New York State County Comparison of Fall-related Hip Fractures of Older Adults and Number of Dual-X-ray Absorptiometry Machines

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## Hospitalizations and Emergency Department Visits due to Falls New York State Residents, 2006-2008

<table>
<thead>
<tr>
<th></th>
<th>Hospitalizations</th>
<th>Emergency Department Visits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean Annual Frequency</td>
<td>Rate per 100,000 Residents</td>
</tr>
<tr>
<td>Total, Ages 65+</td>
<td>51,231</td>
<td>2,002.1</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
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<tr>
<td>65-74</td>
<td>9,923</td>
<td>767.5</td>
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<tr>
<td>75-84</td>
<td>20,373</td>
<td>2,311.8</td>
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<tr>
<td>85+</td>
<td>20,935</td>
<td>5,441.3</td>
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<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>15,554</td>
<td>1,486.4</td>
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<tr>
<td>Female</td>
<td>35,677</td>
<td>2,358.8</td>
</tr>
<tr>
<td>Percent Hip Fracture</td>
<td></td>
<td>27.4%</td>
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</tbody>
</table>
Hospitalizations due Fall-Related Hip Fractures, Ages 65+
New York State Residents, 2006-2008

Scope of the Problem
• 14,055 Annually
• 75% Female
• Nearly 90% are White
• Average Hospital Charge: $39,593 ($7,000 more than overall falls)
• Over 90% expected payer is Medicare
• Over 60% of the injuries occur at home
• Over 60% are discharged to a skilled nursing facility and 18% are discharged to an inpatient rehabilitation facility
Osteoporosis

A skeletal disorder characterized by compromised bone strength, predisposing a person to an increased risk of fracture. Bone strength primarily reflects the integration of bone quality and bone density.


Images Courtesy of Dempster DW ©2010.
Surgeon General Report, 2004

Bone Health and Osteoporosis
A Report of the Surgeon General

Department of Health and Human Services
The Impact of Osteoporosis

- 10 million people have osteoporosis
- 40% of women over 50 will suffer an osteoporosis-related fracture in their lifetime
- Each year, the risk of suffering from osteoporosis is greater than the combined risk of suffering a heart attack, stroke, or breast cancer

NOF - Fast Facts on Osteoporosis, 2009
Bone Mineral Density (BMD) Is a Better Predictor of Osteoporotic Fracture Than Cholesterol Is for Heart Attack

Pathogenesis of Osteoporotic Fractures

Aging

Menopause

Other risk factors

Decreased bone mass

Genetics

Low peak bone mass

Low bone density

Propensity to fall

Poor bone quality

Fractures

BMD Tests

- Requires a prescription with a diagnosis
- Dual X-ray Absorptiometry
  - Gold standard: hip and spine
  - Painless, noninvasive
  - Safe: low dose x-ray
  - Can determine mineral content of bone
Low BMD is a Strong Predictor of Fracture in Post Menopausal Women

1-Year Fracture Outcomes for 163,935 Women Aged ≥50 Years (NORA Study)

NORA = National Osteoporosis Risk Assessment; RR = relative risk.
Ten-Year Risk of Hip Fracture by BMD and the Number of Risk Factors

Rate of Hip Fracture Injury Hospitalizations
Due to Unintentional Falls, Ages 65+
New York State Residents, 2006-2008

Legend

Fall-Related Hip Fracture Hospitalizations
Rate per 100,000 Residents, 65+

- 202.9 - 470.4
- 470.5 - 604.0
- 604.1 - 706.0
- 706.1 - 794.2
New York State
Counties In Current Ecological Study
Rate of Hip Fracture Injury Hospitalizations Due to Unintentional Falls and Rate of DXA Machines by New York State County

Legend

**DXA Machines**
Rate per 100,000 Population, 65+
- 24.4 - 30.7
- 30.8 - 45.3
- 45.4 - 60.8
- 60.9 - 74.9

**Hip Fracture Hospitalizations**
Rate per 100,000 Population, 65+
- 544.0 - 601.9
- 602.0 - 671.1
- 671.2 - 716.4
- 716.5 - 769.8
Linear Regression Analysis

• Can the rate of DXA machines per county predict the fall hip fracture rate?
Linear Regression Results

Fall Hip Fracture Rate

Slope of -1.8 (p-value of 0.02)
Limitations

• The number of DXA machines does not necessarily correlate with the number of DXA scans.

• Additional data, such as Medicare data, would help in determining the number of DXA scans being performed each year.

• This is an Ecological Study.
Summary

• The 65+ population is rapidly increasing in the U.S.
• A multifaceted approach is needed to reduce fall-related hip fractures.
• These findings demonstrate the potential positive impact that increasing the number of DXA machines can have on reducing the number of fall-related hip fractures among older adults.
Summary

• A DXA scan costs only approximately $100.
• The average hospitalization charge for a fall-related hip fracture is $40,000, and this does not include the cost for rehabilitation and skilled nursing.
• Additionally, a hip fracture can potentially cost a person their independence or their life.
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