

# The New (?) Science of Implementation

Steven M Asch MD MPH

# Overview

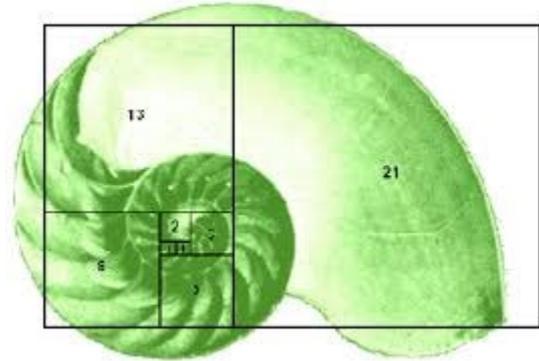
- Why implementation science?
- What is implementation science?
- Dialogue

# Why Implementation Science?

# Why Do We Engage in Scientific Inquiry?

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To increase human  
knowledge of truth?

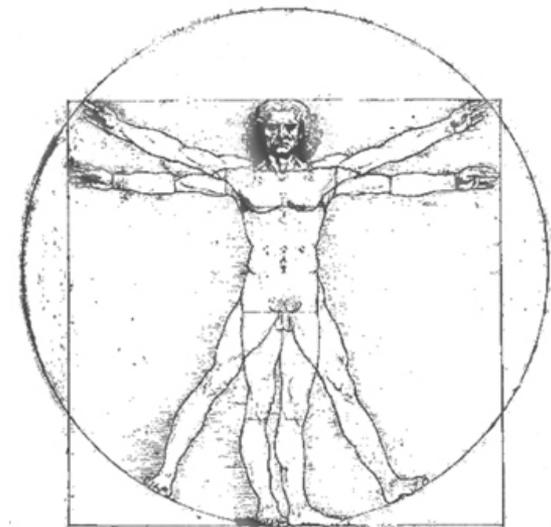
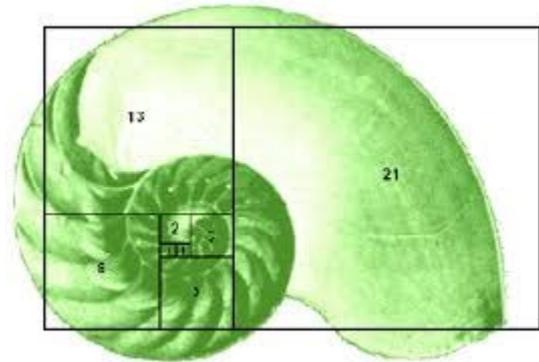


# Why do we engage in scientific inquiry?

To increase human  
knowledge of truth?

OR

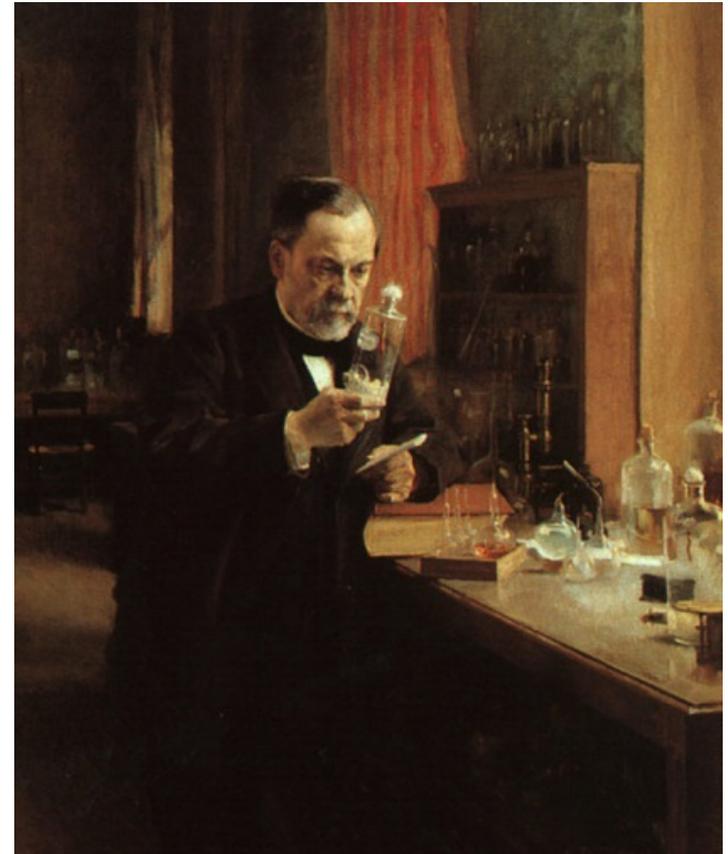
To improve the  
human condition?



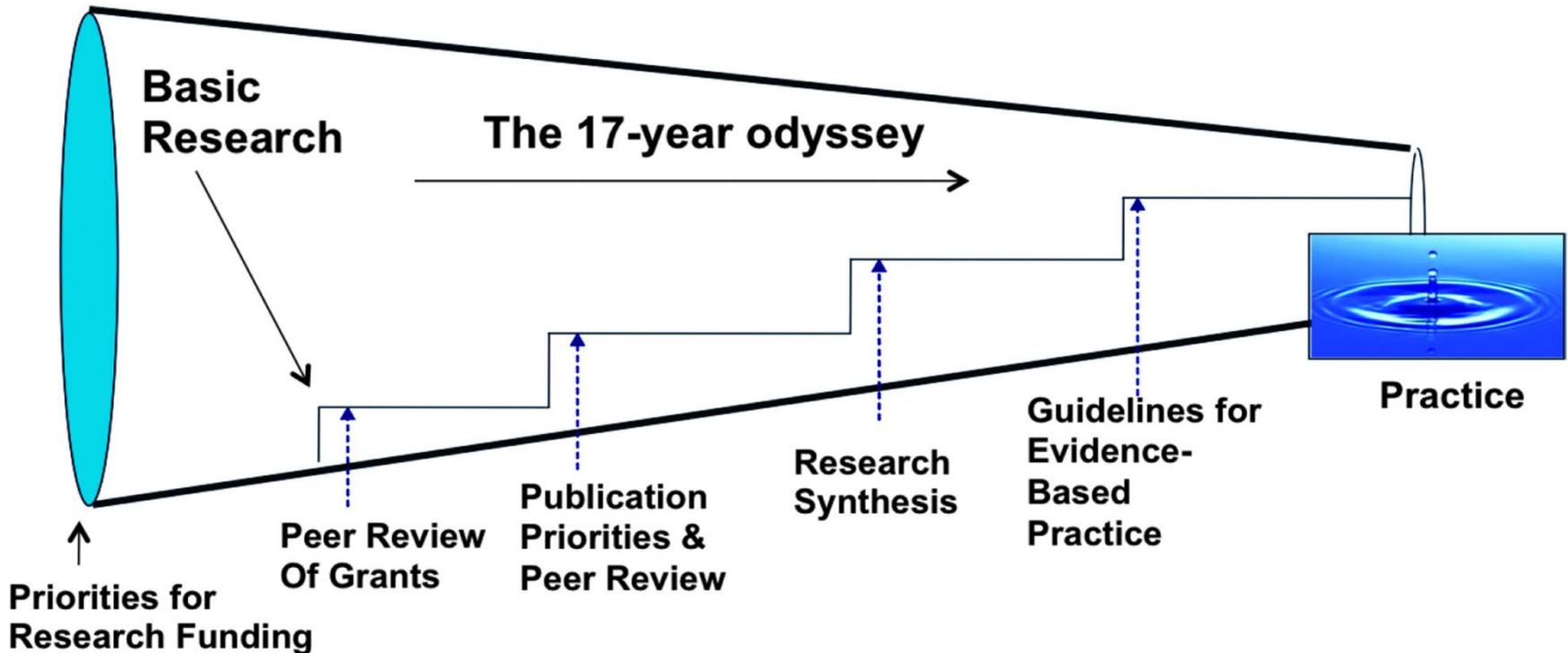
“To that person who devotes his life to science, nothing can give more happiness than increasing the number of discoveries.

But his cup of joy is full when the results of his studies immediately find practical applications.”

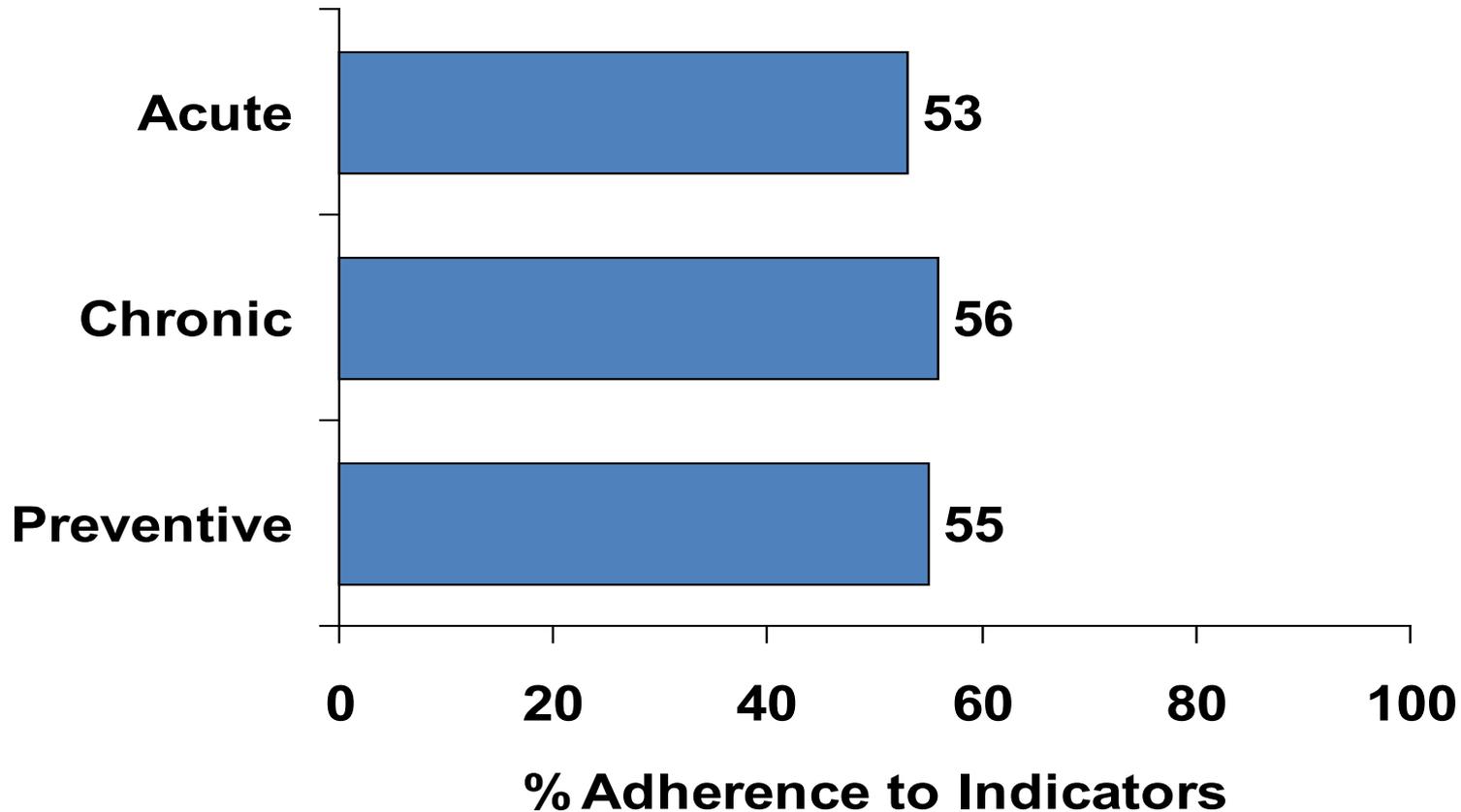
—*Louis Pasteur*



# The Translation Pipeline



# 54% of Recommended Care Received



Diffusion/  
Translation  
↓  
Implementation

Reflection  
↑↓  
Action



Paulo Freire  
1921-1997

# NIH View of Translational Research

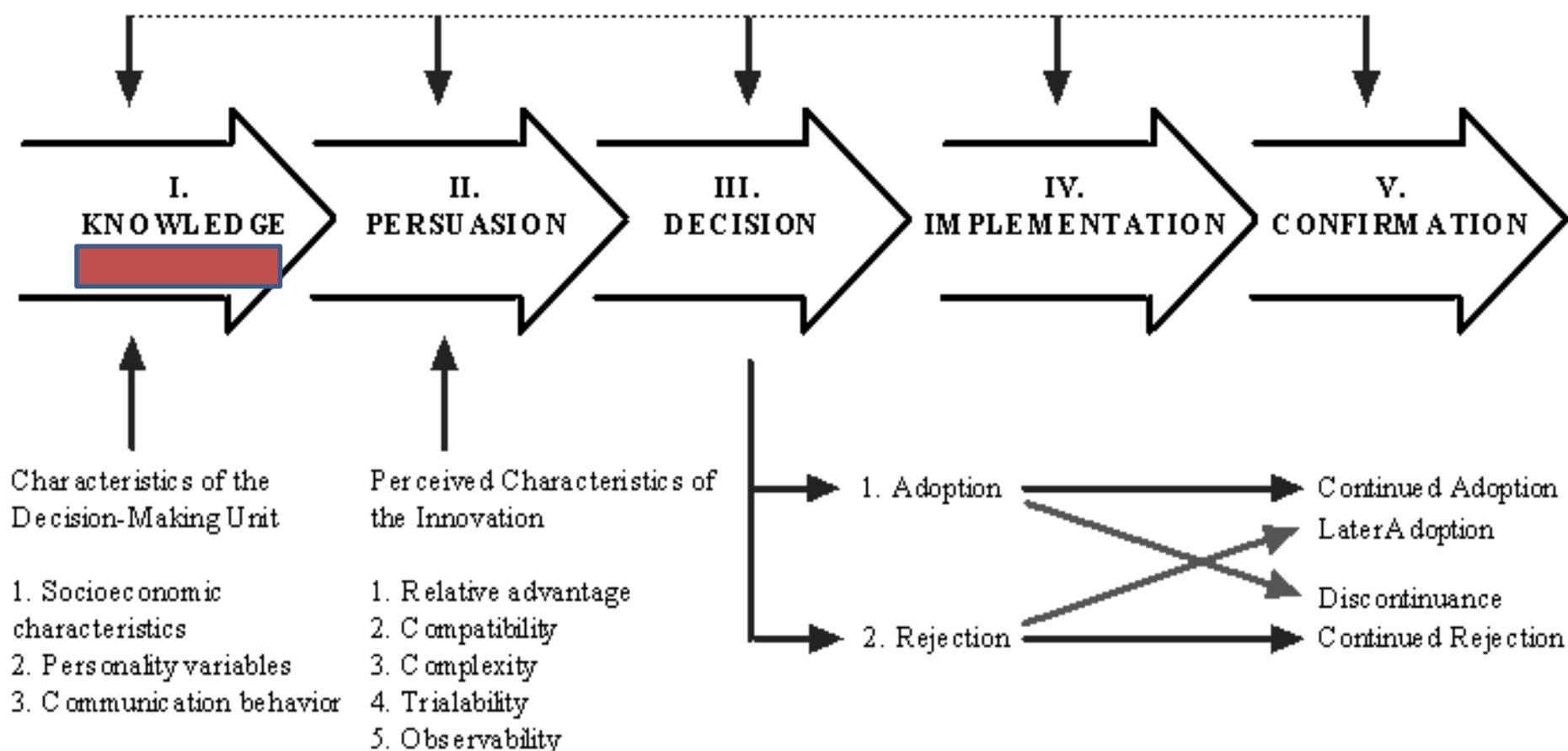
- According to the National Institutes of Health, “in order to improve human health, scientific studies must be translated into practical applications.”



PRIOR  
CONDITIONS

1. Previous practice
2. Felt needs/problems
3. Innovativeness
4. Norms of the social systems

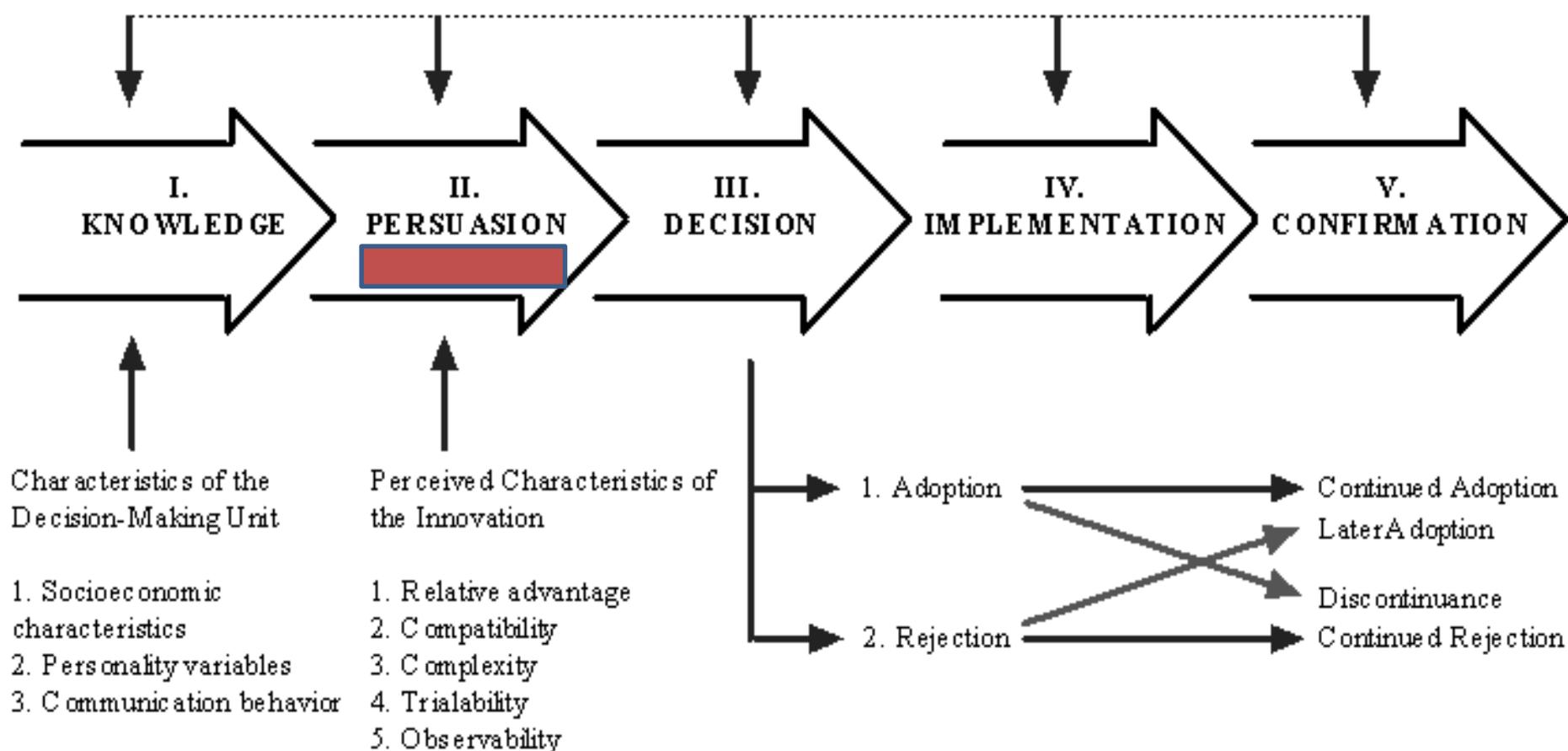
COMMUNICATION CHANNELS



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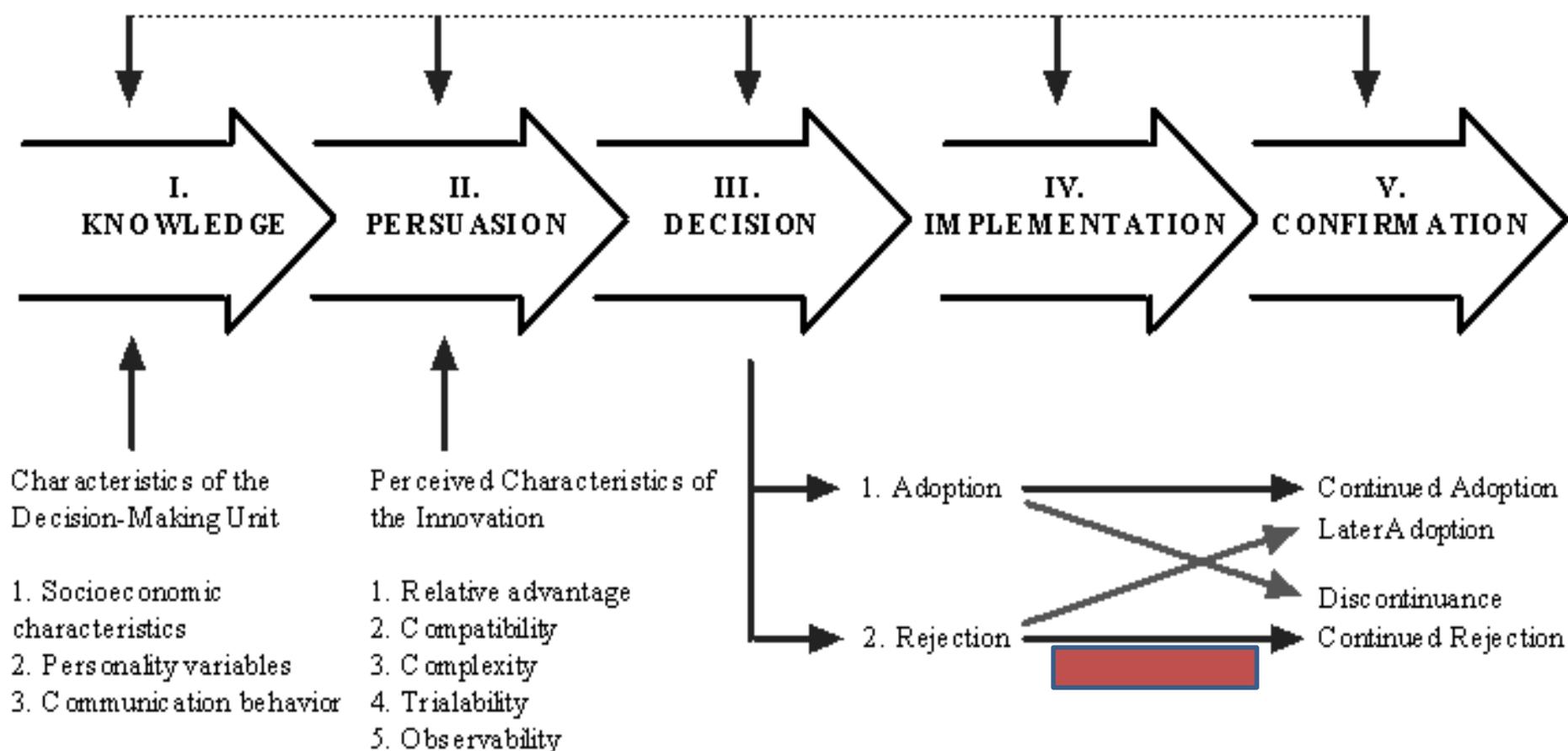
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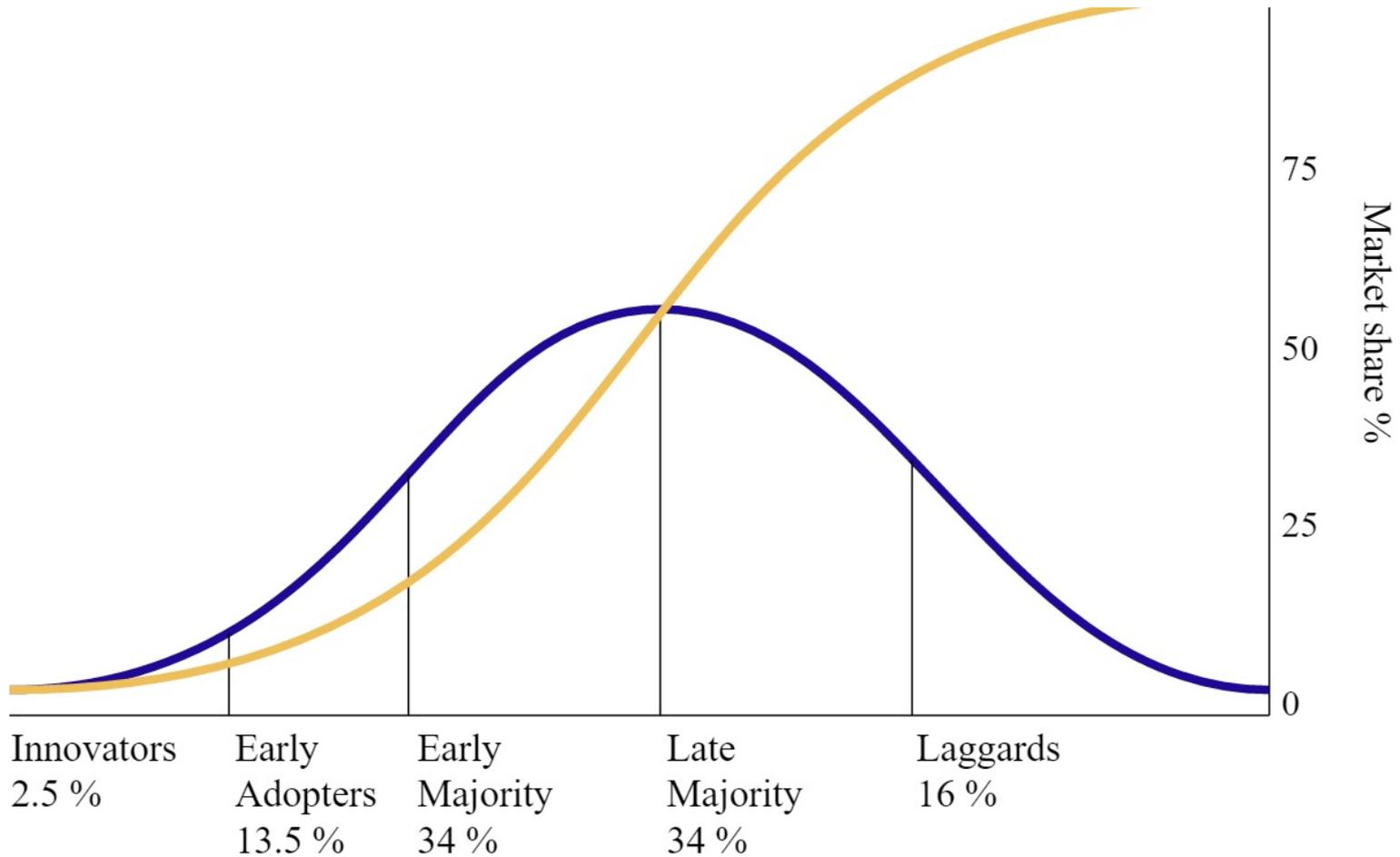
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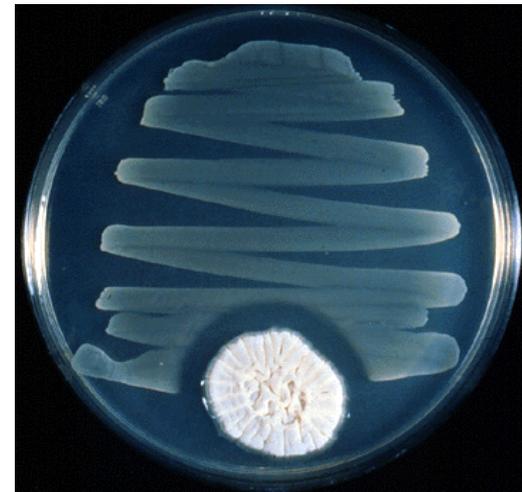


# The Rogers Diffusion Curve



# Penicillin: 1928-1950

- 1928: Fleming discovered antibacterial activity
- 1942: Florey evaluated in humans
- 1943: Produced for military
- 1950: Widely available for civilian use



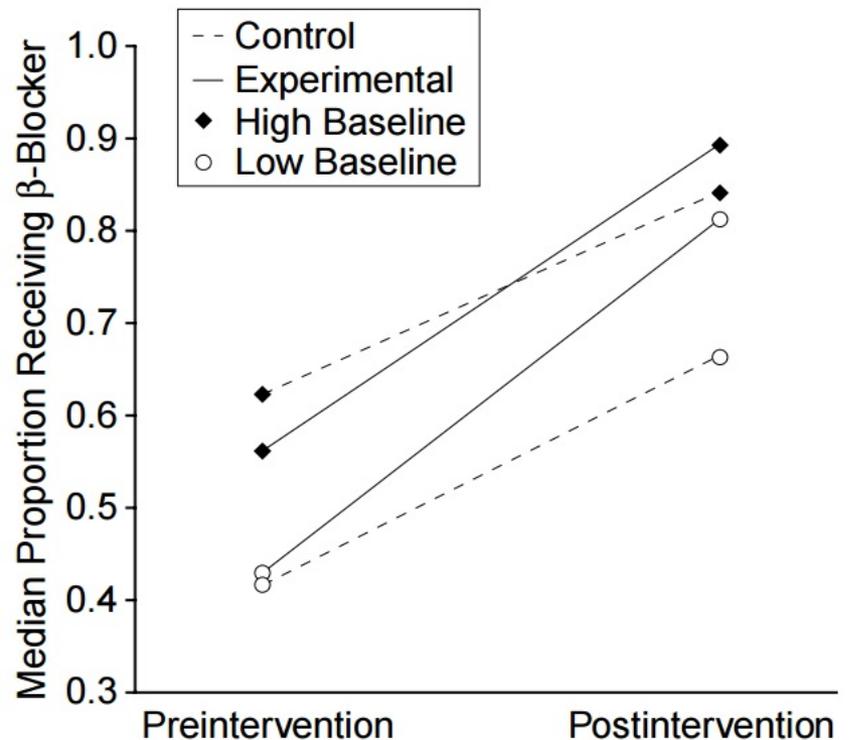
# AIDS drugs: 1987-1997

- 1987: AZT reapplied to HIV pts
- 1987-96: similar reverse transcriptase inhibitors- poor results
- 1996: HAART combinations reported
- 1997: HAART widely available in developed countries
- Now more than 30 drugs



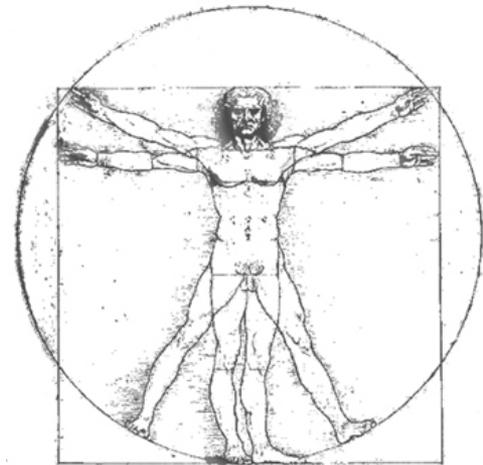
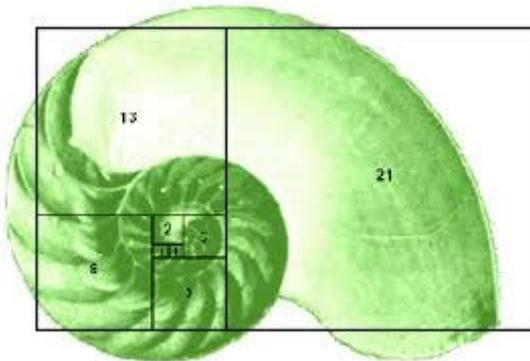
# Influencing Early Adopters

- Review: 18 opinion leader studies in 296 hospitals
- Mean 12% absolute increased adoption relative to controls

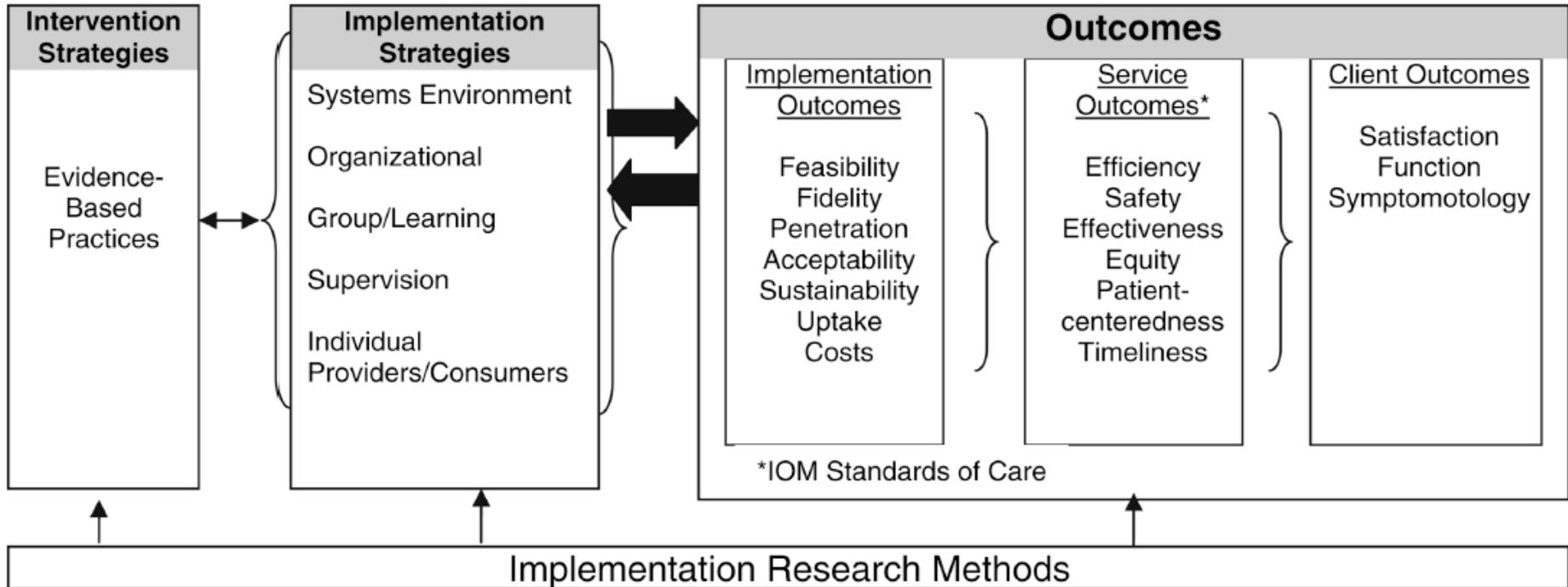


# What is Implementation Science?

*The scientific study of methods to promote the integration of research findings and evidence-based interventions into health care practice and policy (NIH definition)*

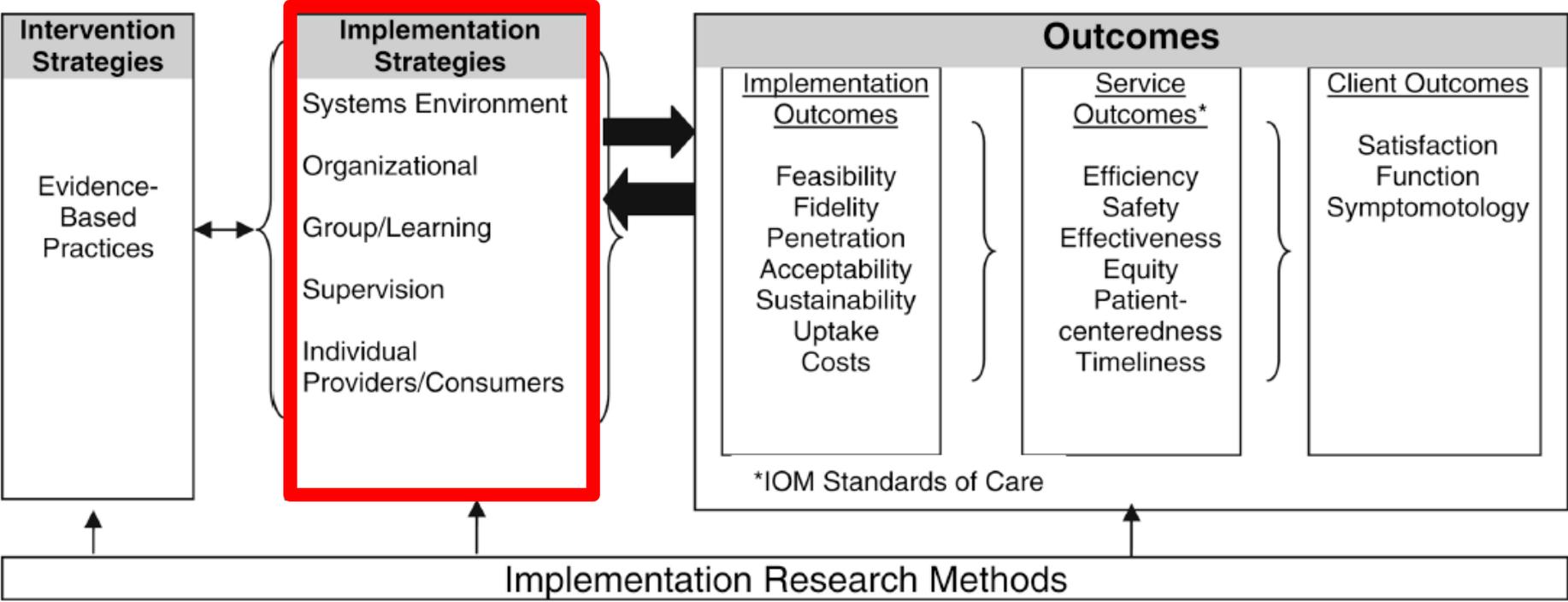


# Where Does Implementation Science Fit?



ACE -> EMR Reminder -> Reminder Use -> ACE Use -> CHF Sx

# Conceptual Model for Implementation Research



# Implementation Strategies

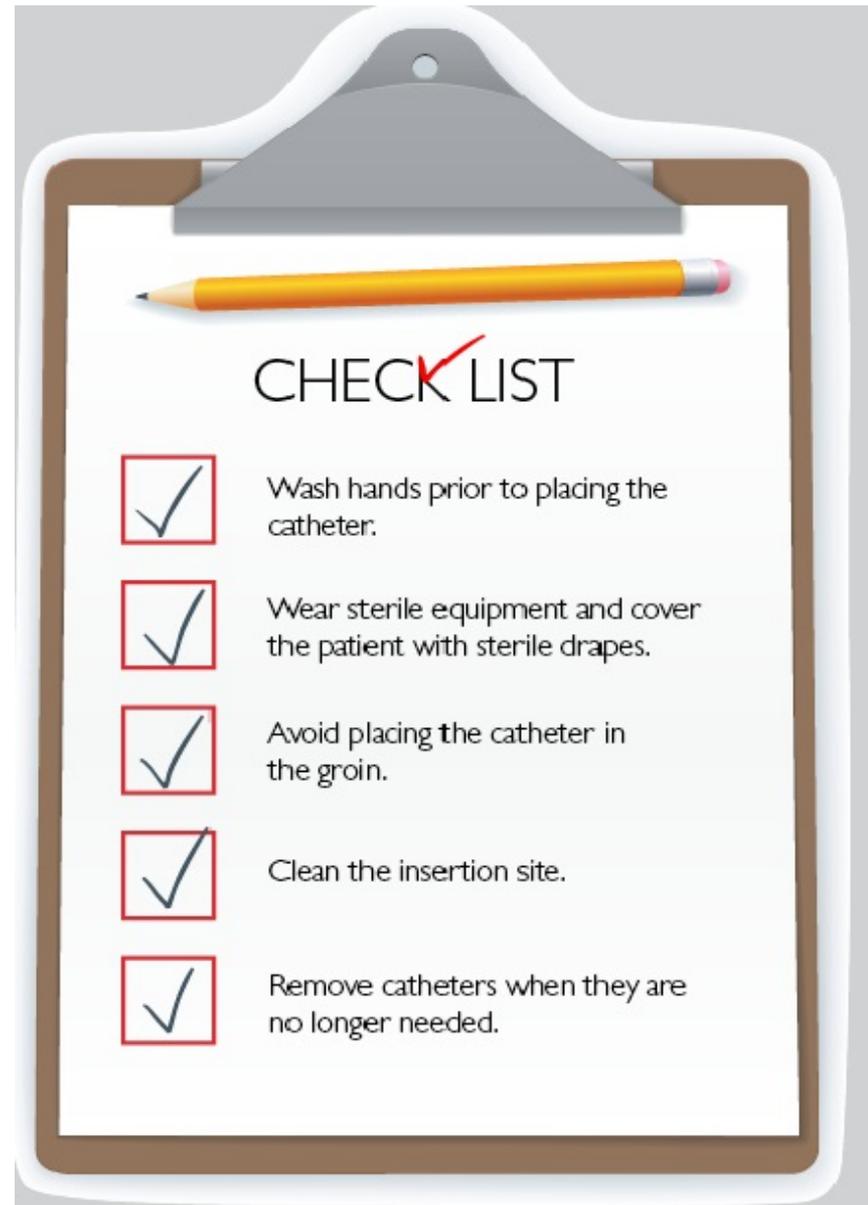
- Target
  - System (e.g. financial incentives)
  - Clinic/unit (e.g case manager dashboards)
  - Provider (e.g. reminder)
- Scope:
  - Discrete single component (e.g., ACE inhibitor reminder)
  - Package of components (e.g., CHF toolkit)

# Implementation Strategies: Function

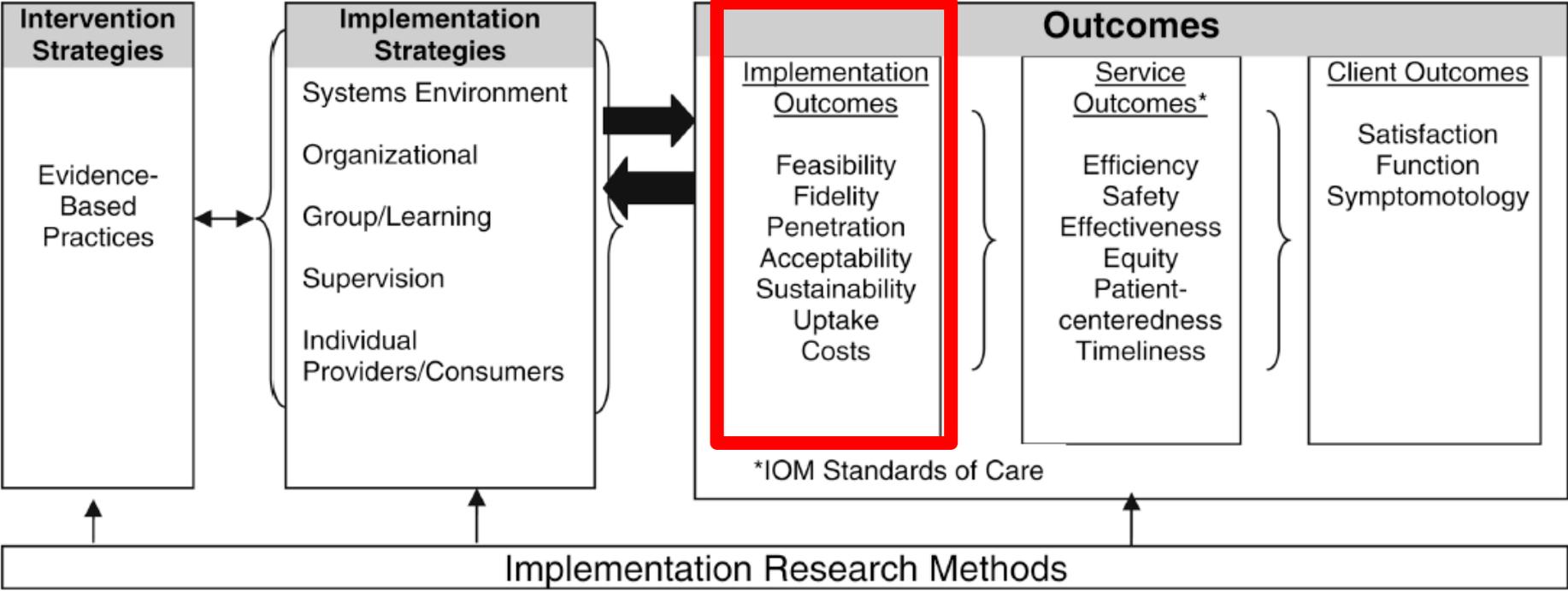
- **Planning** (e.g., conducting a local needs assessment, developing a formal implementation plan, involve leadership, identify champion, build a coalition)
- **Educating** (e.g., conduct educational meetings, distribute educational materials, create learning collaborative, use mass media, use train-the-trainer strategies)
- **Financing** (alter incentive, access new funding, penalize, change fees)
- **Restructuring** (revise professional roles, create teams, change physical structure or service sites, create new record system)
- **Quality improvement** (e.g. tools for quality monitoring, clinical reminders, audit/feedback)
- **Attending to policy context** (e.g., creating or changing credentialing and/or licensure requirements)



Target: Unit level  
Scope: Toolkit  
Function: Quality  
improvement



# Conceptual Model for Implementation Research



# Implementation Outcomes

- Acceptability
- Adoption
- Appropriateness
- Feasibility
- Fidelity
- Implementation cost
- Penetration
- Sustainability

# Implementation Outcomes

- **Acceptability**
- Adoption
- Appropriateness
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- Implementation cost
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- Sustainability

Perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory.

# Implementation Outcomes

- Acceptability
- **Adoption**
- Appropriateness
- Feasibility
- Fidelity
- Implementation cost
- Penetration
- Sustainability

Intention, initial decision, or action to try or employ an innovation or evidence-based practice

# Implementation Outcomes

- Acceptability
- Adoption
- **Appropriateness**
- Feasibility
- Fidelity
- Implementation cost
- Penetration
- Sustainability

Perceived fit, relevance, or compatibility of the innovation or evidence based practice for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address a particular issue or problem

# Implementation Outcomes

- Acceptability
- Adoption
- Appropriateness
- **Feasibility**
- Fidelity
- Implementation cost
- Penetration
- Sustainability

The extent to which a new treatment or innovation can be successfully used or carried out within a given agency or setting

# Implementation Outcomes

- Acceptability
- Adoption
- Appropriateness
- Feasibility
- **Fidelity**
- Implementation cost
- Penetration
- Sustainability

The degree to which an intervention was implemented as it was prescribed in the original protocol or as it was intended by program developers

# Implementation Outcomes

- Acceptability
- Adoption
- Appropriateness
- Feasibility
- Fidelity
- **Implementation cost**
- Penetration
- Sustainability

Refers to the cost from the payer's perspective

# Implementation Outcomes

- Acceptability
- Adoption
- Appropriateness
- Feasibility
- Fidelity
- Implementation cost
- **Penetration**
- Sustainability

Reflects the degree to which an intervention is integrated within target sites

# Implementation Outcomes

- Acceptability
- Adoption
- Appropriateness
- Feasibility
- Fidelity
- Implementation cost
- Penetration
- **Sustainability**

The extent to which a newly implemented treatment is maintained or institutionalized within a service setting's ongoing operations

# Measuring Acceptability: Ottawa Acceptability of Decision Rules Instrument (OADRI)

- 12 items; evaluates decision rule acceptability among clinicians
- Uses: evaluate rules during development, examine acceptability of rule to new audience, identify barriers to a rule use.

Please indicate your level of agreement with each of the following statements about the Canadian C-Spine Rule by clicking on the appropriate box. If you do not currently use this rule in practice, please answer the questions as if you were considering using the rule (the rule would be easy to use, etc.).

Please indicate your level of agreement with each of following statements about the rule	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree	No Opinion/ Don't know
The rule is easy to use.							
The rule is easy to remember.							
The rule is useful in my practice.							

**SAMPLE ITEMS**

# Measuring Adoption: RE-AIM Calculator

VirginiaTech *Invent the Future* | College of Agriculture and Life Sciences

People Pages  
Search Virginia Tech GO  
A to Z Index Directory

QUICKLINKS

RE-AIM

About RE-AIM

Publications

Presentations

Resources and Tools

Self-Rating Quiz

Calculations

Measures and Checklists

Visual Displays

Figures and Tables

RE-AIM Online Module Training

Helpful Links

RE-AIM  
Improving Public Health Relevance  
and Population Health Impact

Resources and Tools

## Calculating Adoption Among Settings

Potential Settings for Adoption (z)

Those eligible to participate (e)

Those contacted to participate (f)

Those who agree to participate (g)

**Potential Settings**

Links to help locate & estimate the number of potential settings

**Adoption Calculator**

Enter your numbers without commas

Potential settings for adoption [z]

Number of eligible settings [e]

Number of settings asked to participate [f]

Number of settings that agree to participate [g]

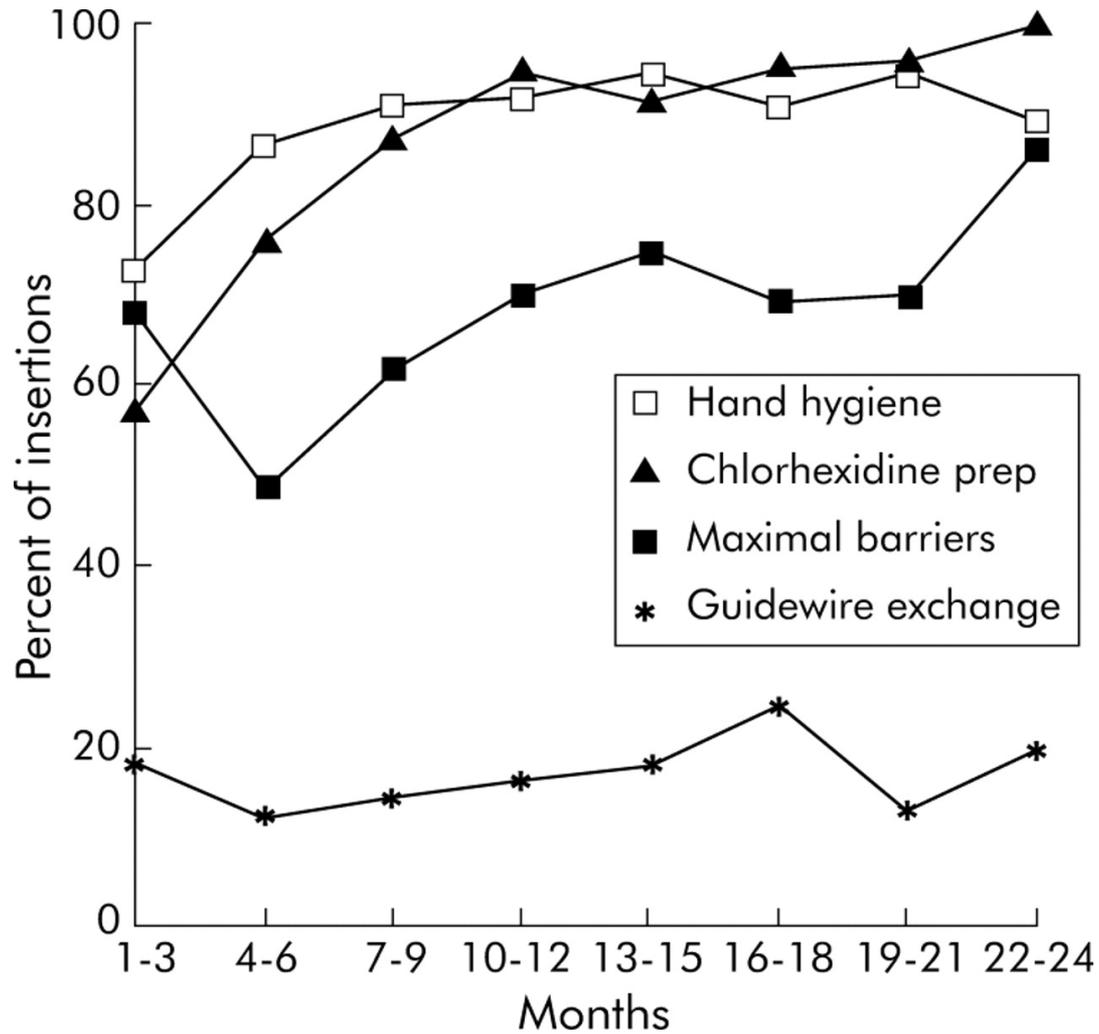
% of eligible settings excluded from study

% of eligible sites contacted to participate

% participation among contacted settings

Clear form and start over:

## Process measurements for central venous catheter (CVC) insertions.

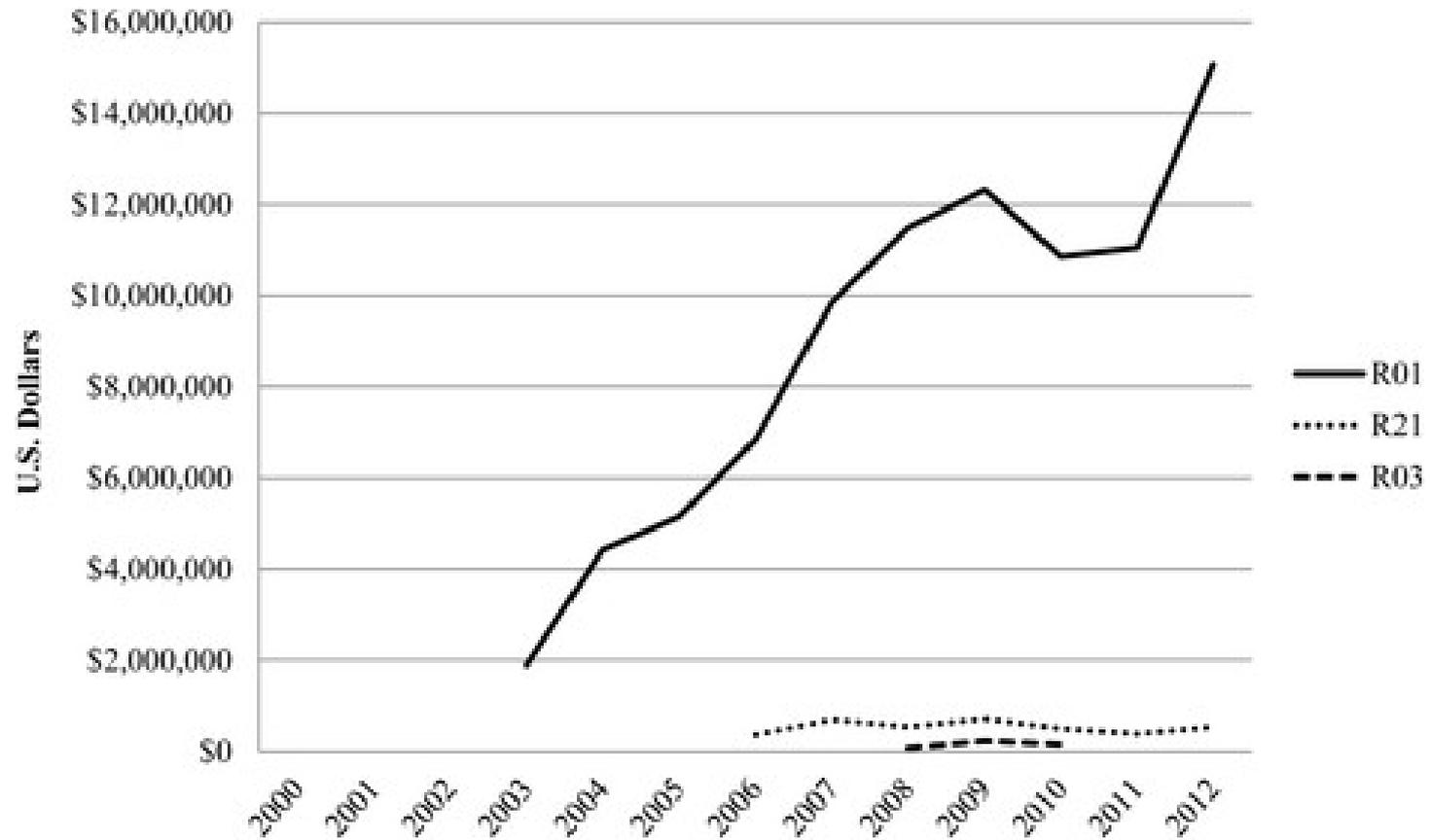


R J Wall et al. Qual Saf Health Care 2005;14:295-302

**Table 4. Incidence-Rate Ratios for Catheter-Related Bloodstream Infections.\***

<b>Variable</b>	<b>Incidence-Rate Ratio (95% CI)</b>	<b>P Value</b>
Study period		
Baseline	1.00	
During implementation	0.76 (0.57–1.01)	0.063
After implementation		
0–3 mo	0.62 (0.47–0.81)	0.001
4–6 mo	0.56 (0.38–0.84)	0.005
7–9 mo	0.47 (0.34–0.65)	<0.001
10–12 mo	0.42 (0.28–0.63)	<0.001
13–15 mo	0.37 (0.20–0.68)	0.001
16–18 mo	0.34 (0.23–0.50)	<0.001
Teaching hospital	1.34 (0.73–2.46)	0.35
Bed size (per 100 beds)	1.03 (0.97–1.09)	0.33

# Diffusion of Diffusion Research



0.3% of total NCI budget of \$5.9 billion

The ultimate goal of D&I science is to ensure that advances in health science become standards for care in all populations and all healthcare settings.

(Glasgow, AJPH, 2012)



# Dialogue and Questions

