Take Aways

Clinicians and Scientists explore new
• scientific approaches, methods, and
• resources for
• integration of research into real-world settings
  – healthcare system barriers,
  – change management, and
  – learning healthcare systems

Your focus: T3 I&I

T3, Implementation, and Improvement sciences

- I am fairly new to T3 I&I practice or science
- I work with patients part or full time
- I lead EBP improvement initiatives
- I know a bit about T3 I&I
- I am a funded T3 I&I researcher

Goal of T3, Implementation, and Improvement Sciences (T3 I&I)

- Move evidence into practice to impact health.
- Transform healthcare delivery and improve population health.

Yet
Capacity is limited;
Practice and Research skills are new.

Our Map: Objectives

1. Status of Translational, Implementation and Improvement Sciences
2. Research underpinnings for fields
3. Research design and methodology for rigorous T3 I&I studies
4. Resources to expand capacity

OBJECTIVE 1

Describe the status of the new fields of Translational, Implementation and Improvement Science T3 I&I

- Catalysts for translational, implementation, and improvement science (IOM Quality Chasm, National Quality Strategy, NIH/CTSA, Future of Nursing)
- Compare/contrast the terminology and fields
Catalysts for T3 I&I

- Need for science to be put to use
  - Variation
  - ‘Standardized’ health care
- Sooner
- With less funding
- Including stakeholders
- Particularly patients

QUALITY OF CARE DEFINED

“degree to which health services to individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”

(IOM, 1990)

Knowledge-to-Outcomes

THE CHALLENGE

Bench Research Results

\[ f_{N_{\text{UAE}}} = \frac{1}{n_1} \left( \frac{1}{n_2} \right) \]

Bedside Care

Crossing the Quality Chasm: A New Health System for the 21st Century

(IOM, 2001)

REDESIGN RECOMMENDATIONS

- Safe
- Timely
- Effective (EBP)
- Efficient
- Equitable
- Patient-Centered

http://www.nap.edu

National Quality Strategy

Three broad aims, used to guide and assess local, State, and national efforts to improve the quality of health care.

Better Care
Improve the overall quality, by making health care more patient-centered, reliable, accessible, and safe.

Healthy People/Healthy Communities
Improve the health of the U.S. population by supporting proven interventions to address behavioral, social and, environmental determinants of health in addition to delivering higher-quality care.

Affordable Care
Reduce the cost of quality health care for individuals, families, employers, and government.

Health Scientists-build the knowledge base for these goals

Background

Future of Nursing calls for “…nurses to lead and manage collaborative efforts with … other members of the health care team to conduct research and to redesign and improve practice environments and health systems.”

(IOM, 2011)

- Improvement is best led with evidence.
- Research builds the evidential/scientific foundation for improvement.
Currently

- 17 years for research to translate into practice
- 14% of research is translated
- Significant delay in delivering/receiving effective interventions

Catalysts

- 1¢ of every research dollar is spent on implementation—(Wolfe 2006 Washington Post)
- 5th year of IOM Future of Nursing-systems focused
- NCATS, IOM Report on CTSAs
- Current CTSA directions (FOAs)-learning organizations, clinicians as community, interprofessional
- Research provides evidence for action

What works?

Target:
Strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings.

“EBP requires an evidence based of its own”

Lexicon in the Fields

?? What terms do you use?
- Bench to bedside
- Knowledge to practice
- Knowledge translation
- Evidence-based practice
- Quality improvement
- Others:

Terminology

- Health Services Research
- Translational Science (T3)
- Implementation Science
- Improvement Science
- Healthcare Delivery Science
- Dissemination Research
Health Services Research

A multidisciplinary science focused on how

- social factors
- organizational and financing systems
- structures and processes,
- personal behaviors and
- health technologies

impact health care, healthcare quality and cost, and health


Implementation Science

The study of strategies to adopt and integrate

- evidence-based health interventions and improve
- practice patterns within specific settings
- barriers and facilitators that influence
- implementation of effective interventions.
- adoption of EBP interventions into routine
- clinical care for the general population

Improvement Science

Improvement Science determines which

improvement strategies work as we strive to assure

effective and safe patient care

Marshall, Pronovost, & Dixon-Woods, 2013. Promotion of

improvement as a science. The Lancet, 381(9864), 419-421.


T3 Research

- T3 research investigates the uptake
- of evidence-based practice (EBP)
- and its effectiveness in real-world
- settings
- CTSAs: NIH Clinical and
- Translational Science Award


Translation Research

Harvard Catalyst Spectrum

http://catalyst.harvard.edu/pathfinder/

OBJECTIVE 2

Research underpinnings for T3 I&I fields

- Framework commonalities
- Theories
  - Complex adaptive systems
  - Adoption of innovation
  - Change Theory
  - Consolidated Framework for Implementation Research (CFIR)
  - Star Model of Knowledge Transformation
61 theories, frameworks, & models

Commonalities
- Improve current status of healthcare delivery and/or outcomes
- Evidence-centric; outcome focused
- Implementation of improvement interventions
- Require change in behavior

http://dissemination-implementation.org/index.aspx

Levels of Change

<table>
<thead>
<tr>
<th>Four Levels of Change for American Healthcare Improvement</th>
<th>Assumptions about Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger System/Environment</td>
<td>Reimbursement, legal, and regulatory policies are key</td>
</tr>
<tr>
<td>Organization</td>
<td>Structure and strategy are key</td>
</tr>
<tr>
<td>Group/Team</td>
<td>Cooperation, coordination, and shared knowledge are key</td>
</tr>
<tr>
<td>Individual</td>
<td>Knowledge, skill, and expertise are key</td>
</tr>
</tbody>
</table>


Consolidated Framework for Implementation Research (CFIR)

http://www.cfirguide.org/

Knowledge Transformation Stevens Star Model © 2015

Knowing What Works in Health Care: A Roadmap for the Nation (IOM, 2008; 2011)

Clinical decisions based on
1. Systematic Reviews
2. EB Clinical Practice Guidelines

Both must be resource-wise and rigorous

Shouldn’t we hold improvement strategies to the same scientific standards?

Systematic Review


- Eighteen comparative evaluations and four thematic papers were identified. Quantitative evidence, mostly of limited quality in design, showed that hospice care at home reduced general health care use and increased family and patient satisfaction with care. Main themes in the qualitative literature revealed that home hospice services support families to sustain patient care at home and hospice day care services generate for the patient a renewed sense of meaning and purpose.

- CONCLUSIONS: Although studies had methodological limitations, in this review we found much evidence to support the benefits of hospice care. There were limited evaluations found on the impact of hospice care on psychological well-being, such as symptoms of depression, and on inpatient hospice care and non-hospital related costs.
**Guideline**

Cincinnati Children's Hospital Medical Center. Best evidence statement (BESt). Evidenced based benefits of palliative care programs on patient/family quality of life. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 Jul 14. 5 p.

**Recommendations:**

It is recommended that clinicians offer patients with life-limiting illnesses and their families palliative care services (see definition in the original guideline document) to improve quality of life in areas of mental and emotional health.

(Wolfe et al., 2008 [4a]; Hays et al., 2006 [4a]; Ringdal et al., 2004 [4a])

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**Theories used in D&I R01’s***

<table>
<thead>
<tr>
<th>Rank (Event to 100)</th>
<th>Theory or model</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diffusion of Innovation + RE-AIM</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Specific reference to theory or model</td>
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</tr>
<tr>
<td>3</td>
<td>Diffusion of Innovation (alone or in combination with another theory or model)</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>All ARE (alone or in combination with another theory or model)</td>
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</tr>
<tr>
<td>5</td>
<td>Specific theoretical framework or model</td>
<td>90</td>
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<td></td>
<td>Community Readiness Model</td>
<td>80</td>
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<tr>
<td></td>
<td>Quality Assurance Model</td>
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<tr>
<td></td>
<td>Self-Efficacy Theory of Health Behavior</td>
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<tr>
<td></td>
<td>Collaborative Depression Care Model</td>
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<tr>
<td></td>
<td>Cognitive Behavioral Therapy</td>
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<tr>
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<td>Advanced Recovery Theory</td>
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<tr>
<td></td>
<td>Program Change Model</td>
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</tr>
<tr>
<td></td>
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**Design**

T3 I&I sciences require designs to account for
- Complex contextual factors
- Multiple levels

**Designs in T3 I&I Research**

- Systematic Review
- Randomization in blocks-4 levels of change
- Quasi-experimental w/o randomization—practical designs
  - Pre/post
  - Interrupted time series
  - Nonequivalent group
  - Regression-discontinuity
- Observational
Design: Stepped Wedge

Rationale for the stepped wedge design

- While parallel group randomized controlled trials (RCT) are considered the gold standard for evaluating EBI efficacy, withholding an effective EBI in practice can be seen as unethical and/or impractical.
- The stepped wedge design addresses this issue by enabling all clinics to eventually receive the EBI during the study and allowing each clinic to serve as its own control, while maintaining strong internal validity.
- Stepped wedge designs are particularly useful when the intervention is thought to do more good than harm and when an RCT is impractical, as is the case of evaluating effectiveness of multi-level mammography intervention in improving appointment adherence (e.g., financial, logistical reasons).


PRISM

- Practical, Robust Implementation and Sustainability Model
  - Combines quality improvement, chronic care, the diffusion of innovations, and measures of the population-based effectiveness of translation
  - Evaluates how the health care program or intervention interacts with the recipients to influence program adoption, implementation, maintenance, reach, and effectiveness.


RE-AIM

- Evaluates public health interventions assessing 5 dimensions: reach, efficacy, adoption, implementation, and maintenance.
- Multilevel interventions incorporating policy, environmental, and individual components should be evaluated with measurements suited to their settings, goals, and purpose.


Implementation Research Funded by NIH

Which title conveys an implementation project?

Why?

- Implementing evidence to prevent urinary infection and enhance patient safety
- Legacy intervention family enactment (LIFE): an effectiveness trial
- Influences on translation of an evidence-based HIV/STI intervention into practice
- Implementing interventions to reduce hospitalizations of nursing home residents
- Implementing a cognitive/exercise therapy for back pain in the community setting

Implementation Research Funded by NIH

Implementing evidence to prevent urinary infection and enhance patient safety
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</tr>
<tr>
<td>✗ Implementing BEST PRACTICES IN cognitive/exercise therapy for back pain in the community setting</td>
<td>✗ Implementing a cognitive/exercise therapy for back pain in the community setting</td>
</tr>
<tr>
<td>✔ Implementing an EVIDENCE-BASED PROGRAM to reduce hospitalizations of nursing home residents</td>
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Influences on translation of an evidence-based HIV/STI intervention into practice
Key Considerations in T3 I&I

• Is the EBI being fully implemented?
• What are the contextual aspects that affect the implementation plan?
• What are the outcomes of the EBI at the individual, micro, and macro levels?

EXAMPLE DESIGN: Improvement Research

Small Troubles, Adaptive Responses (STAR-2): Frontline Nurse Engagement in Quality Improvement

A Network Study of the

STAR-2 Abstract

• Nurses encounter operational failures and system problems that impede efficient completion of work tasks, erode quality, and threaten patient safety. As a high reliability organization (HRO) strategy, frontline detection of operational failures could be the first step in raising awareness, catalyzing appropriate systems-based solutions, fostering learning organization climates, decreasing dangerous workarounds, and making improvements.
• A national multi-site study was conducted to broaden understanding of operational failure categories and rates occurring during the work of acute medical-surgical nurses. The study added the voice of frontline nurses to organizational learning and organizational mindfulness.
• Nurses reported on 27,298 operational failures, reflecting a rate of 6.05 per shift.

What about PDSA?

• Does it produce science?
• Are results generalizable?
• Is it useful?

OBJECTIVE 4

List resources to expand scientific capacity in nursing to conduct implementation and improvement research.

• Competencies under development
• Research networks
• Funding sources
• Examples of nurse-led implementation and improvement studies

Training: Implementation Research Competencies
Implementation Research Competencies

Sample


Implementation Research Competencies

Textbooks

NIH Funding Opportunities

Dissemination and Implementation Research in Health

- Mechanisms
- R03, R21, R31 (reissue forthcoming May 2016)

Standing Study Section
Dissemination and Implementation Research in Health (DIRH)

150+ studies funded from Trans-NIH PARs!
Research Networks

- How do research networks strengthen T3 I&I research?

3R's Challenge

- Improving our work is our work
- Test system strategies for safe, timely, effective, efficient, and equitable patient care

RAPID
- Achieve timely completion

RELEVANT
- Align efforts with stakeholder priorities

RIGOROUS
- Ensure strong study designs and sufficient numbers of testing sites

National Research Network www.ISRN.net

Stakeholders Priorities in Improvement Science–The national agenda

Priorities


T3 I&I Funding Sources

NCI-funded dissemination and implementation (D&I) research is conducted through research institutions in the United States and internationally with funding through Trans-NIH opportunities with other National Institutes of Health Institutes and Centers and other Programs in the Division of Cancer Control and Population Sciences.
10 Key Grant Ingredients

Nurse-Led Studies
- Dissemination and implementation (D&I) research is a growing area of science focused on overcoming the science-practice gap by targeting the distribution of information and adoption of interventions to public health and clinical practice settings.
- The top funders were the National Cancer Institute and the National Institute of Mental Health, together providing 61% of funding.
- Majority PIs were affiliated with Schools of Medicine or large, nonprofit research organizations and think tanks.
- Only 4% of projects were to PIs with appointments at Schools of Nursing, with 7% of the funding.
- The most commonly funded projects across all of the studies focused on cancer control and screening, substance abuse prevention and treatment, and mental health services.

NINR Funded Implementation R01s
- Allen, Rebecca Sue. Legacy intervention family enactment (LIFE): an effectiveness trial. $391,916
- Krein, Sarah et al. Implementing evidence to prevent urinary infection and enhance patient safety. $1,715,510

Future of Nursing calls for “…nurses to lead and manage collaborative efforts with … other members of the healthcare team to conduct research and to redesign and improve practice environments and health systems.” (IOM, 2011)

- Improvement is best led with evidence of what works.
- Research builds the evidential/scientific foundation for transformation.

Assessing Progress on The Future of Nursing Release June 2016
Ten Recommendations:
1. Scope of practice
2. Baccalaureate Degree
3. Residency programs
4. Doctoral Degrees
5. Interprofessional/lifelong learning
6. Workforce diversity
7. Leadership development
8. Redesign care delivery and payment
9. Gain broad support
10. Workforce data
Who leads?

- T3 I&I Research
- T3 I&I Practice
- All RNs
- Clinical Nurse Leaders
- PhD and DNP nurses

PhD and DNP Graduates

Not included in IOM Report

- All RNs
- Masters Prepared RNs
  - All Masters degrees
  - Clinical Nurse Leader
    - Certified in the USA: n = 2,500

TeamSTEPPS®
Team Strategies and Tools for Enhancing Performance and Patient Safety

IS IT
T3? Implementation? Improvement?

- An evidence-based teamwork system
- Demonstrated to improve:
  - Quality
  - Safety
  - Health outcomes
- Practical and adaptable
- Provides ready-to-use materials for training and ongoing teamwork

Paving the Future of Nursing and Healthcare through Improvement Science

University of Minnesota Nursing Research Day
April 22, 2016

Kathleen R. Stevens, RN, EdD, ANEF, FAAN
Professor & Director, Improvement Science Research Network
stevensk@umn.edu
www.ISRN.net
Questions, Comments, Ideas

Thank You

References


Riley, WT, Glasgow, RE, Etteredge, JL, & Abernethy, AP. (2013). Rapid, responsive, relevant (R3) research: A call for a rapid-learning health research enterprise. Clinical and Translational Medicine, 2, 1-14.


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