An Overview of Dissemination & Implementation Science in Clinical & Translational Research

Bethany M. Kwan, PhD, MSPH
Director of D&I, CCTSI
Investigator & D&I Scientist, Adult & Child Center for Outcomes Research & Delivery Science (ACCORDS)
Associate Professor, Department of Emergency Medicine, University of Colorado School of Medicine

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Dissemination and Implementation (D&I) Science

The study of translating research to practice

D&I Definitions

- **Evidence-Based Intervention**: Interventions with proven efficacy and effectiveness

- **Dissemination** is an active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies

- **Dissemination research** is the systematic study of processes and factors that lead to widespread use of an evidence-based intervention by the target population

- **Dissemination strategies** describe mechanisms and approaches that are used to communicate and spread information about interventions to targeted users.

• **Implementation** is the process of putting to use or integrating evidence-based interventions within a setting.
  
  ○ **Implementation research** seeks to understand the processes and factors associated with successful integration of evidence-based interventions within a particular setting (e.g., worksite, school, clinic).
  
  ○ **Implementation strategies** are the systematic processes or methods, techniques, activities, and resources that support implementation of evidence-based interventions in practice.
T1-T4 Continuum

Bench
Can we invent a solution to a health problem?

Bedside
Could the invention work in humans?

Patients
Does it benefit patients?

Practice
Can it be delivered reliably in practice?

Public Health
Does it improve public health?

Dissemination & Implementation Science
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<th>Principle</th>
<th>Example competencies to maximize design for ultimate translation</th>
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| Context matters and is multilevel                                        | • Describe factors that influence research adoption, implementation, maintenance, and reach.  
• Prioritize questions with high relevance to stakeholders.                                                                                                                                                                                                                                                                                                                                 |
| It is not sufficient that evidence exists                                 | • Be familiar with user-centered design; making interventions useful, usable, and desirable (design for dissemination).  
• Understand the stakeholders that should be engaged.  
• Understand the value of early engagement of stakeholders.  
• Understand the relevance of study design and choice of target group to external validity and ultimate translatable.                                                                                                                                                                                                                  |
| Change happens proactively                                               | • Understand the importance of value proposition, designing for dissemination, cost effectiveness, and policy implications.  
• Understand the value of type 1 hybrid design in all phases of clinical research.  
• Understand the sources of error: fidelity/lapses in implementation as a source of reduced/heightened effect.                                                                                                                                                                                                                                                     |
| Both implementation practice and implementation science are team endeavors | • Understand how to identify relevant nonacademic stakeholders in research and how and when to engage with them to aid in movement across research stages and translation into practice.  
• Understand the benefit of and how to communicate with relevant stakeholders.  
• Employ weighted evidence, cost-effectiveness, and translation into policy.                                                                                                                                                                                                                                                     |

Apply marketing principles to inform participant recruitment strategies

Understand social pressures among basic scientists that inform the research questions they pursue

Conduct studies to identify and reduce key barriers to adopting and implementing in routine practice, and to reduce disparities in implementation

Conduct comparative studies of different dissemination strategies to determine most cost-effective method of reaching target settings and audiences

Conduct comparative studies of different dissemination strategies to determine most cost-effective method of sustainably implementing in target settings
D&I in Clinical Translational Science Awards (CTSAs)

• Currently more than 50 CTSAs (including CCTSI) nationwide
• Newest Funding Opportunity Announcement, PAR-21-293
  • Requires each hub to have foundational dissemination and implementation (D&I) capabilities and activities to ensure that translational research results in health impact.

D&I Competencies, Training, & Resources

- Padek et al 2017 Educational competencies for D&I training
  - Section A: Definition, Background, & Rationale for D&I Research
  - Section B: D&I Theory & Approaches
  - Section C: D&I Design & Analysis
  - Section D: Practice-Based Considerations

- Huebschmann et al 2022 Implementation science capacity building programs
  - Additional competencies related to increasing health equity and speed of translation

https://medschool.cuanschutz.edu/accords/cores-and-programs/dissemination-implementation-science-program
D&I Competency: C5 Apply common D&I measures and analytic strategies relevant for your research question(s) within your model/framework.

Proctor’s Implementation Outcomes Framework
A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project

Byron J Powell*, Thomas J Waltz2, Matthew J Chinman3,4, Laura J Damschroder5, Jeffrey L Smith6, Monica M Matthieu6,7, Enola K Proctor8 and JoAnn E Kirchner5,9

Abstract

Background: Identifying, developing, and testing implementation strategies are important goals of implementation science. However, these efforts have been complicated by the use of inconsistent language and inadequate descriptions of implementation strategies in the literature. The Expert Recommendations for Implementing Change (ERIC) study aimed to refine a published compilation of implementation strategy terms and definitions by systematically gathering input from a wide range of stakeholders with expertise in implementation science and clinical practice.
Considering D&I earlier

An earlier focus on...

- Who’s going to deliver it?
- Fit with ultimate patient population
- Building in tests of training, support, adherence, mediators and moderators to high quality delivery
- Hybrid implementation-effectiveness designs
Ensuring Fit to Context

• “Designing for Dissemination and Sustainability” (D4DS)
  • **Enhancing the fit** between a health program, policy, or practice and the context in which it is intended to be adopted
  • Early and active planning for dissemination and sustainability

• Designing for dissemination
  • the process of ensuring that the products of research are developed to match the contextual characteristics of the target audience and setting for intended use

• Designing for sustainability
  • early planning and **design processes** designed to increase the likelihood of sustainment of an evidence-based program or practice after initial implementation

**D&I competency B4:** Describe a process for designing for dissemination (planning for adoption, implementation, and sustainability during the intervention development stage).

*Designing for Dissemination and Sustainability to Promote Equitable Impacts on Health*
Annual Review of Public Health 2022 43:1, 331-353
Fit to Context (F2C) Framework for Designing for Dissemination and Sustainability

**F2C PHASE**

**Conceptualization**
- Develop Partnerships
- Assess Context and Partner Priorities
- Establish Evidence Base

**Design**
- Design Research Product(s) with Partners
- Plan for Dissemination
- Plan for Sustainability

**Dissemination**
- Active Dissemination
- Enhance System Capacity for Adoption and Sustainment

**Impact**
- Demonstrate Impact at Scale
- Monitor and Adapt to Dynamic Context

**Objectives**
- Need and Demand for Innovation
- Capacity for Change
- Equity-Focused Contextual Factors Known

**Evaluation and Iteration**
- Product Perceived as Feasible, Acceptable, Useful, Equitable
- Sustainability and Dissemination Plans Align with Context

**Fit to Context Outcomes**
- Awareness among Intended Audience
- Intention to Adopt and Sustain
- Equitable Access

Health Equity, D&I, and CTSAs

D&I Competency: Develop strategies to promote equity in resource distribution across all external research partners, including community partners or other external organizations and the researcher’s institution.
Community and Partner Engagement and Participatory Methods

D&I competencies:
D1: Describe the importance of incorporating the perspectives of different stakeholder groups;
D4: Determine when engagement in participatory research is appropriate with D&I research
D6: Identify and apply techniques for stakeholder analysis and engagement when implementing evidence-based practices.
CCTSI CU-CSU Summit: Enhancing the Impact of Translational Research through D&I

- **Translational Sciences Benefits Model:** The products of clinical and translational research and assessing impacts at multiple levels
- **Dissemination Planning:** Communication and strategies for enhancing awareness and encouraging adoption of evidence-based approaches
- **Resources:** Collaborating and building personal expertise in D&I science
- **Case examples:** Applying TSBM, D&I theories, models, and frameworks, engaging communities, industry partners, and decision makers in research
- **Networking:** Building relationships and identifying opportunities for team sciences and partnering with communities

Bethany Kwan
Bethany.kwan@cuanschutz.edu
@BethanyKwan