

Title Slide:

National Cancer Institute
U.S. Department of Health and Human Services
National Institute of Health

Research to Reality:
The Evidence Integration Triangle

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Slide 2: Outline

- Need for Implementation Research
- What Do We Know About Dissemination & Implementation (D&I) Science?
- How to Make Sense out of this Complexity?
 - The Evidence Integration Triangle (EIT)
- How to Learn More- and GET FUNDED?
- Future Directions and Opportunities to Get Involved

Slide 3: Translation Continuum

Bi-directional arrow running across five boxes. Boxes going left to right: (1) bench; (2) bedside; (3) clinic; (4) community; and (5) population and policy.

Slide 4: Bench to Bookshelf

[image]

clinician looking at vial and writing notes with arrow pointing to books covered in cobwebs

[end image]

Slide 5: Current Situation in United States¹

[The Need]

- Underperforming health care system²
- Balkanized and silo approaches
- Expensive, unsustainable cost, increasing
- Inequitable: Health disparities
- CRISIS and OPPORTUNITY

¹Institute of Medicine. Unequal treatment...Washington D.C., National Academies Press, 2003

²McGlynn EA et al. The quality of health care...*N Eng J Med* 2003;348(26):2635-2645

Slide 6: No Title

“The significant problems we face cannot be solved by the same level of thinking that created them.”

A. Einstein

Slide 7: Integrated Dynamic, Multilevel Research-Practice Partnerships Systems Approach

[image]

3 circles connected by 3 sectional bars: "Fit", "Partnership" and "Design Appropriate for Question."

First circle has 3 inner circles: Evidence tested program (outer circle), Program as tested (middle circle) and Critical elements (inner circle) is connected to the second circle by the bi-directional sectional bar "Fit". The second circle has 3 inner circles. Health care systems (outer circle), Clinic(s) and Delivery site(s) (middle circle) and Program delivery staff (inner circle). The third circle is Research design team and adaptive design. The third circle is connected to the first circle by the bi-directional bar "Design Appropriate for Question" and to the second circle by the bi-directional bar "partnership".

[end image]

Adapted from Estabrooks et. al. *APJM*, 2005, 31: S45

Slide 8: Implementation and Dissemination Research Characteristics (Russ' view)

[D&I: What we know]

- Contextual
- Complex
- Multi-component programs and policies
- Non-linear
- Transdisciplinary
- Multi-level

Glasgow R & Steiner J. (2011). In Dissemination and Implementation Research. Brownson, R, Colditz, G, and Proctor, E (Eds.). Oxford.

Slide 9: Rapid Learning Approaches

[D&I: What we know]

- Data Collected:
- With real (and complex) patients
- By real-world staff
- Under real-world conditions and settings
- And evaluated through real-time data (often with Electronic Health Records)

Tunis,S.R.; Carino,T.V.; Williams,R.D.; Bach,P.B. A Rapid Learning Health System. *Health Affairs* (supplement). 2007;26(2):140-149.

Slide 10: Recommended Purpose of Research (ala RE-AIM)

[D&I: What we know]

Collect evidence to document interventions that can:

- Reach large numbers of people, especially those who can most benefit
- Be widely adopted by different settings
- Be consistently implemented by staff members with moderate levels of training and expertise
- Produce replicable and long-lasting effects (and minimal negative impacts) at reasonable cost

Slide 11: Ultimate Impact of an Insurance-sponsored Weight Management Program in West Virginia¹

[D&I: What we know]

Dissemination Step	Concept	% Impacted
8.8% of Weight Management sites participated	Adoption	8.80%
5.9% of members participated	Reach	0.52%
91.4% program components implemented	Implementation	0.47%
43.8% of participants showed weight loss	Effectiveness	0.21%
21.2% individuals maintained benefit (individual)	Maintenance	0.04%

¹Abildso CG, Zizzi SJ, Reger-Nash B. Evaluating an Insurance-Sponsored Weight Management Program With the RE-AIM Model, West Virginia, 2004-2008. *Preventing Chronic Disease Public Health Research, Practice, and Policy*. 2010. 7(3).

Slide 12: The Translation Continuum Timeline

[D&I: What we know]

STEP	TRANSLATION ISSUE INVOLVED	LENGTH OF TIME
Initial Research	Choice of measures; generalizability	1-5 years
Replication Research	Degree measures harmonized, samples similar study (ies)	1-3 years
Synthesis Reviews	Criteria used for: inclusion, quality, outcomes, realist review?...	1-2 years?
Guideline Created	Implementation/Adaptation guides? Feasibility?	1-3 years?
Other Guidelines?	Consistency with original; costs and ease of implementation	1-2 years
Adoption of Guidelines	Politics, costs, adaption	6 months?
Implementation of Guidelines	Readiness, capacity, incentives, tracking, guidelines	3-12 months
Patient "Adherence"	Competing demands, cost, meaning	1 – X months
Sustainability	Evolution over time, drift	2 - ? Years
Complete Cascade	Partnership, relevance, adaptation are cross-cutting issues	8-17 +years

Glasgow, 2010

Slide 13: Research to Practice Pipeline

[image]

A cone with the wide portion on the left hand side and the narrow part on the right hand side. Inside the cone there are 4 steps. At the opening of the cone (left side) is "Priorities for research funding". The first step is "Peer review of grants". The second step is "Publication priorities and peer review. The third step is "Research synthesis". The fourth step is "Guidelines for evidence-based practice". Coming out of the cone is "Practice: Funding; population needs, demands; local practice circumstances; professional discretion; credibility and fit of the evidence." Below the steps are two influences that need to be taken into consideration. The first is "Academic appointment, promotion, and tenure criteria" which affects steps 1 and 2. The second is "Evidence based medicine movement" which affects, with the exception of "Priorities for research funding", all the steps and the outcome "Practice".

[end image]

Green, LW et al. 2009.

Annual Rev. Public Health. 30: 151-174

Slide 14: Evidence Integration Triangle: Intervention Program/Policy (Prevention or Treatment)

[E | T]

(e.g. design; key components; principles; external validity)

Multi-Level Context

- Intrapersonal/Biological
- Interpersonal
- Organizational
- Policy
- Community/Economic
- Social/Environment

Ongoing Partnership & Stakeholder Engagement

[Animation]

It is all about context. And context is multi-level and all these levels need to be considered when thinking about a problem and developing or implementing an intervention.

(After first click): Next, we have to consider the stakeholders and stakeholder engagement. The stakeholders could be a community group, clinicians, political leaders, community members, program staff, etc. With this group, the goal(s) and objectives are defined and consider the evidence.

(After click 2): The first component of the evidence-based triangle we need to consider is the program or policy intervention. There are a number of reviews that exist (Cochrane, Community Guide, AHRQ guidelines, etc) that outline the evidence of intervention design, key components and principles. What has been lacking, in the past, is a focus on external validity. There is still work to be done so that intervention designs include factors that make research both “rigorous and relevant” and thus far we have ignored the relevance.

[end Animation]

Slide 15: Evidence Integration Triangle: Practical Measures

[E | T]

(e.g. design; key components; principles; external validity) has a bi-directional connection to "Practical Measures (e.g. actionable & longitudinal measures)"

Multi-Level Context

- Intrapersonal/Biological
- Interpersonal
- Organizational
- Policy
- Community/Economic
- Social/Environment

Ongoing Partnership & Stakeholder Engagement

[Notes]

Leg two is the practical measures. This is how we know how well we are doing and measurement needs to be done iteratively throughout development and implementation. To do so, these measures must be practical so they can, like an intervention, be appropriate and relevant to the setting in which they are used.

[end Notes]

Slide 16: Evidence Integration Triangle: Implementation Process

[E I T]

(e.g. design; key components; principles; external validity) has a bi-directional connection to "Practical Measures (e.g. actionable & longitudinal measures)". "Practical Measures" has bi-directional connection to "Implementation Process" (e.g. team-based science; CBPR; patient centered care). "Implementation Process" has a bi-directional connection to "Intervention (Program/Policy)". This completes the circular connection from "Intervention (Program/Policy)" to "Practical Measures" to "Implementation Process" back to "Intervention (Program/Policy)". "Ongoing Partnership & Stakeholder Engagement" is in the middle of the circle.

Multi-Level Context

- Intrapersonal/Biological
- Interpersonal
- Organizational
- Policy
- Community/Economic
- Social Environment

[Notes]

The third leg of the triangle is the implementation process. This is really how one implements the intervention and the evidence around this implementation process. This has for the most part be excluded from the evidence-based focus thus far.

[end Notes]

Slide 17: Intervention Program/Policy – The “What”

[E I T]

- Identify key components or theoretical principles
- Need for detailed implementation guides, lessons learned manuals
- Need to focus and report on both internal and external validity (need to add relevance to rigor)
- Most focus on treatment; less on prevention; least on policy

Green LW & Glasgow R. *Eval Health Profess.* 2006, 29: 126-53.

Rothwell, PM. *Lancet.* 2006, 365:82-93.

[Notes]

This is the “what” - it is the theoretical principles and the key components of the intervention.

[end Notes]

Slide 18: Practical Measures – the “So What”

[E I T]

Measures need to be:

- Brief and practical
- Collected longitudinally to assess progress
- Reliable and valid
- Sensitive to change
- Have national norms, easily understood and ACTIONABLE
- Culturally appropriate across groups
- Reflect multiple stakeholder perspectives

Society of Behavioral Medicine Health Policy Statement on Public Health Need for Patient Reported Measures. http://www.sbm.org/policy/patient-reported_measures.pdf

Slide 19: Implementation Process – The “How”

[E I T]

- Partnership and Community Based Participatory Research (CBPR) approaches¹
- Patient-centered Care Approach
- Team science in action^{2,3}
- Iterative, self-correcting

¹ Guidelines and Categories for Classifying Participatory Research Projects in Health:
<http://lgreen.net/guidelines.html>

² Gray, D. O. (2008). In C. L. S. Coryn & M. Scriven (Eds.), *Reforming the evaluation of research. New Directions for Evaluation, 118*, 73–87.

³ Mâsse, LC, et al. *Am J Prev Med.* 2008; 35 (2S): S151-S160.
Practical (Pragmatic) Trials: Key Contextual Characteristics

[Notes]

What do we mean by this? For example, if we are talking about a primary care setting, we are talking about how patient-centered is your care. If we are talking about a community program, are you really using CBPR and partnership approaches. If we are talking about a research collaboration center, CTSI, are we really using team science principles. Or are we just paying lip service to these principles, but not actually implementing them in action.

[end Notes]

Slide 20: Evidence Integration Triangle: Current Research Focus

[E I T]

[Current]

This slide uses animation and each is described to convey information and function/relationships.

Intervention (Program/Policy) (e.g. design; key components; principles; external validity) has a bi-directional connection to "Practical Measures (e.g. actionable & longitudinal measures)". "Practical Measures" has bi-directional connection to "Implementation Process" (e.g. team-based science; CBPR; patient centered care). "Implementation Process" has a bi-directional connection to "Intervention (Program/Policy)". This completes the circular connection from "Intervention (Program/Policy)" to "Practical Measures" to "Implementation Process" back to "Intervention (Program/Policy)". "Ongoing Partnership & Stakeholder Engagement" is in the middle of the circle.

Multi-Level Context

- Intrapersonal/Biological
- Interpersonal
- Organizational
- Policy
- Community/Economic

The triangle displays evidence-based intervention, practical measures, and the implementation process.

[Animation] [Notes]

(click) {Current image appears, image of a pie chart appears connected to Implementation. Pie chart is labeled "Current Research Focus of Evidenced-based Practice". the pie chart has 3 sections with 3/4 of the chart being Intervention and the other two sections are Measures and Process. The implementation process and practical measures text boxes shrink in size and the Intervention text box increases in size}: This is to demonstrate there, currently, is too much focus on just evidence-based interventions and little attention paid to incorporating evidence into the implementation process and measurement.

[End Notes]

Slide 21: Evidence Integration Triangle: The Ideal Situation

[E I T]

[Ideal]

[Animation] [Notes]

(click) {Ideal image appears, pie chart disappears and the three legs of the triangle even out in size }: Ideally, we need to balance out these three components more and focus our time and efforts on establishing and integrating evidence into and from each of these when designing and implementing solutions to public health problems. This is the second take home message.

First is context is king, second is we need to address all three of these legs of the triangle and not only integrate the evidence into each leg but also integrate the legs with one another.
[end notes]

Slide 22: Evidence Integration Triangle – Feedback Loop

Intervention (Program/Policy) (e.g. design; key components; principles; external validity) has a bi-directional connection to "Practical Measures (e.g. actionable & longitudinal measures)". "Practical Measures" has bi-directional connection to "Implementation Process" (e.g. team-based science; CBPR; patient centered care). "Implementation Process" has a bi-directional connection to "Intervention (Program/Policy)". Each bi-directional arrow displays the word "Feedback" above it. This completes the circular connection from "Intervention (Program/Policy)" to "Practical Measures" to "Implementation Process" back to "Intervention (Program/Policy)". "Ongoing Partnership & Stakeholder Engagement" is in the middle of the circle.

[Notes]

Like the chronic care model and most models, the key is not just that these components exist and need to be done, but it is how they are connected that is important. Do the activities interact with one another or do they conflict? Continual feedback and two-way connection is needed.

[End Notes]

Slide 23: Practical (Pragmatic) Trials: Key Contextual Characteristics

[E | T]

- Multiple, heterogeneous settings
- Representative populations
- Comparison conditions are real-world alternatives
- Multiple outcomes important to decision and policy makers

Thorpe KE et al., Can Med Assoc J, 2009, 180: E47-57

Tunis SR et al. Practical clinical trials...*JAMA* 2003;290:1624-1632

Glasgow RE et al. Practical clinical trials...*Med Care*2005;43(6):551-557

Slide 24: No title

*"For every complex problem there is a simple solution ...
and it is wrong."*

H.L. Mencken

Slide 25: Bridging the Gap: A Synergistic Model. Getting Evidence-based Cancer Control Interventions into Practice

[E I T]

[Image]

GOAL: To increase the adoption, reach and impact of evidence-based cancer control

"Market Pull/Demand": Building a market and demand for the intervention.

"Science Push": Documenting, improving, and communicating the intervention for wide population use, goes to "Delivery Capacity": Building the capacity of relevant systems to deliver the intervention. Then goes to a section containing:

- Increase the number of systems providing evidence-based cancer control
- Increase the number of practitioners providing evidence-based cancer control
- Increase the number of individuals receiving evidence-based cancer control

Finally to "ULTIMATE GOAL": Improve population health and well-being

Tracy Orleans (RWJF) – Designing for Dissemination Conference Presentation, 9/02

[End Image]

Slide 26: No Title

[Image]

Cartoon: Men hiking through mountains at a fountain of money. "By God Gentlemen, I believe we've found it-the Fountain of Funding"

[End Image]

Slide 27: The Major Cross-NIH D&I Funding Announcement

[Funding]

- R01 - PAR 10-038 (\$500k per annum up to five years)
- R03 - PAR 10-039 (\$50K per annum up to two years)
- R21 - PAR 10-040 (\$275K up to two years)
- Participating Institutes: NIMH, NCI, NIDA, NIAAA, NIAID*, NHLBI, NINR, NIDDK*, NINDS*, NIDCD, NIDCR, & Office of Behavioral & Social Sciences Research
- Starting October 2010, new standing review committee, Dissemination and Implementation Health Research
- Three submission dates per year: February, June, October

* New Participating Institutes

Slide 28: Key Features

[Funding]

- “To identify, ... and refine effective and efficient methods....
- and strategies to disseminate and implement research-tested interventions and prevention... and Quality of Life improvement services.....
- in public health and clinical practice settings”

http://dccps.cancer.gov/d4d/research_portfolio.html

Slide 29: Other D &I Mechanisms

[Funding]

- CTSA funding at many medical schools
- Partnerships with Prevention Research Centers
- Some CDC Mechanisms
- AHRQ Funding- especially via PBRNs and EHR Related
- Other NIH and private funding (ACS, etc.)

Slide 30: Key Content Issues Funded

[Funding]

- Implementation of evidence-based interventions in healthcare and community settings
- Workplace health promotion
- Survey of state (provincial) tobacco plans and implementation research to reach and assist underserved populations

Slide 31: Key Questions Asked By Reviewers

[Funding]

- Is this program or policy ready for dissemination?
- Is team really transdisciplinary?
- Will this advance the field; how is it innovative?
- Is there a good plan for sustainability or broader dissemination of the project?

Slide 32: Content Issues Seldom Addressed (Research Opportunities)

[Funding]

- Comparative Effectiveness Research
- Dissemination to large number of settings
- Proposals addressing complex patients, complex and multilevel problems
- Health policy issues
- Dissemination & implementation of systematic review evidence

Slide 33: Annual D&I Meetings

[funding]

- “State of the D&I Science” Venue
 - Three meetings held since 2007
 - Participation increased from 350 registrants in 2007 to over 900 in 2010
 - Past themes have included: “Building Capacity” and “Methods and Measures”

Next meeting: Bethesda, MD March 21-22, 2011

Theme: Policy and International Contributions

Registration: <http://conferences.thehillgroup.com/obsr/DI2011/index.html>

Slide 34: PREDICTING THE FUTURE...

“You Don’t Need a Weatherman To Know Which Way the Wind Blows”

-Bob Dylan

Slide 35: Evolving Issues

[Future Directions/D&I Opportunities]

- Simulations, MODELING, system dynamic models
- Time-lagged REPLICATIONS
- Natural experiments
- Well-documented quality improvement studies
- RAPID LEARNING and electronic medical records (EHR) databases¹
- Practical and pragmatic trials²

¹Etheredge LM, Health Affairs, 2007, Web Exclusive Collection: w107-118

²Thorpe KE et al., Can Med Assoc J, 2009, 180: E47-57

Slide 36: Challenges and Conclusions

[Future Directions/D&I Opportunities]

- The future is multiple (conditions, behaviors, interactive modalities)
- The future is complex (and we ignore complexity at our peril)¹
- “All models (and designs) are wrong”²— and greater tolerance, respect, and creativity is needed
- We need to UN-learn much of what we have been taught to answer the tough questions

¹Glasgow RE, Emmons KM. *Annual Review of Public Health* Dec 6,2006 epub ahead of print

²StermanJD. *Syst Dynam Rev* 2002;18:501-531

Slide 37: Evidence that...

[Future Directions/D&I Opportunities]

IS MORE	IS LESS
Contextual	Isolated
Practical, efficient	Abstract, intensive
Robust, generalizable	Singular (setting, staff, population)
Comparative	Academic
Comprehensive	Single outcome
Representative	From ideal settings

Slide 38: No title

[image]

Cartoon: Don Quixote sitting on horse with shield and spear and Sanchez by his side, staring at the wind mill farm.

[end image]

Slide 39: COMMENTS, QUESTIONS, ETC.

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NCI Implementation Science Website: <http://cancercontrol.cancer.gov/d4d/>