



Evidence meets
Implementation:

How do we implement
evidence to advance
healthcare?

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Why?

- *The application of what we know already will have a bigger impact on health and disease than any drug or technology likely to be introduced in the next decade.*
 - *Sir Muir Gray, UK Chief Knowledge Officer*



Objectives

- Reflect on the intent and fundamental questions related to implementation.
- Sense-making on how we implement different kinds of evidence.
- Consider how the use of theory can improve interventions and evaluation.



Outline

- Introduction to our problem
- Epistemological reflections
- Where have we been?
- Where are we going?
- How can we get there?



A few definitions....

- Knowledge
- *Individual – facts gained through experience, learning; translated into action via human will and agency*
- *Collective – socially shared, collectively co-created, embedded in systems*

A few definitions....

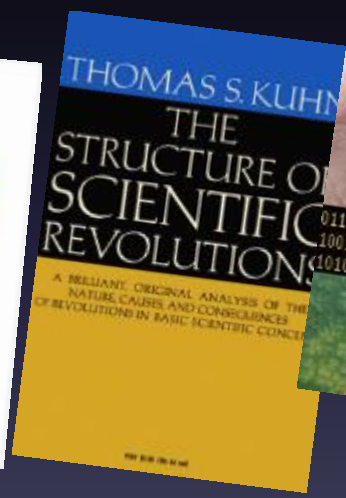
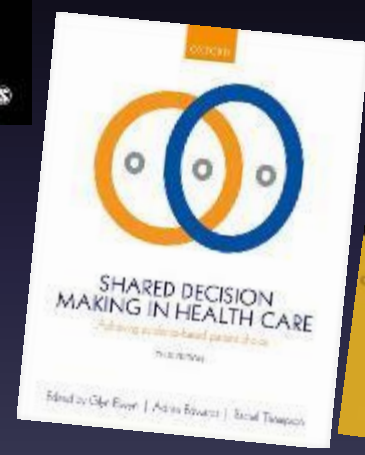
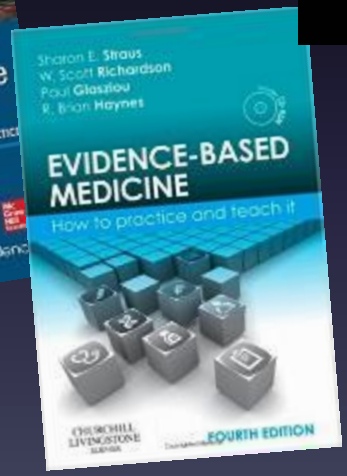
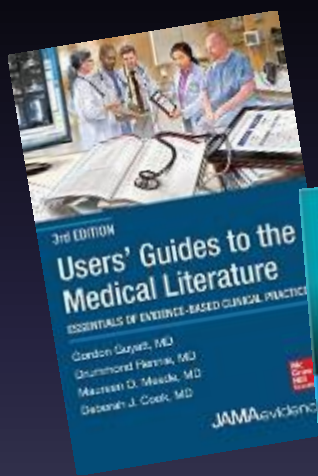
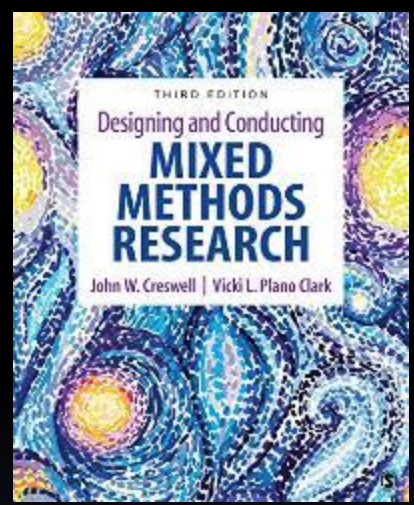
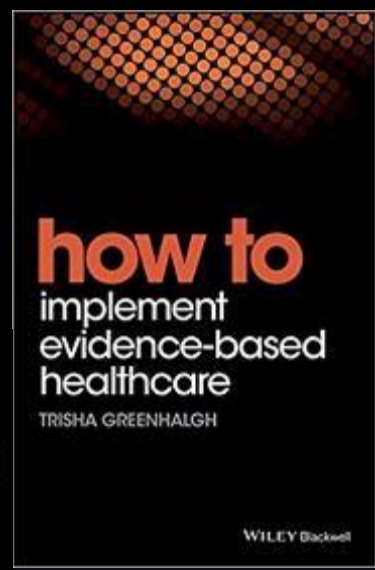
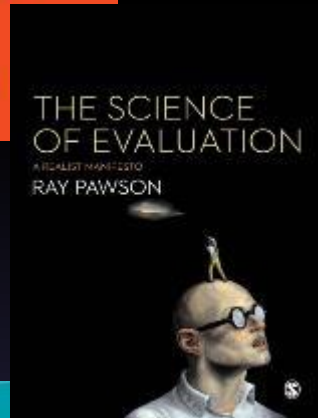
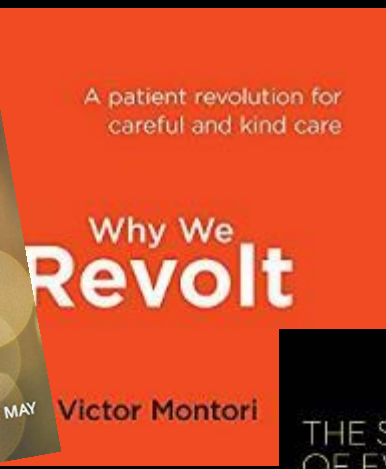
- Knowledge Transfer

(Canadian Institutes for Health Research)

- “dynamic, interactive process that includes the synthesis, dissemination, exchange, and culturally sound application of knowledge to improve health, provide more effective health services and products, and strengthen the healthcare system.”

Are we ready to implement?

- Do we understand the problem and outcome we wish to achieve?
- Do we have the evidence it matters? Is it meaningful?
- Do we understand the context? Opportunity cost? Perspective of frontline staff and people with lived experience? Have they helped co-create the intervention?
- Do we have the physical, material, and personnel resources to implement and sustain the change?
- If the answer is YES --- carry on....
- What kind of intervention is being addressed? Is it more of a technical or adaptive problem?



Standing on the shoulders of giants

A clockwork Universe?



By Andrew Shiva / Wikipedia, CC BY-SA 4.0,
<https://commons.wikimedia.org/w/index.php?curid=28608413>

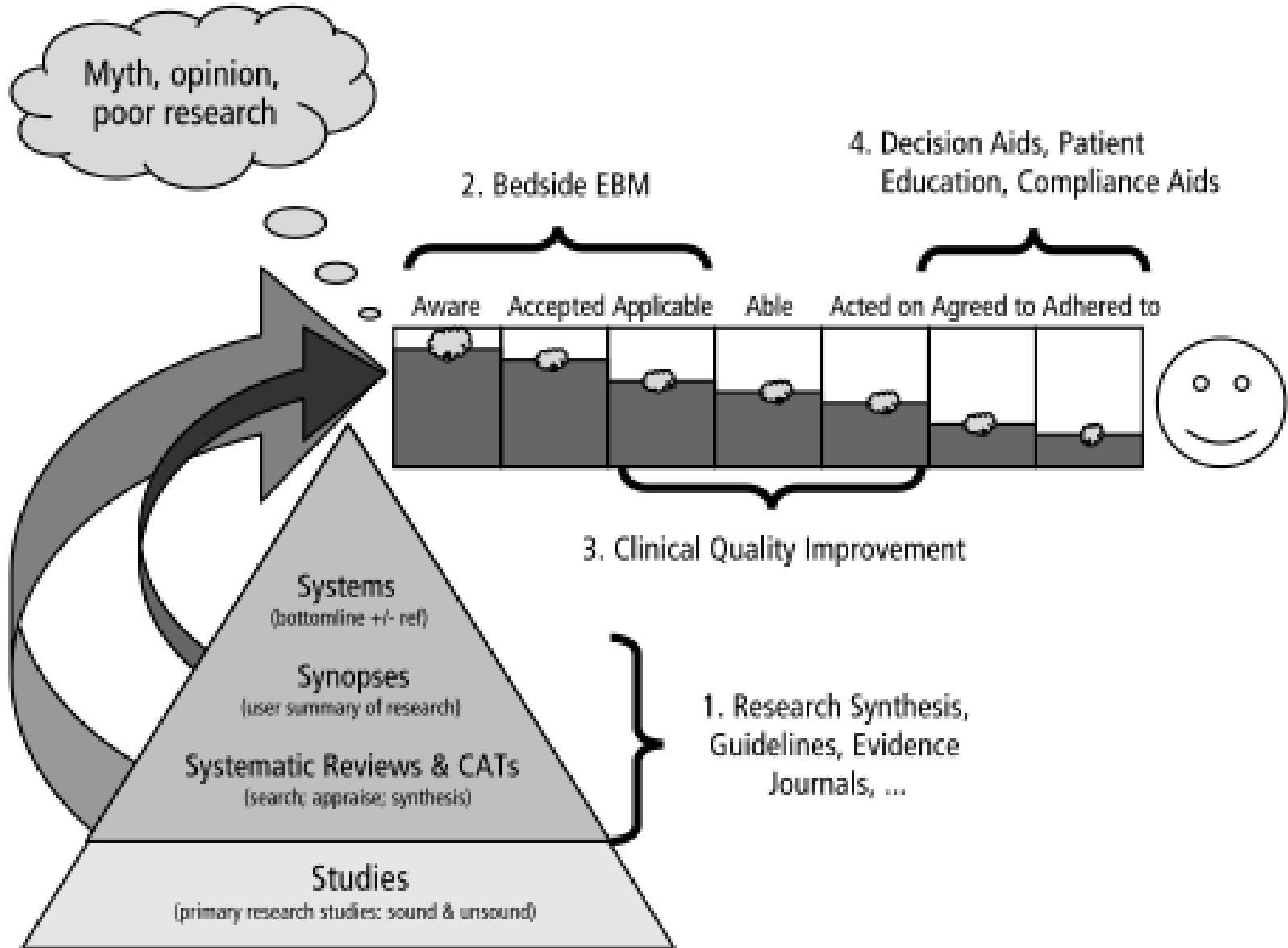
Reductionism

- *"The most natural thing in the world to grasp. It's simply the belief that "a whole can be understood completely if you understand its parts, and the nature of the 'sum'. Now one in her left brain could reject reductionism."*

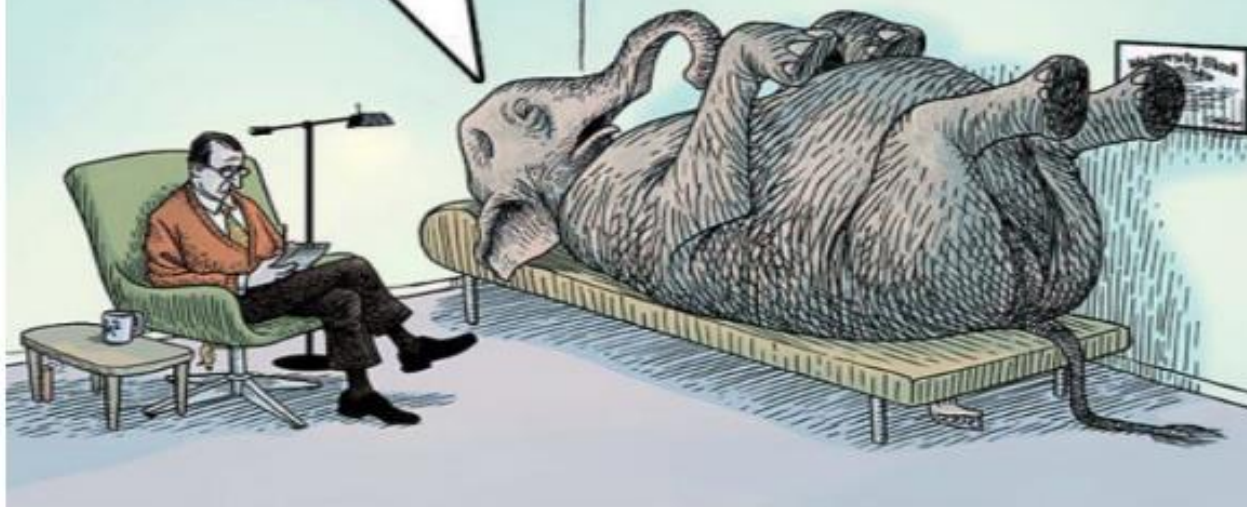
Science is Darwinian

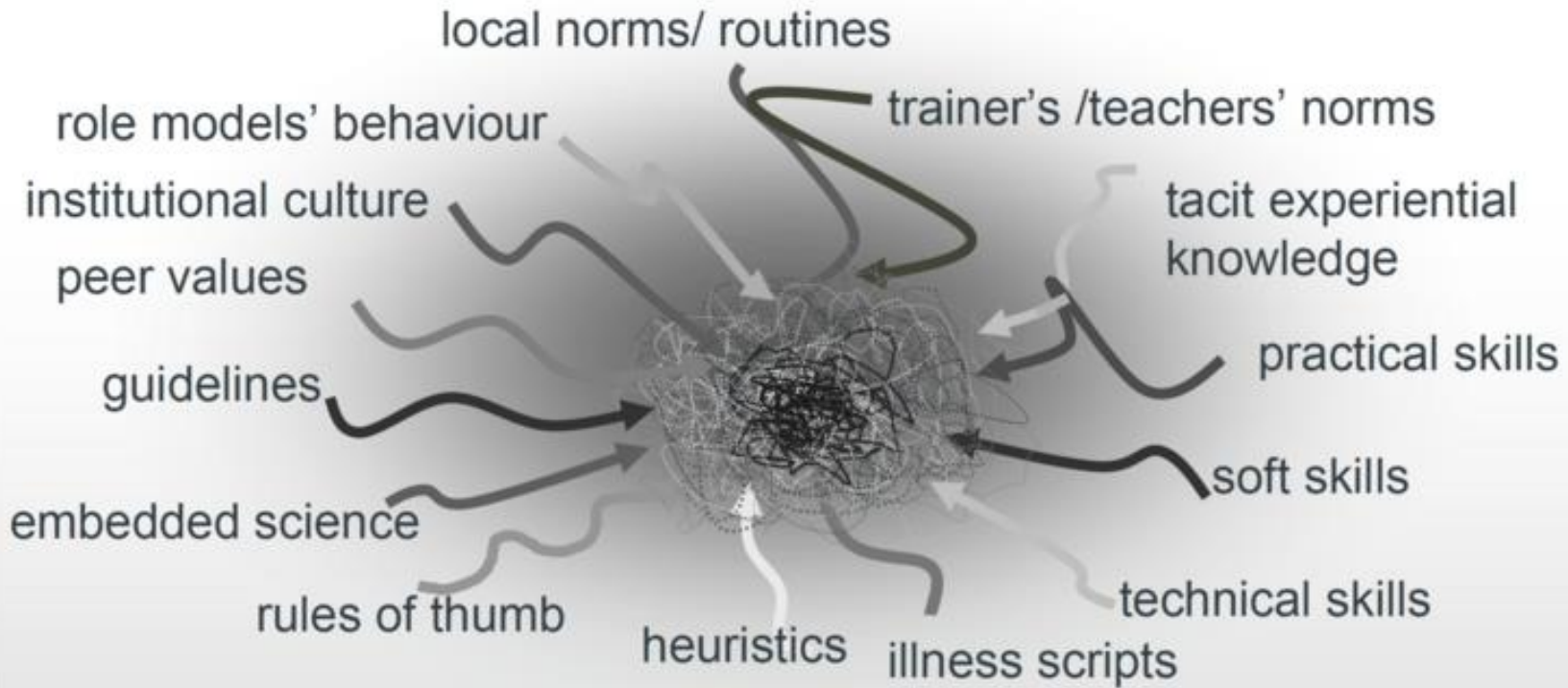


Kuhn, The structure of scientific revolutions
Papiloswallowtail butterflies, Dr Kunte Biodiversity lab,
Tata Institute of Fundamental Research



Sometimes, even if I stand in the middle of the room, no one acknowledges me.





We do NOT live in a clockwork universe.... we live in interconnected complex adaptive systems

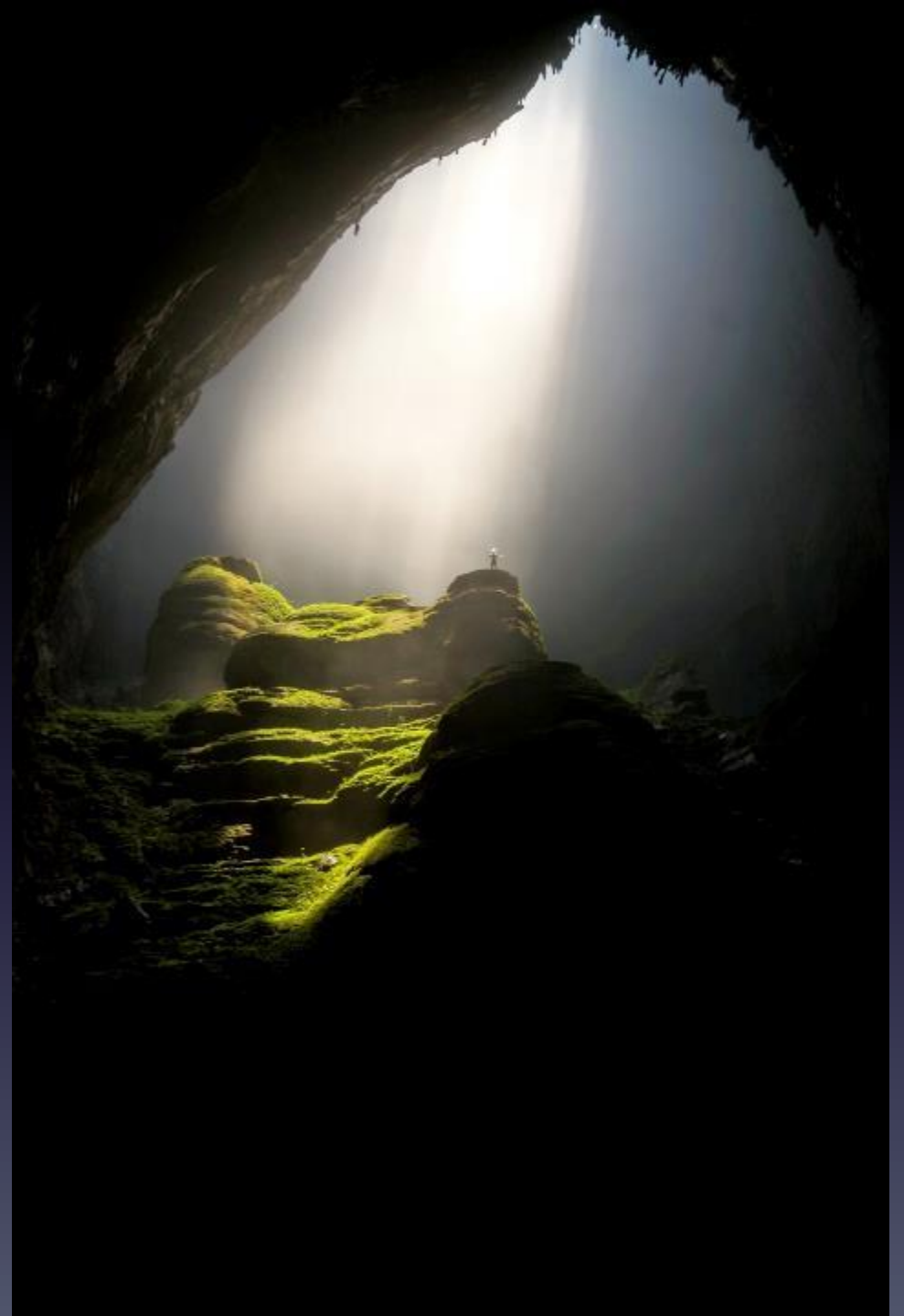
Complex Adaptive Systems:

Collection of individual agents who have freedom to act in unpredictable ways and whose actions are interconnected

Difference between complicated (aircraft) and complex (human)

3 Fundamental Implementation Questions

- (1) How do we make sense of our problem?
- (2) How do we approach the design of the knowledge transfer strategy/ strategies for sustained change?
- (3) How do we pick the most appropriate intervention theory?



(1) How do we make sense of our problem?

“While technical problems may be very complex and critically important, they have known solutions that can be implemented by current know-how. They can be resolved through the application of authoritative expertise and through the organization’s current structures, procedures and ways of doing things.

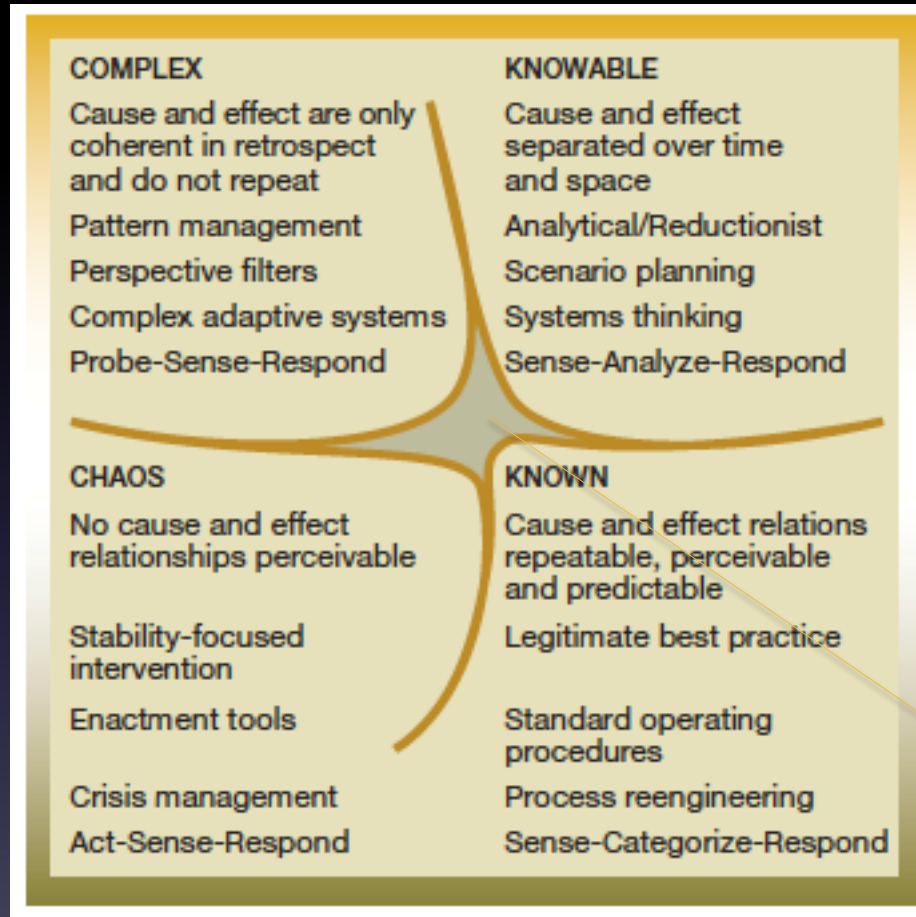
Adaptive challenges can only be addressed through changes in people’s priorities, beliefs, habits and loyalties. Making progress requires going beyond any authoritative expertise to mobilize discovery, shedding certain entrenched ways, tolerating losses and generating the new capacity to thrive anew.”

The Practice of Adaptive Leadership (2009)
by Ronald Heifetz, Alexander Grashow, Marty Linsky

Cynefin Framework

- emergent patterns, perceived not Predicted
- need multiple perspectives on the nature of the system
- narrative methods

unordered



Entrained patterns most dangerous

ordered

domain of disorder

Crucial to understanding conflict between decision makers looking at the same situation from different points of view

Knowledge Management

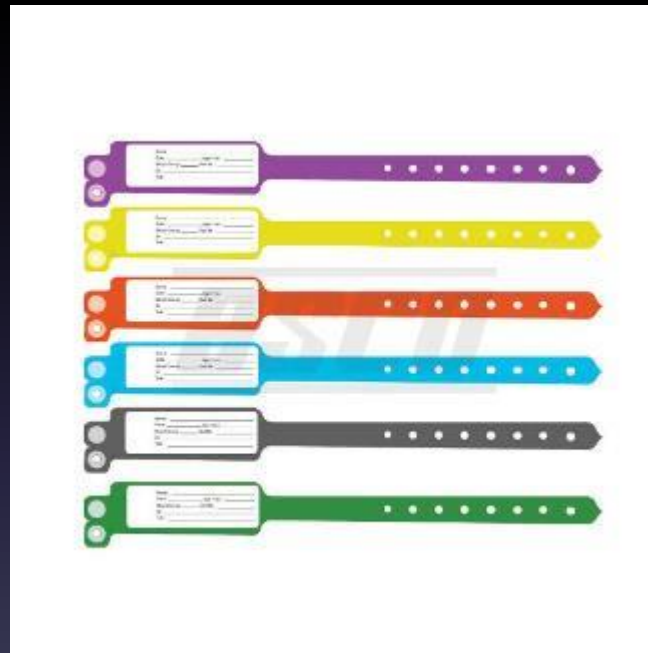
- First generation
 - – information for decision support
- Second generation
 - – focus on movement of knowledge between tacit – explicit states
- SECI (Socialization, Externalization, Combination, Internalization, Ba “shared space for emerging relationships”) Nonaka and Takeuchi 1995
- Third generation
 - – focus on complicated, complex and chaotic

We do NOT live in a clockwork universe.... we live in interconnected complex adaptive systems

Implications:

- 1) All parts are interconnected. You can not do a controlled experiment in a closed system and expect the results to apply in an open system in an unproblematic way. The concept of transferrable effect size is problematic.
- 2) We are not Pavlov and people are not dogs. We need to move beyond theories of operant conditioning to behavioural theories.
- 3) Interventions/ innovations are NOT static.
- 4) Principles scale, programs don't.
- 5) Solutions may be emergent, and naturalistic methods are required to elucidate them.
- 6) There will always be unintended consequences! You must look for them.

Interventions are not static



They adapt to culture and
context...



We do NOT live in a clockwork universe.... we live in interconnected complex adaptive systems

Implications:

“ruthless standardization; top-down centralized implementation with rigid milestones; dashboards of aggregated process metrics DOES NOT WORK”

Eg IT program spectacular failure

Focus on understanding the questions

**Is the most valuable perspective
the one you don't have?**

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■ ■ ■

The better the question.
The better the answer.
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Nursing

Education



Public Health

Nutrition

Health Policy

Obesity Medicine

Pediatrics

Internal Medicine

Endocrinology

Psychiatry

Human Centred Design

People with lived experience

My implementation science butterflies

Graphic Design

(2) How do we approach the design of the knowledge transfer strategy/ strategies for sustained change?

A word about theory ... what you don't know can kill your good idea



Using theory to:

(1) unpack the problem,

(2) design the intervention co-creation,

(3) design and monitor the implementation strategy ~

will help you to understand why and how the intervention did or did not work.

(4) use empiric data to refine the theory

Theory, Model, Framework?

- Theories... explain cause and effect relationships... ~ grand, mid-range, lower level
- Models... simplified representations of phenomena. In contrast to theories, models are descriptive and have a narrowly defined scope
- Frameworks ... list descriptive concepts or variables that account for phenomena into a structure that can serve to measure or evaluate

Theories are important in social & natural sciences

- Robust explanations of previously or currently observed phenomena, and are points of departure for forecasts of future phenomena
- Useful theories for understanding implementation problems

Categories of Theories, Models & Frameworks used in implementation science

1. Process models – steps in process of translating research to practice including implementation. Action model has practical guidance. i.e. Knowledge to Action Model
2. Determinant frameworks- specify determinant barriers and facilitators i.e. Theoretical domains framework, Consolidated framework for implementation research
3. Classic theories – from sociology, psychology, org sci that can provide understanding and/or explanation of aspects of implementation i.e. Normalization Process Theory
4. Evaluation frameworks – specify elements of implementation that could be evaluated for implementation success ie. RE-AIM, CIFR

Normalization process theory

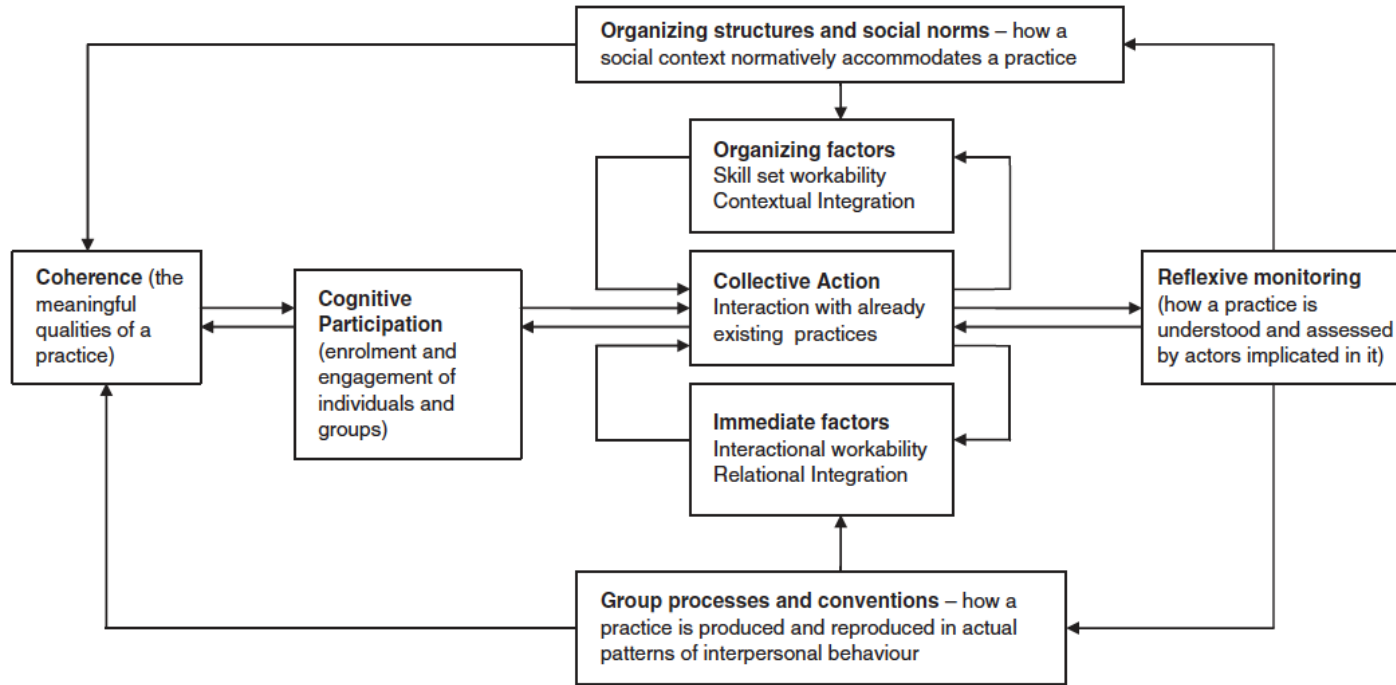


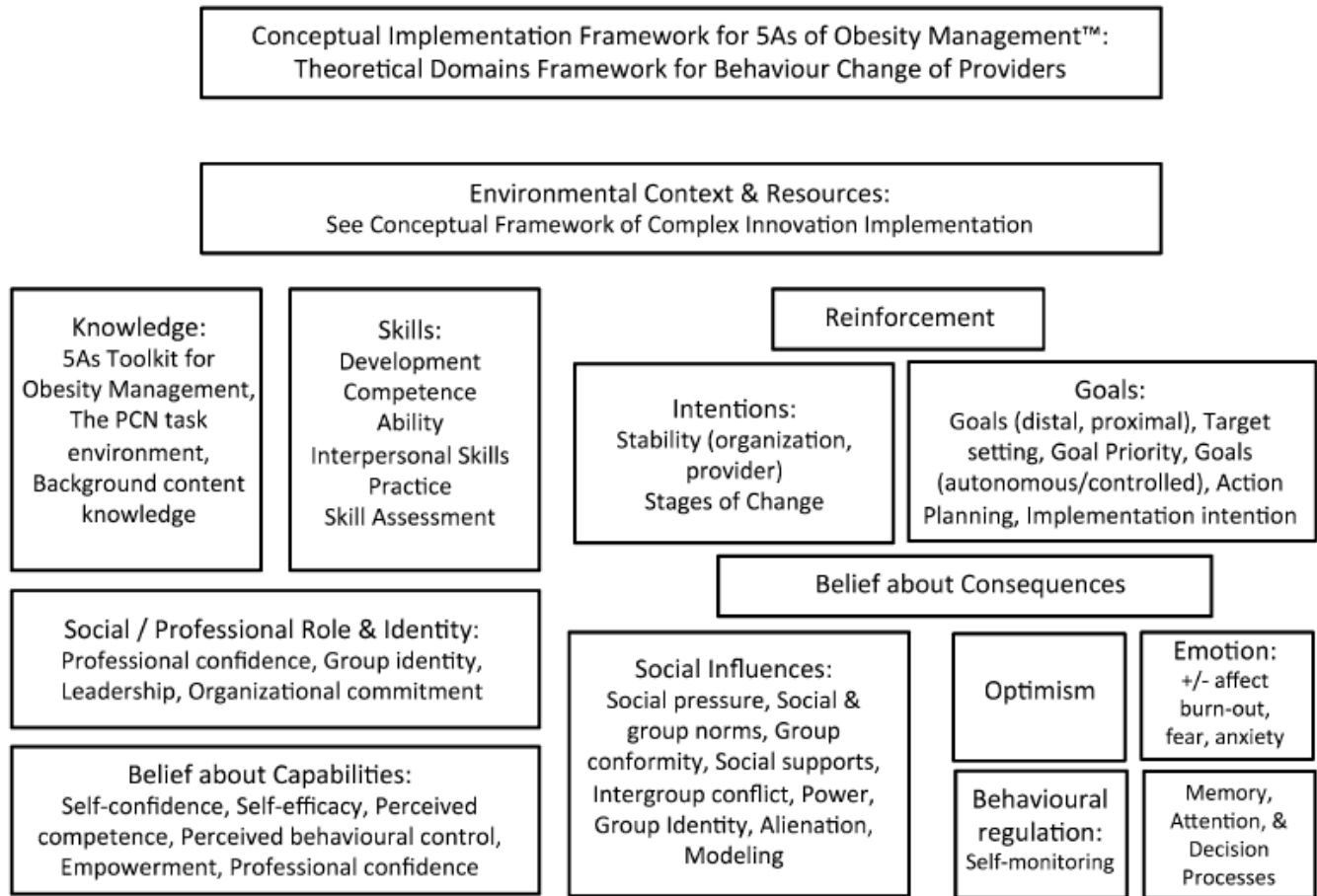
Figure 1 Model of the components of normalization process theory

Describes how practices become routinely embedded in social contexts. Can orient design of improvement interventions toward what is likely important, relevant and feasible in making efforts successful.

(3) How do we co-create interventions & pick the most appropriate intervention theory?

Interventions

- Example for interventions aiming to change behaviours:
- Theoretical domains framework ~ derived from 33 behaviour change theories, 128 constructs sorted into 14 domains



Theoretical domains framework for behaviour change of the provider (adapted from [12])

Theoretical Domains Framework for Behaviour Change

Cane J, O'Connor D, Michie S. Validation of theoretical domains framework for use in behaviour change and implementation research. *Implement Sci.* 2012; 7(1):37.

A word about tools

CANADIAN OBESITY NETWORK

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5AsTM of Obesity Management
Funded by Alberta Innovates Health Solutions

5As Team Project

To access resources developed by the 5AsTM team project, please click here.*

The 5As Team (5AsTM) project is funded by Alberta Innovates Health Solutions and is conducted via a partnership between researchers at the University of Alberta (led by Drs. Denise Campbell-Scherer and Arya Sharma) and the Edmonton Southside Primary Care Network. This randomized controlled trial aims to improve obesity management in primary care.

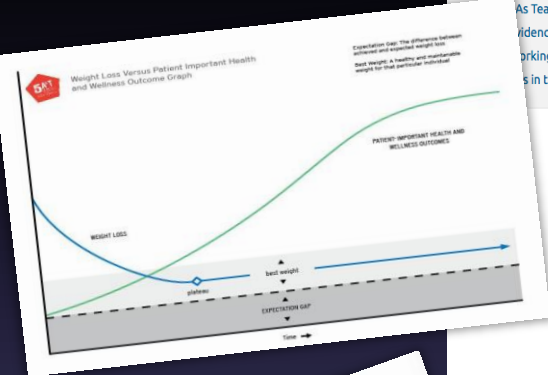
Despite didactic training of experienced front-line, interdisciplinary primary care providers, our partners highlighted how challenging it is to put high quality obesity care into action.

The providers helped to create the 5AsTM intervention aimed at addressing barriers they identified, such as how to conduct comprehensive bariatric assessments in the context of primary care visits with competing agendas like prenatal assessment or diabetic management. Areas of focus included rapid assessments, increasing confidence to ask about weight, emphasizing the importance and supporting longitudinal relationships with patients, increasing the focus on weight gain preventions, strategies for emotional eating, strategies to help patients "sustain the change", focusing on behavioural goals, addressing weight bias in the clinical setting and cultural aspects to weight. Success resulted in increased confidence in asking patients about weight, consistent team messaging and strategies to assist patients with their challenges, increased interdisciplinary team functioning and communication.

5AsTM collaborative providers identified a number of areas where they wanted tools to augment the existing 5As of Obesity Management framework – both for themselves and for discussions with patients. These are provided here for free download. If you have any feedback on your use of the tools, we would really appreciate your input.

5AsTM Sessions

- 5AsTM Intervention 2013: 5AsTM Kickoff
- 5AsTM Intervention 2013: Roleplay on 4Ms of Obesity tool
- 5As of Obesity Management
- 5As Team Intervention Project Opening
- Clinical Assessment of Obesity Related Risk
- Critical Conversations
- Culture and the Body, Culture and Food – Perspectives on Obesity
- Depression Anxiety and Obesity
- Emotional Eating
- Exercise and Weight Management
- How to Sustain the Change
- Pregnancy, Post-partum, Obesity
- Weight Bias
- Weight Gain Prevention



Medication Weight Gain

Medication List: List of medications that can cause weight gain.

Medication Name, Dose, Frequency, Potential Weight Gain, Action

Medication Name	Dose	Frequency	Potential Weight Gain	Action
Insulin
...

The effect of lack of sleep on appetite

Diagram showing the relationship between sleep and appetite. Lack of sleep leads to increased ghrelin (hunger) and decreased leptin (satiety), resulting in increased appetite and weight gain.

The effect of lack of sleep on appetite

Document explaining the physiological mechanisms of how sleep deprivation affects hunger hormones and appetite.

4Ms for Interdisciplinary Team Weight Management Care

Document detailing the 4Ms framework for weight management care.

Mechanical Domain Assessment - Mental Domain Assessments

Document providing information on mental domain assessments for weight management.

Finding an implementation framework for your work

- Construct flexibility
- Socioecologic framework level: system, community, organization, individual
- Implementation and/or dissemination ?

Finding an implementation framework for your work

Model	Dissemination and/or Implementation	Construct Flexibility: Broad to Operational	Socio-Ecological Level					References
			System	Community	Organization	Individual	Policy	
Diffusion of Innovation	D-only	1		x	x	x		21
RAND Model of Persuasive Communication and Diffusion of Medical Innovation	D-only	1		x	x	x		22
Effective Dissemination Strategies	D-only	2		x	x	x		23
Model for Locally Based Research Transfer Development	D-only	2		x	x			24
Streams of Policy Process	D-only	2	x	x	x		x	25, 26
A Conceptual Model of Knowledge Utilization	D-only	3	x	x			x	27
Conceptual Framework for Research Knowledge Transfer and Utilization	D-only	3			x			28
Conceptualizing Dissemination Research and Activity: Canadian Heart Health Initiative	D-only	3		x	x			29, 30
Policy Framework for Increasing Diffusion of Evidence-based Physical Activity Interventions	D-only	3	x	x	x		x	31
Blueprint for Dissemination	D-only	4		x	x			32
Framework for Knowledge Translation	D-only	5		x	x	x		33
A Framework For Analyzing Adoption of Complex Health Innovations	D > I	2	x	x	x	x		34, 35
A Framework for Spread	D > I	2		x	x			36, 37
Collaborative Model for Knowledge Translation Between Research and Practice Settings	D > I	2			x	x		38
Coordinated Implementation Model	D > I	2			x	x		39
Model for Improving the Dissemination of Nursing Research	D > I	2			x	x	x	40

A brief word about evaluation

- 3 key questions for convergent mixed-methods analysis and multi-methods in RCTs in the real world
 1. What are the contextual factors that impact the primary outcome measure?
 2. How did the process of implementation work and what actually happened in the intervention?
 3. What were the impacts of the intervention (positive and negative beyond the primary outcome measure)?
 4. Do the qualitative findings predict individual quantitative results?

Take home points

- We live in interconnected complex adaptive systems. Technical solutions may be appropriate for some implementation challenges, but not for adaptive problems.
- Cynefin can be a useful sense making structure
- Theory and rigorous qualitative evaluation are crucial to improve interventions and evaluation.
- You can not create and implement a successful intervention without co-creation with people with tacit knowledge
- To succeed we need a lot of butterflies.





Useful references

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