Implementing Improvements: Advancing Quality Improvement with Implementation Science

Amy Tyler, MD, MSCS
Objectives

• Identify ways Quality Improvement Science and Implementation Science are the same
• Identify ways Quality Improvement Science and Implementation Science are different
• Name three ways you can integrate Implementation Science and Quality Improvement Science in your next project
Has this ever happened to you?

Yay! It worked! Let’s spread this to other clinics/hospitals!
Has this ever happened to you?

They are chartering a QI team to improve [Blank].
Has this ever happened to you?

I don’t think we speak the same language.
Definitions

**Implementation Science**

The study of methods to promote the integration of research findings and evidence into healthcare policy and practice. – NIH

**Quality Improvement Science**

An applied science that emphasizes innovation, rapid-cycle testing in the field, and spread in order to generate learning about what changes, in which contexts, produce improvements. – IHI
Focus

Implementation Science Focus:
Developing approaches to close the gap between what is known (research findings) and what is practiced (by clinicians).

Quality Improvement Science Focus:
Transforming systems of care to improve healthcare quality and delivery
Why Quality improvement science?

- Safety
- Timeliness
- Effectiveness
- Efficiency
- Equity
- Patient-centeredness
Why Implementation Science?

- **Negative results**
  - 18% Dickersin, 1987
  - 46% Koren, 1989
  - 35% Balas, 1995

- **Lack of numbers**

- **Inconsistent indexing**

**Original research variable**
- **Submission**
  - 0.5 year Kumar, 1992

**Acceptance**
- 0.6 year Kumar, 1992

**Publication**
- 0.3 year Poyer, 1982

**Bibliographic databases**

**Reviews, guidelines, textbook**
- 9.3 years

**Implementation**

Bales & Boren, 2000
Why Implementation Science?

It takes 17 years to transform 14% of original research into the benefit of patient care.

Dickersin, 1987

Koren, 1989

Balas, 1995

Kumar, 1992

Poyer, 1982

Kumar, 1992

Bales & Boren, 2000
Why Implementation Science?

- It is adopted
- Clinicians are trained to deliver it
- Trained clinicians choose to deliver it
- Eligible populations receive it
- It is sustained

If we assume 50% at each step...

\[ 0.5 \times 0.5 \times 0.5 \times 0.5 = 3\% \text{ benefit} \]

Glasgow RE, 1999
Quality Improvement (QI) + Implementation Research (IR)

- Starting Point
  - Local problem (QI)
  - Evidence based practice (IR)
Quality Improvement (QI) + Implementation Research (IR)

- **Starting Point**
  - Local problem (QI)
  - Evidence based practice (IR)

- **Methods/Tools**
  - Understand problem and test solutions (QI)
  - Understand barriers to implementation and test strategies (IR)
Quality Improvement (QI) + Implementation Research (IR)

- **Starting Point**
  - Local problem
  - Evidence based practice

- **Methods/Tools**
  - Understand problem and test solutions (QI)
  - Understand barriers to implementation and test strategies (IR)

- **Goals**
  - Improve the problem, spread the intervention (QI)
  - Adapt EBP to context, understand why implementation works or not, produce generalizable knowledge (IR)
QI + Implementation Science

Tyler & Glasgow, 2021
Call to Action

1. Align Terminology
2. Share methods
3. Agree on publication standards
4. Collaborate in the design and conduct of studies
5. Collaborate between scholars and clinicians (implementers and improvers)
6. Educate professionals in both fields

Check, 2019
Koczwara, 2018
Delivery science Conceptual Model

What?
EBP
Intervention

How?
Implementation
Strategies

Implementation
Outcomes
Feasibility
Acceptability
Reach
Adoption
Cost
Sustainability

Quality Domains
Efficiency
Safety
Effectiveness
Equity
Patient-Centeredness
Timeliness

Health
Outcomes
Health status
Symptoms
Function
Quality of Life
Satisfaction

Context

Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
What are we trying to implement?

- What? EBP Intervention
- How? Implementation Strategies

Implementation Outcomes
- Feasibility
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Health Outcomes
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Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Model for improvement

Model for Improvement

- What are we trying to accomplish?
- How will we know a change is an improvement?
- What change can we make that will result in an improvement?

Act  Plan
Study  Do
Model for improvement

Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

Changes That Result in Improvement

- Implementation of Change
- Wide-Scale Tests of Change
- Follow-up Tests

Hunches, Theories, Ideas

- Very Small Scale Test

DATA

APSD

APSD
Evidenced Based Practice

Results of basic, clinical efficacy, effectiveness, and comparative effectiveness research

• Treatment guidelines
• Evidence-based treatments
• Evidence-Based practice/program
• Effective Quality improvement interventions
How do we implement?

What?
EBP
Intervention

How?
Implementation Strategies

Implementation Outcomes
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Context

Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Selecting Implementation Strategies

Quality Improvement

• Interventions

Implementation Science

• What (EBP)

• How (Implementation Strategies)
Selecting Implementation Strategies

Quality Improvement

• Interventions

  - Discharge Checklist
  - Champions
  - Education
  - Clinical Decision support in EHR

Implementation Science

• What (EBP)

• How (Implementation Strategies)
Selecting Implementation Strategies

Quality Improvement

• Interventions

Implementation Science

• What (EBP)

• How (Implementation Strategies)

Discharge Checklist
Champions
Education
Clinical Decision support in EHR
Selecting Implementation Strategies

Quality Improvement

- Interventions

 Implementation Science

- What (EBP)
- How (Implementation Strategies)

Discharge Checklist
Champions
Education
Clinical Decision support in EHR
Context Informs all phases of delivery science

What?
- EBP
- Intervention

How?
- Implementation
- Strategies

Implementation Outcomes:
- Feasibility
- Acceptability
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Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
What is Context?
What is Context?

Systems, social norms, people and culture
How do we measure context?

Context

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Context

Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Measuring Context in Implementation Science

- Measure context to choose implementation strategies & make planned adaptations to the EBP (or intervention)
- Identify barriers and facilitators on multiple levels
  - Organizational
  - Provider
  - Patient
- Qualitative and mixed methods approaches
EXPLANATORY OR DETERMINANT FRAMEWORKS

How context and implementation strategies will affect a desired change

Consolidated Framework for Implementation Science (CFIR)

integrated - Promoting Action on Research Implementation in Health Services (i-PARIHS)

Practical Robust Implementation and Sustainability Model (PRISM)
Helping Navigate Dissemination and Implementation Models

The D&I Models Webtool is an interactive, online resource designed to help researchers and practitioners navigate D&I Models through planning, selecting, combining, adapting, using, and linking to measures.

Access the D&I Models Webtool Here!

https://dissemination-implementation.org/
Practical, Robust Implementation and Sustainability Model (PRISM)

What organizational partners and patients think about the intervention (EBP)

Organizational factors

Intended Audience characteristics

Context in Quality Improvement

Process mapping
Key Informant Interviews
Key Driver Diagram
5 Whys (Root Cause Analysis)

“QI is an inside job.”
Context in Quality Improvement Science

Physical and sociocultural makeup of the local environment
  • Environmental factor
  • Organizational dynamics
  • Collaboration Resources
  • Leadership

Generalizability of interventions

SQUIRE 2.0 Guidelines
STaRI

Standards for Reporting Implementation Studies (STaRI) guidelines

Describe the context in which the intervention was implemented

Social
Economic
Policy
Healthcare
Organizational barriers and facilitators

Might influence implementation elsewhere
Partnering with QI teams to Measure Context
Fishbone + PRISM

Organizational perceptions of EBP

Organizational characteristics

Patients’ perceptions of EBP

QI Infrastructure

External Environment

Institution has lower adoption of the EBP compared to other similar institutions
Equity-focused Quality Improvement
Choosing Equity-focused interventions in QI

“QI is an inside job.”

Who’s on the QI team?

Representativeness

What organizational partners and patients think about the intervention (EBP)

Intended Audience characteristics
Choosing Equity-focused interventions in QI

Whose voices are included when selecting and studying interventions?

Voice of the customer
Process mapping
Interviews
Kaizen events
5 Whys

Average perspective?
Outliers?
Traditionally Marginalized populations?
Context informs selection of implementation strategies

What?
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Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Implementation Strategies

Expert Recommendations for Implementing Change (ERIC) study

Expert panel - Delphi technique to generate consensus

73 strategies
Selecting Implementation Strategies

• No universally effective strategies
• Need more studies on what strategies are most effective in which contexts

ISLAGIATT Model

(It Seemed Like A Good Idea At The Time)
Selecting Implementation Strategies

- Choose strategies that you hypothesize will work to address your barriers

- Consider effectiveness and feasibility
  - Experience in your organization
  - Cost/effort/resources/time

Key Driver Diagram

SMART AIM
Specific Measurable Actionable Relevant Timely

Global AIM

Key Drivers
Major leverage points to achieve Aim

Interventions
Specific tactics to accomplish one or more Key Drivers
Selecting Implementation Strategies

5 step process for selecting implementation strategies

• Choose mechanisms of change and select or design implementation strategies
• Produce implementation protocols and materials
• Evaluate implementation outcomes

Iterative with the planner circling back to previous steps throughout this process
Tailoring Implementation Strategies to Context

- Surveyed “implementation experts” (n=169) who selected implementation strategies they felt would best address each CFIR barrier
Selecting Strategies
ERIC Strategies + Key Driver Diagram

Aim

Increase guideline recommended EBP from X% to Y% by April 30, 2023

Improve the delivery of guideline concordant care

Key Drivers (Causes from Fishbone)

Interventions (ERIC Strategies)

From: Use of concept mapping to characterize relationships among implementation strategies and assess their feasibility and importance; results from the Expert Recommendations for Implementing Change (ERIC) study.
Adapting EBP and Implementation Strategies to Context

- What? EBP Intervention
- How? Implementation Strategies

**Implementation Outcomes**
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Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Adapting EBP and Implementation Strategies to Context

Modifications are often made to evidence-based interventions and implementation strategies

**When?**

**How?**

**Why?**

**Impact?**
Using the Model for Improvement to tailor interventions (EBP) to context
Tailoring Interventions (EBPs) to Context

What is the reason for changing the EBP or implementation strategies?

How will we know the change is an improvement?

What change to the EBP or implementation strategy will result in improvement?

1. Carefully outline or plan the change
2. Make the change
3. Study the change
   • (Was it carried out as planned? Was there improvement?)
4. Act on those results
   • (Abandon the change/Make additional changes/ Adopt the intervention)
Implementation outcomes

- What?
  - EBP
  - Intervention

- How?
  - Implementation Strategies

Implementation Outcomes:
- Feasibility
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Quality Domains:
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Health Outcomes:
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Context

Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Implementation Outcomes

Effective intervention (EBP), unsuccessfully implemented

Ineffective intervention (EBP), successfully implemented

• Acceptability
• Appropriateness
• Feasibility
• Adoption
• Fidelity
• Implementation Costs
• Penetration
• Sustainability

Proctor, et al 2009
Using Implementation Outcomes in QI
QI Measures

Outcomes

Balancing

Process

Financial
Implementation Outcomes + QI Measures

Outcomes
Balancing
Financial

Acceptability
Appropriateness
Feasibility
Adoption
Fidelity
Cost
Penetration
Sustainability
Implementation Outcomes + QI Outcomes

- Acceptability
- Appropriateness
- Feasibility
- Adoption
- Fidelity
- Cost
- Penetration
- Sustainability

PDSA cycles
Spread

Outcomes
Balancing
Financial

Process
Implementation Science Frameworks

Assess implementation outcomes

RE-AIM
- REACH: How do I reach those who need this intervention?
- EFFECTIVENESS: How do I know my intervention is working?
- IMPLEMENTATION: How do I ensure the intervention is delivered properly?
- MAINTENANCE: How do I incorporate the intervention so it is delivered over the long-term?
- ADOPTION: How do I develop organizational support to deliver my intervention?
## RE-AIM Implementation Science Framework

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<th>What to Consider</th>
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Practical, Robust Implementation and Sustainability Model (PRISM)

RE-AIM Outcomes

Who? Who is intended to benefit from the EBP? Who actually does? How representative are the individuals who receive the EBP of the population?

How? How long? EBP or intervention is working
Using Implementation Science Evaluation Frameworks to expand on QI measures
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Glasgow & Estabrooks, 2018
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Glasgow & Estabrooks, 2018
“Context is King”
“Every system is perfectly designed for the results it achieves”
Context & Systems are Dynamic

What?
- EBP
- Intervention

How?
- Implementation Strategies

Implementation Outcomes
- Feasibility
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Quality Domains
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Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health
Data in Quality Improvement

- Use data over time and rules for interpretation
  - Run charts or control charts
  - Signal when there is real improvement or real change in the wrong direction
  - Avoids over/under reactions
Improve sustainability by utilizing Control Charts to identify the need to adapt to context.
Control Charts + Adaptation

- A change in the wrong direction may signify change in context and/or system and the need for adaptations of the intervention or EBP and implementation strategies.
Quality Improvement is Rapid and Iterative

- The model for improvement (PDSA) can be used rapidly and iteratively adapt the “What” & “How” to the changing context
What did we learn?

- Implementation Science: How do we get clinicians to use knowledge in practice?
- Quality Improvement: Improve the quality of healthcare delivery

Identify ways Implementation Science and QI Overlap

- Different starting points, different stated focus, and different methods
- Both working to improve outcomes and ‘in action’ may look the same
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| **Partner with QI teams to Measure Context** | Combine Implementation Science Frameworks with QI tool (e.g. PRISM + Fishbone) |
| **Use IS framework to improve the equity of QI** | QI team representativeness Multi-level and diverse partner engagement |
| **Use ERIC to select interventions or implementation strategies** | ERIC + Key Driver Diagram CFIR-ERIC matching Tool |
| **Using the Model for Improvement to tailor interventions (EBP) to context** | |
| **Use Implementation Outcomes** | Enhance PDSA cycles and spread and sustain results Expand on QI measures (e.g. Reach) |
| **Use Data over time and PDSA cycles to measure and rapidly adapt to changing context** | |
Questions or Comments?

Thank you

• Amy Tyler, MD, MSCS