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Implementation Science: A brief introduction

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Overview

- What is implementation science?
 - Systematic approaches
- Overview of approaches to implementation and the science of implementation
 - Frameworks
 - Using frameworks
 - Example

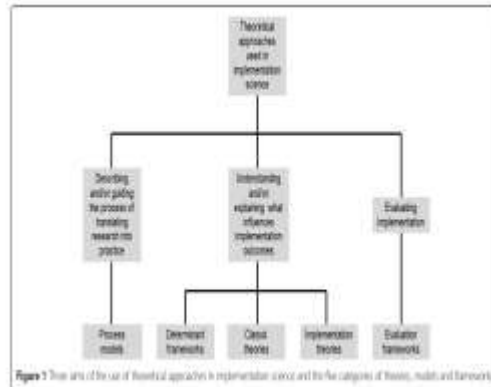
Defining implementation science (IS)

- Implementation science is the study of **methods to promote the integration of research findings and evidence into healthcare policy and practice.**
- It seeks to understand the behavior of healthcare professionals and other stakeholders as a key variable in the sustainable uptake, adoption, and implementation of evidence-based interventions.
- <http://www.fic.nih.gov/News/Events/implementation-science/Pages/faqs.aspx>
- Implementation science is the study of human behavior change under organizational constraints

A systematic approach to implementation research

Frameworks and models provide important guidance for doing implementation

- Process frameworks
 - Describing
 - Guiding the process
- Determinant frameworks
 - Understanding
 - Explaining what influences implementation
- Evaluation frameworks
 - How well the process worked



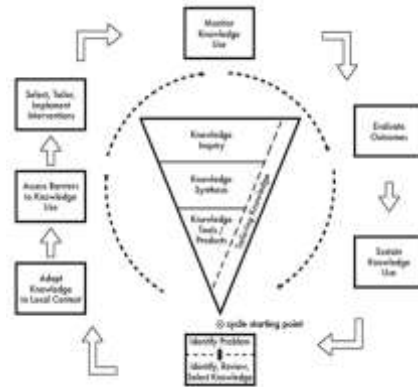
Nilsen, *Implementation Science* 2015
<http://www.implementationscience.com/content/10/1/53>

There are a lot of frameworks

- Most recent systematic review identified 61 different models or frameworks for dissemination and implementation
 - Tabak RG, Khoong EC, Chambers DA, Brownson RC. Bridging research and practice: models for dissemination and implementation research. *Am J Prev Med.* 2012 Sep;43(3):337-50. doi: 10.1016/j.amepre.2012.05.024. Review. PubMed PMID: 22898128; PubMed Central PMCID: PMC3592983
- Several efforts to consolidate frameworks
 - Damschroder LJ et al. 2009
<https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-4-50>
The Consolidated Framework for Implementation Research (CFIR)
 - Francis et al. 2012
<https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-7-35>
The Theoretical Domains Framework (TDF)
 - Flottorp et al. 2013
<https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-8-35>
: The Tailored Implementation in Chronic Disease (TICD) checklist

Process frameworks

- Describe or guide process of implementation
 - Often steps in a cycle



<http://ktclearinghouse.ca/knowledgebase/knowledgetoaction>

Evaluation frameworks

- Specify aspects of implementation for evaluation
- How do you measure the success of implementation?



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Determinants frameworks

- Specify types/classes/domains of factors that influence the success of implementation
- Damschroder LJ et al. 2009 <https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-4-50> The Consolidated Framework for Implementation Research (CFIR)
- Francis et al. 2012 <https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-7-35> The Theoretical Domains Framework (TDF)
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How to use these three types of frameworks

- Process
 - Planning your work
- Evaluation
 - Did your efforts work?
- Determinants
 - Figure out what you need to do
 - Design one or more implementation interventions

Focusing on determinants

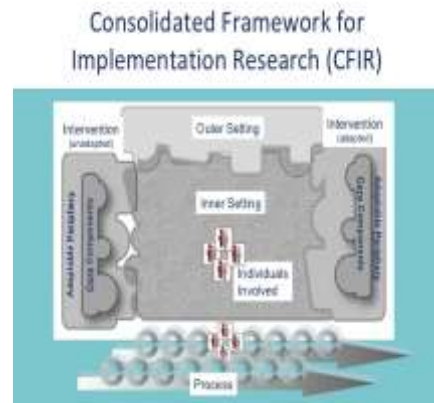
- Step 3
 - Assess barriers and facilitators to implementing your innovation/evidence based practice/policy/program
 - Why?

Reasons to assess barriers and facilitators (**determinants of implementation success**)

- To overcome them
 - Planning
 - Awareness
- To study them
 - We have plenty of catalogs
 - Listing them is not necessarily all that helpful
 - Determinants frameworks are catalogs of barriers and facilitators
 - Organized into some kind of taxonomy or system for classifying them

CFIR

- Five domains
 - Outer Setting
 - Inner Setting
 - Intervention Characteristics
 - Characteristics of Individuals
 - Implementation Process
- 26 main constructs
- 13 sub-constructs



www.cfirguide.org

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TDF

- Fourteen domains
 - Knowledge
 - Skills
 - Social/professional role identity
 - Beliefs about capabilities
 - Optimism
 - Beliefs about consequences
 - Reinforcement
 - Intentions
 - Goals
 - Memory, attention and decision processes
 - Environmental context and resources
 - Social influences
 - Emotion
 - Behavioral regulation
- 84 constructs



<https://www.biomedcentral.com/collections/tdf>

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TICD

- Seven domains
 - Guideline factors
 - Individual health professional factors
 - Patient factors
 - Professional interactions
 - Incentives and resources
 - Capacity for organizational change
 - Social, political and legal factors
- 37 major constructs
- 26 sub-constructs



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So how do you use these?

- Assessing barriers and facilitators
 - Conduct interviews guided by your selected framework
 - Analyze interviews using the same (possibly additional) framework(s)
 - Evaluate the types of barriers and/or facilitators that need to be addressed
 - Prioritize– which are most important?
 - Assess feasibility– which can be overcome, and how?
 - If feasible, link to implementation strategies and/or behavior change techniques

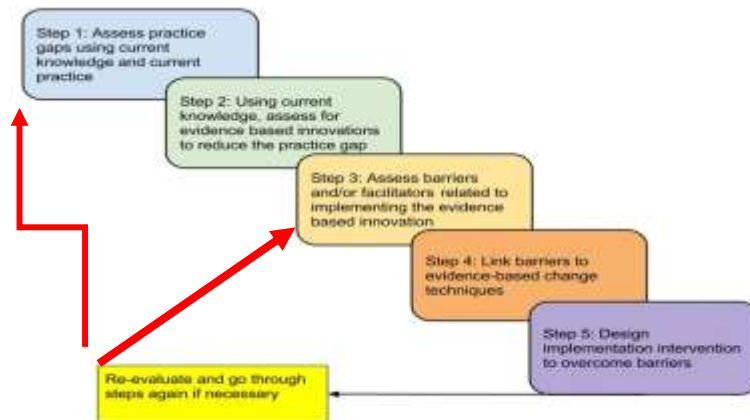
Designing interventions

- Current leading edge in implementation research
 - Linking barriers to techniques (at individual level)
 - Linking barriers to strategies (at higher level)
 - Designing interventions from strategies (broad) and techniques (micro) as indicated



Example: Implementing
evidence based practices in
an ICU

Systematic approaches are important



Problem: Patients are on mechanical ventilation for a long time

- Longer than other comparable units
- Long term outcomes are poor
 - High mortality
 - Loss of functional status
 - Long term impairment
- ABCDE evidence based bundle for improvement
 - Spontaneous Awakening trials
 - Spontaneous Breathing trials
 - Coordination of these two
 - Delirium assessment
 - Early mobilization

How do we get



- What behavior needs to change?
 - Need to check whether the patient can breathe without assistance → discontinue ventilator
 - Need to see whether the patient can tolerate being awake → trial of sedation interruption
 - Need to help the patient sit up, stand up, walk

Going from barrier assessment to behavior change technique (using TDF)

- Barrier: Nurses are not sure they have the skills to handle initial attempts at interrupting sedation
 - Barriers: Skills, self-efficacy, action planning
 - Behavior change techniques:
 - Goal/target specified: behavior or outcome
 - Monitoring/self-monitoring
 - Graded tasks
 - Social processes of encouragement, support
 - Prompts, triggers, cues

More barriers to implementation

- Providers are unaware of their actual performance
 - Lack of motivation/goals
 - Behavior change techniques:
 - Goal/target specification
 - Contract
 - Feedback
 - Rewards and incentives
 - Persuasive communication
 - Information about behavior and outcomes

Designing an intervention

- Most relevant issues are self-efficacy on the part of nurses, lack of performance awareness by all staff
 - Intervention could include
 - Feedback component: **Audit with feedback**
 - Ensure that people know what the current status is and what patient outcomes are
 - Specifying the goal or target for improvement: **Goal setting or action planning**
 - Ensuring they know how they are doing in meeting that target
 - **Social processes of encouragement and support**
 - Leadership engagement and coaching: **Mandating change**

Don't forget process and evaluation

- Process frameworks offer guidance in addition to the very specific use of determinants frameworks in design of implementation interventions
- Evaluation is critical
 - Did it work?
 - Evaluation frameworks are not study designs
 - Generally provide guidance about what to measure
 - Assessing success of implementation

Summary

- We have a lot of studies and literature suggesting that systematic approaches to implementing evidence based practices are more effective
 - We have guidance that is embodied in frameworks about
 - How to do implementation (process frameworks)
 - What to measure and plan for (determinants frameworks)
 - How to figure out whether what we did worked (evaluation frameworks)
 - Using this guidance should make the process simpler and easier to study

Questions?

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