LESSONS LEARNED…

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CRISP Seminar Series
December 10, 2012
Overview of D&I
IF AN INTERVENTION WORKS

AND NOBODY CAN USE IT.....

DOES IT STILL MAKE AN IMPACT?
“it takes 17 years, on average, ...for 14% of research ...to translate into practice”

Research to Practice Pipeline

The 17-year odyssey

Priorities for research funding

Peer review of grants

Publication priorities and peer review

Research synthesis

Guidelines for evidence-based practice

Practice

Funding; population needs, demands; local practice circumstances; professional discretion; credibility and fit of the evidence.

Academic appointments, promotion, and tenure criteria

Evidence-based medicine movement

“To him/her who devotes his life to science, nothing can give more happiness than increasing the number of discoveries, but his/her cup of joy is full when the results of his/her studies immediately find practical applications.”

-- Louis Pasteur
THE LATEST RESEARCH SHOWS THAT WE REALLY SHOULD DO SOMETHING WITH ALL THIS RESEARCH
Scientists: Evidence-based Practice

Is it valid?

Is it important?

Is it useful?

High internal validity + Low external validity = Diminished relevance for practice!

*G Ramirez, FIU Stempel College Public Health & Social Work, 2009 presentation at CDC
The Research “establishment” pushes us toward effective, internally valid interventions that may be worthless to practitioners.

Practitioners, who know their environment and intended users best, don’t have the resources to translate “home grown”/externally valid interventions into evidence-based interventions.
1. Practitioners need to receive the lessons of research and put them into practice.

2. Research and practice are entirely separate disciplines and each must develop their own answers to their own problems.

3. Research and practice have complementary perspectives and skills that need to be used together to address the real need, collaborative knowledge production.

In D & I, We Need Evidence that... 

<table>
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<tr>
<th>is MORE</th>
<th>is LESS</th>
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<tr>
<td>Contextual</td>
<td>Isolated</td>
</tr>
<tr>
<td>Practical, efficient</td>
<td>Abstract, intensive</td>
</tr>
<tr>
<td>Robust, generalizable</td>
<td>Singular (setting, staff, pop.)</td>
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<tr>
<td>Comprehensive, Comparative</td>
<td>Single outcome</td>
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<tr>
<td>Representative</td>
<td>From ideal settings</td>
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RIGOROUS, RELEVANT, and PRACTICAL

“Dissemination is the targeted distribution of information and intervention materials to a specific public health or clinical practice audience. The intent is to spread knowledge and the associated evidence-based interventions.”

An active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies.

“Implementation is the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings.”

The process of putting to use or integrating evidence-based interventions within a specific setting.

- differ from effectiveness research – explicit focus on understanding spread and adoption of intervention strategies
Definitions - D&I research

Evidence-based intervention:
- The objects of dissemination and implementation are interventions with *proven* efficacy and effectiveness.
Definitions - D&I research

- **Knowledge translation**: A dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge.
  - Strong linkage between researchers and users of knowledge

- **Translational research (CDC)**: The sequence of events (i.e., process) in which a proven scientific discovery (i.e., evidence based public health intervention) is successfully institutionalized (i.e., seamlessly integrated into established practice and policy).
  - Comprised of implementation, dissemination, and diffusion research
  - Includes research on replication
### Dissemination vs. Implementation (some fairly arbitrary distinctions)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Dissemination</th>
<th>Implementation</th>
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<tr>
<td>More messy</td>
<td>More structured (perhaps)</td>
<td></td>
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<tr>
<td>Policy and media level</td>
<td>Organizational and clinic level</td>
<td></td>
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<tr>
<td>Community/whole population</td>
<td>Specific settings/ smaller groups/ individuals</td>
<td></td>
</tr>
<tr>
<td>Prevention (primary, secondary)</td>
<td>Screening, treatment, rehabilitation/end-of-life/survivorship</td>
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Integrated Dynamic, Multilevel Research-Practice Partnerships Systems Approach to Dissemination and Implementation Science (D&I): It’s all about CONTEXT

Evidence-Tested Program
- Program as Tested
- Critical Elements
- Non-critical Packaging
- Program as Marketed

Organization
- Delivery Site(s)
- Program Delivery Staff

Design Appropriate for Question

Partnership

Research Design Team
And Adaptive Design

Critical Elements Program as Tested Evidence-Tested Program

Fit

Broader Health Policy and Cultural Context

Estabrooks et. al. *APJM*, 2005, 31: S45
“All models are wrong…some are useful”

George E P Box

Objective: create a dynamic, sustainable ongoing learning system

- Evidence from community or population
- Refinement
- Evaluation
- Policy, Program & Practice Implementation
- Assess Relevant Knowledge/Evidence
- Consider Multi-level Context

Sustainable Ongoing Learning System

- Health Disparities
- Framework/Logic Model
- Global Health
- Scale-Up

Evidence from Etiologic Research

- Simulation Modeling
- Participatory Approaches
- Evidence Reviews
- Practice-based Research

Types of Evidence

- CER
- Sustainability
- E-Health

Practice-Based Evidence & Effectiveness Studies, and Use of Theory

- Rapid Learning Systems
- Complex Intrv.
- Cost Effect.

Intervention Evidence from Efficacy Studies, and Use of Theory to Fill Gaps

- Pragmatic Trials
- Designing for Diss.

Figure adapted with permission from Ward V, House A, Hamer S. Developing a framework for transferring knowledge into action: a thematic analysis of the literature. J Health Serv Res Policy 2009 14:156—164
Theories and Structural Frameworks
Why theory-based?

- Theory-based interventions more likely to be effective

- Two main types of theory (complementary)
  - Explanatory theory
    - Understanding why an individual smokes and barriers to quitting
  - Change theory
    - Working across stages to find the most effective method of quitting
Unraveling the “Black Box”

"I think you should be more explicit here in step two."
What theories are being used in effectiveness trials?

- Review of 11 SRs since 2000
  - Few examine comparative theory testing
- Relatively small # of theories used
- Most common
  - SCT (Social Cognitive Theory)
  - TTM/Stages of Change
  - HBM (Health Belief Model)
  - TPB (Theory of Planned Behavior)
  - PRECEDE/PROCEED planning model

Less research on D & I models & frameworks (NIH D&I grants, 2005-09)

<table>
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<tr>
<th>Setting</th>
<th>Diffusion of Innovations</th>
<th>RE-AIM</th>
<th>Systems/Network Theory</th>
<th>CBPR</th>
<th>QI</th>
<th>Organizational Theory</th>
<th>Other</th>
<th>Multiple</th>
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<tbody>
<tr>
<td>Community/Public Health (N = 18)</td>
<td>28%</td>
<td>17%</td>
<td>17%</td>
<td>17%</td>
<td>0%</td>
<td>0%</td>
<td>28%</td>
<td>50%</td>
</tr>
<tr>
<td>Primary Care (N = 11)</td>
<td>18%</td>
<td>36%</td>
<td>9%</td>
<td>0%</td>
<td>36%</td>
<td>0%</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>Specialty Care (N = 10)</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>20%</td>
<td>30%</td>
<td>50%</td>
<td>20%</td>
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Application of Theories to D&I Research

- At least 28 health-related theories/frameworks in the literature
- At least that many non-health theories
- Systematic review of 33 frameworks
  - 28 follow one or more theoretical approaches
  - Most common approaches
    - Persuasive communication
    - Diffusion of Innovations
    - Social marketing

Tips for thinking about how you use theory

In your research study...

- Do you have a theory?
- Is your theory/framework well developed throughout your proposal?
  - Linked to aims, research design, measures, analytic strategies
- When finished, will use of your theory/framework advance the field of dissemination research?
- Is the theory from outside of health? (may get you innovation points!!)
Some General Recommendations

Researchers and practitioners should:

- evaluate the dissemination of effective interventions targeting diverse populations and various community settings
- develop and use reliable and valid measures of dissemination constructs, multiple data sources and combination of quantitative and qualitative data
- focus on and measure the “real-world” relevance dissemination studies
- use theories or models to plan and evaluate their implementation and dissemination activities
- Pick a theory, justify choice, then use consistently throughout proposal
Approaches and Examples
Interventions Designed for Dissemination

- Potential win-win between researchers and practitioners re D&I research
  - Researchers generate the evidence -> Evidence-Based Interventions (EBIs)
  - Practitioners implement EBIs AND design externally valid intervention approaches

- High expectations of practitioners to use evidence-based interventions, BUT....

Publication in a peer review journal ≠ Easily disseminated and implemented
Steps in Translation Practice

Knowledge Integration

- Discoveries from multiple disciplines
- Tests of promising interventions
- Evidence based recommendations, policies, guidelines
- Population health outcomes
- Organizational and community systems and quality improvement

Khoury, Muin. 2011
Dissemination Research Topics (NIH)

- Analysis of factors influencing the creation, packaging, transmission and reception of valid health research knowledge
- Experimental studies to test the effectiveness of individual and systemic dissemination strategies, focusing on relevant outcomes (e.g., acquisition of new knowledge, use of knowledge in practice decision-making).
- Studies testing the utility of alternative dissemination strategies for service delivery systems targeting rural, minority, and/or other underserved populations.
- Studies on how target audiences are defined, and how evidence is packaged for specific target audiences.
Common dissemination strategies (interventions)

- Knowledge brokering
- Social marketing
- Training/capacity building
- Linking systems
- Coalition building
- Media advocacy
- Agenda setting
Common dissemination outcomes

- Dissemination rate (speed and extent)
- Reach
- Adoption/Uptake
- Implementation/Use
- Effectiveness
- Level of program/policy implementation
- Changes in scope
- Enforcement
- Sustainability

- Risk factor change
- Quality of life
- Mortality
Other types of dissemination research studies

- Policy dissemination research
- Dissemination via the media (e.g., media advocacy)
- Dissemination research among populations with high disparities
- Dissemination that crosses multiple systems & risk factors
Take home

• Be suspicious of demands for fidelity when the intervention is on behavior, complex organizations, or communities

• Draw evidence from the practitioners, patients, organizations or communities in which the intervention would be adopted or adapted

• Try to identify the core elements (functions) of the intervention(s) that must be implemented with fidelity, as distinct from the adaptable (forms) that could be matched and varied with the context and persons

• Measure forms (duration, strength, intensity, content) of the implementation as they emerge
Dissemination and Implementation Research: Opportunities
Dissemination and Implementation Research in Health

- PAR-10-038; 10-039;10-040
- NIMH, NCI, NIDA, NIAAA, NIAID, NHLBI, NINR, NIDDK, NINDS, NIDCD, NIDCR, OBSSR, NCCAM
- 2010 CSR standing review committee
Key Features of DIRH PAR

• “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”

Examples of Other Funding Opportunities

CTSA funding at many medical schools

CTSI Program

PT-D/I Program

- Evidence Synthesis
  - Systemic Literature Reviews
  - Meta-Analyses

- Evidence Generation
  - Observational Medical Outcomes Studies
  - Practical Trials

- Evidence Translation
  - Dissemination & Implementation Research

Community & Stakeholder Engagement

Better Outcomes
Examples of Other Funding Opportunities

• **NIDDK/NICHD/OBSSR**
  – PAR-09-176: Translational Research for the Prevention and Control of Diabetes and Obesity (R18)
  – Centers for Diabetes Translational Research (awarded: Center for American Indian and Alaska Native Diabetes Translational Research)

• **AHRQ**
  – PAR-08-136: Researching Implementation and Change while Improving Quality (R18)

• **Centers for Disease Control and Prevention (CDC)**
  – Prevention Research Centers (PRC) Program

• **Patient Centered Outcomes Research Institute (PCORI)**
  – Assessment of Prevention, Diagnosis, and Treatment Options
  – Improving Healthcare Systems
  – Communication and Dissemination Research
  – Addressing Disparities
  – Accelerating Patient-Centered Outcomes Research and Methodological Research
Key Opportunities to Advance D&I Research

• **Scaling up**
  – How best to scale up successful interventions to regional, national or international levels
  – Little evidence exists to recommend optimal strategies for effective large-scale rollout

• **Sustainability**
  – Long-term integration of effective interventions within specific settings
  – Limited data on how to maintain changes
## Suggestions to Enhance D&I

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<th>Rigor and relevance</th>
<th>Diverse and low-resource settings</th>
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<td>Alternative research designs (e.g. simulation modeling, pragmatic trials, rapid learning studies)</td>
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| Efficiency and speed | Access existing and expanding datasets (e.g. EHRs, rapid learning health care systems and organizations) |

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<th>Collaboration</th>
<th>Team science (health care, economists, information scientists, biostatisticians, key stakeholders)</th>
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<td>CBPR</td>
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<td>CTSAs</td>
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<tr>
<td>Improved Capacity</td>
<td>Make methods available to traditional scientists, scientists in training, and key stakeholders</td>
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<td>NIH training efforts (e.g. TIDIRH)</td>
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<td>VA Quality Enhancement Research Initiative</td>
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<td>Knowledge Translation Canada</td>
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<td>Knowledge Registry of Evidence-Based Programs and Practices</td>
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<td>Research-tested Intervention Programs</td>
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<tr>
<td>Cumulative Knowledge</td>
<td>Textbooks, journals (<em>Implementation Science</em>)</td>
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References and Resources

Additional Resources

- www.implementationscience.com
- www.effectivehealthcare.ahrq.gov
- http://rtips.cancer.gov/rtips
- https://researchtoreality.cancer.gov