A Call to Action: Raising Awareness for Reducing Adverse Events in Nursing Homes

September 23, 2014
Baltimore, Maryland
Call to Action: Adverse Events in NHs

Logistics:

- the meeting room
- ground rules for the meeting
- parking lot

Meeting Facilitators:

- Allison Muma – Abt Associates
- Alice Bonner – Northeastern University
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Meeting Purposes:

- Create strategies and actions among CMS and its partners to “Raise Awareness and Reduce Adverse Events in Nursing Homes.”

- Create an action plan for work to be carried out beyond this meeting to keep the momentum going.
Call to Action: Adverse Events in NHs

Meeting Participants represent:

- Nursing Home Consumers and Advocates
- Nursing Home Providers
- Nursing Home Clinical Professionals
- Nursing Home Quality and Patient Safety Experts
- Nursing Home Policy Makers and Regulators
- Quality Improvement Organizations
Call to Action: Adverse Events in NHs

Shari Ling, MD
Deputy Chief Medical Officer
Center for Clinical Standards and Quality
Call to Action: Adverse Events in NHs

Adverse Events in Skilled Nursing Facilities:
National Incidence among Medicare Beneficiaries
Jeremy Moore, MPA  
Project Leader & Senior Policy Analyst  
Office of Inspector General, HHS

Lee M. Adler, DO  
Lead Physician  
Office of Inspector General National Harm Studies  
Senior Advisor Safety, Quality & Innovation, Adventist Health System  
Faculty, Institute for Healthcare Improvement  
Associate Professor, University of Central FL, College of Medicine
Order of Discussion

1. Study objectives
2. Scope
3. Key terms
4. Findings
5. Discussion
OIG Objectives

1. Estimate the national incidence of adverse events in SNFs.

2. Assess the extent to which adverse events were preventable.

3. Estimate the costs associated with adverse events to the Medicare program.
Sample

- 653 Medicare beneficiaries
  - All 50 States and DC
  - Drawn from 100,771 beneficiaries who met criteria
  - Included long-stay and short-stay population

- 692 Medicare-paid SNF stays
Criteria

- Medicare Part A stays that began within 1 day of discharge from a hospital
- Limited to stays of 35 days or less
- Selected from all stays that ended in August 2011

Describes 70% of stays during observation period
Definitions

- Adverse events - Harm to a patient as a result of medical care or in a health care setting
  - Do not always involve errors, negligence, or poor quality of care
  - Are not always preventable
- Attributable to care provided in the SNF
## Definitions

<table>
<thead>
<tr>
<th>Harm Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>I level</td>
<td>Contributed to or resulted in death</td>
</tr>
<tr>
<td>H level</td>
<td>Required intervention to sustain life</td>
</tr>
<tr>
<td>G level</td>
<td>Contributed to or resulted in permanent harm</td>
</tr>
<tr>
<td>F level</td>
<td>Prolonged stay and/or led to hospitalization</td>
</tr>
<tr>
<td>E Level</td>
<td>Temporary; required intervention</td>
</tr>
</tbody>
</table>
Definitions

Patient Harm

Adverse Event

Temporary Harm Event

I H G F E
Findings

All harm = 33%

AE = 22%

I H G F E

TH 11%
<table>
<thead>
<tr>
<th>Harm Level</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>I level</td>
<td>6%</td>
</tr>
<tr>
<td>H level</td>
<td>14%</td>
</tr>
<tr>
<td>G level</td>
<td>--</td>
</tr>
<tr>
<td>F level</td>
<td>79%</td>
</tr>
</tbody>
</table>
Findings

Patient Harm by Category of Harm

- Adverse Events:
  - Medication: 37%
  - Resident Care: 26%
  - Infections: 17%

- Temporary Harm Events:
  - Medication: 43%
  - Resident Care: 40%
Costs to Medicare

- 59% of adverse and temporary harm events resulted in hospitalization
  - 19% percent hospitalization rate among observed population
- $208 million – Estimated reimbursements for August 2011
- $2.8 billion – Extrapolated reimbursements for FY 2011
Preventability

Patient Harm

Preventable

Not Preventable

UTD

Clearly Preventable

Likely Preventable

Likely Not Preventable

Clearly Not Preventable

UTD
## Preventability

### Patient Harm

<table>
<thead>
<tr>
<th>Preventable</th>
<th>Not Preventable</th>
<th>UTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventable</td>
<td>Not Preventable</td>
<td>UTD</td>
</tr>
<tr>
<td>CP 13%</td>
<td>CP 13%</td>
<td>UTD</td>
</tr>
<tr>
<td>LP 46%</td>
<td>LP 46%</td>
<td>UTD</td>
</tr>
<tr>
<td>LNP 26%</td>
<td>LNP 26%</td>
<td>UTD</td>
</tr>
<tr>
<td>CNP 11%</td>
<td>CNP 11%</td>
<td>UTD</td>
</tr>
<tr>
<td>UTD 4%</td>
<td>UTD 4%</td>
<td>UTD</td>
</tr>
</tbody>
</table>
Preventability

Preventable—Harm could have been avoided through improved assessment or alternative actions

- Medical error
- Substandard treatment
- Inadequate monitoring
- Inadequate assessment
- Necessary treatment not provided
- Event rarely happens with appropriate care
- Poor communication
- Flawed safety systems
- Breakdown in environment
Preventability

Not preventable—Harm could not have been avoided given the complexity of the resident’s condition or care required

- Proper procedures followed
- Patient highly susceptible
- Could not have anticipated
- Patient’s condition complex
Preventability

Unable to Determine

- Poor or absent documentation
- Medical care complex
- Patient’s condition complex
Assessing Harm

Questions

1: Did an event occur? If so, how many events occurred

2: What was the level of harm?

3: Is this a case of omission or commission?

4: Was the event preventable?
Assessing Harm – Scenario #1

**Day 1** – Entered SNF following left knee arthroplasty for osteoarthritis. 84 years old with multiple chronic conditions (CHF, a. fib, mitral regurgitation, hypertension).

**Day 5** – Superficial infection develops around surgical site.

**Day 7** – Started on levofloxacin with an onset of diffuse pruritic rash over back and chest. Rash progressed to face, neck and arms. Levofloxacin discontinued and begun on cephalexin, prednisone, and antihistamines.
Assessing Harm – Scenario #1
Answers

1: Two unrelated adverse events:
   1. SSI
   2. Allergic reaction to a medication

2: Both events caused F level harm

3: Acts of commission

4: First event was preventable; Second event was not preventable
Next Steps

- Development of a SNF GTT
  - Lead developers: Lee Adler (OIG consultant and IHI Faculty) and Jeremy Moore (OIG)
    - In testing
    - Will be available on IHI.org target date 1st Quarter 2015

- Visit IHI.org for other trigger tools and patient safety content

- For more information contact Frank Federico (ffederico@ihi.org)
Contact information:

Lee Adler – ldbugsdoc@gmail.com
or lee.adler.do@ahss.org

Jeremy Moore – jeremy.moore@oig.hhs.gov
Call to Action: Adverse Events in NHs

What are Adverse Events?

Medication Related - Steven Handler, University of Pittsburgh

Care Related - Lew Lipsitz, Institute for Aging Research

Infection Related - Nimalie Stone, Centers for Disease Control and Prevention

Wrap-up - Doug Pace, Advancing Excellence
Call to Action: Adverse Events in NHs

Events Related to Medication

Steven M. Handler, MD, PhD, CMD
Assistant Professor, Division of Geriatric Medicine and Dept. of Biomedical Informatics, University of Pittsburgh
CMIO, UPMC Community Provider Services
Director, Geriatric Telemedicine Programs
Clinical Vignette

- Mr. Brown is an 86 year old long-stay resident, who has an extensive past medical history including diabetes and chronic kidney disease. He receives finger-stick blood glucose (FSBG) monitoring 4 times a day to monitor his diabetes. He is on sliding scale insulin (SSI) monotherapy which was started during his last hospital stay just 14 days ago.

- The nursing staff frequently have to give him orange juice or glucose gel because of hypoglycemic episodes. They don’t bother calling the attending of record since managing these episodes is part of the SSI protocol.

- Over the last 2 days, he has decreased eating and drinking. You receive a page during this meeting that his FSBG is 30 mg/dL, is dehydrated, and he has a change in mental status. The staff want to send him to the hospital.
Medication Use in NHs

- We rely heavily on pharmacotherapy to palliate symptoms, improve functional status and quality of life, cure or manage disease and prolong survival

- Drugs are the most frequently used and misused form of therapy, with NH residents taking an avg. of 8.3 meds/day
  

- The benefits of drug therapy in older adults must be counterbalanced by the problems that they pose

THE MEDICATION USE PROCESS IN LONG-TERM CARE

1. **PREScribing**
   - Evaluate resident
   - Determine need for medication
   - Select appropriate medication

2. **DOCUMENTING**
   - Write order in chart or transcribe verbal order
   - Transmit order to pharmacy
   - Transcribe order to medication administration record (MAR)

3. **DISPENSING**
   - Receive, review, and confirm order at pharmacy
   - Prepare and dispense medication to facility

4. **ADMINISTERING**
   - Review MAR
   - Administer the right medication, in the right dose or rate, in the right route, at the right time, to the right patient
   - Record administration in MAR

5. **MONITORING**
   - Assess patient response to medication
   - Report and document outcomes

Handler SM, Am J Geriatr Pharmacother, 2004
Adverse Drug Events (ADEs)

- Are defined by the Institute of Medicine (IOM) as *injuries or harm* resulting from a medical intervention related to a drug
  
  Kohn, National Academies Press, 2000

- Are the most frequent medication-related adverse events in the NH setting, with an incidence as high as 10.8 events per 100-resident/months
  
  - Translates into approximately 135 ADEs/NH or 2 million ADEs/year when all U.S. NHs are combined

Systems Analysis of ADEs in NHs

- Only the presence of *polypharmacy* has consistently been found to increase the likelihood of developing an ADE
  
  Leape LL, et al. JAMA, 1995

- Approximately half of the events are considered preventable (i.e., medication errors)
  

- Most (80%) of the preventable events are associated with *monitoring* rather than *prescribing* errors
  
Incidence of Adverse and Temporary Harm Events

Patient Harm by Category of Harm

Adverse Events
- Medication: 37%
- Resident Care: 37%
- Infections: 26%

Temporary Harm Events
- Medication: 43%
- Resident Care: 40%
- Infections: 17%

Table 3: Adverse Events Identified Among Medicare SNF Residents by Category

<table>
<thead>
<tr>
<th>Types of Adverse Events</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Events Related to Medication</strong></td>
<td>37%</td>
</tr>
<tr>
<td>• Medication-induced delirium or other change in mental status</td>
<td>12%</td>
</tr>
<tr>
<td>• Excessive bleeding due to medication</td>
<td>5%</td>
</tr>
<tr>
<td>• Fall or other trauma with injury secondary to effects of medication</td>
<td>4%</td>
</tr>
<tr>
<td>• Constipation, obstipation, and ileus related to medication</td>
<td>4%</td>
</tr>
<tr>
<td>• Other medication events</td>
<td>14%</td>
</tr>
</tbody>
</table>
### Table 6: Percentage of preventable Adverse and Temporary Harm Events by Clinical Category

<table>
<thead>
<tr>
<th>Types of Adverse and Temporary Harm Events</th>
<th>Percentage of Preventable Adverse and Temporary harm Events (n=155)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events Related to Medication</td>
<td>66%</td>
</tr>
<tr>
<td>Events Related to Resident Care</td>
<td>57%</td>
</tr>
<tr>
<td>Events Related to Infections</td>
<td>52%</td>
</tr>
</tbody>
</table>

Source: OIG analysis of SNF stays for 653 Medicare beneficiaries discharged in August 2011.
## Preventability Rationale

### Table 7: Adverse and Temporary Harm Events by Preventability Rationales

<table>
<thead>
<tr>
<th>Adverse and Temporary Harm Preventability Rationale</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventable Events</td>
<td></td>
</tr>
<tr>
<td>Appropriate treatment was provided in a substandard way</td>
<td>56%</td>
</tr>
<tr>
<td><strong>The resident’s progress was not adequately monitored</strong></td>
<td>37%</td>
</tr>
<tr>
<td>Necessary treatment was not provided</td>
<td>25%</td>
</tr>
<tr>
<td>Error was related to medical judgment, skill, or resident management</td>
<td>14%</td>
</tr>
<tr>
<td>Resident care plan was inadequate</td>
<td>11%</td>
</tr>
<tr>
<td>Care plan was incomplete or not sufficient in describing resident’s condition</td>
<td>7%</td>
</tr>
<tr>
<td>The resident’s health status was not adequately assessed</td>
<td>4%</td>
</tr>
</tbody>
</table>
Monitoring Errors in the NH

- Refer to inadequate laboratory evaluation of drug therapies or a delayed response or failure to respond to signs or symptoms of drug toxicity or laboratory evidence of toxicity.

- Frequently caused by a loosely coupled system, leading to poor communication and errors of omission and commission.
Impact of Medication Monitoring on ADEs

Medication started  →  ADE begins  →  With high-quality monitoring: ADE diagnosed and appropriate action taken

Without high-quality monitoring: ADE persists (1) and may lead to later complications (2)

Methods for Detecting ADEs in the NH

Manual Methods of Detection
- Voluntary Reporting:
  - Medication Error / Adverse Drug Event Reports
  - Incident Reports

Involuntary Methods:
- Comprehensive chart review
- Trigger-based chart review
- Direct Observation

Automated Methods of Detection
- Medication Profile
- Laboratory Data
- Allergy Profile
- Administrative/Billing Data
- Clinical Narratives

Combined Modalities

Integrated Data Sources
- Data driven vs. time driven; rule-based vs. non-rule-based

Murff et al., J Biomed Inform, 2003
ADE/Med Error Reporting

- Reasons for reporting:
  - Makes people aware of potentially correctable problems
  - Facilitates QI efforts to reduce future occurrence
  - Establishes base rates of errors/events

- Common *modifiable* barriers to reporting include lack of:
  - Readily available reporting systems
  - Information on how to report an error/event
  - Feedback to the reporter/facility on errors/events

Handler SM, Am J Geriatr Pharmacother, 2004
Trigger-Based Chart Reviews

- Developed a list of ADE triggers and an Institute Healthcare Improvement endorsed tool for use in NHs
  Handler S, Hanlon J. Ann Longterm Care, 2010

- Determined the utility (positive predictive value [PPV] and time requirement) of the trigger tool and described the most common types of ADEs detected with the tool

- Among 321 veterans, 50.5% (n = 162) had at least one abnormal laboratory value contained in the trigger tool

- The overall PPV of the ADE trigger tool was 40.1% (65/162), and the average time to complete resident assessments was 8.8 (standard deviation ± 5.7) minutes

Table 2: Most Common Potential Adverse Drug Events (ADEs) by Type Among those with a Trigger Alert (N = 162)

<table>
<thead>
<tr>
<th>Potential ADE*</th>
<th>Residents with an ADE n (%)</th>
<th>Most Common Medication Classes Associates with Potential ADEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Abnormality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Acute kidney injury</td>
<td>30 (18.5)</td>
<td>ACE inhibitors/ARBs (N = 18)</td>
</tr>
<tr>
<td>• Hypokalemia</td>
<td>18 (11.1)</td>
<td>Loop diuretics (n = 8)</td>
</tr>
<tr>
<td>• Hypoglycemia</td>
<td>13 (8.0)</td>
<td>Insulin (n = 14)</td>
</tr>
<tr>
<td>• Hyperkalemia</td>
<td>10 (6.2)</td>
<td>ACE inhibitors/ARBs (n = 6)</td>
</tr>
<tr>
<td>• Hyponatremia</td>
<td>6 (3.7)</td>
<td>Loop diuretics (n = 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SSRI (n = 2)</td>
</tr>
</tbody>
</table>

*Adding up this column may result in a value >100% since some veterans may have had abnormal laboratory results for more than one laboratory value; those veterans who had >1 abnormal value of the same laboratory test were only counted once in this table.

**Abbreviations:** ACE = Angiotensin-converting enzyme, ARB = Angiotensin II receptor-blocker, INR = International normalized ratio, N/A = Not applicable, SSRI = Selective serotonin-reuptake inhibitor.

Trigger Tool for our CMS Award

- Acute Kidney Injury (RIFLE Criteria):
  - Risk: \((1.5 \text{ SCr increase})\)
  - Injury: \((2x \text{ SCr increase})\)
  - Failure: \((3x \text{ SCr increase or increase of 0.5 if SCr} \geq 4)\)

- Hypoglycemia: \((\text{BS} \leq 70 \text{ mg/dL})\)

- Drug Induced Anemia: \((\geq 2 \text{ g/dL decrease})\)

- Hyperkalemia: \((K \geq 5.5 \text{ mmol/L})\)

- Hypokalemia: \((K < 3.5 \text{ mmol/L})\)

- Hyponatremia: \((Na \leq 130 \text{ mEq/L})\)
Routine Lab Monitoring

- To determine the minimal frequency of laboratory monitoring of 30 types of chronic medications/classes that are administered to NH residents and are either listed under pharmacy services tag F329 (the tag for unnecessary medications) or have a narrow therapeutic index.

- Consensus agreement was reached for 33 of 35 parameters amongst 20 pharmacists, 48 physicians, and 48 nurse practitioners.

- They selected three or six months as the minimum interval for 30 of 35 parameters (85.7%), one month as the minimum for two parameters, and 12 months as the minimum for one parameter.

As part of our CMS Innovation Award, we recommend the following routine lab monitoring:

<table>
<thead>
<tr>
<th>Trigger Medications:</th>
<th>Antipsychotic Medications:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete blood count (CBC)</td>
<td>Vital signs, BMI</td>
</tr>
<tr>
<td>Basic metabolic panel (BMP)</td>
<td>Fasting lipid profile</td>
</tr>
<tr>
<td></td>
<td>HgbA1C</td>
</tr>
<tr>
<td></td>
<td>CBC</td>
</tr>
</tbody>
</table>

Handler SM, Shirts BH, Perera S, Becich MJ, Castle NG, Hanlon JT. Consult Pharm 2008
Clinical Decision Support (CDS)


Active Medication Monitoring CDS

- Enhancing the Detection and Management of ADEs in the Nursing Home (NCT01531088)

- To determine if physicians who receive active medication monitoring alerts from medication safety pharmacists:
  
  1. *have more ADEs detected and managed* compared to physicians providing usual care in the NH.

  2. *have a faster ADE management response time* compared to physicians providing usual care in the NH.

Funding Support: AHRQ R01HS018721 (PI= Handler)
Multicomponent Active Medication Monitoring System Intervention: Pharmacist to Physician Notification

Knowledgebase of: 145 med-lab or therapeutic drug monitoring EZ alerts AND acute kidney injury (AKI) alert

Consultant Pharmacist Notification of Potential ADEs

Access Additional Information from IT or Clinician Resources as Needed

TheraDoc

EZAlerts

MDIAchieve
Census, MDS, Financial, and Diagnosis Data

Rx Partners
Pharmacy and Allergy Data

AccuNurse
Vitals, I&O’s, acute change in condition

Quest/UPMC Hospitals
Laboratory Data

Construct ADE Alert:
S= Situation
B= Background
A= Assessment
R= Response

Attending Physician Notification through preferred method of communication

Pharmacist-Physician Partnership
1. Academic detailing prior to and during the study (provide tools, information, and details about a collaborative practice agreement for medication therapy management).

2. Be available to physicians for consultation during the study to answer any questions, make laboratory monitoring recommendations, suggest alternative medications, etc.

Respond to ADE Alert:
S= Situation
B= Background
A= Assessment
R= Response

Components of the intervention*
ADE Alert to be Reviewed by Pharmacist

**ADE: Drug-Associated Acute Kidney Injury**

Demographics & renal function
- Age: 79 years
- SCr: 4.18 (CrCl: 9 mL/min (Cockcroft-Gault; weight used=55 kg))
- Sex: F
- Height: 61 in (155 cm)
- Weight: 145.2 lb (66 kg)

Possible drug associated ACUTE KIDNEY FAILURE.

This patient’s CREATININE has increased greater than or equal to 3 fold relative to the nadir value (1.2 mg/dL) found in the past 365 days and has at least 1 active order(s) for a drug associated with acute kidney injury.

**Most Recent Serum Creatinine:** CREATININE = 4.18 MG/DL (COMPREHENSIVE METABOLIC PANEL W/EGFR Collected: 09/06/2012)

**Nadir Serum Creatinine:** Creatinine = 1.2 mg/dL (Basic Metabolic Profile Collected: 07/10/2012 06:35:00)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Start</th>
<th>End</th>
<th>Status</th>
<th>Pat Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUROSEMIDE TAB 40MG</td>
<td>40 MG PO QD</td>
<td>08/31/2012</td>
<td></td>
<td>ACTIVE</td>
<td>I</td>
</tr>
</tbody>
</table>
(AiDE-MD: ADE Alert) Detailed info sent to your UPMC email. Please respond to the email or call Monica Aspinall at 412-328-4490 before 4:00 PM today.
Intervention Pharmacist’s Email to Physician

Please respond to the email or call Monica Aspinall at 412-328-4490 before 4 PM:

S: Resident has acute kidney failure as defined by the RIFLE criteria.
B: Resident is a 79 yo w/ baseline CrCl of 33 mL/min (Stage 3 chronic kidney disease) and diastolic congestive heart failure.
A: Furosemide was increased from 20 mg daily to 40 mg daily on 08/31/12. Since this time, weight has decreased 5 lbs. and oral intake has consistently been at 75%-100%.
R: Recommendations include: 1) stop furosemide; 2) start IVFs D5W @ 75 cc/hr x 1 liter; 3) strict I&O’s x 5 days; and 4) repeat SCr in 24 hr.

ADE: Drug-Associated Acute Kidney Injury

Demographics & renal function

Age: 79 years
SCr: 4.18 ()
9 mL/min(Cockcroft-CrCl: Gault; weight used=55 kg)

Sex: F
Height: 61 in (155 cm)
Weight: 145.2 lb (66 kg)

Possible drug associated ACUTE KIDNEY FAILURE.
Federal regulations require that a consultant pharmacist conduct a Medication Regimen Review (MRR) on each SNF resident at least monthly (F-Tag 428)

More frequent reviews of the regimen are required for short-stay admissions, as well as for patients that have conditions or risk factors that place them at a higher risk of an ADE (anticoagulants, diabetes agents, and/or opioids)

Funding Support: 1E1CMS331081-01-00

Mr. Brown Redux

- Hypoglycemic episodes could have been reported and led to physician notification to manage events

- ADE Trigger tool could have been used to detect the hypoglycemic events or AKI and led to physician notification to manage events

- Active medication monitoring system could have led to real-time detection of the hypoglycemic events or AKI and could be coupled to physician notification and recommendations

- Routine lab draws could have detected hypoglycemic events or AKI and led to physician notification to manage events

- Telemedicine could have been used to do a real-time MRR and suggested alternate therapies to SSI monotherapy to the physician
Events Related to Patient Care

Lewis A. Lipsitz, MD
Director and Senior Scientist, Institute for Aging Research
Hebrew Senior Life, Harvard
Call to Action: Adverse Events in NHs

Events Related to Resident Care 37%

- Falls and Injury 6%
- Exacerbations of preexisting conditions (e.g., CHF, COPD, anemia, diabetes) 6%
- Acute kidney injury 5%
- Fluid and other electrolyte disorders 4%
- Thromboembolic events 4%
- Other (pressure sores, skin tears, etc.) 14%
Falls

- 50% of NH residents fall each year.
- High morbidity, mortality, service use
- Multiple causes & risk factors
- Potentially preventable
- Most common causes are sedating medications, gait & balance disorders, arthritis/spinal stenosis, muscle weakness, poor vision, hypotension.
Falls are Multifactorial

- Falls result from the interaction of multiple physiologic changes, pathologic conditions, external hazards, and situational stresses.
- Risk of falling increases with the number of risk factors.
- It is inappropriate to attribute falls solely to situational, environmental, or “mechanical” factors.
- Ask “Why did this resident fall in response to this particular situation, while others may not have?”
- Falls are often the first manifestation of an acute problem – They should “Trigger” a medical evaluation!
Mrs. T is an 80 yo SNF resident with hypertension, CHF, and arthritis, found on the floor after a fall. After an overnight rest with the help of trazadone, she stood up, took her usual medications (atenolol, lisinopril, furosemide, and isosorbide), ate a good breakfast, read the paper, then went to the toilet and strained to defecate. Upon standing she suddenly felt unstable and fell to the floor. Why did she fall?
Elderly residents are at risk of hypotension and associated falls during common daily activities.
Nach dem essen sollst du ruhen
oder tausand schritte tuen

-German folk wisdom
Physical Activity is Key!
Resistance Training Improves Muscle Mass and Strength at Any Age

100 frail nursing home residents aged 72-98 years (mean 87) randomized to 10 weeks of progressive quadriceps resistance training or placebo.

RESULTS:

• 113% increase in muscle strength
• 12% increase in gait velocity
• 28% increase in stair climbing power
• 3% increase in thigh muscle area
Interventions to Prevent Falls

Significant Factor from 40 RCTs

- Muscle Strengthening & Balance Training 0.80
- Tai Chi Chuan 0.51
- Home Hazard Assessment & Modification 0.64
- Withdrawal of Psychotropic Medications 0.34
- Multidisciplinary, Multifactorial 0.75

Cochran Database of Systematic Reviews, 2002
Importance of Vitamin D

Elderly Residents are at High Risk of Dehydration

- Decreased thirst
- Reduced renal ability to conserve salt and water.

Common Predisposing Factors:
- Diuretics
- Fluid restriction prior to procedures
- Glucose intolerance/glucosuria
- Fever
- Mobility impairment – unable to access fluids
- Dementia
Consequences of Dehydration

- Hyperosmolar coma
- Hypotension, Falls, and Syncope
- Delirium
- Renal Failure
- Constipation
Prevention of Dehydration

- Anticipate volume losses
  - Hold diuretics if not drinking
  - Avoid prolonged NPO
  - “Fluid rounds”
- Liberalize salt, watch for CHF
- Address incontinence concerns
Contact information:

Lewis Lipsitz, MD
Hebrew SeniorLife
lipsitz@hsl.harvard.edu
617-971-5318
Events Related to Infection

Nimalie Stone

Centers for Disease Control and Prevention
Addressing infections as a cause of adverse events in nursing homes

Nimalie D. Stone, MD, MS

Medical Epidemiologist for LTC
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention
Burden of infections in US NHs

- Infection incidence data from NHs are varied
  - 3-7/1,000 resident-days from studies before 2000
  - 1.4-5.2/1,000 resident-days from studies after 2000

- Extrapolation to US NH population estimates between 1.6-3.8 million infections/year

- Limitations of estimates:
  - Data from small studies
  - No adjustments for resident or facility characteristics
  - Not representative of current NH population

*Strausbaugh LJ et al. ICHE 2000. 21(10): 674—679;
Impact of infections in US NHs

- Infections are among the most frequent causes of hospital transfers from nursing homes
  - Accounted for 36% of hospital readmissions from a skilled nursing facility within 30-days\(^1\)
  - Resulted in 25% of all hospitalizations from 32 nursing homes in a single year\(^2\)
  - Hospitalization for acute infections result in excess cost compared to management in the nursing home\(^3\)
  - Morbidity from hospital transfers (delirium, pressure wounds accelerate functional decline) causes poor resident outcomes and increase costs of care\(^4\)

## Incidence of NH-associated infections*

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Surveillance Period</th>
<th>Overall NH infection incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho, USA</td>
<td>07/01 - 06/2002</td>
<td>3.64/1000 resident days</td>
</tr>
<tr>
<td>Norway</td>
<td>10/04-03/2005</td>
<td>5.2/1000 resident days</td>
</tr>
<tr>
<td>Canada**</td>
<td>09/06-05/2008</td>
<td>3.4/1000 resident days</td>
</tr>
<tr>
<td>Australia</td>
<td>1/06-12/2010</td>
<td>4.16/1,000 resident days</td>
</tr>
<tr>
<td>Poland</td>
<td>12/09 -11/2010</td>
<td>3.6/1000 resident days</td>
</tr>
</tbody>
</table>

* Each study used different criteria to define NH infections events, often based on 1991 McGeer surveillance definitions for LTCFs

** Canadian study, matched cohort to assess risk of infection after ED
Harm from infections among SNF residents

- Infections were among the most common causes of harm, accounting for 26% of adverse events

<table>
<thead>
<tr>
<th>Type of Harm</th>
<th>Events related to infection</th>
<th>Infection events deemed preventable</th>
<th>Transfers to hospital from infection event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events (n=148)</td>
<td>39 (25.8%)</td>
<td>22 (59%)</td>
<td>34 (87.2%)</td>
</tr>
<tr>
<td>Temporary (n=113)</td>
<td>20 (16.8%)</td>
<td>9 (45%)</td>
<td>NA</td>
</tr>
<tr>
<td>Total Harm events (n=261)</td>
<td>59 (22.6%)</td>
<td>31 (51.7%)</td>
<td>34 (57.6%)</td>
</tr>
</tbody>
</table>

OIG report: Adverse Events in Skilled Nursing Facilities: National Incidence Among Medicare Beneficiaries (OEI-06-11-00370), February 2014
## Types of infections causing harm among SNF residents

<table>
<thead>
<tr>
<th>Type of Infection</th>
<th>Events (All harm)</th>
<th>Preventable events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia and respiratory tract</td>
<td>15 (includes 2 cases of sepsis)</td>
<td>5 (33%)</td>
</tr>
<tr>
<td>Surgical site infection (superficial only)</td>
<td>14</td>
<td>9 (64%)</td>
</tr>
<tr>
<td>Urinary tract, associated with catheter</td>
<td>14 (includes 3 cases of sepsis)</td>
<td>10 (71%)</td>
</tr>
<tr>
<td>C. difficile infections</td>
<td>7</td>
<td>5 (71%)</td>
</tr>
<tr>
<td>Soft tissue and other</td>
<td>6</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Vascular device associated.</td>
<td>3</td>
<td>2 (67%)</td>
</tr>
</tbody>
</table>

OIG report: Adverse Events in Skilled Nursing Facilities: National Incidence Among Medicare Beneficiaries (OEI-06-11-00370), February 2014
Example of Harm: Case 1

- 86 year old with recent resection of colon cancer
  - Past history also included heart disease and hypertension
- Documented diarrhea during her 21-day SNF stay with 19 lb weight loss; receiving diuretics
- Became acutely confused (delirium) and transferred to Emergency Department
  - *C. difficile* stool toxin positive on admission
  - Diuretics discontinued and began IV fluids
- Failure to recognize *C. difficile* resulting in hospital transfer – deemed clearly preventable event
Example of Harm: Case 2

- 99 year old with urinary catheter placed in hospital for obstructive uropathy, admitted to SNF 7/7
  - D/c orders recommended follow-up in 2 weeks with urology
- On 7/20, patient afebrile, no documented complaints, but urine culture submitted
  - Culture revealed many bacteria, white cells on urinalysis
  - Started Augmentin and Rocephin on 7/20; Rocephin stopped on 7/23; Augmentin changed to Ertapenem 7/27 for 2nd culture
  - No documentation of signs/symptoms except urine results
- Sent to hospital 8/3 for antibiotic management; no documented follow-up with urology
- Poor management of urinary device – deemed clearly preventable event;
  - Evidence of inappropriate antibiotic use
Challenges to infection management in NH residents

- Frail and medical complex population often with cognitive and/or functional impairments
  - Impacts quality of assessments when change in status
  - Multiple explanations for change in status must be considered due to complexity of resident

- Impaired immune response leads to atypical manifestation of infections
  - Blunted fever response, challenges differentiating colonization from true infection

- Limited access to on-site clinical provider expertise and diagnostic testing
  - Assessments often made by surrogate nursing staff
  - May lower threshold for medications and/or transfers to acute care
Gaps/opportunities to prevent infections in NHs

- **Better recognition of the problem**
  - Improved identification and communication of changes in status
  - Standardize the way infections are defined and reported to monitor the burden of the problem

- **Improved documentation of the response**
  - Inadequate documentation of actions leads to incomplete information and missed opportunities
  - Provide guidance and standards for implementing best practices
  - Improve communication across care transitions

- **Increased accountability for prevention**
  - Facility practices to prevent infection should be monitored for adherence and impact
  - Implement consistent methods for assessing the effectiveness of infection prevention activities
National infection reporting system

- CDC managed web-based data system designed for healthcare facility reporting of infections
  - Developed from established, voluntary reporting systems
  - Initial focus and experience with hospital reporting;
  - Tailored reporting for different healthcare settings
- Designed to track high-risk infection events to drive prevention efforts
  - Events related to devices/procedures
  - Events from antibiotic resistant organisms and C. difficile
- Reporting into NHSN has been incentivized by state/federal quality reporting programs in targeted healthcare settings (e.g., hospitals)
Benefits of NHSN surveillance: Data for action

- Standardizes and validates surveillance definitions used by all participating in the system
- Provides data to inform local quality improvement
- Provides comparisons of infection data with adjustments for facility and/or resident characteristics
- Provides national benchmarks to assess performance in local and national prevention efforts
- Demonstrates trends in improvements and/or areas of opportunity for each infection reported in the system
NHSN Long-term care facility component

- NHSN reporting tailored for LTCF providers, launched in September 2012
  - 186 nursing homes currently enrolled and eligible to report
  - Smaller number actively reporting

- Reporting options
  - Urinary tract infection,
  - Antibiotic resistant organisms and C. difficile
  - Adherence to hand hygiene and gown/glove use

www.cdc.gov/nhsn/ltc
HHS National Action Plan to Prevent HAIs: LTC Chapter

- Outlines the HHS priority actions for addressing infections in nursing homes and other LTC settings

http://www.hhs.gov/ash/initiatives/hai/actionplan/index.html
HHS Priority Areas for preventing infections in NHs

- Better recognition of the problem
  - Increasing enrollment and reporting into the NHSN LTCF Component
  - Reporting *Clostridium difficile* infections (CDI) in NHSN
  - Reporting Urinary tract infections (UTI) in NHSN

- Promoting best practices for prevention
  - Increasing resident and healthcare personnel influenza vaccination coverage
  - Increasing resident pneumococcal vaccination coverage

http://www.hhs.gov/ash/initiatives/hai/actionplan/index.html
CDC initiatives to promote infection prevention practices

- Supporting states to include NHs in healthcare-associated infection prevention programs
  - State regional prevention programs to address prevention across the care continuum
  - Technical assistance to states implementing NHSN reporting and infection prevention education for NH
- Development of core elements for implementing antibiotic stewardship in hospitals and NHs
  - Activities to optimize safe use of antibiotics while reducing adverse events, C difficile, and antibiotic resistance
- Prevalence projects to assess the burden of infections and antibiotic use in nursing homes
  - Feasibility pilot completed 9 NHs across 4 states
CDC supported state regional infection prevention programs

- State public health infrastructure to coordinate efforts to reduce antibiotic resistant organisms and improve antibiotic use across healthcare facilities

Portfolio of activities including:
- Mapping patient movement across the care continuum
- NHSN surveillance for antibiotic resistance and *C. difficile* by acute and NH partners
- Implementing infection prevention and antibiotic stewardship activities in all facilities
- Improving communication during care transitions
- Measuring impact of effort and addressing gaps

Partner initiatives to promote infection prevention practices

- Advancing Excellence campaign infections goal
  - Collaboration among CDC, Advancing Excellence, and NH experts in quality improvement and infection prevention
  - Tools and resources for tracking *C. difficile* and improving core infection prevention practices

[Website Link: www.nhqualitycampaign.org]
Partner initiatives to promote infection prevention practices (cont.)

- Multi-organizational projects funded by AHRQ
- Partners including: CDC, The Joint Commission, academic researchers, infection prevention and quality improvement organizations
- Examples of recent/active projects:
  - Applying High Reliability Principles to Infection Prevention and Control in Long Term Care
  - AHRQ Safety Program for Long-Term Care: Prevention of CAUTI
  - Standardized Antibiotic Use in Long-Term Care Settings
  - Using Nursing Home Antiibiograms to Improve Antibiotic Prescribing and Delivery
Where do we go from here?

- OIG report highlights the critical need for coordinated efforts to track and improve infection prevention efforts
  - Infections in report align with focus areas in HHS Action Plan
  - NHSN available to track NH infections
  - Several programs exist to support NH prevention activities

- Key questions:
  - How do we expand these efforts and develop additional programs?
  - What can facilitate NH participation?
  - What other tools/resources are needed to support NH providers?
  - How can we ensure accountability for prevention?
Thank you!!

Email: nstone@cdc.gov with questions/comments

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Call to Action: Adverse Events in NHs

Wrap up:

- Questions about what you heard?
- What are contributing factors to medication, care & infection related adverse events?
- What work/activities is already happening relative to each type of adverse event?
- Are there gaps?
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Lunch

Please return no later than 12:45
Call to Action: Adverse Events in NHs

Please sit at your assigned table for the breakout sessions
Call to Action: Adverse Events in NHs

CMS Activities Related to Adverse Events

Evan Shulman
Deputy Director,
Division of Nursing Homes,
CMS
Call to Action: Adverse Events in NHs

**CMS response to OIG report:**

- Facilitate Call to Action series of meetings to reduce adverse events

- Collaborate with AHRQ to help nursing homes recognize adverse events and precursor events that lead to serious injury
  - List of triggers
  - Common definitions

- Identify areas in SOM for needed revision
**Call to Action: Adverse Events in NHs**

**CMS response to OIG report:**

- Exploring ways to enhance the survey process using existing guidance to improve surveyors’ abilities to identify non-compliance that contributes to adverse events

- Quality Assurance & Performance Improvement (QAPI)
  - Training for providers and surveyors
  - Incorporating QAPI principles in POC
Call to Action: Adverse Events in NHs

CMS response to OIG report:

- QIOs using QAPI and Change Package to help nursing homes implement best practices and systems approach.
- Testing innovative approaches through demonstration projects to identify strategies that work to reduce HAIs/HACs and other adverse events.
- Give us your thoughts/feedback on Comment Cards.
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Breakout Sessions

Facilitators:
Alice Bonner, Northeastern University
Joe Ouslander, Florida Atlantic University
Doug Pace, Advancing Excellence
Feedback from morning session

- Risk factors
- Areas to consider
Risk Factors for Adverse Events

- First 48 hours after hospital transfer/admission
- Transfers on Friday afternoons
- Lack of critical thinking by frontline nursing staff (may be LPNs, ADNs; very few BSNs)
- Lack of close communication among CNAs, nursing and other NH staff and between nursing home staff and physicians/APRNs
Risk Factors for Adverse Events

- Consultant pharmacists not truly integrated into teams. Can’t always access data
- Lack of coordination across settings
- Limited data exchange between settings, platform interoperability
- Lack of resident/family engagement
- Physicians/APRNs are not in building 24/7
- Physician visits only required once a month
Risk Factors for Adverse Events

- Staffing insufficient – residents may go all night without seeing a nurse. Long waits to use bathroom may contribute to dehydration (resident afraid to drink)
- Lack of dedicated infection preventionists
- Lack of knowledge around infection prevention and antibiotic use in nursing homes. Families need education
Areas to consider

- Integrating evidence and implementing strategies that work (best practices) into PIPs, QAPI
- Regulations need to be updated
- Initiatives must align, incentives must align
- Consider entire medication use process, starting with assessment and problem identification, clinical indications. Consider non-pharmacological interventions whenever possible (e.g., encourage fluids)
Areas to consider

- How can we encourage/enforce increased monitoring within first 48 hours by nursing?
- How can we identify the “bad habits” in facilities? IHI process; culture of safety
- How can we balance technical and affective/adaptive approaches? How can we change attitudes and behavior?
- Can we link mini-campaigns through a QAPI/INTERACT framework?
- Can we build on the work on rehospitalizations
- How can the survey process be woven into the process?
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Questions to consider:

- What actions is my organization willing to undertake to reduce adverse events in each category?
- What is already being done?
  - Can my organization leverage work already being done?
  - Can work be repackaged/refreshed?
- Are there gaps in what is happening?
- How to create “Culture of Safety”?
- How will we know if improvement is happening?
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Questions to consider:

- How can your organization work with other groups at the association, state, national level?
- Who will be responsible for coordinating the specific recommendations?
- How will success be measured – who will be responsible for those metrics?
Call to Action: Adverse Events in NHs

Report Out

Alice Bonner, Northeastern University
Joe Ouslander, Florida Atlantic University
Doug Pace, Advancing Excellence
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Debbra Hattery
CCSQ Deputy Director-Operations
Next Steps

Alice Bonner, Northeastern University
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How do we keep the momentum going?
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Thank you

Debra.lyons@cms.hhs.gov