



September 16, 2016 – December 13, 2016



Washington, D.C.

# Introduction Webinar

Ross C. Brownson

Amy Kilbourne

# ***Dissemination Science & Designing for Dissemination***

**Training Institute for Dissemination and  
Implementation Research in Health**

September 2016

# Objectives

1. Describe the underpinnings of D&I research.
2. Begin to understand the differences between dissemination research, research dissemination, and implementation research.
3. Explore some dissemination research topics (illustrated with policy research).
4. Describe the principles of designing for dissemination and how these may improve your work.

# The Gap: Scurvy

What progress have we made in getting evidence into practice?

Total elapsed time from Lancaster to adoption: 264 years



104 years

146 years

48 years

70 years

1497 → 1601 → 1747 → 1795 → 1865

Vasco da Gama:  
100 of 160 crew  
died of scurvy;  
citrus suspected  
as cure

Capt James Lancaster  
sails with 4 ships:  
crew on Ship #1 given  
3 tsps of lemon juice  
daily; 0% mortality.  
40% of crew on other  
3 ships perish.

James Lind, British  
Navy physician  
conducts random trial  
of 6 treatments for  
scorbutic sailors on  
HMS Salisbury: citrus  
again proves effective  
against scurvy

British Navy orders  
that citrus fruits  
become the diet on  
all navy ships.

British Board of  
Trade adopts the  
innovation, ordering  
proper diets on  
merchant vessels.



Negative  
results

Original research

18%

Dickersin, 1987

variable

Submission

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



Inconsistent  
indexing

Poynard, 1985

Reviews, guidelines, textbook

9.3 years

Implementation

“PUBLICATION PATHWAY”

# An Evidence-Based PA Intervention

Is only so good as how and whether...

- It is adopted?
- Practitioners are trained to deliver it?
- Trained practitioners choose to deliver it?
- Eligible populations receive it?

If we assume 50% threshold for each step...  
(even w/perfect access/adherence/dosage/maintenance)

Impact:  $.5 * .5 * .5 * .5 = 6\%$  benefit

Too often, we have assumed...  
“If you build it...”



# Some Remedies

- ***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/population outcomes.



# Dissemination vs. implementation (some fairly arbitrary distinctions)

	<b>Dissemination</b>	<b>Implementation</b>
<b>Characteristic</b>	More messy	More structured (perhaps)
<b>Level</b>	Policy and media level	Organizational and clinic level
<b>Target</b>	Community/whole population	Specific settings/ smaller groups/ individuals
<b>Goals</b>	Spread, sustain	Adopt, integrate
<b>Topic</b>	All levels: primary, secondary, tertiary prevention	All levels: primary, secondary, tertiary prevention

# What we know, dissemination\*

1. Dissemination generally does not occur spontaneously and naturally;
2. Passive approaches to dissemination are largely ineffective;
3. Single-source prevention messages are generally less effective than comprehensive, multilevel approaches;
4. Stakeholder involvement in the research or evaluation process is likely to enhance dissemination;
5. Theory and frameworks for dissemination are beneficial; and
6. The process of dissemination needs to be tailored to various audiences

**\*These all inform D&I research**

# Key Characteristics of D&I Science

Point #	Characteristic	Implication
Systems Perspective		
1	Context is critical	Research should focus on and describe context
2	Multilevel complexity	Most problems, and interventions are multilevel and complex
3	Focus on systems characteristics	More emphasis needed on interrelationships among system elements and systems rules
Robust, Practical Goals		
4	Representatives and reach	Focus on reaching broader segments of population and those most in need
5	Generalizability	Study generalization (or lack of such) across settings, subgroups, staff, and conditions
6	Pragmatic and practical	Producing answers to specific questions relevant to stakeholders
7	Scalability and sustainability	From outset, greater focus on scale-up potential and likelihood of sustainability
Research Methods to Enhance Relevance		
8	Rigorous	Identify and address plausible threats to validity in context of question. Greater focus on replication
9	Rapid	Approaches that produce faster answers
10	Adaptive	Best solutions usually evolve over time, as a result of informed hypotheses and mini-tests with feedback
11	Integration of methods; triangulation	For greater understanding, integrated Quantitative and Qualitative methods are often required
12	Relevance	Relevance to stakeholders should be top priority
Flexibility		
13	Multiplicity	Encourage and support diverse approaches with the above characteristics (all models are wrong)
14	Respect for diverse approaches; humility	Different perspectives, goals, methods and approaches are needed. Continuing the same existing approaches will produce the same unsatisfactory results

Glasgow RE, Chambers D. Developing robust, sustainable, implementation systems using rigorous, rapid and relevant science. *Clin Transl Sci*. Feb 2012;5(1):48

*Is it research dissemination or dissemination research?*

- Most research dissemination has been passive
- Federal agencies fund both research dissemination and dissemination research

# Policy dissemination research

# The big picture impact: Top 10 public health achievements

- *Examples*
  - Vaccination
  - Motor-vehicle safety
  - Safer workplaces
  - Fluoridation of drinking water
  - Recognition of tobacco use as a health hazard
- Each of these advances involved policy

How well do research and PA  
policy connect?



Because what you  
told me is absolutely

Yes, how  
did you  
know?

# *The problem*

Because you don't know  
where you are, you don't  
know where you're going,  
and now you're blaming  
me

Ye  
You must  
policy n





# A Few Challenges

## For the policy maker:

1. Poor timing
2. Lack of relevant data

## For the researcher:

1. Mismatch of randomized thinking with nonrandom problems
2. Lack of control over the independent variable

# What is funded...

Purtle *et al.* *Implementation Science* (2016) 11:1  
DOI 10.1186/s13012-015-0367-1

Implementation Science

RESEARCH

Open Access



## A review of policy dissemination and implementation research funded by the National Institutes of Health, 2007–2014

Jonathan Purtle<sup>1\*</sup>, Rachel Peters<sup>1</sup> and Ross C. Brownson<sup>2</sup>

# Study Purpose

Content Analysis to:

- Determine the extent to which policy D&I research has been funded by NIH between 2007-2014
- Identify trends in NIH-funded policy D&I
- Describe the characteristics of NIH-funded policy D&I projects

# Results

- 12 (8.2%) of projects funded through D&I FOAs were classified as policy D&I
- \$16,177,250 was awarded for these projects, 10.5% of all funding through D&I FOAs
- Annual policy D&I funding increased by 98.9% between 2007-2014
- The National Cancer Institute (NCI) supported 6 of the 12 policy D&I research projects

# Considerations

- Policy dissemination research is important and needs more science
- Designs and methods differ from much of NIH-supported research
- Worth distinguishing “small p” from “Big P”
- Likely some variation by institute/center

A few words on designing for  
dissemination...

(mainly from a national survey; 266  
US researchers)

# Definition

- Designing for dissemination (D4D)
  - The process of ensuring that evidence-based interventions are developed in ways that match well with adopters' needs, assets, and time frames.
    - Might apply to any actionable finding or packaging/designing interventions (RTIPs, post hoc)
- Focus of this portion is on D4D, not dissemination *research*
  - But D4D should inform your research

# How well are we doing in D4D?

- Responses = 266
- Response rate = 48%\*
- Median completion time = 11 minutes

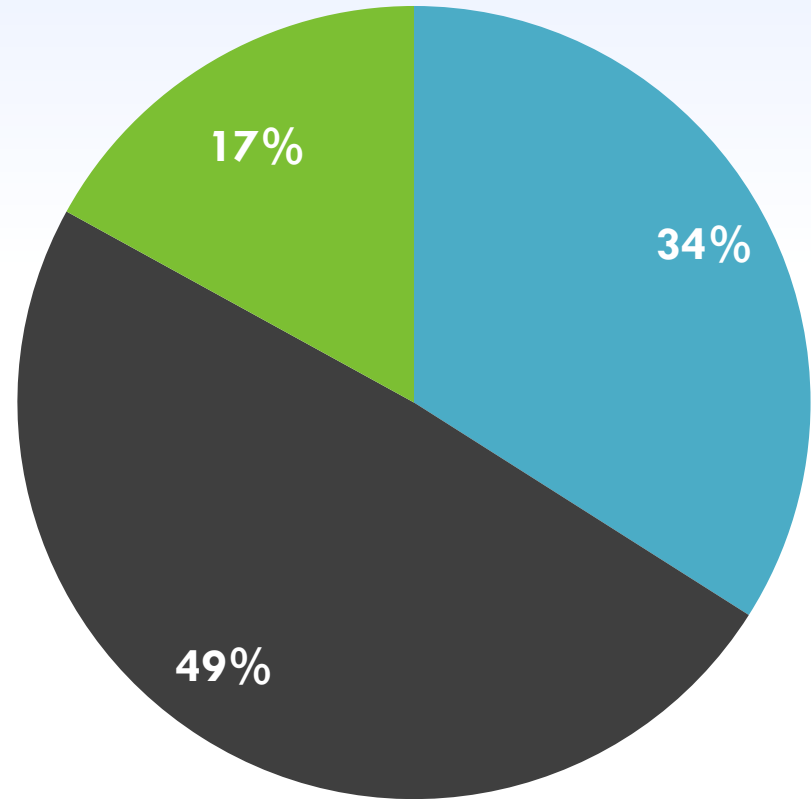
	n	%
University	172	65%
- affiliated with CDC PRC	63	
- no affil. with CDC PRC	109	
NIH	25	9%
CDC	34	13%
Other	34	13%
	266	100%



# Involving Stakeholders

## Survey question:

- As a part of your research process, how often do you involve stakeholders?

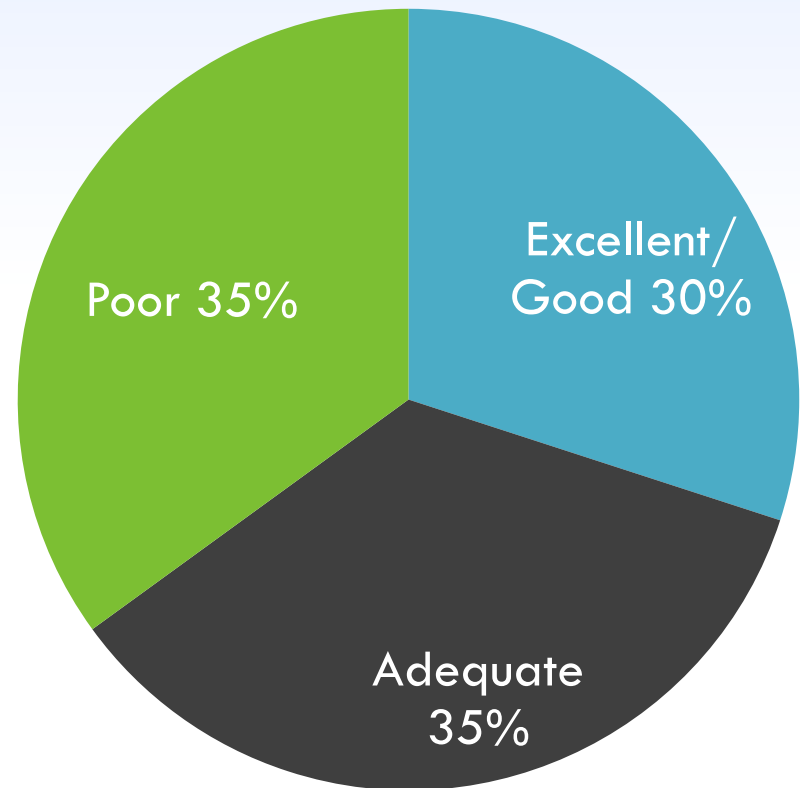


■ Always/Usually ■ Sometimes/Rarely ■ Never

# Rate Efforts

Survey question:

- Overall, how do you rate your efforts to disseminate your research findings to non-research audiences?



# Multivariate predictors of excellent dissemination

- Important for their department
  - OR=2.3; 95% CI=1.2-4.5
- Expected by funder
  - OR=2.1; 95% CI=1.3-3.2
- Worked in policy/practice setting
  - OR=4.4; 95% CI=2.1-9.3
- NIH least effective among settings

# Example of the disconnect

How local public health agencies learn about research findings?	How researchers perceive they most effectively reach practitioners?
1. Professional associations	1. Journal articles
2. Seminars/workshops	2. Face-to-face meetings
3. Email alerts	3. Media interviews
4. Journal articles	4. Press releases

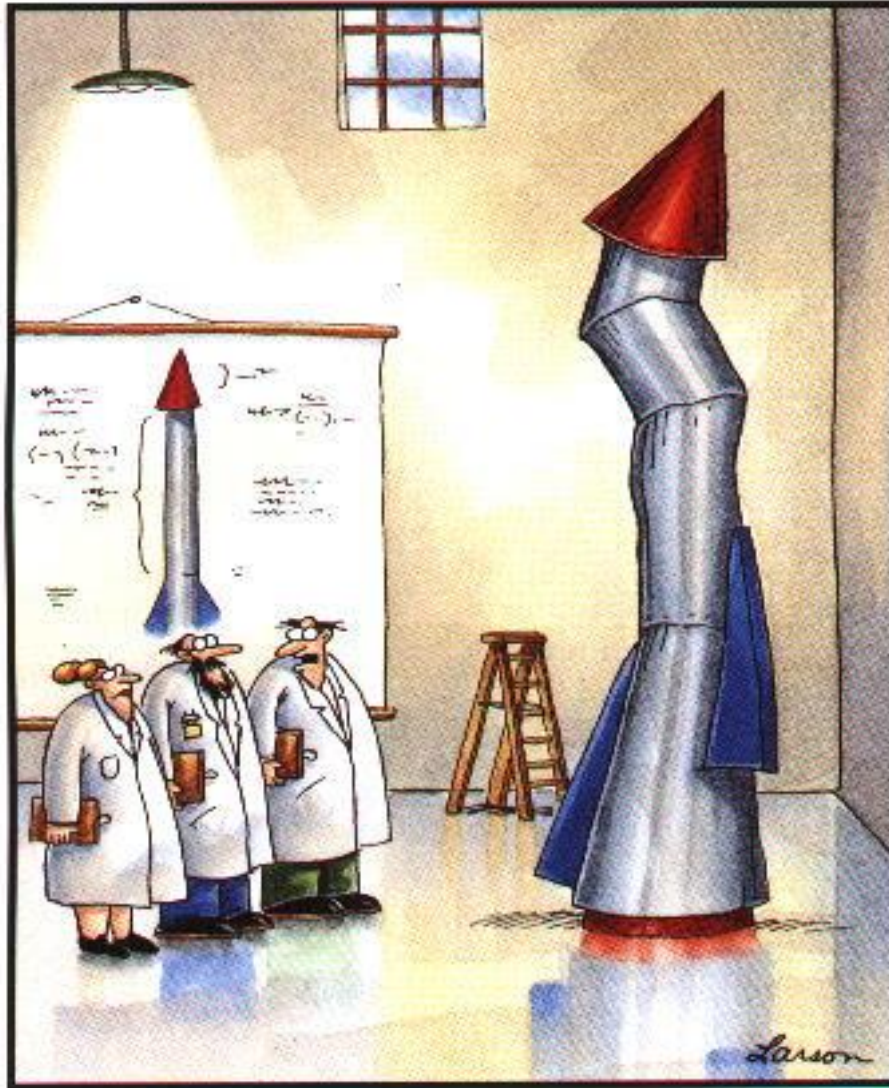
# Improving D4D: Start early!!

- Think about dissemination at the beginning of a research project
  - Structures
    - In a grant applications, are D4D principles embedded or a separate aim?
    - Do you have a conceptual model?
  - Processes
    - How to engage stakeholders early and often?
  - Products
    - How to frame messages, develop brief summaries?
  - Systems changes
    - How to shift funder, academic priorities/incentives?

# Make better use of models/frameworks

- Outlined in Tabak *et al.*, proliferation of models: 61 reviewed!!
  - ◆ Context is critical
    - ◆ Focus on external validity
  - ◆ Begin with stakeholders—take their perspective
  - ◆ Need balance between fidelity to EB program and adaptation to local setting
  - ◆ Unlikely to need to create a new model

Know what you don't know...



"It's time we face reality, my friends. ...  
We're not exactly rocket scientists."

THE LATEST RESEARCH SHOWS THAT  
WE REALLY SHOULD DO SOMETHING  
WITH ALL THIS RESEARCH





THANKS to David Chambers,  
Maria Fernandez, Bridget  
Gaglio, Christine Hunter,  
Jonathan Lomas, Borsika,  
Rabin, Cindy Vinson!!

# ***Take home points***

1. Dissemination research is a vibrant field with many practical applications.
2. There is a close nexus between dissemination research and research dissemination.
3. Following several key principles will improve dissemination research and D4D.

# Implementation Science

**Amy M. Kilbourne, PhD, MPH**

**Director, VA Quality Enhancement Research Initiative (QUERI)**

**Acting Director, VA Health Services Research and Development**

**Professor of Psychiatry, University of Michigan**

# *Research to Practice*

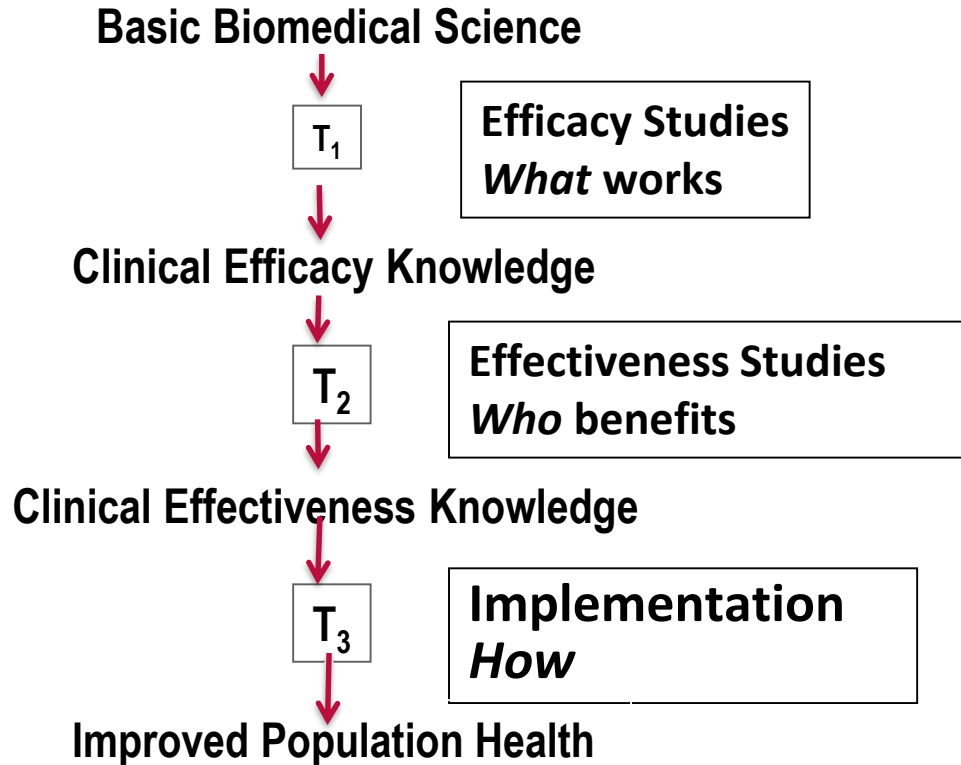


*Last Scene from Raiders of the Lost Ark*

# ***Healthcare is Changing***

- Big Data, e-Health/m-Health
- Consumer-driven Healthcare reform
  - Exchanges/ACOs
  - Medicaid expansion
- ***Learning Healthcare Systems***
  - Aligning science with clinical priority goals
  - Conducting more rapid and efficient studies
  - Leveraging existing data to deploy and evaluate innovations and best practices

# Implementation and the 3T's Road Map



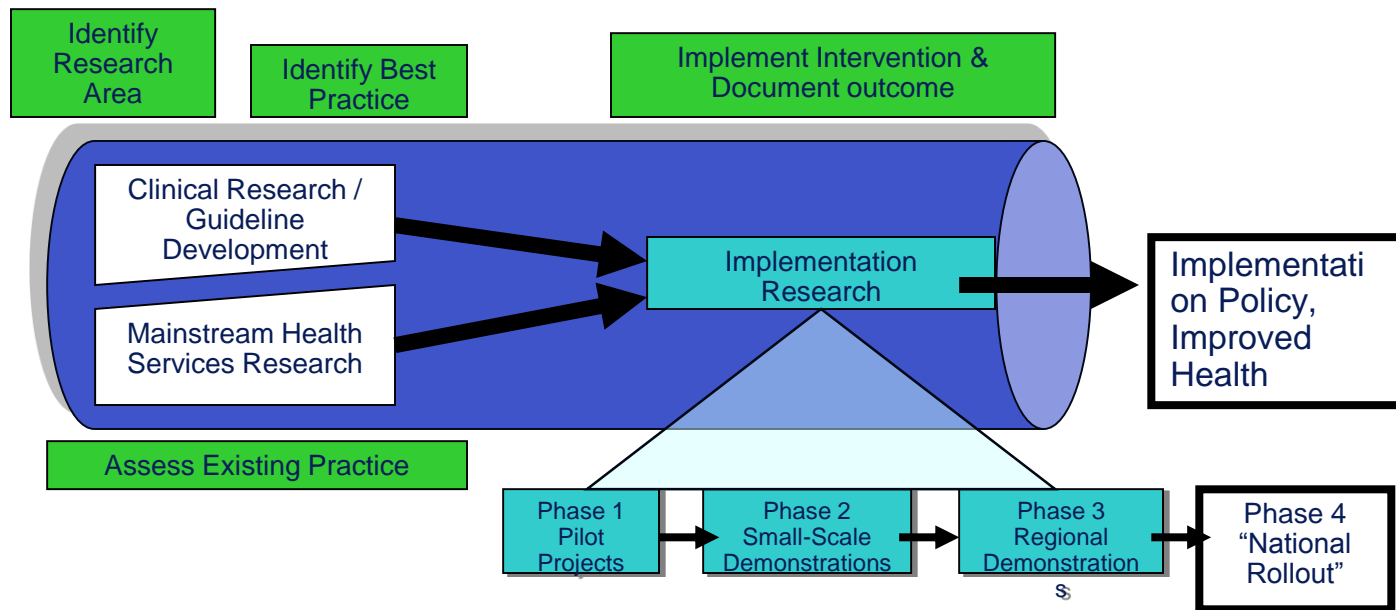
*Modified from Dougherty and Conway, JAMA 2008;299:2319-2321*

## ***The Long Road to Learning Healthcare Systems (and why we need implementation)***

- New research takes **too long** to get adopted
- Research is often **not aligned** to address critical health/health care problems
- Providers lack **tools/technical assistance** to implement effective treatments (data not enough)
- Large programs being rolled out without **adequate planning** to maximize effectiveness and learning
- **Variation** and patient-centered care
  - Treatments work differently for different people
  - But inefficiency is a problem

# Implementation as a “Linear Process”

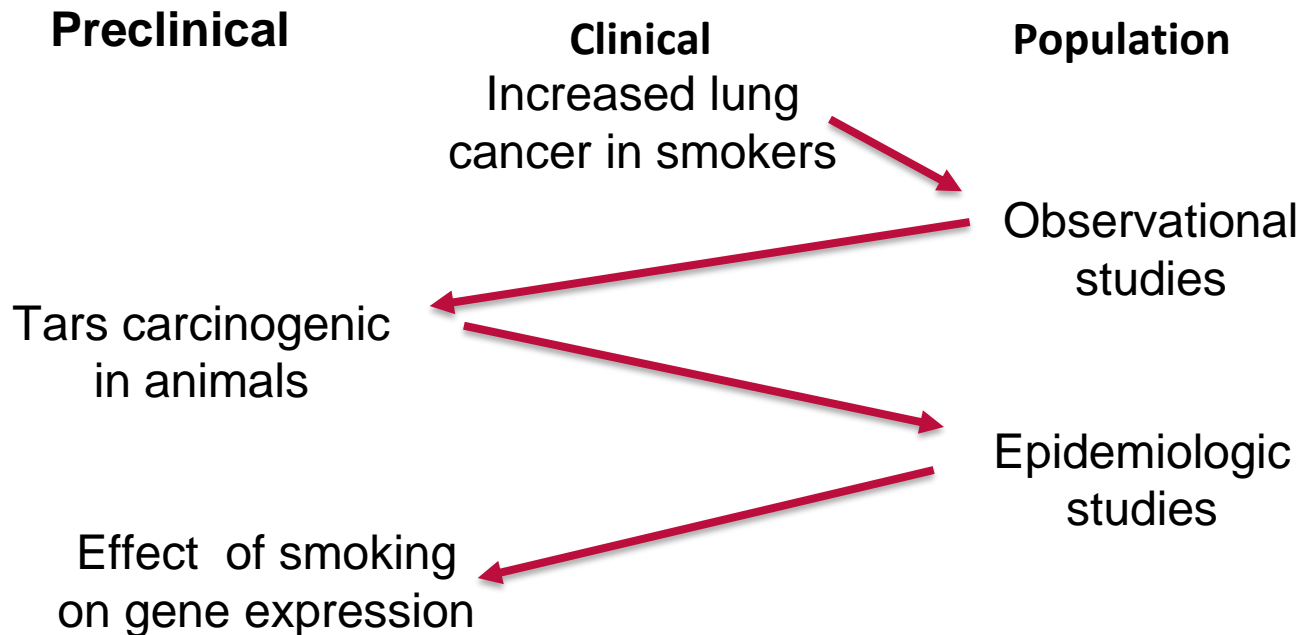
## First Generation QUERI Implementation Pipeline





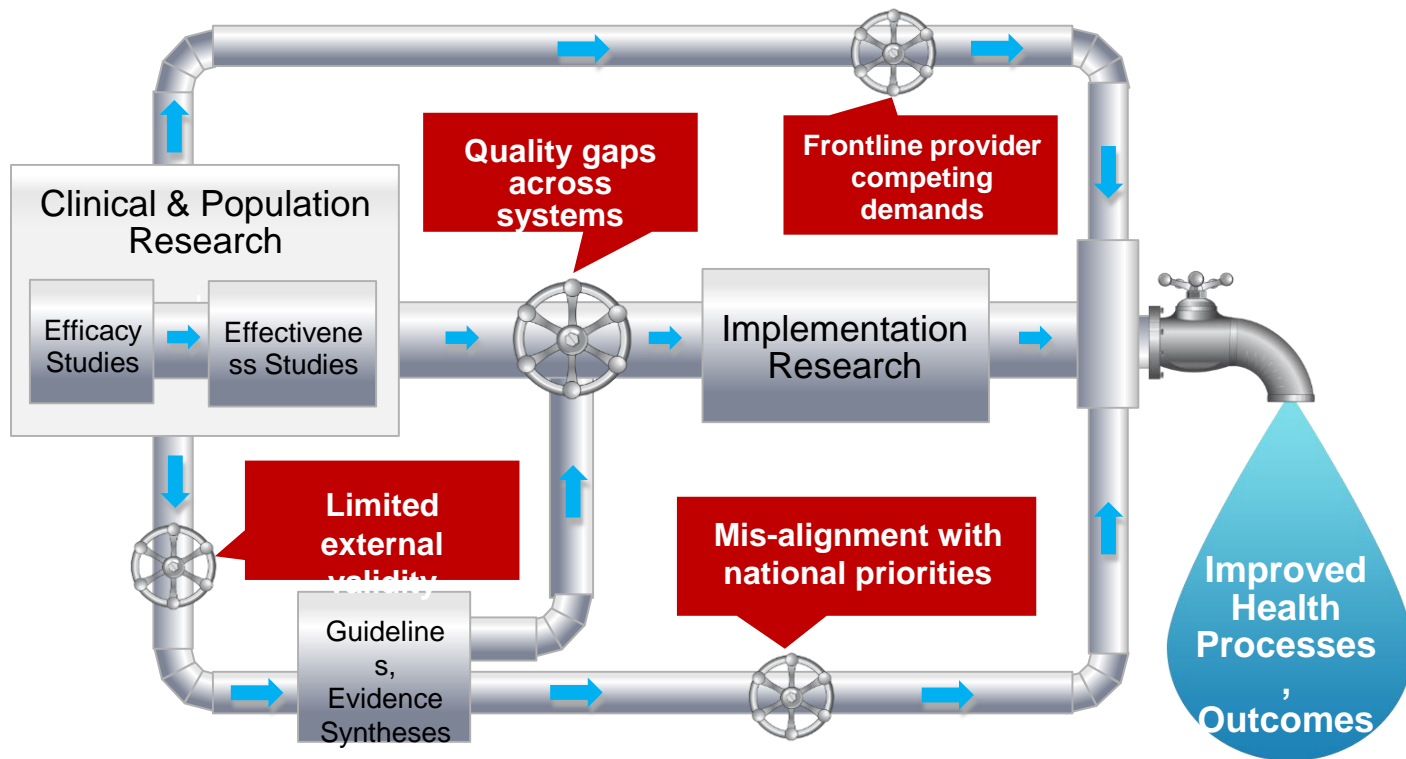
# ***Beyond the Pipeline:***

**Dissemination & Implementation May Follow an Iterative Research Process**

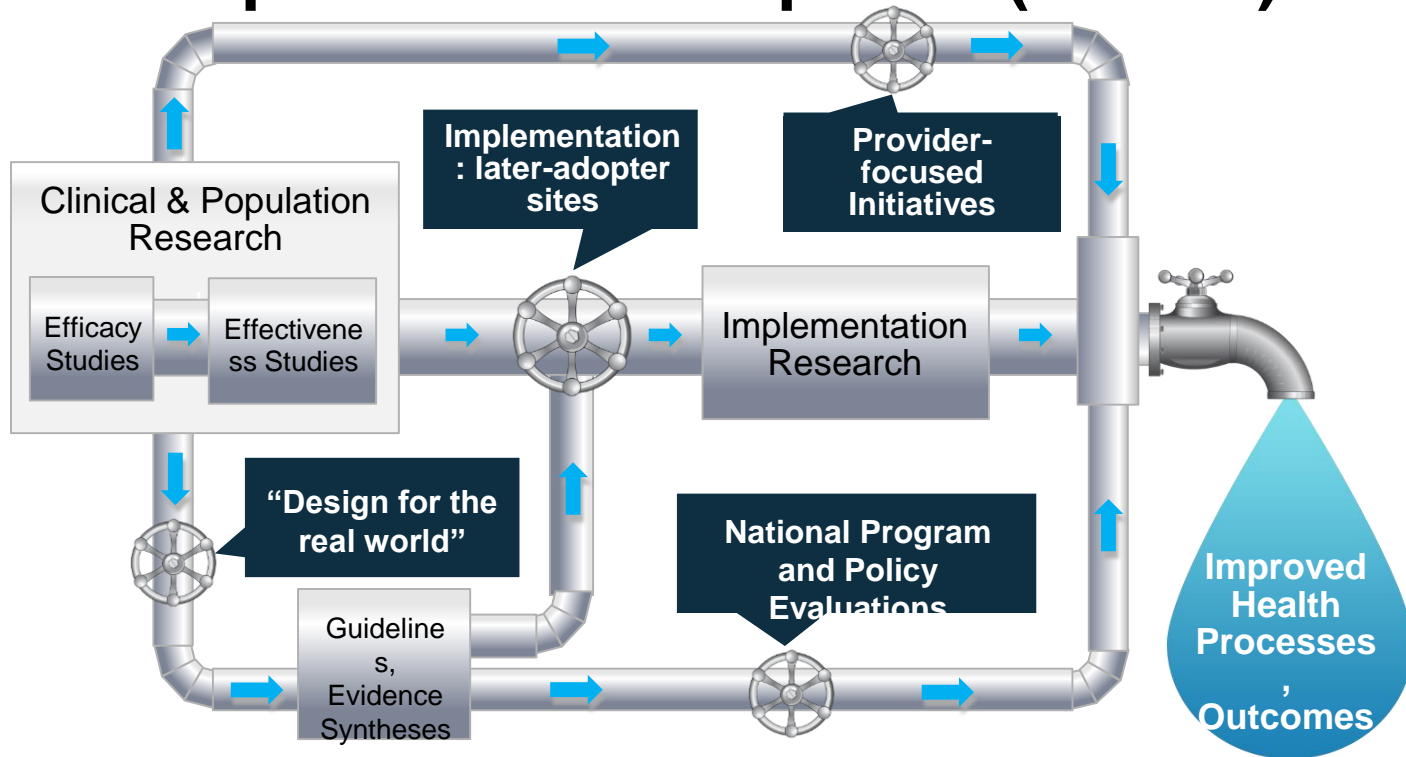


*Modified from Rutter M: Psychological Medicine 2009 39,529-42*

# Second-Generation Implementation Pipeline (QUERI)



# Second-Generation Implementation Pipeline (QUERI)



# Implementation Science

“The scientific study of methods to promote the systematic uptake of research findings and other EBPs into routine practice, and, hence, to improve the quality and effectiveness of health services” (Eccles & Mittman, 2006)

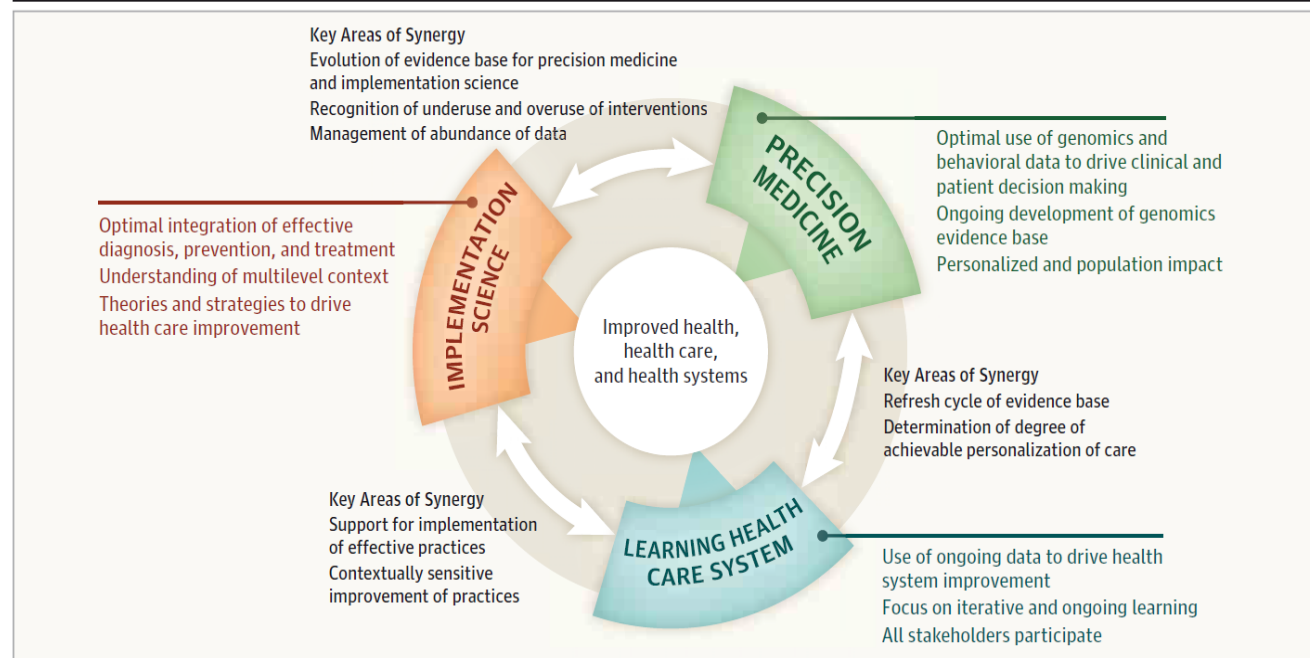
*Synonyms include:*

*Knowledge Translation*

*Technology Transfer*

# Conversion of Implementation Science, Precision Medicine, & Learning Health Care System

Figure. Contributions of Implementation Science, Learning Health Care System, and Precision Medicine

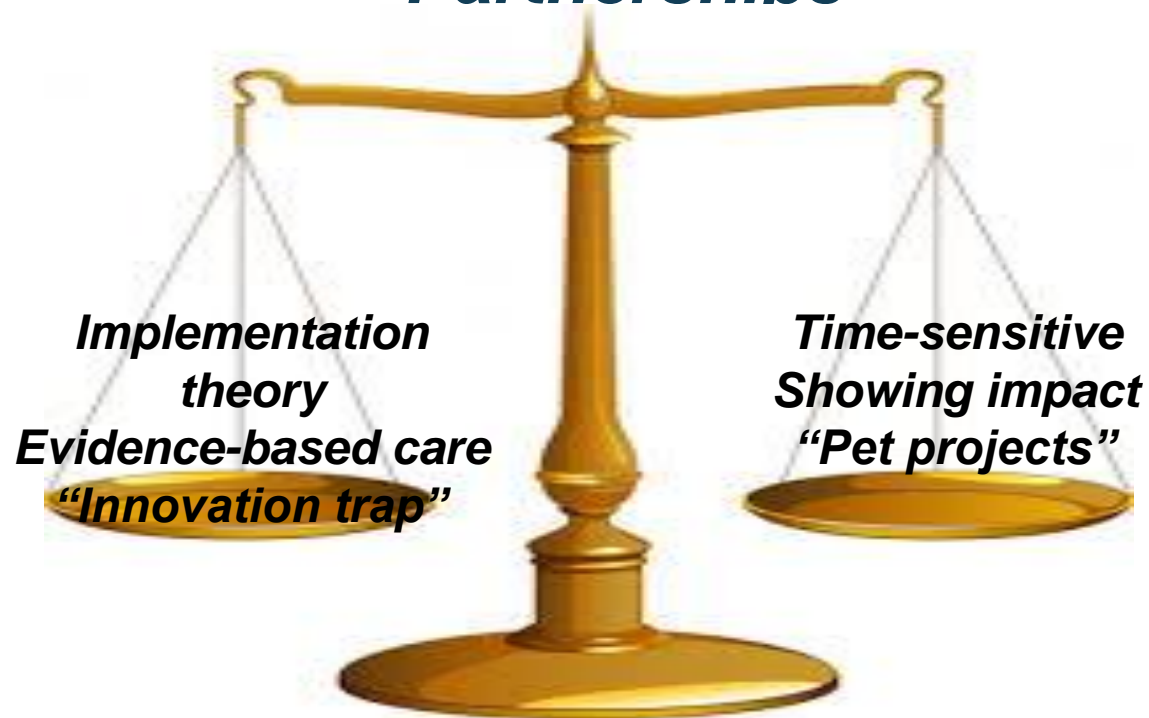


Chambers DA, Feero WG, Khoury MJ. Conversion of Implementation Science, Precision Medicine, and the Learning Health Care System, JAMA 2016

# Why Implementation Science?

- *Journal publishing insufficient*
- *Relationships are important*
- *Health systems continuously adapting*
- *Top-down AND bottom-up strategies*

# ***Implementation Involves Managing Partnerships***



# Implementation Theory

*May C. Towards a general theory of implementation. Imp. Sci. 2013*

“A deliberately initiated **process**, in which **agents** intend to bring into operation new or modified **practices** that are institutionally sanctioned, and are performed by themselves and other agents”

## **Key terms:**

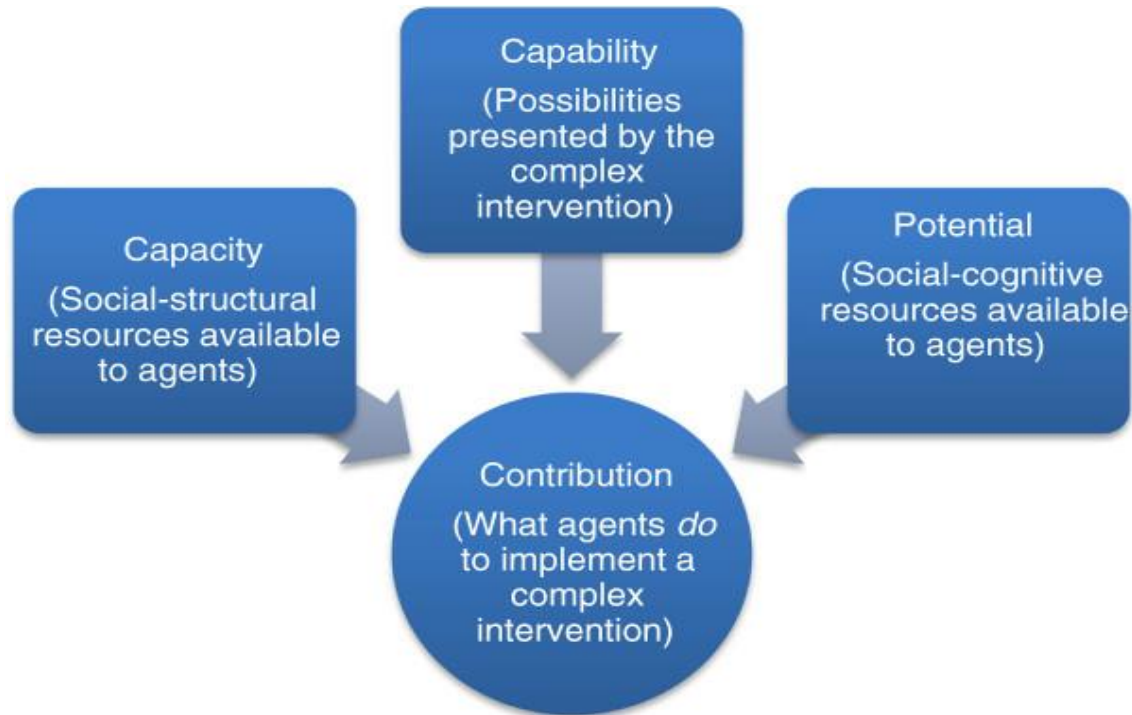
**Process**

**Agents**

**Institutionally sanctioned practices**



# General Theory of Implementation



***May C. Towards a general theory of implementation. Implement Sci. 2013***

# What Influences Implementation?

Domain	Factors/
Capacity	Organizational resources . . . ?
Capability	Program characteristics . . . ?
Potential	Provider, recipient factors . . . ?
Contribution	Day-to-day operations . . . ?

***May C. Towards a general theory of implementation. Implement Sci. 2013***

# Applying Theory: Choosing Implementation Frameworks

*“Theories inform the (frameworks) that provide the under girding or infrastructure, much like the frame of a house.”*

- Explanatory: *how* implementation activities will affect a desired change
- Process: *what* implementation strategies should be planned

*Sales A, Smith JL, Curran G, Kochevar L. Models, strategies and tools: The role of theory in implementing evidence-based findings into health care practice. JGIM 2006; 21:S43-49.*

# Some Implementation Frameworks

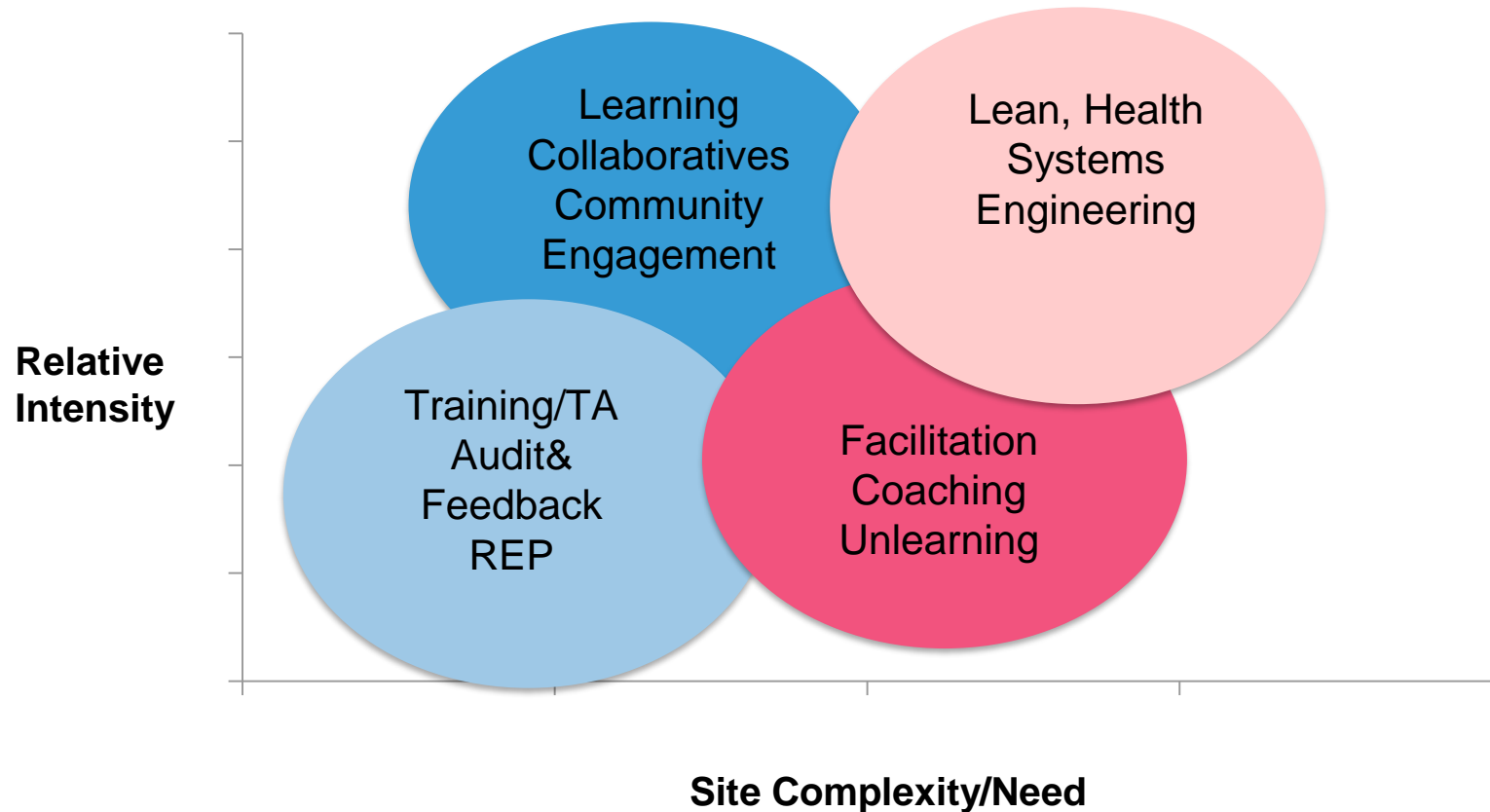
- Explanatory
  - Consolidated Framework for Implementation Research (CFIR)
  - Theoretical Domains Framework (TDF)
  - Greenhalgh Implementation Processes Model
- Directive/applied
  - Reach Effectiveness Adoption Implementation Maintenance (RE-AIM)
  - Evidence-based Quality Improvement
  - Blended Facilitation
  - Replicating Effective Programs (REP/Enhanced REP)
  - Getting to Outcomes

# Frameworks Inform Implementation Strategies

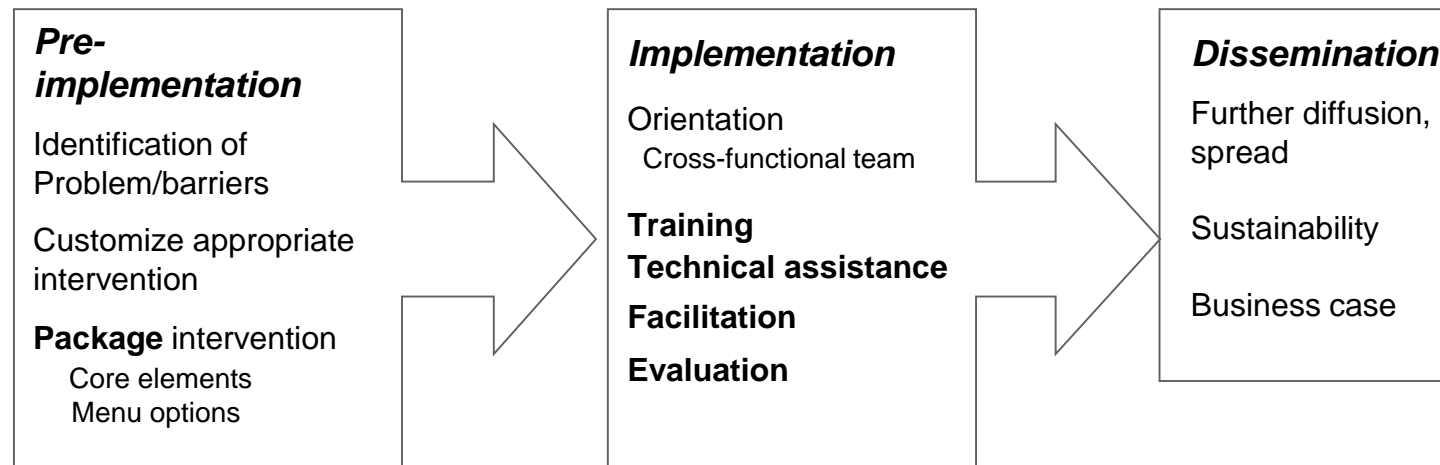
*Highly-specified, systematic processes used to implement treatments/practices, often at the clinic or provider level, into usual care settings*

- Address barriers, facilitators to adoption
- Buy-in from providers, organizations
- Should be tested across effective practices/programs

# ***Examples of Implementation Strategies***



# Example: Enhanced Replicating Effective Programs (REP) Framework



*REP was developed by the Centers for Disease Control to rapidly translate HIV prevention programs to community-based settings*

*Enhanced REP includes additional facilitation based on the PARiHS framework: developing relationships and promoting provider self-efficacy*

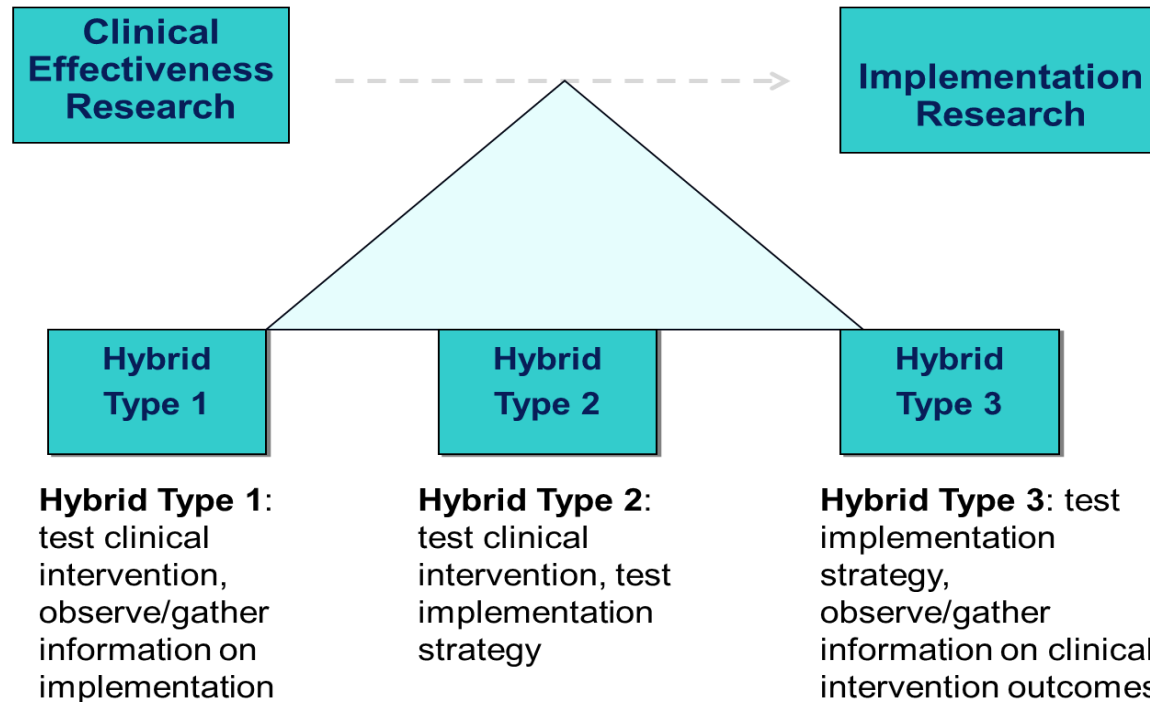
# Hybrid Effectiveness/ Implementation Designs

- Testing implementation strategies
- Address limits of step-wise research (speed research → practice)
- Promote external validity
- Blend effectiveness, implementation stages

*Curran, et. al. Effectiveness-Implementation Hybrid Designs. Med Care 2012*



# Types of Hybrid Designs

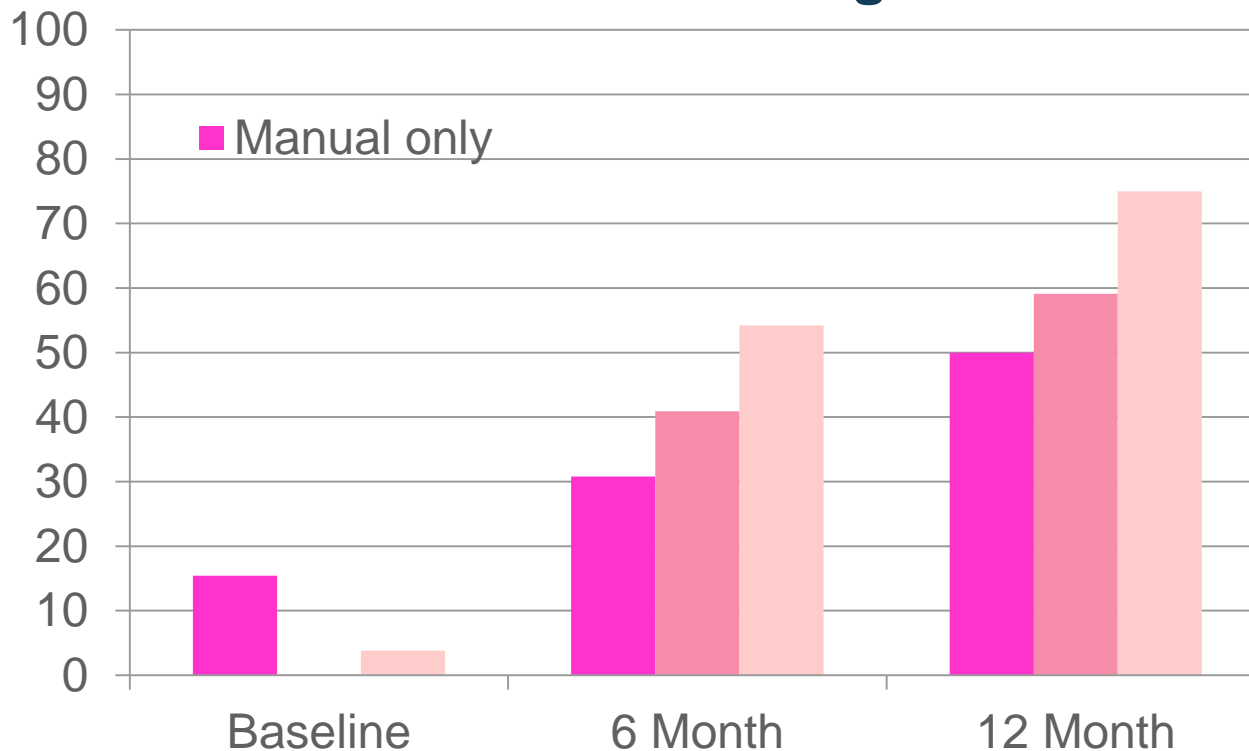


# Hybrid Effectiveness/ Implementation Designs

	Type I	Type II	Type III
Design Characteristic	Test clinical intervention	Test both clinical & implementation strategies	Test implementation strategy
Question	Is treatment effective versus usual care (UC)?	Is treatment delivered through tailored provider education effective vs UC?	Does tailored (vs. standard) provider education improve treatment use?
Unit of analyses	Patient	Providers/clinics	Providers/clinics
Primary outcomes	Health outcomes	Process measures	Uptake

**Curran, et. al. Effectiveness-Implementation Hybrid Designs. Med Care 2012**

## Hybrid Type III: REP and Uptake of HIV Prevention Interventions in AIDS Service Organizations



*Kelly J, et al. AJPH 2000*

# Take Home Points

- “Nothing is more practical than a good theory”
- Partner or perish
  - Understanding what your stakeholders need AND
  - The lay of the land: barriers, facilitators to translation
  - Expect to jump on moving trains
- Go beyond assessing barriers/facilitators
- Mix **top-down** and **bottom-up efforts**
  - **Centralized** and **locally driven** approaches
  - Plan a good design

Thank you for your attention.

Please return to the Wikispace for assigned readings and Assignment 1 questions for response.