Teaching and Measuring Systems Thinking in a Quality and Safety Curriculum

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Acknowledgements

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OBJECTIVES

- Definition
- Significance
- Ways to teach
- Measurement
- Examples of research
Key Components to High Quality Safe Patient Care:

- Vigilant Individualized Care (Traditional)
- Optimal Patient Care
- Vigilant Systems of Care (Contemporary)

QSEN
- Patient Centered Care
- Teamwork & Collaboration
- Evidenced Based Practice
- Safety
- Quality Improvement
- Informatics
Definition of Systems Thinking

An individual’s or team’s ability to consider a group of interdependent people, items, processes and products and services that have a common purpose or aim

Nolan & Provost, 1990
An approach to problem solving that

- Views problems as parts of an overall system rather than a specific part
- Requires cyclical rather than linear cause effect thinking
Domains

- Sequence of events
- Causal sequence
- Multiple causations possible
- Variation of different types (random-special)
- Interrelations of factors
- Patterns of relationships
- Feedback loops
- Mechanisms that explain the cause and effect
Importance

Quality Improvement

- Nurses are part of systems of care
- Outcomes in care (NDNQI)
- Identify gaps between local and best practices
- Approaches for changing processes of care

QSEN, 2007
Importance

Safety

- Delineate categories of errors
- Use root cause analysis and FMEA
- Participate in error reporting
- Appreciate the cognitive and physical limitations of human performance

QSEN, 2007
Importance

BUSINESS

Systems Thinking is one of the 5 core knowledge areas needed for learning organizations (Senge, 1990)
Importance

Medicine

Competencies

- Systems-based Practice
- Medical Knowledge
- Interpersonal & Communication Skills
- Practice-based Learning & Improvement
- Patient Care
- Professionalism
- Developing competence as a physician

http://acgme.org/acWebsite/home/home.asp
Importance

The Future of Nursing

Nurses should be full partners, with physicians and other health care professionals, in redesigning health care in the United States
Importance

The Future of Nursing

Systems thinking is required to redesign healthcare to improve the quality and safety of care.
Ways to teach
I will turn my patient
I will post a note above the bed to remind others
I will ask other nurses about products to prevent ulcers
I will look at our ulcer rate on our unit
I will compare our unit ulcer rate with benchmarks
Ways to teach

- Flow charting the system
Process diagrams
Ways to teach

Patient/family factors
- Perception of illness
- Previous care experiences
- Financial issues
- Family support
- Comfort with system

Health care worker factors
- Time pressures
- Competing demands
- Previous care experiences
- Payer expectations
- Institutional support
- Comfort with patient
- Comfort with family

Delivery of Care
Ways to Teach

1. Two patients with similar names are admitted.
2. The patients are placed in rooms next to each other.
3. Drug orders are left at the nursing station by the doctor who is seeing both patients.
4. The patients are both discharged in the lunch hour and their medical orders are mixed up.

Safety
Ways to Teach

- Root Cause Analysis

Source: Own Illustration
Ways to Teach
Measurement

Systems Thinking Scale (STS)

http://fpb.case.edu/SystemsThinking/index.shtm
Response Format

Instructions:
Please read each of the statements and place an “x” in the answer box that indicates frequency of agreement with the statement:

When I want to make an improvement...

<table>
<thead>
<tr>
<th>Never</th>
<th>Seldom</th>
<th>About Half the Time</th>
<th>Often</th>
<th>Most of the Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

1. I believe the harder I work the more improvement I can make.

2. ........

X
Examples of Items (8 of 30)

- I believe the harder I work the more improvement I can make
- I think recurring patterns are more important than any one specific event
- I believe understanding how the chain of events occur is crucial
- I think that lasting change relies on personal effort and motivation
Systems Thinking Scale

Psychometrics (N=342)

- 3 subscales
  - Interdependencies
  - Personal Effort
  - Reliance on Authority
Systems Thinking Scale
System Interdependencies

- 20 items

Psychometrics (N=342)

- Internal Reliability Alpha=.83
- Test-retest Correlation=.74
Discriminate Validity

3 dose levels of systems thinking education

- No dose graduate level nursing students
- Low dose Medical students RCA case
- High dose 12 week CQI course
Concurrent Criterion-Related Validity

- SA question on a root cause analysis
- QIKAT

- Quality Improvement Knowledge & Attitude Test
<table>
<thead>
<tr>
<th>Sample</th>
<th>Systems Thinking Scale (STS)</th>
<th>STS &amp; Comparative Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Dose N=32</td>
<td>Pre  61.0 (7.1)</td>
<td>*p=.01</td>
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<tr>
<td></td>
<td>Post 57.3 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Low Dose N=78</td>
<td>Pre  56.1 (7.4)</td>
<td>*p=.001</td>
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<td></td>
<td>Post 54.9 (8.6)</td>
<td></td>
</tr>
<tr>
<td>High Dose N=12</td>
<td>Pre  60.1 (8.3)</td>
<td>*p=.01</td>
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<tr>
<td></td>
<td>Post 62.0 (7.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SA question on systems thinking &amp; STS Correlation=.28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>QiKAT &amp; STS Correlation=.46</td>
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</tbody>
</table>
Conclusion

- A reliable and valid measure of systems thinking increases our ability to assess the effect of our educational efforts.

- Enhance our efforts to increase systems thinking in our graduates.