A Program of Research on Nursing Home Care: Discovering Internal Capacity for Improvement, Intervention Development, Implementation and Outcomes

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Acknowledgements:
NIH/National Institute of Nursing Research
• R01 NR003178, Anderson PI
• R56 NR003178, Anderson & Colón-Emeric, PIs
Overall Aim of Research Program

What management practices influence effective, efficient and equitable outcomes in health care delivery systems?
A Journey: Early influences

- Wheatley MJ. *Leadership and the new science: Learning about organization from an orderly universe.*
- Stacey RD. *Complexity and creativity in organizations.*
- Capra F. *The web of life.*

Reuben R. McDaniel, Jr
The University of Texas at Austin
The Essence of Complexity Science (Capra, 1996)

The study of...

- *patterns and relationships*
The Essence of Complexity Science (Capra, 1996)

The study of...

- *dynamics rather than stability*
The Essence of Complexity Science (Capra, 1996)

*The study of...*

- whole systems

Anderson, Crabtree, Steele, & McDaniel, (2005)
Characteristics of Complex Adaptive Systems

Agents

- Cells
- Organs
- Individuals
- Groups
- Organizations
Agents

- Agents gather information
- Novelty from diversity
Agents are Connected

- Agents interact
- Interactions are local, patterns are global
- No single agent can know the system as whole
- Interactions are non-linear
Self-Organization

- People mutually adjust their behaviors
- Create the new structures and behaviors needed to meet the current demands
Co-Evolution

- Open systems
- Agents & environment—both change
- Future behavior is linked to history
Emergent Properties

- System properties emerge
- Emergent properties of the whole are distinct from the properties of the agents
Self Organization

System Control Parameters

- Rate of new information flow
- Nature of connections among people
- Cognitive diversity

Ralph Stacey, 1996
Conceptual Model

Nursing Management Practices

System Control Parameters
- Rate of NEW information flow
- Number & intensity of interconnections
- Level of diversity within & between cognitive schema

Process Outcomes
- Self-Organization
- Behaviors for Quality Outcomes

Foundation: Quantitative Study (N=164 facilities, N> 3500 participants)

Nursing Management Practices
- Communication
- Participation in decision making
- Administrative Climate (reward)
- Leadership Behaviors (relationship-orientated)
- RN & administrative clinical leadership

Context
- Ownership
- Size
- Case Mix

Outcomes
- Resident Outcomes
- Staff Turnover

R01 NR003178, Anderson PI
Asking the “Why” Questions: Qualitative Case Studies

- Descriptions
  - relationship patterns & management practices
- Explanations
  - relationship patterns & management practices
- Hypothesis
  - about how relationship patterns and management practices foster better outcomes.

R01 NR003178, Anderson PI
Outcomes of Nursing Management Practice in Nursing Homes
(competing continuation #1)

- Funded by National Institute of Nursing Research (NIH 2 R01NR003178-04A2; R01NR03178-05S1, Anderson, PI)
  - Team: Natalie Ammarell; Donald Bailey; Cathleen Colon-Emeric; Kirsten Corazzini; Debra Lekan-Rutledge; Mary Lynn Piven; Queen Utley-Smith
  - Consultants: Benjamin Crabtree; Reuben McDaniel; Marilyn Rantz
Methods: Comparative, multiple-case study

- Eight case studies
  - Four formative cases of about 6 months in each facility
  - Four replication cases of about 4 months in each facility

- Data Collection Methods
  - Direct observation
  - Shadowing
  - Depth interviews
  - Document review
  - Resident interviews
Individual Participants

10 NHAs
11 DONs
6 ADONs
16 MDS nurses
14 RN & LPN managers
15 Social workers
139 Floor nurses (LPN & RN)
232 NAs/Med techs
335 Non-nursing staff

778 = Total Staff

602 = Residents
Data Analysis--Qualitative

- Open coding, sorting into categories and subcategories
- Identify themes, stories etc and verify against original transcripts
Findings: Relationship Patterns

Colón-Emeric and team (2006)
Findings:
Nursing Management Practices

- Formal management practices
  - Management control systems (e.g.)
    - Staffing, scheduling approaches
    - Disciplinary policies
    - Formal reward and reorganization systems
Findings:
Nursing Management Practices

- Third set of codes—
  - informal
  - appeared mundane

They were all about local interactions
A Common Pattern

Local Interaction Patterns

Opportunities for Informal Interaction
(e.g., Chance Encounters; Rounds; spontaneous meetings)

Avoid Ignore

Emergent Characteristics

Work Environment
- Being behind
- Care planning w/o information
- “Heavy lifting”

Individual Staff
- Dissatisfaction
- Burnout & Stress
- Exhaustion
- Frustration
- Not feeling valued

Resident Care
- Poor quality outcomes
- Poor Safety climate

Anderson et al. 2014
Every so often....

Something outstanding
A Positive Pattern

Local Interaction Patterns

• Exchange Information
  • Connect
  • Cognitive Diversity

Emergent Characteristics

Work Environment
• Reciprocity
• Respect
• Teamwork
• Learning
• Better care processes (e.g., planning, decision making)

Opportunities for Informal Interaction
(e.g., Chance Encounters; Rounds; spontaneous meetings)

Listen
• Give/receive information
• Explain
• Verify meaning

Better quality and outcomes
A Positive Pattern

Local Interaction Patterns

- Exchange Information
- Connect
- Cognitive Diversity
- Provide Local Reward

Emergent Characteristics

Work Environment
- Reciprocity
- Respect
- Teamwork
- Learning
- Better care processes (e.g., planning, decision making)

Opportunities for Informal Interaction (e.g., Chance Encounters; Rounds; spontaneous meetings)

- Be Approachable
- Pitch-in
- Seek assistance
- Reciprocate
- Coach/Mentor
- Show appreciation
- Give respect
- Say thank you
- Give praise
A Positive Pattern

Local Interaction Patterns

- Pay Attention
- Ask questions
- Give/receive feedback
- Suggest alternatives
- Sensemaking

Opportunities for Informal Interaction
- Chance Encounters
- Rounds
- Spontaneous meetings

Exchange Information
- Connect
- Cognitive Diversity

Individual Staff
- Feeling good
- Confidence
- Satisfaction

Resident Care
- Better quality and outcomes

Better care processes (e.g., planning, decision making)
Model of Local Interaction Strategies

Local Interaction Patterns

Opportunities for Informal Interaction
(e.g., Chance Encounters; Rounds; spontaneous meetings)

Exchange Information:
- Listen
- Give/receive information
- Explain
- Verify meaning

Connect:
- Be Approachable
- Pitch-in
- Seek assistance
- Reciprocate
- Coach/Mentor
- Show appreciation
- Give respect
- Say thank you
- Give praise

Cognitive Diversity:
- Pay Attention
- Ask questions
- Give/receive feedback
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Emergent Characteristics

Work Environment
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- Better care processes (e.g., planning, decision making)

Individual Staff
- Feeling good
- Confidence
- Satisfaction

Resident Care
- Better quality and outcomes

Anderson et al. 2014.
Sharpens our clarity that system change can occur through local interaction.

Global patterns are created through local interaction.
Next Steps

- Developed intervention with small internal grant and did small scale evaluation of components
- NIH R56 and VA HSR&D funding: Intervention Pilot in 8 nursing homes (completed)

Connecting Care and Outcomes through Local Interaction
Pilot Intervention Studies

CONNECT for Better Falls Prevention in VA Nursing Homes (VA EDU 08-417)

- Cathleen Colón-Emeric (PI), Ruth Anderson, Sandro Pinheiro, Ellie McConnell, Kirsten Corazzini

Outcomes of Nursing Management Practice in Nursing Homes (competing continuation) (R56NR003178 - 09)

- Ruth Anderson (PI), Cathleen Colón-Emeric (PI), Sandro Pinheiro, Ellie McConnell, Kirsten Corazzini, Deirdre Thornlow
Research Question

- Does an intervention in which staff learn to purposefully use effective local interaction strategies (CONNECT) improve uptake of a falls quality improvement intervention (FALLS)?
What Interventions, FALLS &/or CONNECT, Help Staff Reduce Falls?

**FALLS (Content-Focused)**
- Audit & Feedback
- Educational Modules
- Toolkits
- Academic Detailing

**CONNECT (Process Focused)**
- Learning protocols
- Relationship map protocols
- Unit-based mentoring protocols

**Fall-related Process Measures**
- Risk factor assessment
- Risk factor reduction interventions

**Complexity Science Measures**
- Communication
- Participation in decision-making–LPN and NA
- Local interaction
- Safety culture
- Staff perceptions of care quality

**Outcome Measures**
- N of Falls
- Fall rates
Study Design – Cluster Randomized Trial

- CONNECT
- FALLS (6 mo.)

Outcomes
- Staff interactions
- Falls QIs
- Fall rates (exploratory)

4 NHs
- 2 VA
- 2 community

4 NHs
- None
- FALLS (6 mo.)
Study Design

- **Setting:**
  - 4 VA Community Living Centers (matched pairs)
  - 4 Community nursing homes (matched pairs)

- **Staff Participants:**
  - Goal to enroll 288 staff (about 36 in each site)

- **Residents:**
  - Goal to have falls data on n=680 unique fallers

- **Randomized to**
  - FALLS alone
  - CONNECT followed by FALLS
Complexity Science Measures

- **Communication**
  - Roberts & O’Reilly openness, accuracy scales (10 items, 5-point scale)
  - Shortell's timeliness scale (3 items, 5-point scale)
  - Alpha coefficients of .81, .72 & .68, respectively

- **Participation in Decision Making—LPN/CNA**
  - 11 items, 10-point scales
  - Alpha coefficients of >.90

- **Local Interaction Scale**
  - 22 items, 5-points
  - Alpha > .90
Complexity Science Measures

- Safety Culture
  - Vogus & Sutcliff's Safety Organizing Scale
  - 9-item, 7-point scale
  - Alpha > .90

- Staff perceptions of care giving quality
  - 7 items, 5-point scale
  - Alphas > .80
Fall Rate

- Medical Record, MDS, Incident reports, Weekly census
  - Numerator: number of falls occurring in a 6 month period
  - Denominator: number of occupied bed days
Fall Risk Reduction Activities

- Medical record, RAI, Incident reports
  - Orthostatic Blood Pressure
  - Sensory Impairment
  - Footwear
  - Gait and Assistive Devices
  - Toileting
  - Environment
  - Psychotropic Medication Reduction
  - Calcium and Vitamin D
# FALLS QI Intervention

## FALLS Coordinator Role

<table>
<thead>
<tr>
<th>Activity</th>
<th>Role</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training Session</td>
<td>Coordinator</td>
<td>4 hours</td>
</tr>
<tr>
<td>Weekly teleconference</td>
<td>Coordinator</td>
<td>11 x 30 min</td>
</tr>
</tbody>
</table>

## Staff Education

<table>
<thead>
<tr>
<th>Activity</th>
<th>Tailored for role</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case-based online modules</td>
<td></td>
<td>1 hour</td>
</tr>
</tbody>
</table>

## Post-fall Problem Solving Sessions

<table>
<thead>
<tr>
<th>Activity</th>
<th>All staff</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic detailing</td>
<td></td>
<td>30 min x 2</td>
</tr>
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</table>

## Audit and Feedback

<table>
<thead>
<tr>
<th>Activity</th>
<th>Role</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls care quality report</td>
<td>Coordinator</td>
<td>30 min</td>
</tr>
</tbody>
</table>

## Toolbox

<table>
<thead>
<tr>
<th>Tools</th>
<th>Role</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worksheets, handouts, posters</td>
<td>Coordinator</td>
<td>Voluntary</td>
</tr>
</tbody>
</table>
## CONNECT Intervention

### Learning Protocols

<table>
<thead>
<tr>
<th>Learning sessions: Basic &amp; Advanced</th>
<th>All staff</th>
<th>2 x 45 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-house coach(es) identified</td>
<td>Coaches</td>
<td>6 hrs</td>
</tr>
</tbody>
</table>

### Relationship Map Protocols

<table>
<thead>
<tr>
<th>Group-to-group maps</th>
<th>Managers</th>
<th>2 x 1 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual maps</td>
<td>All staff</td>
<td>2 x 45 min</td>
</tr>
</tbody>
</table>

### Unit-Based Mentoring Protocols

<table>
<thead>
<tr>
<th>Structured mentoring (research staff)</th>
<th>All staff</th>
<th>2 x 10 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance encounter mentoring (in-house coaches)</td>
<td>All staff</td>
<td>1.25 hr/d co-facilitator</td>
</tr>
</tbody>
</table>
CONNECT Protocols:
CONNECT & Learn Session

- Learn new skills and create new connections
- Approaches:
  - Stories from the case studies
  - Role-playing and discussion
  - Interdisciplinary learners
Group to Group Relationship Map

Sample Group-to-Group Maps

- Approaches
  - Facilitate staff discussions to map existing relationships and
  - Identify and agree on goals for changes
Individual to Individual Relationship Map

Approaches

- Help individuals identify most important relationships when caring for his/her group of residents.
- Individual learns to self-monitor interactions with others
Sample Feedback Report

Sample Feedback:
- You reported talking with 3 of the 9 people on your map.
- Good balance of interaction strategies. It is usual to “exchange information” more than the other types.
- I will contact you to talk about increasing your interactions with other people on your map & using more two-eyed seeing.
Analysis

- Intention to treat
- Glimmix procedure to account for clustering
- Models estimated assuming no treatment variation over time
  - Treatment by time interaction controlling for baseline measurement
  - Adjusted for confounders
Participants

Eligible Staff (n=881)

- No consent or participation (n=553)
  - Withdrew or lost (n=7)
    - Classes only (n=108)
    - Surveys only (n=50)
    - Surveys & other (n=183)

Intervention NHs (n=4)

Eligible Staff (n=755)

- No consent or participation (n=394)
  - Withdrew or lost (n=12)
    - Classes only (n=64)
    - Surveys only (n=130)
    - Surveys & other (n=108)

Control NHs (n=4)
Mean Staff Survey Response

- **Control**
  - Baseline: 4.4
  - 3 months: 4.2
  - 6 months: 4.0

- **Intervention**
  - Baseline: 3.6
  - 3 months: 3.8
  - 6 months: 4.0

**p < 0.01.**

Intervention - mean subset items
Control - mean subset items
Mean Staff Survey Response

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>3 months</th>
<th>6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=4

p<0.01.
Falls Quality Indicators

Proportion of Potential Fall Risk Reduction Processes Completed

- Control
  - Baseline
  - Post-Intervention
  - Change

- Intervention
  - Baseline
  - Post-Intervention
  - Change
Fall Rates

Falls/bed/year

Control
Intervention

Baseline
Post-Intervention
Change

Hazard Ratio
1.01 (0.62, 1.65)
0.88 (0.56, 1.37)
Focus Groups to evaluate interventions

- FALLS QI content familiar
- Good reminder about what to watch for and to engage in teamwork

FALLS only
- n=21
- 2 focus groups at each site

CONNECT & FALLS
- n=16
- 2 focus groups at each site
Focus Groups to evaluate interventions

Self-assessment

FALLS only
n=21
2 focus groups at each site

It was good to hear but we’re pretty good at preventing falls.

CONNECT & FALLS
n=16
2 focus groups at each site
Focus Groups to evaluate interventions

**Self-assessment**

We did the mapping and things and realized that there was a lack of communication between us and administration or us and NAs on different departments.

**FALLS only**
- n=21
- 2 focus groups at each site

**CONNECT & FALLS**
- n=16
- 2 focus groups at each site
Focus Groups to evaluate interventions

It’s taken a lot of stress off and drama because it’s hard to prevent falls when you’re dealing with attitudes ….. we’re more willing to stick to toilet programs … now that we’ve been able to communicate and it’s not like I’m bossing you around

FALLS only
n=21
2 focus groups at each site

CONNECT & FALLS
n=16
2 focus groups at each site
Focus Groups to evaluate interventions

It puts you more on alert and it helped us communicate better about residents.

People have become accountable for the residents. It doesn’t matter if you work in the kitchen or outside on the grounds or whatever. We have an eye, you’re trained to pay attention to little things and pass it along.

FALLS only
n=21
2 focus groups at each site

CONNECT & FALLS
n=16
2 focus groups at each site
Conclusions

- CONNECT feasible
- Improves staff communication
  - Ceiling effect in VA
- Possible impact on fall rates
- No impact on fall QIs
  - No relation between process indicators and fall rates
Current Work (R01)

- 16 facilities for full test of intervention
- Same design
  - Added a new measure of process indicator of use of fall prevention interventions using staff report
  - In addition to chart abstraction.
- Currently finishing the 3rd and final wave
Protocol/Pilot Publications


- **Qualitative Focus Group Pilot Results**: Colón-Emeric, C.S., ...Anderson, R.A., ... (2014). Connecting the Learners: Improving Uptake of a Nursing Home Educational Program by Focusing on Staff Interactions. *The Gerontologist*, 54(3), 446-459.
Questions

Comment & discussion