2017 Online Conference

Knowledge Translation
Outcome Measurement

Hosted by AIR’s Center on Knowledge Translation for Disability and Rehabilitation Research (KTDRR)

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Knowledge Translation in the Age of Complexity

Diane Finegood, Centre for Dialogue, Simon Fraser University
November 1, 2017
We are living in the age of complexity

Key Messages

• Complex systems are not the same as simple or complicated systems.

• Knowledge translation is complex.

• Solutions to complex problems are not the same as solutions to simple or complicated problems.

• KT is an integral component of many solutions appropriate for complex problems.
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Definitions

• **System**: A set of things – people, cells, molecules, or whatever – interconnected in such a way that they produce their own pattern of behavior over time\(^1\).

• **Systems thinking**: a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviors, and devising modifications to them in order to produce desired effects\(^2\).

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Types of Systems

Simple

Complicated
Complex System

## Characteristics of Systems

<table>
<thead>
<tr>
<th>Simple or Complicated Systems</th>
<th>Complex Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homogeneous</td>
<td>Heterogeneous</td>
</tr>
<tr>
<td>Linear</td>
<td>Nonlinear</td>
</tr>
<tr>
<td>Deterministic</td>
<td>Stochastic</td>
</tr>
<tr>
<td>Static</td>
<td>Dynamic</td>
</tr>
<tr>
<td>Independent</td>
<td>Interdependent</td>
</tr>
<tr>
<td>No feedback</td>
<td>Feedback</td>
</tr>
<tr>
<td>Not adaptive or self-organizing</td>
<td>Adaptive and self organizing</td>
</tr>
<tr>
<td>No connection between levels or subsystems</td>
<td>Emergence</td>
</tr>
</tbody>
</table>

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A Great (Canadian) Framework for iKT

Knowledge Translation in Health Care: Moving from Evidence to Practice, 2009, Edited by S. Straus, J Tetroe and ID Graham. Reprinted with permission
More than 100 different ways to say KT

- Action Research
- Adoption
- Applied Dissemination
- Applied Health Research
- Audit and Feedback Definitions
- Bench to Bedside
- Best Practice
- Capacity Building
- Change
- Change Implementation
- Clinical and Translational Science
- Co-operation
- Co-optation
- Cognitive Application
- Collaborative Development
- Communication
- Communicative Utilization
- Communities of Practice
- Comparative Effectiveness Research
- Complex Interventions
- Complexity Science
- Conceptual Utilization
- Confirmatory or Disconfirmatory Utilization
- Continuing Education
- Continuing Professional Development
- Crossing the Quality Chasm
- Diffusion
- Diffusion of Innovations
- Dissemination
- Educational Influentials
- Educationally Influential
- Effective Dissemination
- Effectiveness Research
- End of grant KT
- Evaluation
- Evaluation Research
- Evidence Based Healthcare
- Evidence Based Medicine
- Evidence Based Nursing
- Evidence based practice
- Evidence Informed Practice
- Gap Analysis
- Guideline Implementation
- Health Care Innovation Impact
- Implementation
- Implementation Research
- Implementation Science
- Information
- Information Dissemination and Utilization
- Information Science
- Innovation
- Innovation Adaptation
- Innovation Adoption
- Innovation Adoption & Diffusion
- Innovation Development Process
- Innovations in Health Service Delivery & Organization
- Institutionalization
- Integrated KT
- Integrating Evidence
- Know-Do Gap
- Knowledge Adoption
- Knowledge Broker
- Knowledge Brokering
- Knowledge Communication
- Knowledge Cycle
- Knowledge Development and Application
- Knowledge Diffusion
- Knowledge Dissemination
- Knowledge Exchange
- Knowledge Integration
- Knowledge Management
- Knowledge Mobilization
- Knowledge Production & Utilization
- Knowledge Synthesis
- Knowledge Transfer
- Knowledge Transformation
- Knowledge Translation
- Knowledge Uptake
- Knowledge Utilization
- Knowledge-to-Action
- Linkage and Exchange
- Mindlines
- Opinion Leaders
- Organizational Innovation
- Participatory Action Research
- Patient Safety
- Policy
- Policy Research
- Popularization of Research
- Potentially Better Practices
- Quality Assurance
- Quality Improvement
- Research Capacity
- Research Implementation
- Research Integration
- Research Utilization
- Research-Practice Gap
- Routinization
- Science Communication
- Service Innovations
- Sociology of Knowledge
- Spread
- Sustainability
- Third Mission
- Total Quality Management
- Transfer
- Translation
- Translational Medicine
- Translational Research
- Translational Research Phase I
- Translational Research Phase II
- Translational Research Phase III
- Translational Science
- Transmission of Knowledge
- TRIP
- Use
- Utilization
- Validation

Source: [WhatisKT wiki](https://www.whatiskt.org/wiki) accessed September 25, 2017
Knowledge translation: traditional research system

Source: Liz-Burgos, Osgood, Finegood, Unpublished observations.
Knowledge translation: Practice-based research system

Source: Liz-Burgos, Osgood, Finegood, Unpublished observations.
Knowledge translation system
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Common responses to complex problems

• Retreat

• Despair

• Believe the problem is beyond hope

• Assign blame, figure out who is responsible

• Simple solutions

• Galvanize our collective response and invest significant resources

Wicked problems cannot be solved with a reductionist paradigm

• The information needed to understand the problem depends upon one's idea for solving it.

• The process of formulating the problem and of conceiving a solution are identical, since every specification of the problem is a specification of the direction in which a treatment is considered.

• Problem understanding and problem resolution are concomitant to each other.

Obesity System Map

Problem definition depends on who is in the room

Problem definition and resolution are concomitant

Reprinted with permission from B. Butland, unpublished observations
Systems approach to implementation

- Define
- Assess
- Implement
Approach to system/problem definition

• Be holistic and integrative rather than reductionist
• Focus on relationships, boundaries, context actors, actions and outcomes
• Consider power imbalances, heterogeneity, dynamics, incentives and disincentives, non-linearity, randomness

With permission. Based on work of Ackerly, C. Challenging knowledge divides: Communicating and co-creating expertise in integrated knowledge translation. Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Arts in the School of Communication Faculty of Communication, Art and Technology, Simon Fraser University 2017.
The Cynefin model

- **Complex**
  - Emergent practice
- **Complicated**
  - Good practice
- **Chaotic**
  - Novel practice
- **Simple**
  - Best practice

“*The Cynefin model*” by Jurgen Appelo is licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/)
Intervention Level Framework

- Paradigm = deeply held beliefs
- Goals = what the system is trying to achieve
- Structure = information flows, connectivity, trust
- Feedback & Delays = self-regulation, reinforcement, adaptation
- Structural Elements = subsystems, actors, operating parameters

<table>
<thead>
<tr>
<th>Level</th>
<th>Affordable</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradigm</td>
<td>Requires healthy food to be affordable for everyone</td>
<td>Requires food to be priced according to its full cost including environmental costs</td>
</tr>
<tr>
<td>Structure</td>
<td>Supply management of commodity crops to stabilize markets and consumer prices.</td>
<td>Supports local food production and distribution</td>
</tr>
<tr>
<td>Structural elements</td>
<td>• Ensure low-income families receive sufficient food assistance for healthy.</td>
<td>• Encourage strip tillage to save soil.</td>
</tr>
<tr>
<td></td>
<td>• Improve access to healthy food in underserved neighbourhoods.</td>
<td>• Eliminate routine use of antibiotics in livestock.</td>
</tr>
<tr>
<td></td>
<td>• Improve access through farmer’s markets.</td>
<td>• Reduce use of packaging.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase pasture based dairy production.</td>
</tr>
</tbody>
</table>

Solutions to Complex Problems

- Move from “attribution” to “adaptation”
- Support individuals / individuals matter
- Match capacity to complexity
- Set functional goals
- Distribute decision, action, & authority
- Separate simple and complex processes

- Establish networks and teams
- Build authentic trust
- Utilize the relationship between cooperation and competition
- Assess effectiveness
- Act locally, connect regionally and learn globally
- Move from “let it happen” or “make it happen” to help it happen

Based on the ideas of Bar-Yam, Wheatley, Greenhalgh, Solomon & Flores
Match capacity to complexity

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Synthesis

“Adoption SFD” by Apdevries is licensed under GNU Free Documentation License
Dissemination
## Exchange

<table>
<thead>
<tr>
<th>Bottom-up</th>
<th>Top-down</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergent</td>
<td>Planned</td>
</tr>
<tr>
<td>Adaptive</td>
<td>Influenced</td>
</tr>
<tr>
<td>Self-organizing</td>
<td>Enabled</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Managed</td>
</tr>
<tr>
<td>construction</td>
<td>Dissemination</td>
</tr>
<tr>
<td>Knowledge transfer</td>
<td></td>
</tr>
</tbody>
</table>

Source: Greenhalgh T. Et al. The Milbank Quarterly, Vol. 82, No. 4, 2004 (pp. 581–629).
Ethically Sound

“Large scale Penny Byrne work” by surtr is licensed under CC BY-SA 2.0
“Trust Matters”

• Elements important to developing trust:
  – Sensitive use of discretionary power by health workers
  – Perceived empathy by patients of the health workers
  – Quality of medical care
  – Workplace collegiality

• Trust reduces social complexity and inherent uneven distribution of power between clients and providers.

• Understanding and supporting trust processes will improve health sector collaboration and stimulate demand for services.

Trust reduces complexity

• **Simple Trust**
  – Devoid of suspicion, demands no reflection, no conscious choice
  – Can’t be recovered if it is lost

• **Authentic Trust**
  – Mature, articulated, carefully considered
  – Recognizes possibility of betrayal and disappointment
  – Must be continuously cultivated

• **Cordial Hypocrisy**
  – Façade of goodwill and congeniality that hides distrust and cynicism
  – Destructive to teamwork
  – Makes honest communication impossible

KT Influences Emergence

• **Stage 1 – Networks:**
  – self-organized, based on self interest
  – have fluid membership

• **Stage 2 – Communities of Practice:**
  – also self-organized, but people commit to be there for each other
  – used to share knowledge and to intentionally create new knowledge
  – good ideas move rapidly amongst members

• **Stage 3 – Systems of Influence:**
  – can’t be predicted; sudden appearance
  – pioneering efforts at the periphery suddenly become the norm
  – policy/funding debates include perspectives/experiences of pioneers
  – critics suddenly become chief supporters

Source: M. Wheatley and D Frieze, Using emergence to take social innovation to scale, 2006
Assessment Considerations

• Focus on adaptation rather than attribution and fidelity
• Focus on improving (rather than proving) effectiveness
• Create shared measurement systems
• Consider outcomes of interest to diverse stakeholders
• Emphasize participatory and co-production approaches
• Value different types of evidence (scientific, practice, contextual)
• Develop measures/methods to assess complexity, capacity and trust
• Create relevant and timely feedback loops

“Wicked” problems are different from “tame” problems

• There is no definitive formulation of a wicked problem.

• Wicked problems have no stopping rule.

• Solutions to wicked problems are not true-or-false, but good-or-bad.

• There is no immediate and no ultimate test of a solution to a wicked problem.

• Every wicked problem is essentially unique.

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Disclaimer

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