost)</th>
<th>Patient Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder Management</td>
<td>• Bladder logs</td>
<td>• Incontinent episodes</td>
<td>• UTI • bladder catheter infections • sepsis - bladder infections</td>
<td></td>
</tr>
<tr>
<td>Bowel Management</td>
<td>• Bowel logs</td>
<td>• Incontinent episodes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin Integrity</td>
<td>• Salzberg tool</td>
<td></td>
<td>• Wounds • Sepsis - wounds • Infective arthritis or osteo</td>
<td></td>
</tr>
<tr>
<td>Behavioral Health</td>
<td>• BDI-II • CAGE • DAST</td>
<td></td>
<td>• Depression</td>
<td>• Knowledge Survey</td>
</tr>
<tr>
<td>Quality of Life and Functional Independence</td>
<td>• CHART-SF • WHOQOL-BREF</td>
<td>• Hours performing self care • Time lost from work/school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Mass Index</td>
<td></td>
<td>• BMI</td>
<td>• Obesity</td>
<td></td>
</tr>
<tr>
<td>Medications and supplies</td>
<td>• Medication log</td>
<td>• Medication possession ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Health Maintenance</td>
<td>• PACIC</td>
<td>• Routine PCP visits</td>
<td>• Pneumonia/Flu • Surgical/Medical complications</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>• Nutrition contract</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>• Exercise contract</td>
<td>• Time spent exercising/wk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Outcome Measures

- Clinical outcomes
  - Multiple medical outcomes (see table)
  - WHO-QOL-BREF
  - CHART-SF
- Knowledge surveys
- Compliance with Wellness goals
- Satisfaction with Care
  - PACIC
- Cost
  - Utilization of unplanned care
  - Cost of preventable conditions
Wellness Program

- 50 enrolled
- Feb 2012 to current
- 1 deaths averted
- 3 with unplanned hospitalizations
  - 1 several admissions
- 2 ER visits
- Incentive Plan 22 (44%)
  - 3 in maintenance phase
  - 3 met long term goals
  - 8 met short term goals
  - 8 with wellness plan
Take Home Points

Preventable or iatrogenic conditions
- 1/3 of hospitalizations
- > 1/3 deaths
- Biggest problem in younger adults

- We can and should change the way we practice
References


• Send reprint requests to Michael Lane at mil72@pitt.edu