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

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Overall Aim of Research Program

What management practices influence effective, efficient and equitable outcomes in health care delivery systems?

A Journey: Early influences

Reuben R. McDaniel, Jr

The University of Texas at Austin

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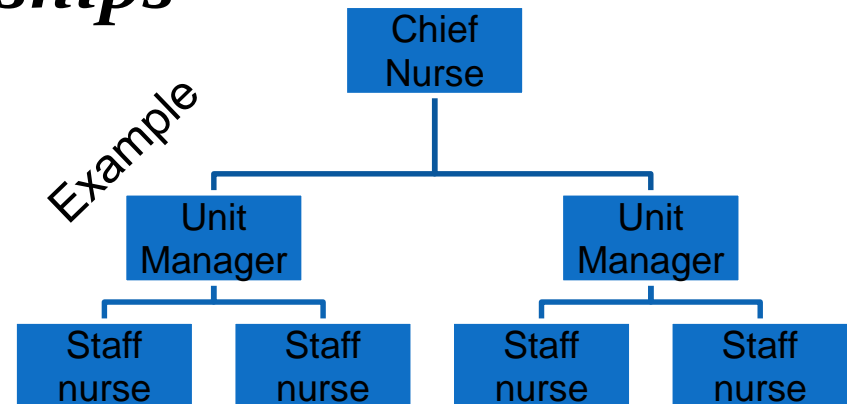- Capra F. *The web of life.*

The Essence of Complexity Science (Capra, 1996)

The study of...

- ***patterns and relationships***

Example

```
                    Chief
                    Nurse
          ┌───────────┴───────────┐
      Unit                         Unit
    Manager                      Manager
    ┌────┴────┐                  ┌────┴────┐
  Staff     Staff             Staff      Staff
  nurse     nurse             nurse      nurse
```

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
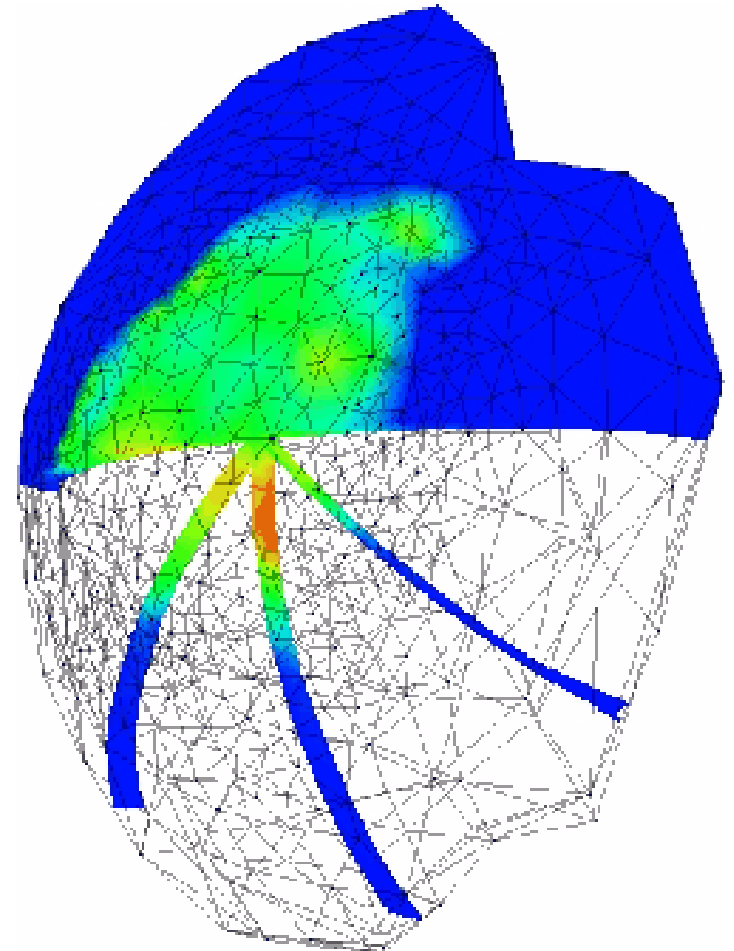- Individuals
- Groups
- Organizations

Agents

- Agents gather information
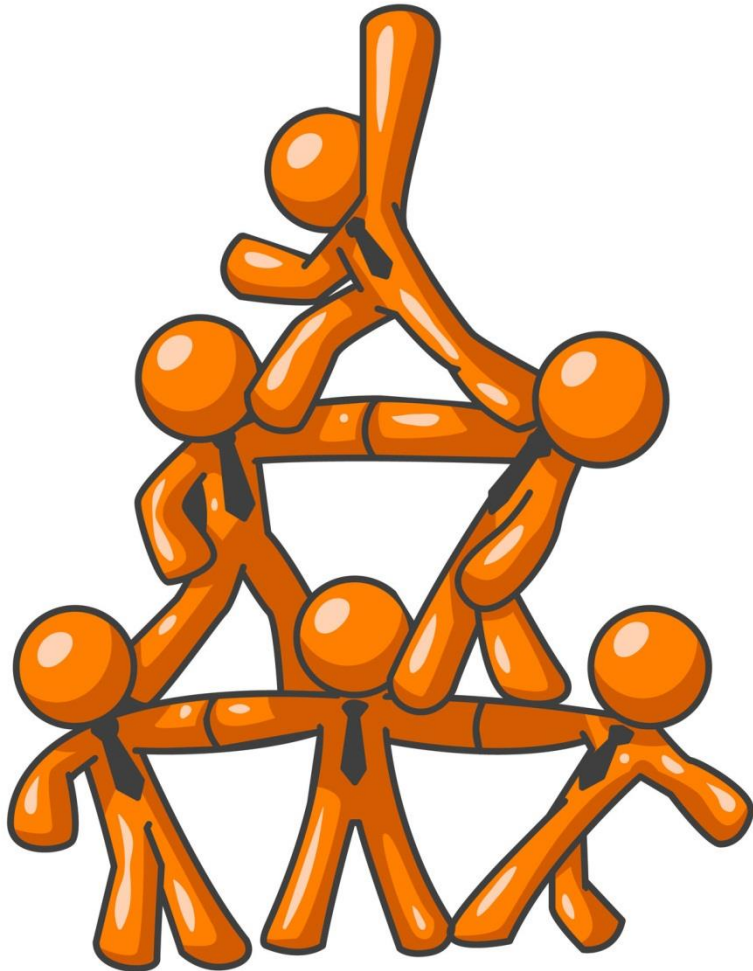
- Novelty from diversity

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

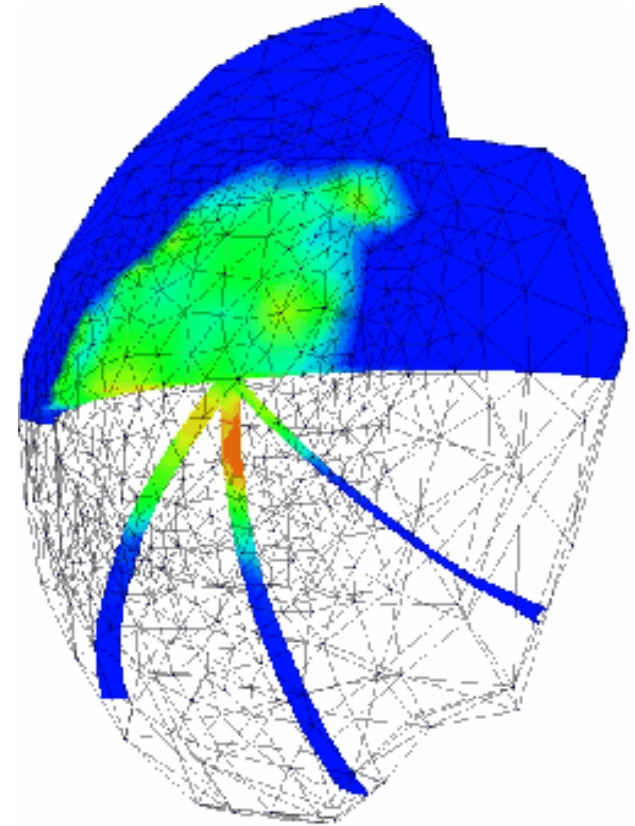# Emergent Properties

work environment quality of care

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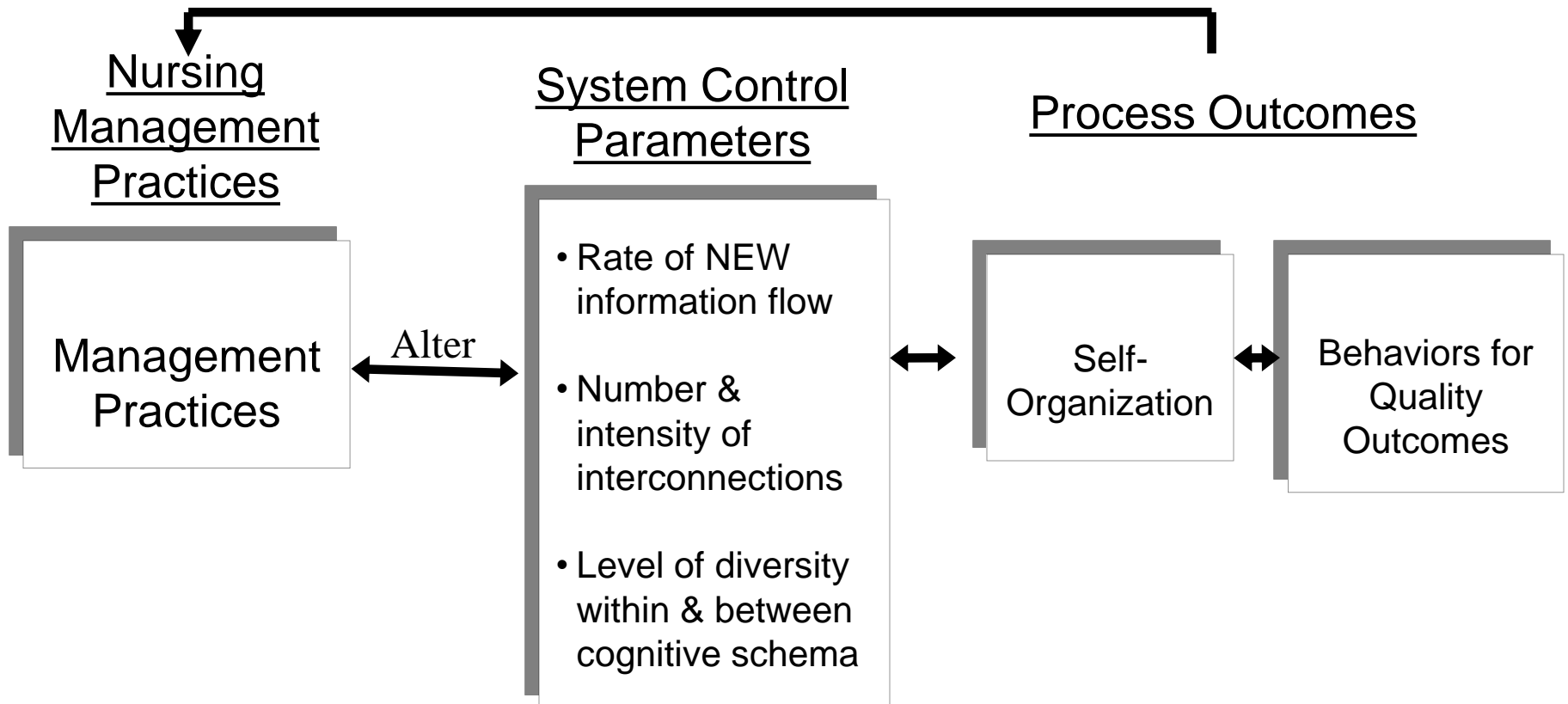
Self Organization

System Control Parameters

- Rate of new information flow

- Nature of connections among people

- Cognitive diversity

Ralph Stacey, 1996

Conceptual Model

Anderson, Issel & McDaniel (2003)

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
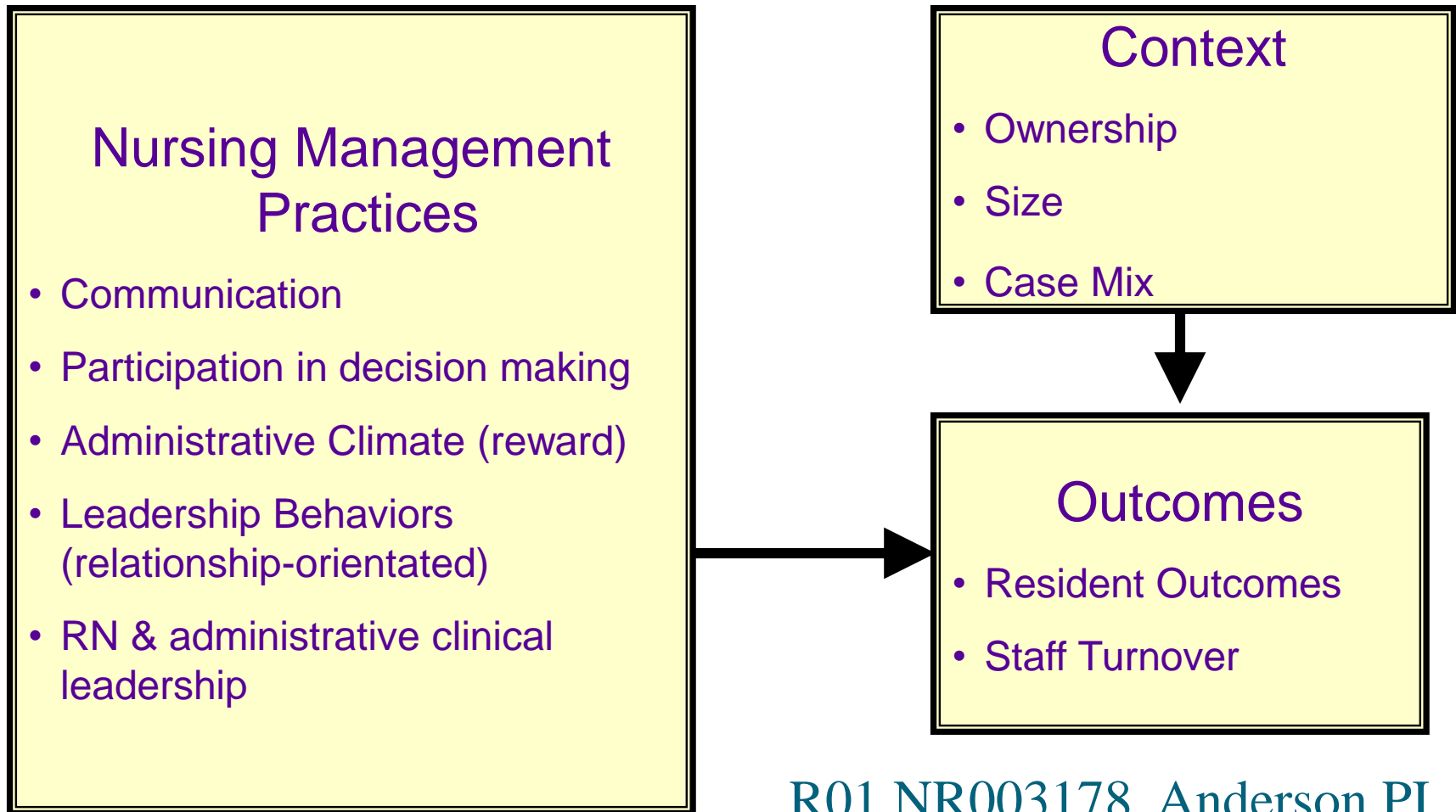
Asking the "Why" Questions: Qualitative Case Studies

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

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

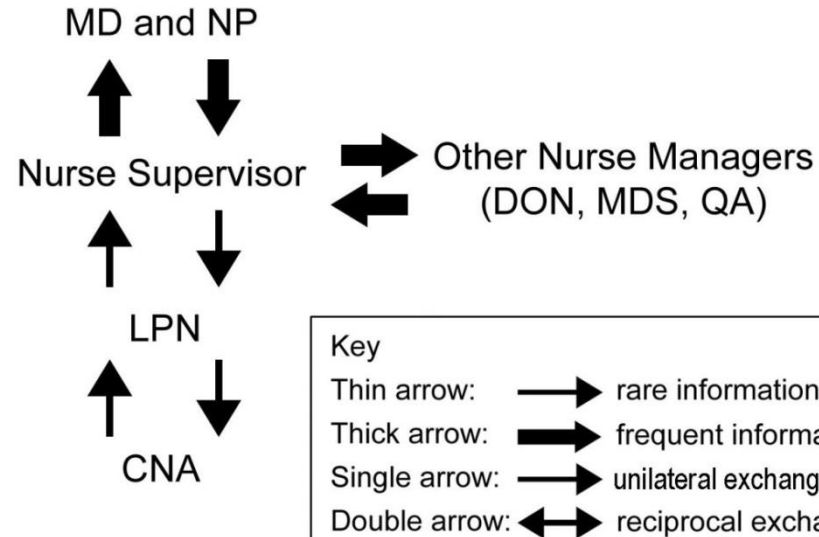778 = Total Staff

602 = Residents

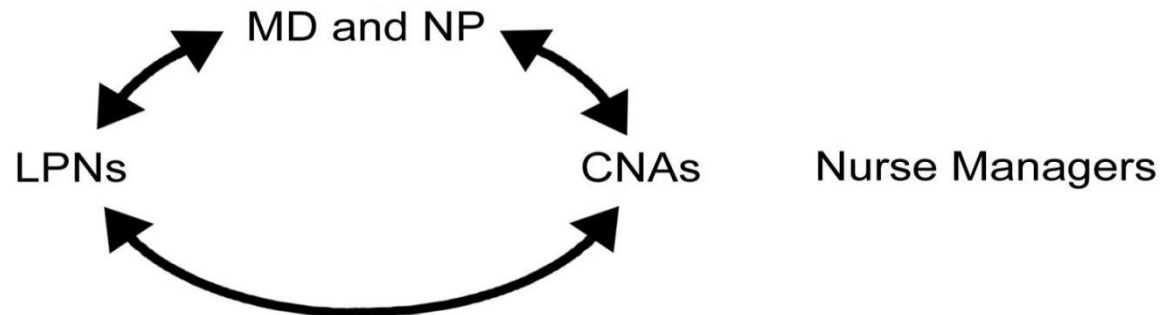# Data Analysis--Qualitative

- Open coding, sorting into categories and subcategories

- Identify themes, stories etc and verify against original transcripts

Findings: Relationship Patterns

Site 1: Communication Pattern at Sweet Dell[1]

MD and NP

Nurse Supervisor → Other Nurse Managers (DON, MDS, QA)

LPN

CNA

Key
Thin arrow: → rare information exchange
Thick arrow: → frequent information exchange
Single arrow: → unilateral exchange
Double arrow: ↔ reciprocal exchange

Site 2: Communication Pattern at Harbor[2]

MD and NP

LPNs   CNAs   Nurse Managers

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
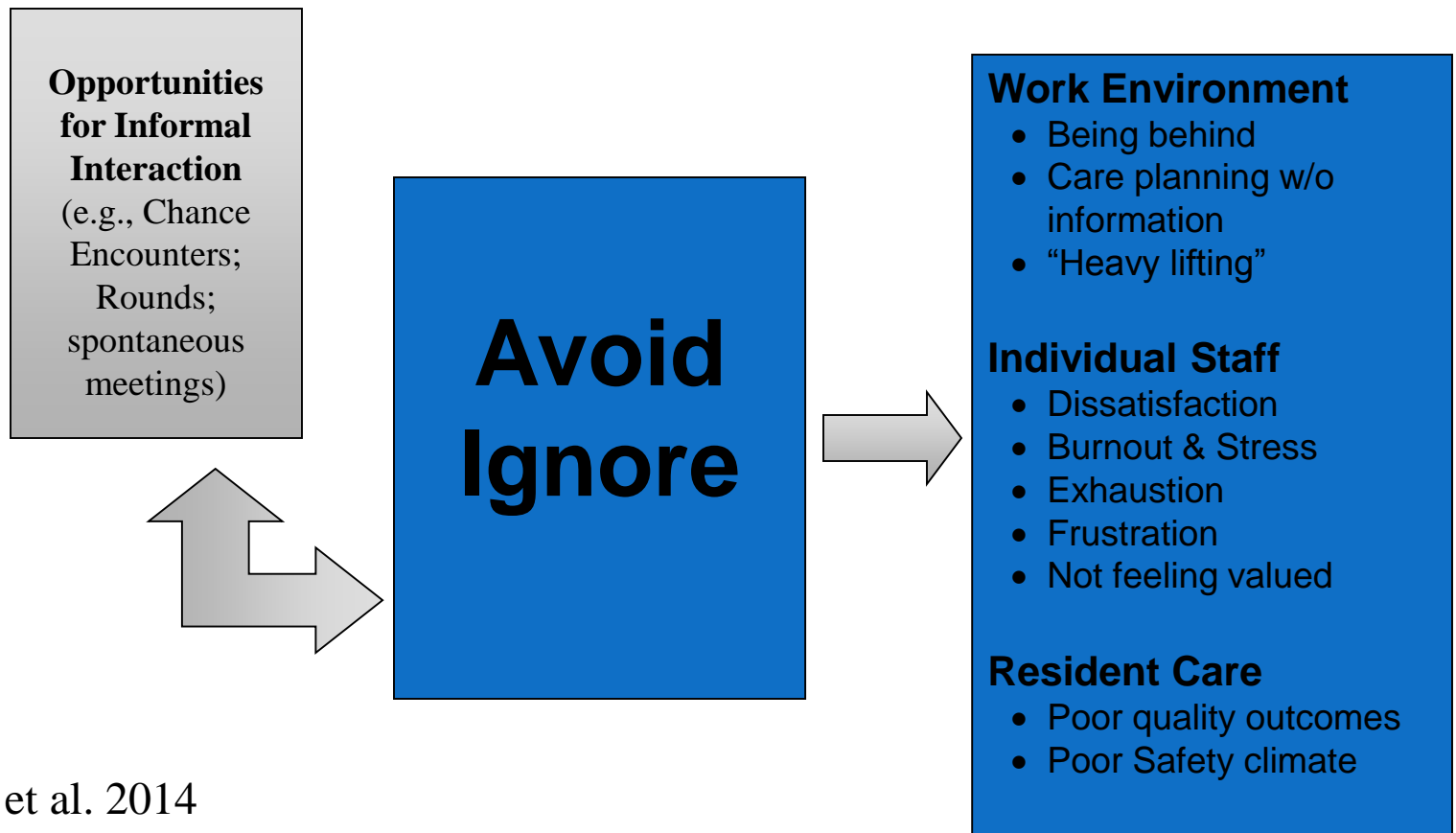
Findings:
Nursing Management Practices

- Third set of codes—
  - informal
  - appeared mundane

They were all about local interactions

A Common Pattern

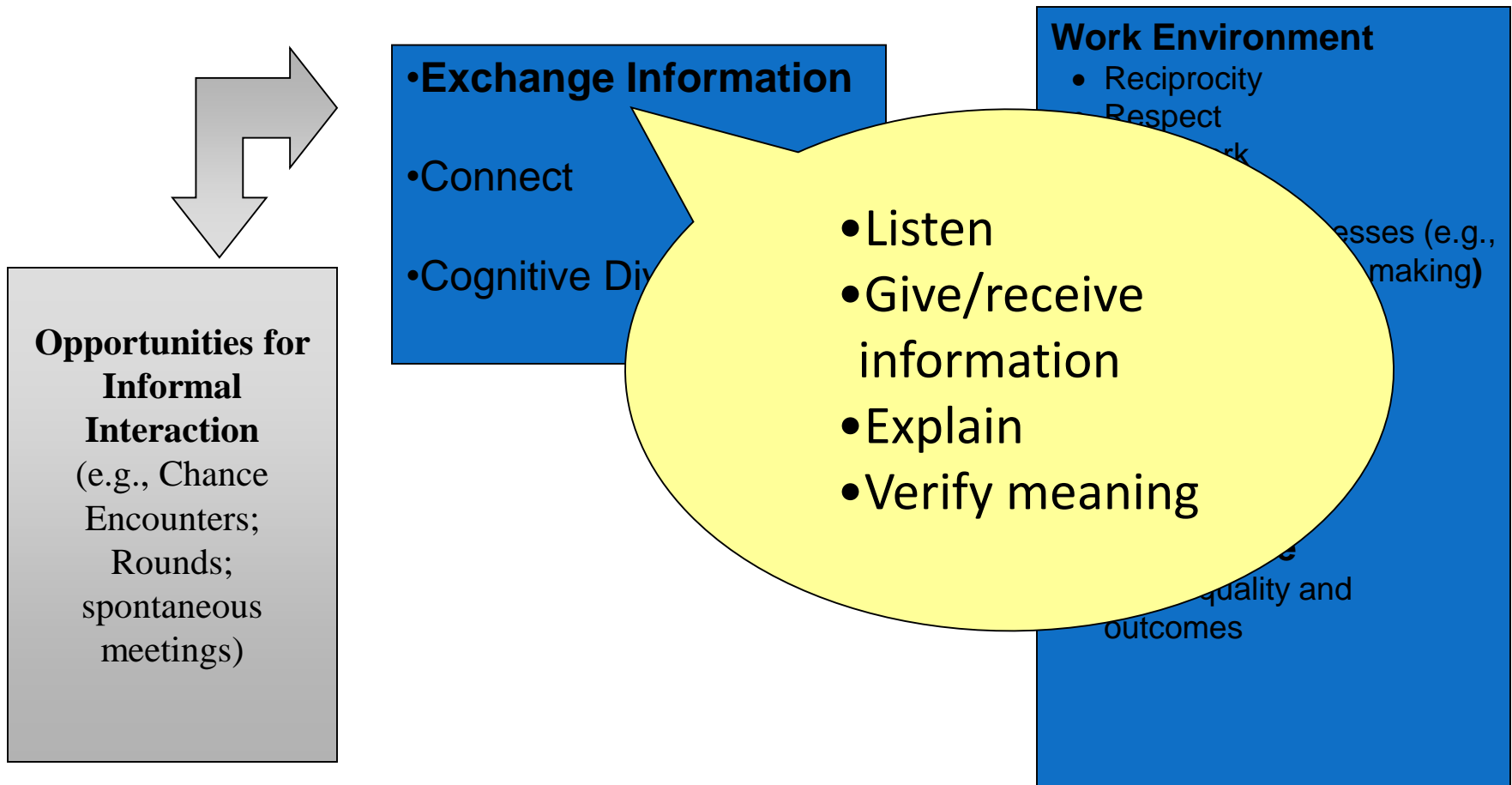| Local Interaction Patterns	Emergent Characteristics

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

Avoid Ignore

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

Emergent Characteristics

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

- **Exchange Information**
- Connect
- Cognitive Div

Work Environment
- Reciprocity
- Respect
- esses (e.g., making)
- quality and outcomes
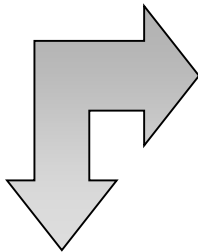
- Listen
- Give/receive information
- Explain
- Verify meaning

A Positive Pattern

Local Interaction Patterns

Emergent Characteristics

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

- Exchange Information
- **Connect**
- Cognitive Di...
- Provide Local Re...

Work Environment
- Reciprocity
- Respect
- Teamwork
- Learning
- ...are processes (e.g., ...ision making**)**

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

A Positive Path

Local Interaction ...

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

- Exchange Inform...
- Connect
- **Cognitive Diversity**

- Pay Attention
- Ask questions
- Give/receive feedback
- Suggest alternatives
- Sensemaking
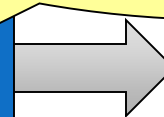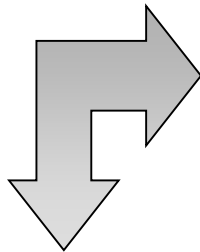
- Better care processes (e.g., planning, decision making)

Individual Staff
- Feeling good
- Confidence
- Satisfaction

Resident Care
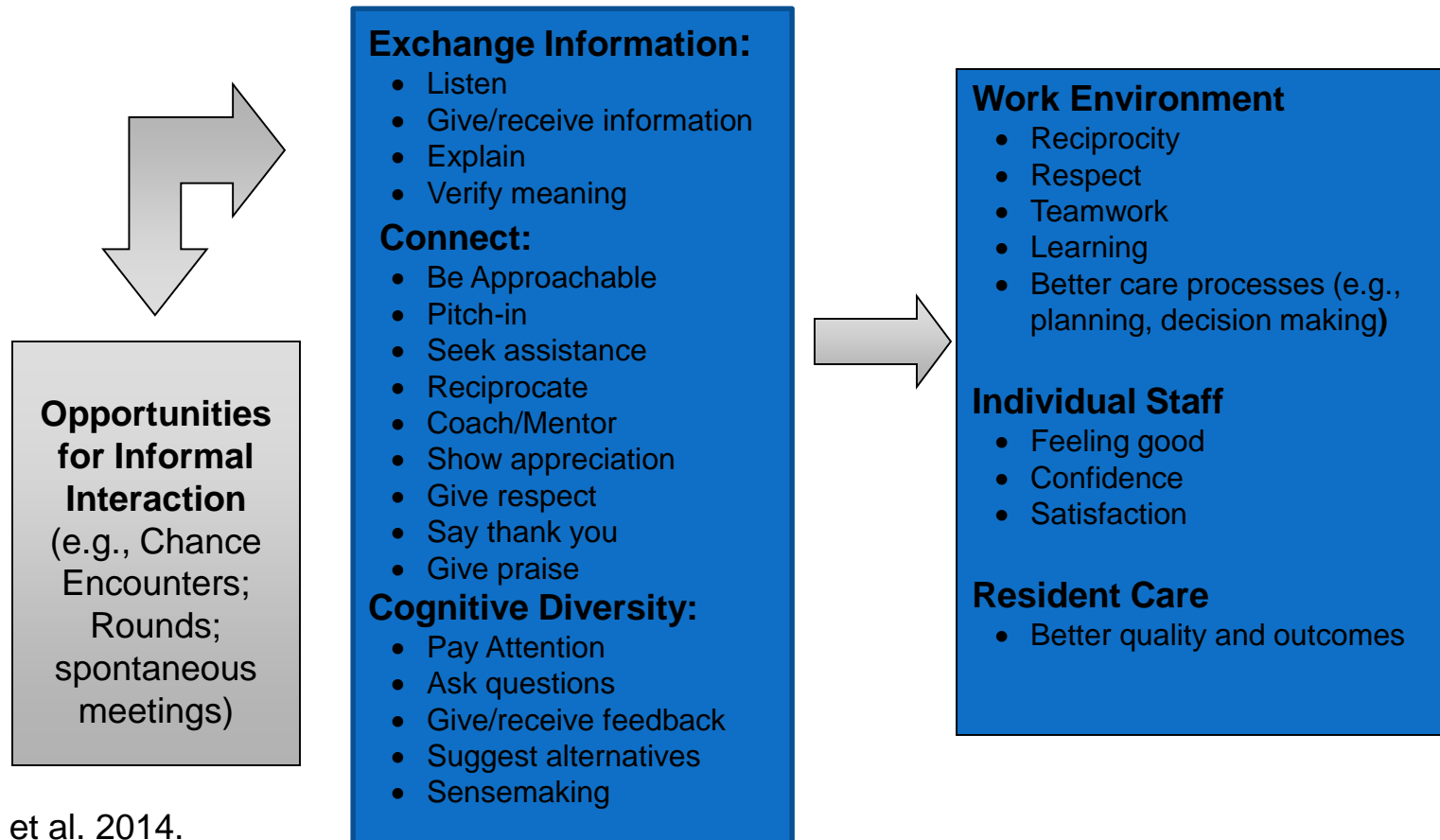- Better quality and outcomes

Model of Local Interaction Strategies

Local Interaction Patterns	Emergent Characteristics

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
- Suggest alternatives
- Sensemaking

Work Environment
- Reciprocity
- Respect
- Teamwork
- Learning
- 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 local interaction
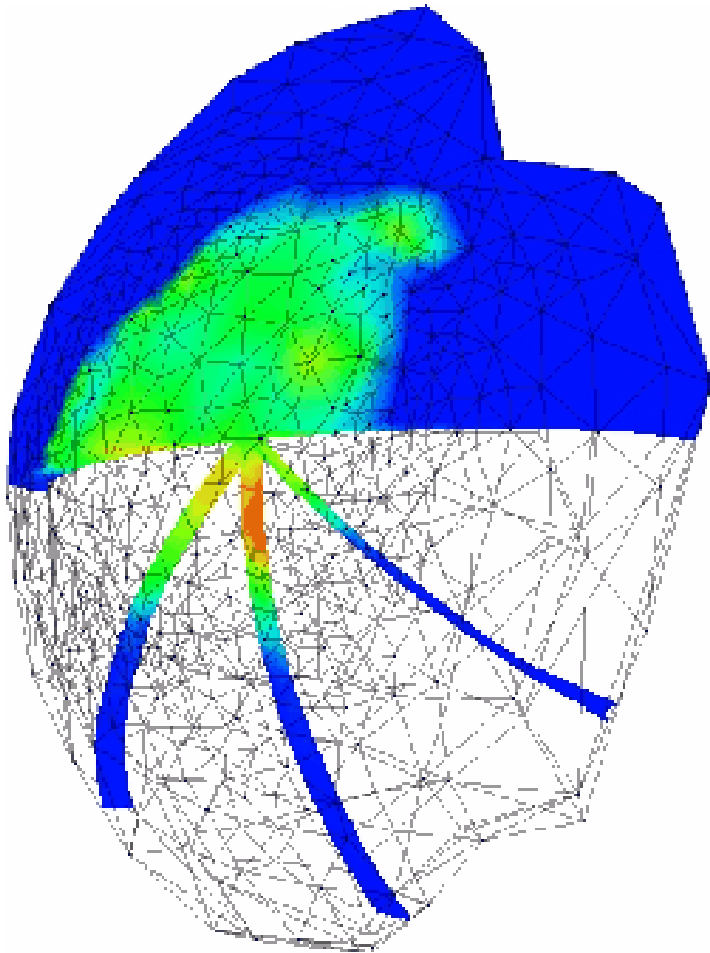
Global patterns are created through local interaction

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)
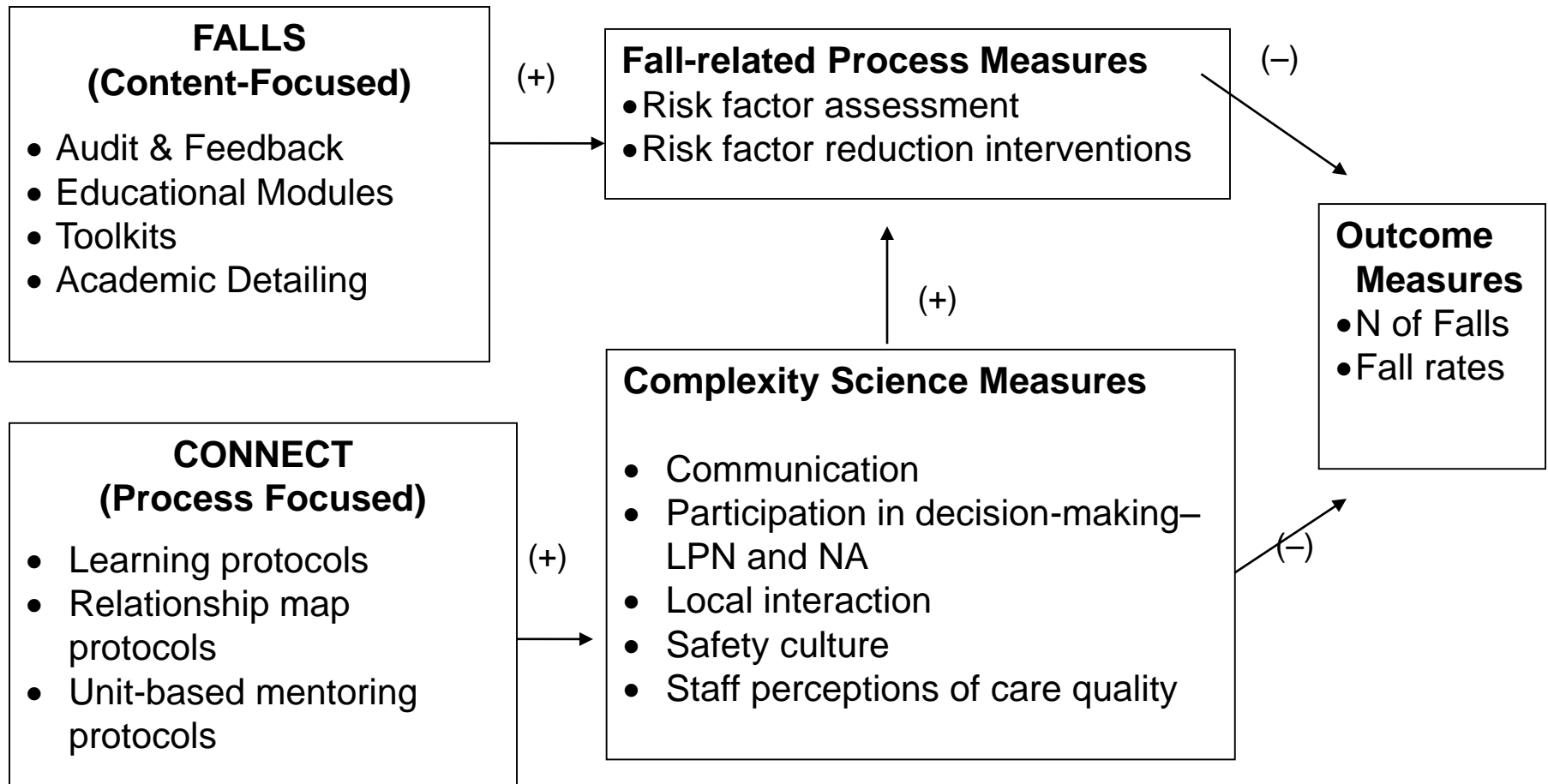(R56NR003178 - 09)

- 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

(+) →

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

(−)

Outcome Measures
- N of Falls
- Fall rates

(+)

Complexity Science Measures

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

(−)

CONNECT (Process Focused)

- Learning protocols
- Relationship map protocols
- Unit-based mentoring protocols

(+) →

Study Design – Cluster Randomized Trial

4 NHs
2 VA
2 community

- CONNECT
- FALLS (6 mo.)

4 NHs
2 VA
2 community

- None
- FALLS (6 mo.)

Outcomes
Staff interactions
Falls QIs
Fall rates (exploratory)

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		
Training Session	Coordinator	4 hours
Weekly teleconference	Coordinator	11 x 30 min
Staff Education		
Case-based online modules	Tailored for role	1 hour
Post-fall Problem Solving Sessions		
Academic detailing	All staff	30 min x 2
Audit and Feedback		
Falls care quality report	Coordinator	30 min
Toolbox		
Worksheets, handouts, posters	Coordinator	Voluntary

CONNECT Intervention

Learning Protocols		
Learning sessions: Basic & Advanced	All staff	2 x 45 min
In-house coach(es) identified	Coaches	6 hrs
Relationship Map Protocols		
Group-to-group maps	Managers	2 x 1 hr
Individual maps	All staff	2 x 45 min
Unit-Based Mentoring Protocols		
Structured mentoring (research staff)	All staff	2 x 10 min
Chance encounter mentoring (in-house coaches)	All staff	1.25 hr/d co-facilitator

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

CONNECT Individual Map

Draw Your Desired Relationship Map Here (area for drawing draft map on back of sheet):

Dolly + Keep
Betsy SW
Dottie Med Tech
Mary Supervisor
ME CNA
Liz LPN
Abby Activities
Deb CNA
Martha CNA
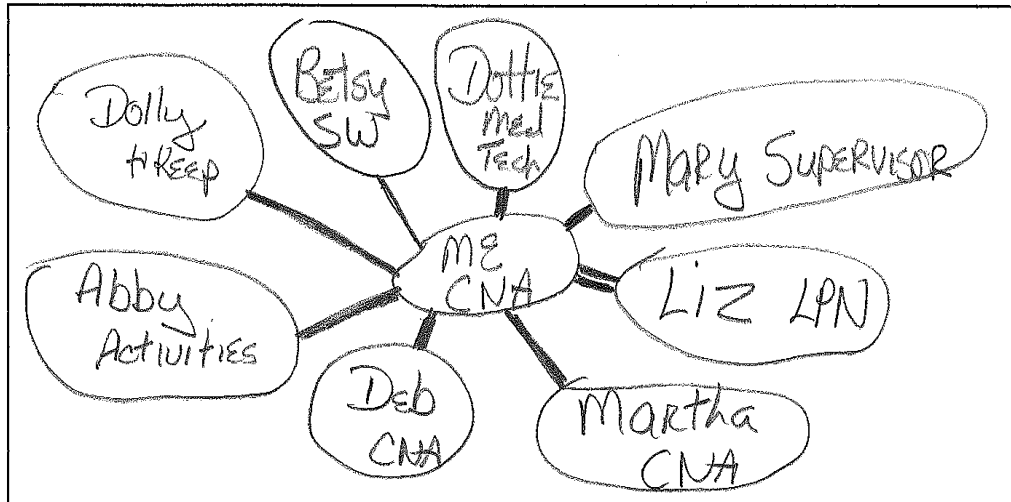
Connect Computer Log-On Info
Computer Log On: **connect**
Computer Password: **Connect10**
Personal Entry Code: _____
Personal Password: _____

- 3 individuals from your work group
- 5 co-workers from other work groups
- 1 co-worker from the shift before or after your shift

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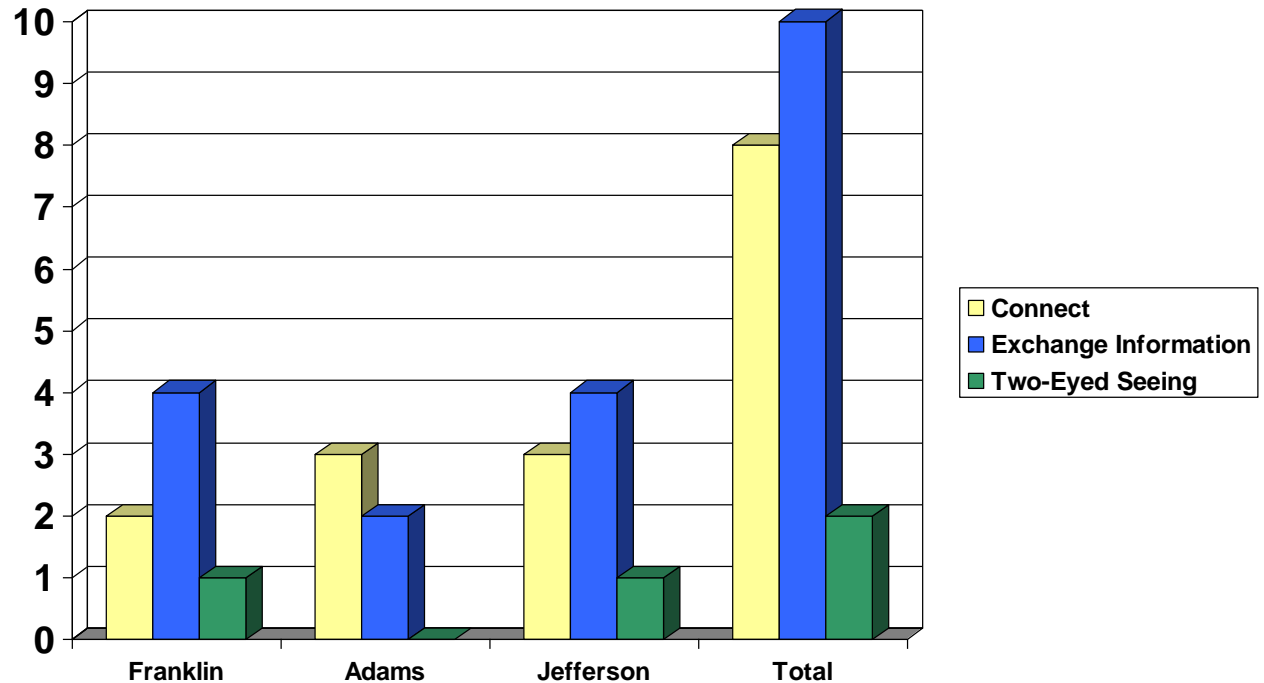
Sample Feedback:
- You reported talking with 3 of the 9 people on your map.
- Good balance of interaction strategies. It is usual to "exchange information" more than the other types.
- I will contact you to talk about increasing your interactions with other people on your map & using more two-eyed seeing.

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
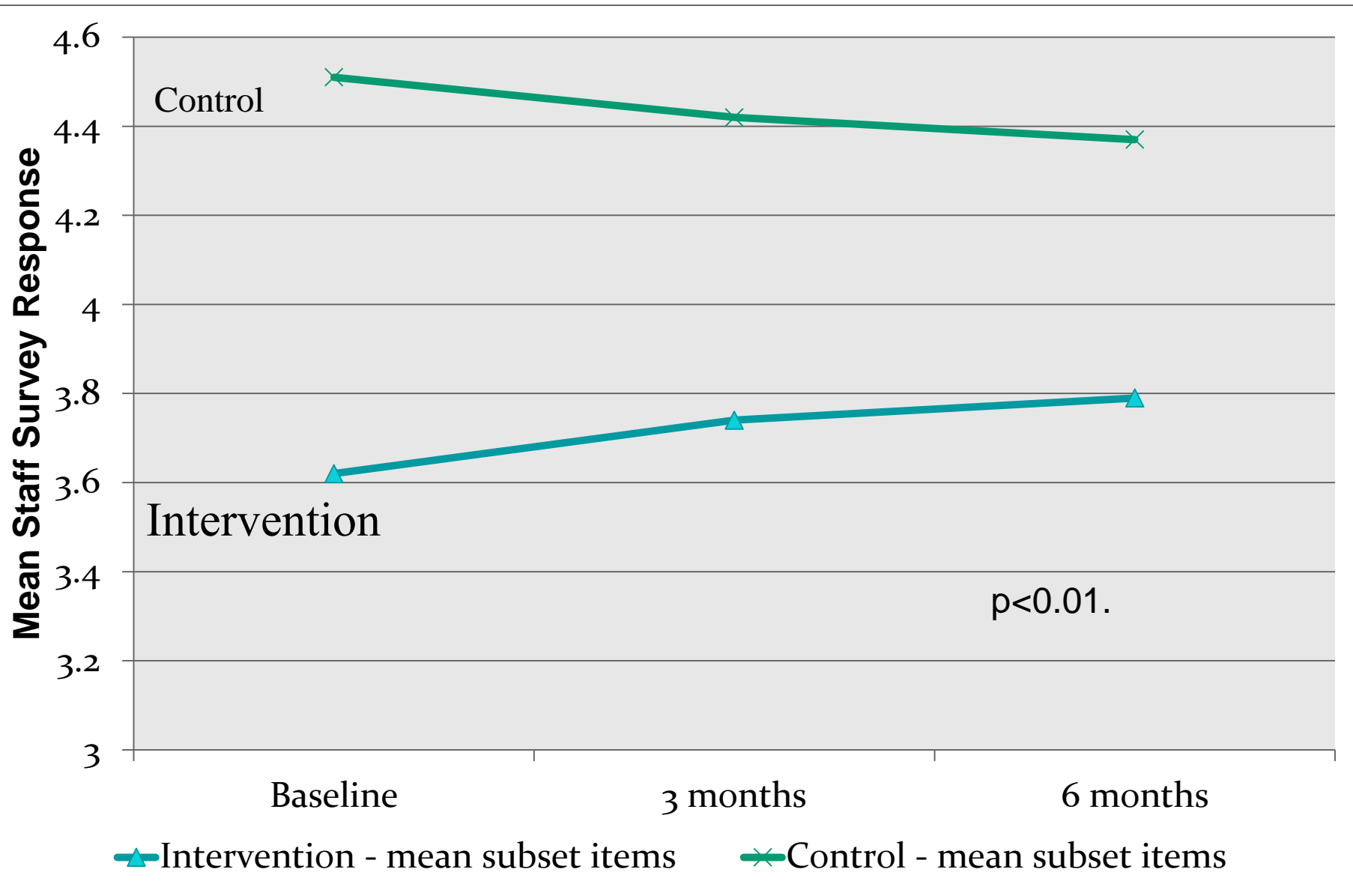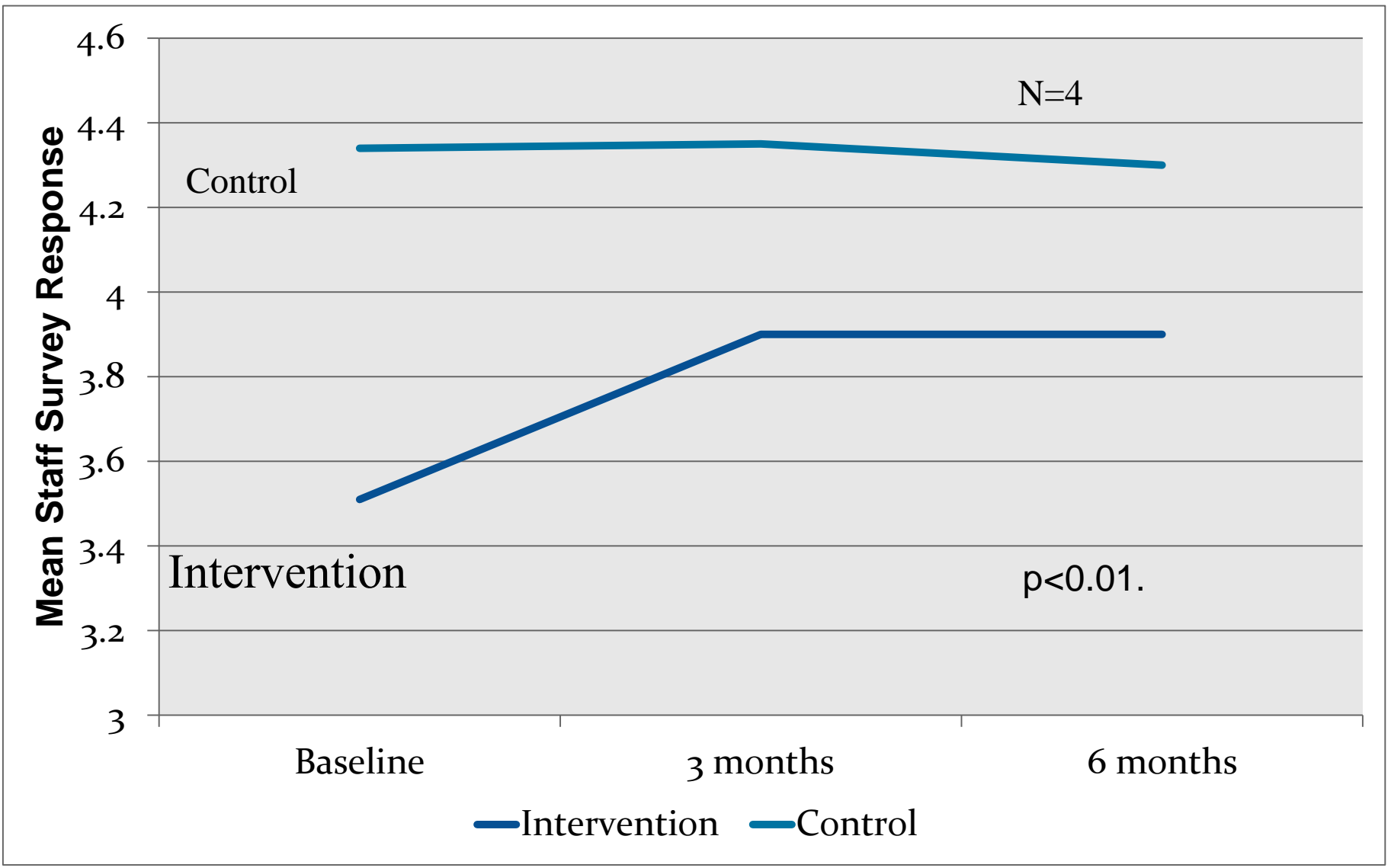
Falls Quality Indicators

Fall Rates

Hazard Ratio 1.01 (0.62, 1.65)   Hazard Ratio 0.88 (0.56, 1.37)

Falls/bed/year

Control   Intervention

■ Baseline   ■ Post-Intervention   ■ Change
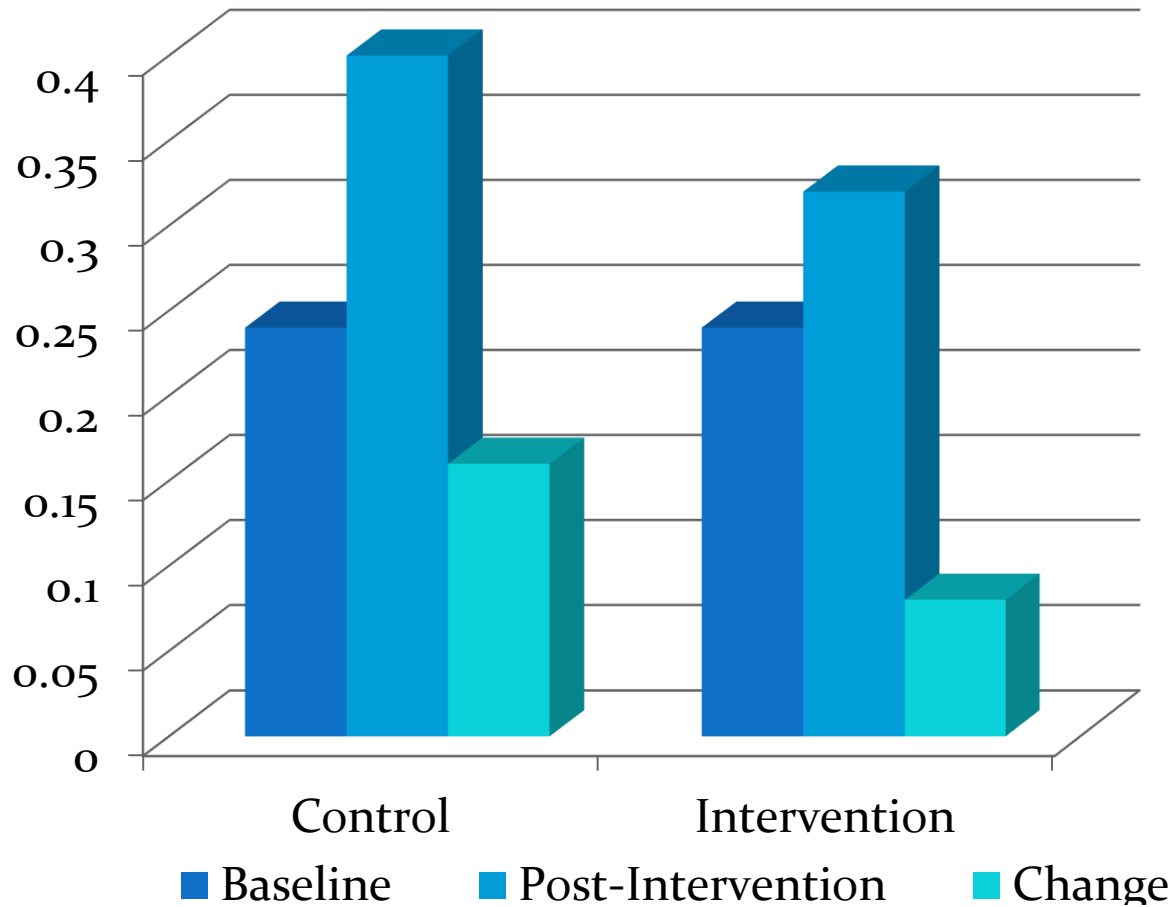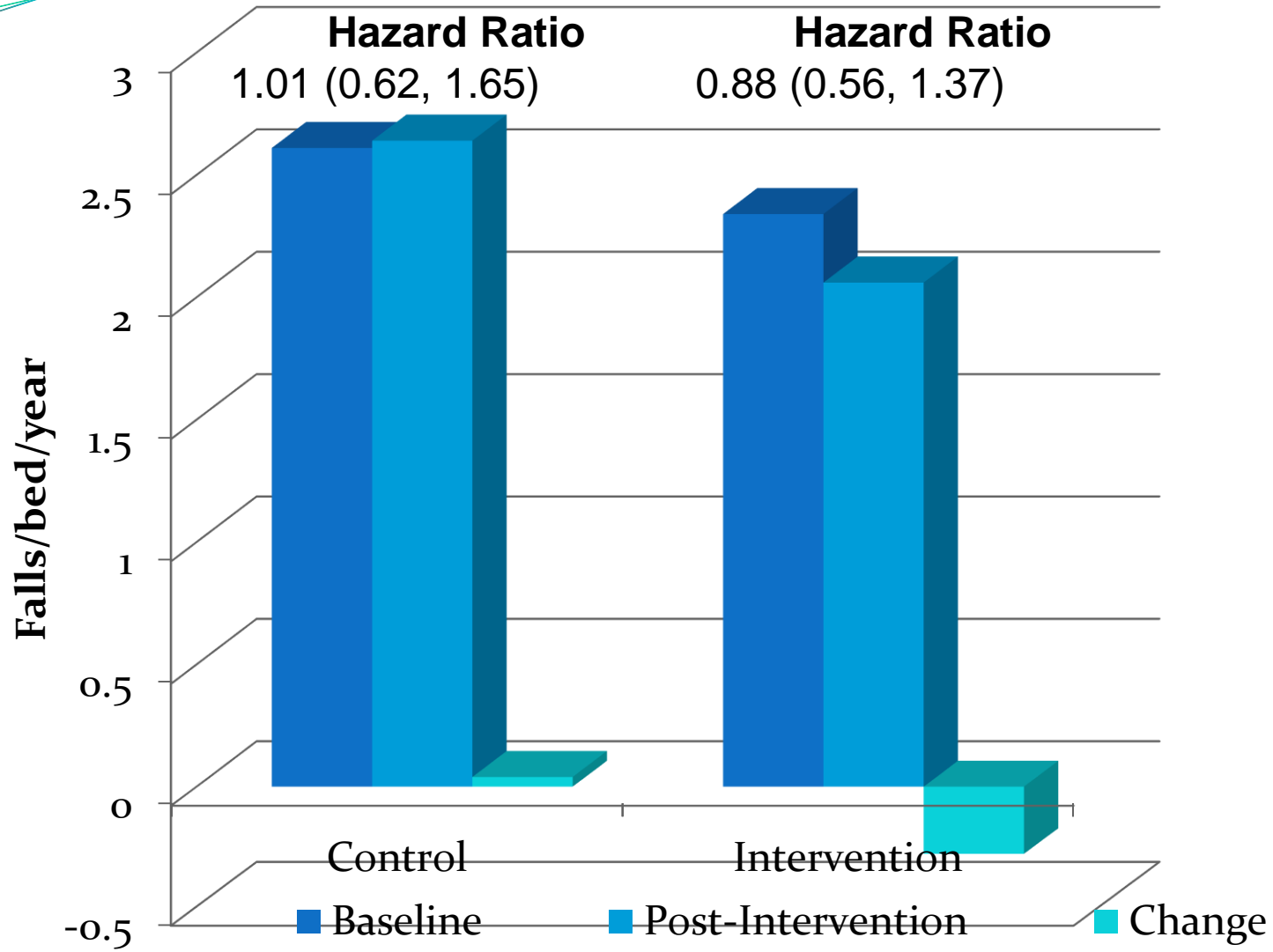
Focus Groups to evaluate interventions

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

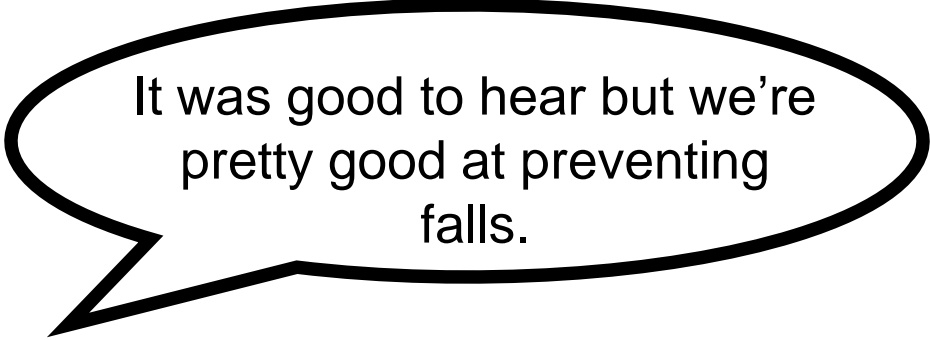**FALLS only**

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

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

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

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

- **Protocol:** Anderson, R. A., ... Colón-Emeric, C. (2012). CONNECT for Quality: Protocol of a Randomized Controlled Trial to Improve Fall Prevention in Nursing Homes. *Implementation Science, 7*(2), 11. Doi:10.1186/1748-5908-7-11.

- **Protocol:** Simpson, K. M., ...Anderson, R.A. (2013). Tool for evaluating research implementation challenges: A sense-making protocol for addressing implementation challenges in complex research settings. *Implementation Science 8*, (2).

- **Quantitative Pilot Results**: Colón-Emeric, ... Anderson, R. A. (2013). CONNECT for Better Fall Prevention in Nursing Homes: Results from a Pilot Intervention Study. *Journal of the American Geriatrics Society*. *61*(12), 2150-2159.

- **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