Implementation Science in Action:
Some Reminders and Real-Life Examples

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### Implementation challenges: Four reminders

1. Implementation influences (barriers, facilitators) are multifaceted, multilevel

2. Implementation influences are heterogeneous and vary over time

3. Implementation processes and strategies are (and should be) multifaceted and multilevel

4. Implementation processes and strategies will (and should) vary over time and place

   *adaptation happens… and should be embraced, studied and guided rather than suppressed or ignored*
Selected barriers to implementation: physicians’ clinical practices

- Insufficient information, knowledge, skill, time
- Too much information
- Evidence is not accepted as legitimate
- Implementation gaps not recognized
- Misaligned financial incentives
- Insufficient staff or systems support
- Lack of external pressure, expectations
Levels of influence on clinical practice

- Point of care (MD knowledge, patient demand)
- Microsystem, team (norms, culture)
- Clinic, hospital (policies, leadership)
- Delivery system (organizational/fiscal policies, leadership, resources)
- Professional norms (local, regional, national)
- Patients, businesses, other stakeholders (community, region, province/state, nation)
- Local, regional, national regulations
  
Contrast with “1950s medicine”
Requirements for practice change

1. Valid, legitimate, accepted evidence
2. Clinician/staff knowledge, skill
3. Supportive professional norms
4. External expectations, monitoring, incentives
5. Patient acceptance
6. Evidence of quality gaps
7. Etiology of practices, quality gaps
8. Effective, feasible logistical arrangements
Research to support policy and practice: decision makers’ questions

Does it work? Is it “effective”?

- Should it be approved? Funded? Promoted? Mandated?
- Included in the formulary?
- Should I use it?
“Is the intervention Effective?”
How do researchers answer?

- Do outcomes differ for those receiving the intervention vs. not (or intervention A vs. B)?
- Do selected features of intervention settings and targets influence effects?
- Gold standard method: randomize and measure outcome differences; perform subgroup analyses ... or use other impact-focused designs
- Focus is on impact
Does it work? Is it “effective”? 

- For some drugs, the answer is “Yes, for many/most patients” (but cf precision medicine)
- For robust complex interventions (e.g., some health promotion programs, healthcare delivery innovations) the answer is “Yes, often enough”
- For most complex interventions, the answer is “sometimes…it depends”
Implementation initiatives require:

1. Multistep, incremental approaches
2. Extensive partnerships and engagement
3. Attention to function before form
4. Guidance for adaptation
Translational research

Basic Science → Pre-Clinical/Translational Research → Clinical Research → Implementation Research

Type 1 Translation

Type 2 Translation

Improved Health Processes, Outcomes
Implementation and pre-implementation

Clinical Research
- Efficacy Studies
- Effectiveness Studies

Quality/impl gap dx

Implementation Research

Observational

Guidelines, Evidence Syntheses

Implementation Research

Improved Health Processes, Outcomes
Implementation approaches: Implications

Implementation initiatives require:

1. Multistep, incremental approaches
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Definitions:
Key features of complex health interventions

- Multiple, interacting components
- Intervention targets multiple levels, entities
- Intervention is adaptable
- Intervention effects occur through multiple, mediated, moderated causal pathways

Guise et al, JClinEpi 2017
Support for policy/practice leaders: evidence vs. insights and guidance

- Support for dichotomous approval or selection decisions (FDA, formulary, treatment):
  - *Is it effective? Does it work? Which is more effective?*

- Insights and guidance for practice:
  - *How can we enhance its effectiveness?*
Support for policy/practice leaders: evidence vs. insights and guidance

Two very different aims

1. Does it work? Is it “effective”?  
   • Should it be approved?  
   • Included in the formulary?  
   • Should I use it?

2. How, why, when and where does it work?  
   • How should I use it?  
   • How do I make it work (by adapting intervention, modifying context)?

For most complex interventions we need research-derived insights and guidance (to guide selection, adaptation and management) vs. an estimate of the average effect size (to guide a yes/no decision)
Studying and guiding adaptation: **form vs. function (vs. components)**

- **Function:** purpose, intended effect(s); linked to needs
- **Form:** activity, format, operationalization


## Form vs. function

<table>
<thead>
<tr>
<th>Form Description</th>
<th>Function Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity forms: walking, running, swimming</td>
<td>Prints forms related to physical activity forms.</td>
</tr>
<tr>
<td>Patient education forms: printed materials, videos, nurse education, MD education, peer education</td>
<td>Training materials for patients, educational videos, nurse and MD education, peer education.</td>
</tr>
<tr>
<td>Inpatient stay information transfer (care transitions interventions) forms: shared EHR, discharge summary,</td>
<td>Information transfer forms such as shared EHR, discharge summary, faxed/mailed/emailed/hand-carried</td>
</tr>
<tr>
<td>faxed/mailed/emailed/hand-carried letter</td>
<td>letter.</td>
</tr>
<tr>
<td>Smoking cessation core functions: nicotine replacement, motivation, support</td>
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