Implementation Science
Methods to Inform Nutrition Research

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The Warren Alpert Medical School of Brown University
Department of Psychiatry and Human Behavior
Brown Research on Implementation and Dissemination to Guide Evidence Use (BRIDGE Program)
A 100-year knowledge-to-practice gap
What does an implementation scientist do?

- Assess gaps related to the failure to use evidence-based interventions
- Assign implementation strategies that reduce gaps between research and practice
- Evaluate implementation efforts
- Apply theories, models, and frameworks
Implementation science made too simple: a teaching tool

Geoffrey M. Curran

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Implementation Science: A Quick Overview

- **THE THING**: The intervention/practice/innovation
- **Efficacy and Effectiveness research**: whether THE THING works
- **Implementation research**: how best to help people/places do THE THING
- **Implementation Strategies**: methods or techniques that help people do THE THING
Implementation Science: A Quick Overview

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An introduction to implementation science for the non-specialist

Mark S. Bauer¹,⁷*, Laura Damschroder², Hildi Hagedorn³, Jeffrey Smith⁴ and Amy M. Kilbourne⁵,⁶
<table>
<thead>
<tr>
<th></th>
<th>Efficacy Design Principles</th>
<th>Effectiveness Design Principles</th>
<th>Implementation Design Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis</strong></td>
<td>MI beats control</td>
<td>MI beats control</td>
<td>MI will be adopted and sustained</td>
</tr>
<tr>
<td><strong>Population &amp; setting</strong></td>
<td>Exclude psychosis, bipolar, anxiety; any setting with cooperative patients</td>
<td>Include most comorbidities; typical setting is nonspecialized practice sites</td>
<td>Unit of observation may be patients, providers, or clinics; typical setting is nonspecialized practice sites</td>
</tr>
<tr>
<td><strong>Outcome measures</strong></td>
<td>Health outcomes, many: “just in case…”</td>
<td>Health outcomes, short &amp; sweet</td>
<td>Emphasize MI adoption measures</td>
</tr>
<tr>
<td><strong>Intervention: clinicians</strong></td>
<td>PhDs, MSWs hired &amp; trained by PI</td>
<td>Addiction counselors hired as study staff</td>
<td>Endogenous addiction counselors</td>
</tr>
<tr>
<td><strong>Intervention: fidelity</strong></td>
<td>Trained to criterion, audiotaped for fidelity</td>
<td>Trained to criterion, QI-type monitoring as in clinical system</td>
<td>Formative evaluation the focus</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>Make sure that the trial is successful, at all costs</td>
<td>Work within “typical” conditions</td>
<td>Maintain typical conditions</td>
</tr>
<tr>
<td><strong>Research support</strong></td>
<td>Crypto-case management</td>
<td>Research support, but “firewalled”</td>
<td>Research support limited; e.g., only for training</td>
</tr>
<tr>
<td><strong>Validity emphasis</strong></td>
<td>Internal &gt;&gt; external</td>
<td>External &gt; internal</td>
<td>Plan to optimize protocol in real time using formative evaluation, in violation of “traditional” considerations of internal validity, while systematically documenting adaptations</td>
</tr>
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Implementation Strategies

“Methods or techniques used to enhance the adoption, implementation, and sustainability of a clinical program or practice” (Powell et al, 2015)
Implementation Strategies
Expert Recommendations for Implementation Change (ERIC) Project

- Evaluation and Interactive Strategies
- Interactive Assistance
- Adapting and Tailoring Content
- Developing Relationships
- Training/Educating Partners
- Supporting Clinicians
- Engaging Consumers
- Using Financial Strategies
- Changing Infrastructure

Powell et al., 2012
## Examples of matching strategies to determinants

<table>
<thead>
<tr>
<th>Identified Determinants</th>
<th>Implementation Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge</td>
<td>Interactive education sessions</td>
</tr>
<tr>
<td>Perception/reality mismatch</td>
<td>Audit and feedback</td>
</tr>
<tr>
<td>Lack of motivation</td>
<td>Incentives/sanctions</td>
</tr>
<tr>
<td>Beliefs/attitudes</td>
<td>Peer influence/opinion leaders</td>
</tr>
<tr>
<td>Systems of care</td>
<td>Process redesign</td>
</tr>
</tbody>
</table>
A methodology for generating a tailored implementation blueprint: an exemplar from a youth residential setting

Cara C. Lewis¹,²,³*, Kelli Scott² and Brigid R. Marriott⁴
Case Example 1: Starting a Vegetable Garden as a New Hobby
The Thing: Gardening

**Effectiveness Outcome:** Whether I grow any vegetables

**Implementation Outcome:** Whether I do any gardening

**Implementation Strategies:** Methods to help me do the gardening
Step A: Barrier Identification

- Qualitative interviews
  - Focus groups
  - Individual interviews
  - Rapid ethnography
- Quantitative methods
  - List barriers in a survey format
- Evidence synthesis methods
  - Rapid evidence reviews
  - Evidence scans
  - Established systematic reviews
Step B: Barrier Prioritization
Step C: Implementation Strategy Prioritization
Feasibility

Low
- Connect hose to sink spout
- Attend a class on gardening
- Read a book about gardening
- Use a watering can

High
- Use a pitcher that you already have
- Ask a friend who is an avid gardener
- Wait for it to rain*
- YouTube University
Impact

Low Impact on Program Success
- Wait for it to rain

Moderate Impact on Program Success
- Read a book about gardening

High Impact on Program Success
- Use a watering can
- Connect hose to sink spout
- Use a pitcher that you already have
- Ask a friend who is an avid gardener
- YouTube University
- Attend a class on gardening
Step D: Implementation Strategy Selection

High Impact and High Feasibility

- Use a pitcher that you already have
- Ask a friend who is an avid gardener
- YouTube University
Step E: Implementation Blueprint Creation

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Action Step</th>
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<tr>
<td>Use a pitcher that you already have</td>
<td>Designate a pitcher that you will use on a regular basis and have readily available to water your plants</td>
</tr>
<tr>
<td>Ask a friend who is an avid gardener</td>
<td>Ask your friend to show you how to do initial planting and borrow their tools to do so</td>
</tr>
<tr>
<td>YouTube University</td>
<td>Watch videos about how to maintain a garden and when to harvest vegetables</td>
</tr>
</tbody>
</table>
Implementation science and NOPREN

Early Childhood Work Group, which specifically focuses on policy, systems, and environmental strategies to reach young children and their families.

- **Policy**
  - Implementation, dissemination, and evaluation of NOPREN-relevant programs to inform policy
  - Studying the implementation of NOPREN-consistent policies

- **Systems**
  - Adapting and testing theories of change based in implementation work
  - Understanding context through contextual inquiry (qualitative interviews, barrier identification)

- **Environmental strategies**
  - Developing implementation blueprints
  - Hybrid implementation-effectiveness studies
Discussion/questions?

- How do you see implementation science fitting into your work?
- What kind of implementation work are you already doing?
- What questions do you have for us?
How to stay in touch

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- [ruben_martinez@brown.edu](mailto:ruben_martinez@brown.edu)