Pragmatic frameworks and systematic approaches to intervention design

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Some thoughts about healthcare and how it works

• You need to deal with issues related to professionalism
  • Autonomy
  • Self-regulation
  • Specialized knowledge

• You almost always have to deal with organizations and individuals inside organizational contexts
  • Implications for behavior
  • Implications for measurement
  • Implications for analysis
Thinking about levels from the provider’s perspective
Behavior, decisions, and practices

• Our practice is made up of a series of decisions and actions or behaviors
  • Examples include
    • Treating a patient with high blood pressure
    • Adjusting medications for diabetes
    • Discussing treatment options for a patient with newly diagnosed breast cancer
  • Almost all practices are bundles of behaviors formed at some level by decisions
• It’s all about behavior and decision-making
  • How much do we think about what we do?
  • Can we make decisions if we don’t think about what we do?
  • Can we change our decisions and our behavior if we don’t think (much) about what we do?
Thinking about what we do

Source: http://www.greenbookblog.org/2012/03/15/lessons-from-thinking-fast-slow-system-1-and-system-2/
Implications for decision-making and behavior

- **System 1**
  - Automatic
  - Unplanned
    - “Ingrained”
  - Fast
  - Reflexive (not reflective)

- **System 2**
  - Intentionality
  - Planning
  - Rational decision making
  - Rational behavior

Much of decision making in health care is automated, fast, System 1 thinking; we often need people to engage in System 2 thinking for innovation to take hold
To summarize

- We may be fighting an uphill battle to achieve implementation of innovations, especially evidence-based care, in health care.
- Overcoming barriers related to:
  - Professional autonomy
  - Hierarchical behavior
  - Chaotic, often poorly managed systems designed to achieve outcomes which are not our desired outcomes
  - Ways of thinking and decision making that are not aligned with what’s needed to allow innovation to take hold
Solutions

• Planning, planning, planning
• Keeping a broad scanning field as you assess barriers
  • May come from multiple levels
  • Resistance is often unexpected
• Systematizing approaches makes sense
  • We promote standardization as part of most evidence based practice; we should at least try to use it ourselves
One possible systematic approach

Step 1: Assess practice gaps using current knowledge and current practice

Step 2: Using current knowledge, assess for evidence based innovations to reduce the practice gap

Step 3: Assess barriers and/or facilitators related to implementing the evidence based innovation

Step 4: Link barriers to evidence-based change techniques

Step 5: Design implementation intervention to overcome barriers

Re-evaluate and go through steps again if necessary
Deciding what to implement: choosing a practice to focus on

- What is most important?
  - Figuring out criteria for making this determination
    - Feasibility
    - Burden to patients and/or providers
    - How are people doing?
      - What is their current performance?
      - How does it compare with ideal?
      - Do you have data to understand this?
- These should all factor into decision about what to implement
Mapping and analyzing

- Process mapping
  - Understanding how processes contribute to outcomes
  - Identify practices that need intervention
  - Identify influences above the level of the individual
- Practice mapping
  - Mapping out the practices under consideration for intervention
  - Understand what behaviors make up the practices
  - Understand decision points
- Root cause analysis
  - Mapping out the causes of failures and safety problems
  - Can be used as an approach to mapping causes more generally
Intervening to implement a new practice

- Begin by understanding the bundle of behaviors and decisions that constitute that practice
  - Map it out
- Assessing barriers (and facilitators) to implementation
  - Systematic approach based on theory
      - Product of years of development by psychologists and others
      - Set of constructs from 33 different behavior change theories grouped into 12 domains
        - This has been revised and updated
      - Domains focus largely on individual responses to attempts to promote behavior change
      - Largely qualitative (to date) approach to assessing which of these constructs apply to create barriers or possibly facilitate implementation of EBPs
        - Focus to date has been principally on barriers—need to be overcome
# TDF Domains and origins

## TABLE 1

Key Determinants of Behaviour Change from Fishbein et al., 2001; Michie et al., 2004 (see Original Publications for Definitions)

<table>
<thead>
<tr>
<th>Fishbein, Triandis, Kanfer et al., 2001</th>
<th>Michie, Johnston, Abraham et al., 2004</th>
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</thead>
<tbody>
<tr>
<td>Self-standards</td>
<td>Social/professional role and identity</td>
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<td>Skills</td>
<td>Knowledge</td>
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<tr>
<td>Self-efficacy</td>
<td>Skills</td>
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<tr>
<td>Anticipated outcomes/Attitude</td>
<td>Beliefs about capabilities</td>
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<td>Intention</td>
<td>Beliefs about consequences</td>
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<td>Environmental constraints</td>
<td>Motivation and goals</td>
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<tr>
<td>Norms</td>
<td>Memory, attention, and decision processes</td>
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<td>Environmental context and resources</td>
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<td>Social influences</td>
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<td>Emotion</td>
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<td>Action planning</td>
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Assessing barriers continued

- Complementary approach
  - Consolidated framework for implementation research (CFIR) ([link](http://www.wiki.cf-ir.net/index.php?title=Main_Page))
    - Brings together a large number of existing frameworks
    - Originally published in 2009 but has expanded and been refined through Wiki and other means
    - Sets of constructs organized into conceptual framework to be used in assessing influences on implementation
  - Five domains
    - Intervention characteristics, Outer setting, Inner setting, Characteristics of individuals, Process
    - Some overlap with TDF, but also many differences
    - More focus on factors outside the individual
  - Largely qualitative approach to date to assessing areas of focus for implementation interventions
Systematic approaches to using tools

• Both TDF and CFIR provide methods as well as frameworks
  • Methods currently are largely qualitative
    • Require interviews and possibly focus groups
    • Analysis using the frameworks to guide coding
    • Qualitative assessment of specific factors
  • More quantitative measures exist for some domains (ORCA, OCM, others)
  • Provide a catalogue of barriers to address
What to do: designing interventions

• Need to overcome barriers
  • Approaches are still being developed
  • TDF offers clear linkage to interventions based on theories
    • Further development from health psychology/techniques of behavior change
The behavior change wheel

- Puts together barriers, techniques and approaches to policy change

Practical resources

• http://www.implementationscience.com/series/TDF
• http://www.wiki.cf-ir.net/index.php?title=Main_Page
• http://www.ucl.ac.uk/health-psychology/about
  • This link provides information about two recently released books that give extensive information about behavior change techniques, the Behavior Change Wheel, and links to the barriers assessed using TDF
  • For more information on a very practical training program on using the behavior change techniques:
    • http://www.bct-taxonomy.com/#register
### Link to behavior change techniques

**BCT Taxonomy (v1): 93 hierarchically-clustered techniques**

<table>
<thead>
<tr>
<th>Page</th>
<th>Grouping and BCTs</th>
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<tbody>
<tr>
<td>1</td>
<td>1. Goals and planning</td>
<td>8</td>
<td>6. Comparison of behaviour</td>
<td>16</td>
<td>12. Antecedents</td>
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<tr>
<td></td>
<td>1.1. Goal setting (behavior)</td>
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<td>6.1. Demonstration of the behavior</td>
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<td>12.1. Restructuring the physical environment</td>
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<td>1.2. Problem solving</td>
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<td>6.2. Social comparison</td>
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<td>12.2. Restructuring the social environment</td>
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<td>1.3. Goal setting (outcome)</td>
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<td>6.3. Information about others’ approval</td>
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<td>12.3. Avoidance/reducing exposure to cues for the behavior</td>
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<td>1.4. Action planning</td>
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<td>12.4. Distraction</td>
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<td>1.5. Review behavior goal(s)</td>
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<td>12.5. Adding objects to the environment</td>
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<td>1.6. Discrepancy between current behavior and goal</td>
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<td>12.6. Body changes</td>
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<td>1.7. Review outcome goal(s)</td>
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<td>1.8. Behavioral contract</td>
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<td>1.9. Commitment</td>
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| 3    | 2. Feedback and monitoring | 9    | 7. Associations | 17   | 13. Identity |
|      | 2.1. Monitoring of behavior by others without feedback |      | 7.1. Prompts/cues |      | 13.1. Identification of self as role model |
|      | 7.2. Cue signalling reward |      | 7.3. Reduce prompts/cues |      | 13.2. Framing/reframing |
|      | 7.4. Remove access to the reward | 12   | 12.8. Antecedents |
|      | 7.5. Remove aversive stimulus |      |                  |      |                   |
|      | 7.6. Satiation |      |                  |      |                   |
|      | 7.7. Exposure |      |                  |      |                   |

<table>
<thead>
<tr>
<th>No.</th>
<th>Label</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Goal setting (behavior)</td>
<td>Set or agree on a goal defined in terms of the behavior to be achieved</td>
<td>Agree on a daily walking goal (e.g. 3 miles) with the person and reach agreement about the goal</td>
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<td><em>Note: only code goal-setting if there is sufficient evidence that goal set as part of intervention; if goal unspecified or a behavioral outcome, code 1.3, Goal setting (outcome); if the goal defines a specific context, frequency, duration or intensity for the behavior, also code 1.4, Action planning</em></td>
<td>Set the goal of eating 5 pieces of fruit per day as specified in public health guidelines</td>
</tr>
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EXAMPLE: IMPLEMENTING EBP IN AN INTENSIVE CARE UNIT SETTING
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
Going from barrier assessment to intervention design (using TDF)

- Barrier: Nurses are not sure they have the skills to handle initial attempts at spontaneous awakening
  - 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

- Barrier: 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
Consider the broader context (using CFIR)

- What are the overall goals of the hospital?
  - How does this ICU fit into the hospital as a whole?
- Key issues:
  - Staffing
  - Continuity of care
  - Morale
  - Previous attempts to change practice
  - Resources
  - Leadership support
  - Organizational readiness to change
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
      - Ensure that people know what the current status is and what patient outcomes are
    - Specifying the goal or target for improvement
      - Ensuring they know how they are doing in meeting that target
    - Social processes of encouragement and support
    - Leadership engagement and coaching
On a final note

• Complex Interventions in Health: An Introduction to Research Methods
  • Edited by David Richards, Ingalill Rahm Hallberg,
  • Routledge – 2015 (Due March)

• 33 chapters, covering problems in implementation, study design, and approaches to implementation
• Includes one I co-authored covering much of this material
Take away messages

• Key factors influence our ability to readily move evidence-based innovation into practice settings
  • Patient level factors pose different issues, some of which are analogous
• Systematizing our approaches to assessing probable barriers (and facilitators) is important
• There are emerging approaches that have advantages
  • Frameworks and theories that link to action (prescribing approaches) rather than description are more useful for intervention design
• Planning is essential
References


- Cane J, O’Connor D, Michie S. Validation of the Theoretical Domains Framework for use in behavior change and implementation research. Implement Sci. 2012 7:37 http://www.implementationscience.com/content/7/1/37


