An Introduction to Implementation Science

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11th Genomic Medicine Meeting, La Jolla, CA
September 5, 2018
Presentation Outline

- What is Implementation Science and How Does it Relate to Genomic Medicine?
- Key IS Activities/Resources
- Where the field is moving…
- Summary: Exciting times ahead!
“PUBLICATION PATHWAY”

Dickersin, 1987

Koren, 1989

Balas, 1995

Poynard, 1985

Balas & Boren, 2000

Original Research

Submission

18%

variable

Kumar, 1992

Kumar, 1992

Poyer, 1982

Antman, 1992

Negative results

It takes 17 years to turn 14 percent of original research to the benefit of patient care

Bibliographic databases

Reviews, guidelines, textbook

Implementation

6 - 13 years Antman, 1992

9.3 years

Inconsistent indexing

50%

18%

46%

14%

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The fish-bicycle conundrum…

Ref: Paraphrased from Irina Dunn, 1970
Beyond The Test Itself…

- Even if a genetic test can identify optimal treatment for a specific illness or reduce risk for health problems, if:
  - Only half of insurers choose to provide it
  - Half of health systems choose to train clinicians to prescribe it
  - Half of the clinicians at those systems prescribe it
  - Half of their patients get tested:

(Assuming perfect access/testing/follow-up)

Impact: \(0.5 \times 0.5 \times 0.5 \times 0.5 = 6\%\) benefit
Beyond efficacy/effectiveness

**Figure 1. Elements of the RE-AIM Framework**

- **Maintenance**
  - How do I incorporate the intervention so it is delivered over the long-term?
- **Reach**
  - How do I reach the targeted population?
- **Adoption**
  - How do I ensure the intervention is delivered properly?
  - How do I develop organizational support to deliver my intervention?
- **Effectiveness**
  - How do I know my intervention is effective?

Glasgow, RE-AIM

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Key Terms

- **Implementation Science** is the study of methods to promote the integration of research findings and evidence into healthcare policy and practice.

- **Dissemination research** is the scientific study of targeted distribution of information and intervention materials to a specific public health or clinical practice audience. The intent is to understand how best to spread and sustain knowledge and the associated evidence-based interventions.

- **Implementation research** is the scientific study of the use of strategies to adopt and integrate evidence-based health interventions into clinical and community settings in order to improve patient outcomes and benefit population health.
Example: Lynch Syndrome

Sample IS Challenges:

- ID of Lynch Syndrome within CRC pop
- Family member scale-up
- Implementing screening/monitoring/
- Workforce capacity/training needs
Example: Precision Medicine

- How does clinical practice incorporate PMI findings?
- How do you implement evidence that will be evolving?
- How do you train and support the workforce?
- What services will be covered/paid for?
Example: Personalized Medicine (Life?)

- Diagnostician(s)
- Pediatrics
- County Services (Infant & Toddlers)
- Educational System
- Behavioral Analysts
- Insurance Companies
- Public/Private Therapist(s)
- Physician Specialists
- Equipment Manufacturers
- Lawyers
- County Services
Who is ultimately in charge of implementation?

- Diagnostician(s)
- Pediatrics
- County Services (Infant & Toddlers)
- Educational System
- Behavioral Analysts
- Insurance Companies
- Equipment Manufacturers
- Public/Private Therapist(s)
- Physician Specialists
- Lawyers
Implementation Challenges Abound…

- Money
- Time
- Travel
- Multiple Dx
- Policy Barriers
- Caregiver Burden
- Varied Opinion
- Opposition
- Behavioral
- Access
- Adverse Events
- County Services
- Public/Private Therapists
- Pediatrics
- Equipment Manufacturers
- Physicians
- Specialists
- Money
- Time
- Travel
- Multiple Dx
- Policy Barriers
- Caregiver Burden
- Varied Opinion
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- Behavioral
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- Adverse Events
- County Services
- Public/Private Therapists
- Pediatrics
- Equipment Manufacturers
- Physicians
- Specialists

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The Importance of What…

What is the intervention that needs to be implemented?

A. Genetic/genomic tests
B. Information Dissemination/educational intervention
C. Monitoring and Follow-up
D. Preventive Care
E. Treatment
F. All of the above?
Studying Implementation

What?
- QIs
- ESTs

How?
- Implementation Strategies
  - Outcomes
    - Feasibility
    - Fidelity
    - Uptake
    - Costs
  - Outcomes*
    - Efficiency
    - Safety
    - Effectiveness
    - Patient-centeredness
    - Timeliness

Service Outcomes*
- Efficiency
- Safety
- Effectiveness
- Patient-centeredness
- Timeliness

Health Outcomes
- Satisfaction
- Function
- Health status/symptoms

*IOM Standards of Care

Implementation Research Methods

THE USUAL

THE CORE OF IMPLEMENTATION RESEARCH

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The Current Paradigms for D&I Science

2004

The DSF: Managing the Fit Between an Intervention and Context to Optimize Benefit

2013

Incorporation of Knowledge Integration into the Translation Continuum

The National Cancer Institute

BASIC RESEARCH

TRANSLATION from basic science to human studies

CLINICAL RESEARCH

TRANSLATION from clinical research to patients and communities

CLINICAL AND COMMUNITY PRACTICE

Improved Health

Discoveries

Promising Applications

Population Health Measures

Knowledge Management

Knowledge Synthesis

Knowledge Translation

Evidence-based Recommendations & Policies

Practice

T0

T1

T2

T3

T4

Increasing Public Health Benefit
Tabak et al. review of Implementation Science Models

- Identified 109 models
- Exclusions
  - 26 focus on practitioners
  - 12 not applicable to local level dissemination
  - 8 end of grant knowledge translation
  - 2 duplicates
- Included 61 models
- Across Construct Flexibility, SEF, D/I

Tabak, Khoong, Chambers, Brownson, *AJPM*, 2012
Current Funding Announcements

- NIH: PAR-18-007; 18-017; 16-237 (R01, R21, R03)
- NCI leads (16 ICs total, including FIC, NIMH, NHLBI, NHGRI, as well as OBSSR and ODP)
- Organizes the D&I research agenda across NIH
- >200 grants funded through NIH since 2006
- 2010 CSR standing review committee
- Program staff (contacts) happy to review concept papers, specific aims, answer questions at any time
Selected Priority Areas for PARs

• Studies of the local adaptation of evidence-based practices in the context of implementation
• Longitudinal and follow-up studies on the factors that contribute to the sustainability of evidence-based interventions
• Scaling up health care interventions across health plans, systems, and networks
• De-Implementation of ineffective or suboptimal care
Implementation Science Training…

Training Institute for Dissemination and Implementation Research in Health

September 16, 2016 – December 13, 2016

Washington, D.C.

Research Career Development Programs in T4 Implementation Research (K12)

National Heart, Lung, and Blood Institute

APPLICATIONS NOW BEING ACCEPTED!

TRAINING INSTITUTE FOR DISSEMINATION AND IMPLEMENTATION RESEARCH IN CANCER

ALL MATERIALS DUE FEB. 9, 2018
Hope for the future…
The Implementation Journey Continues...

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