KNOWLEDGE TRANSLATION: THE CASE OF ADHD

Part 1: Key Issues in Knowledge Translation

Dialogue = co-construction of monologue
Overview

• Part 1: [Rosemary]
  • Introduction to knowledge translation (KT)
• Part 2: [Rosemary]
  • Development of a KT product: TeachADHD
• Part 3: [Peter]
  • Implementation & ongoing development of the KT product (TeachADHD)
Overview; Part 1

• What is ‘knowledge-translation’ (KT) ?
• Why is KT important?
• What are the major KT components & processes?
• What issues need to be considered in KT about ADHD for the educational system?
• First KT steps in ADHD:
  • clinical diagnostic interview for teachers (Clinic to classroom)
Knowledge Translation (KT)

- Developed primarily within the health care system

- A major focus of the Canadian Institutes of Health Research (CIHR)
  - [http://www.cihr-irsc.gc.ca/e/39033.html](http://www.cihr-irsc.gc.ca/e/39033.html)

A major training focus at the Hospital for Sick Children
- [http://www.sickkids.ca/Learning/AbouttheInstitute/Programs/Knowledge-Translation/Knowledge-Translation.html](http://www.sickkids.ca/Learning/AbouttheInstitute/Programs/Knowledge-Translation/Knowledge-Translation.html)

- We have ‘translated’ KT concepts for KT on ADHD within the health care system & between health care & the educational system
Knowledge Translation is about…

- Helping users become aware of scientifically sound knowledge & facilitating their use of it to improve health & health care systems
- Closing the gap between what we know & what we do (the know-do gap)
- Moving knowledge into action
Knowledge creation, distillation, & dissemination...

Are insufficient in themselves...

to ensure use of knowledge in daily practice
Knowledge Translation
as defined by Canadian Institutes of Health Research

• “A dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products, and strengthen the health care system.”

A move beyond simple dissemination of knowledge into actual use of knowledge

• Has been adopted by WHO & by United States National Center for Dissemination of Disability Research
Other terms used to describe KT

<table>
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<td>Research utilization</td>
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But the audience & aims for KT are far larger than those for CME or Professional Development. Strategies for KT will need to vary according to target audience & type of knowledge being translated.
**WHAT IS NOT KT**

Knowledge Mobilization is emerging as the main term in some circles; Research still uses Knowledge Translation.

The new generation of KT research is called Practice Based Implementation Research.

Knowledge management is a term primarily used in the business sector.

KT/KM work has traditionally been separate from Tech Transfer and commercialization, but Tech Transfer is moving into KM sectors.

Medical model terminology for bench to bedside innovations.

- Knowledge translation
- Knowledge mobilization
- Knowledge exchange
- Knowledge brokering
- Dissemination
- Reach
- Implementation

Knowledge management

Technology transfer

Commercialization

Translational Medicine
Learning Checkpoint

• Write down your definition of Knowledge Translation as relevant for the field of Education

(as opposed to Health, which is the focus of most KT)
WHY IS KT IMPORTANT?
KT IS NEEDED TO BRIDGE THE TIME GAP BETWEEN THE CREATION OF ROBUST EVIDENCE & ITS UPTAKE & USE IN PRACTICE
NEW RESEARCH DISCOVERIES AND THE TIME TO THEIR UPTAKE IN PRACTICE
1497
Vasco da Gama and a crew of 160, of which 100 die of scurvy; citrus suspected as cure

1601
Capt. James Lancaster sails with four ships, with crew of one vessel given 3 tsps lemon juice daily having 0% mortality compared to 40% mortality on other 3 ships

1747
British Navy physician James Lind conducts random trial of 6 treatments for scorbutic sailors; citrus again proves effective

1795
British Navy declares citrus to be part of diet on all navy ships

1865
British Board of Trade adopts this ‘innovation’ at the ‘policy level’ due to adherence from the ‘ground – up’

TOTAL 368 years!
The 368 year gap is now a 17 year gap

> 17 years to translate evidence from discovery into health care practice

Balas EA, Boren SA. 
Managing clinical knowledge for health care improvement. 
In: Bemmel J, McCray AT, eds. Yearbook of Medical Informatics. 

But, only 14% of it is believed to enter day-to-day clinical practice

Westfall JM, Mold J, Fagan L. 
JAMA. 2007;297:403–6. 22
Bike Helmets

Issue: Head injuries are the leading cause of severe injury to children on bicycles. **Problem - Low helmet use.**

Research: Research shows that a properly fitted helmet can decrease the risk of serious head injury by over 80%. This means that 4 out of 5 head injuries could be prevented if every cyclist wore a helmet.

Application: Helmet laws encourage helmet use. Head injury rates among child and youth cyclists are about 25 per cent lower in provinces with helmet laws, compared to provinces without.

Limitations: Only 30% of Canadians are covered by helmet legislation. Six provinces currently have province-wide legislation, but only four cover all ages. Both helmet use & cycling should be promoted to keep kids health, active & safe.
Two decades of research indicate that the IQ-achievement discrepancy criterion for identification of LD is invalid

• **1992**: No difference in psychological processes
  • Siegel L. *J Learn Disabil.* 25(10):618-20.

• **2000**: No difference in response to intervention.
  • Vellutino et al *J Learn Disabil.* 33(3), 223-238

• **2004**: **POLICY CHANGE in USA**:
  • IDEA US Department of Education prohibits schools from requiring IQ-achievement discrepancy for identification of LD

• **2011**: No difference in brain basis of phonological deficit
  • Tanaka et al, *Psychol Sci* 22(11), 1442-51

• **2013 (May)**: **CLINICAL PRACTICE GUIDELINE**:
  • DSM-5 abandons requirement for IQ-achievement discrepancy in diagnostic criteria of LD

• **To date in 2013**: Most school boards in most countries still require evidence of IQ-achievement discrepancy for LD identification

• **KT IS URGENTLY NEEDED!**
The need for KT

• Increasing recognition of the gaps in translating knowledge to action is leading to efforts to change behaviour, practices, and policy.

• Changing behaviour is a complex process, requiring the evaluation of the entire health care organization - & in the case of ADHD, the educational system.
Learning Checkpoint

In thinking about how KT is relevant to your work, take a moment to reflect on a project you recently completed/or knowledge that you have recently created. (Discuss with others around you)

1) What were the main messages of your project/work?
2) Who did you share these with & how?
3) What impacts do you want to see?
4) What impacts do you think you achieved?
WHAT ARE THE KEY COMPONENTS OF KT?
Two broad types of KT activities
(as defined & funded by CIHR)

• End of Project KT
  • Researchers develops & implements a plan for making knowledge users aware of the knowledge generated through the research project (*beyond published articles & presentations at conferences*)

• Integrated KT
  • An approach to doing research (not a method)
  • Involves engaging & integrating knowledge-users into the research process
  • Collaborative, participatory, action-oriented research; co-production of knowledge
  • Researchers & Knowledge Users work together to:
    • *Shape the research questions & decide methodology*
    • *Help with data collection & development of tools*
    • *Interpret study findings & craft key messaging around them*
    • *Conduct widespread dissemination & application of findings*
Knowledge-to-Action Process

How is Knowledge Created?

• Deriving knowledge from **primary studies**, such as randomized controlled trials (empirical studies)

• **Synthesizing findings** from primary studies to form robust secondary knowledge; as in **systematic reviews & meta-analyses**

• **Generating knowledge tools or products** (**third generation knowledge**), e.g., **practice guidelines**, decision aids, or care pathways, based on best available evidence distilled from synthesized knowledge
Knowledge Application: 7-steps

1. Identify the knowledge-to-action gaps; identify, review, & select relevant knowledge, & its users
2. Adapt knowledge to local context & knowledge users (make it accessible)
3. Assess barriers & facilitators to knowledge use
4. Select, tailor & implement intervention to address barriers to knowledge use
5. Monitor knowledge use
6. Evaluate outcome of knowledge use
7. Develop mechanisms to sustain knowledge use
Beware of the ‘KT Imperative’

- The ‘KT imperative’
  - is the perceived need to do everything to encourage everyone to apply their research findings

- The importance of knowledge synthesis:
  - results from a single study need to be contextualized within a synthesis of global research results before extra-ordinary dissemination or implementation is undertaken

- Need for judicious KT:
  - We need to bring common sense as well as scientific/academic rigour to bear on our decisions about the degree and intensity of KT activities to undertake
Learning Checkpoint

• List as many of the 7 steps in the knowledge-to-action cycle as you can

• Which steps have you undertaken?

• Amongst those that you identify, which do you think poses the greatest challenge & why?
WISH IT WERE A CASE OF SIMPLY FOLLOWING THE STEPS!
KT in the field of education

• “The poor connection between practitioners and researchers have many resultant costs. Perhaps the most often cited is the difficulty of getting research into practice:”

• “well-meaning researchers generate ideas, findings, practices, and programs that are not optimally communicated to practitioners, and often not optimally designed for use in practice.”

• *Catherine Snow – Harvard Graduate School of Education*
Challenges to overcome in KT-1

• One major common challenge faced by all users & decision-makers (i.e., clinicians, educators, managers/administrators, policy-makers) relates to knowledge management & infrastructure.
  • Accessing the research evidence
  • The sheer volume of research evidence being produced
  • Limited time to read
  • Lack of skills to appraise evidence
  • Inadequate information provided as to how to apply the research evidence in practice
In 2012, you would have needed to read 43 articles per week to be abreast of current knowledge; there are already 276 awaiting you in 2013.
Learning Checkpoint

Discuss amongst yourselves...

• One knowledge-to-action gap in the broad field of ADHD is related to the most effective treatment of ADHD

• What do you know about this issue; what are the sources of your knowledge?

• Who are the knowledge users you need to reach?

• From where/whom do they currently get their knowledge of this issue?

• What are some of the challenges you would anticipate encountering in the KT action-cycle?
Effective treatment of ADHD: sources of knowledge

- Clinical practice guidelines (e.g., NICE guidelines for ADHD; European Guidelines for ADHD; Canadian Guidelines for ADHD)
- Cochrane reviews
- Meta-analyses
- CME
- PHARMA
Effective treatment of ADHD: knowledge users & sources of knowledge

• Parents/patients: get mixed messages from multiple sources
  • media, magazines, religious groups, other parents/patients/family members, clinicians, school professionals, advocacy group websites

• Clinicians: get mixed messages from multiple sources
  • CME, journals, pharma reps, peers, NIMH briefs etc

• Researchers: get mixed messages from multiple sources
  • Discrepancies in the literature, clinical vs research conferences

• Teachers & other school personnel: limited awareness
  • Parents/individual cases, indirect communication from clinicians, professional development

• Policy makers:
  • limited awareness & incomplete or conflicting knowledge, yet make payment decisions for treatment
Challenges in KT-2

- KT often requires an effective interaction with adult knowledge users – adult learners

- Take into account

  - **Motivation**: self-regulated learning, self-efficacy
    - **KT**: didactic lectures, on-line modules, detailing
  
  - **Affective domain**: adoption of values, beliefs & attitudes that are important precursors of behavioural change
    - **KT**: group interaction, role-play, self-evaluation, case studies & simulation
  
  - **Psychomotor domain**: skills acquisition & development
    - **KT**: supervised skill performance, practice

- Stages of Change/Readiness for change
Stages of Readiness for change  
(Prochaska & Velicer, 1997)

- **Precontemplation**: no plan to adopt in foreseeable future
  - **KT strategies**: continuing education, educational outreach, performance feedback
- **Contemplation**: intends to adopt within next 6-months
  - **KT strategies**: provision of resources & support, coaching
- **Preparation**: intends to adopt within next month
  - **KT strategies**: reminders & prompts, reinforcers
- **Action**: has been using the knowledge for past 6 months
  - **KT strategies**: reminders & prompts, reinforcers
- **Maintenance**: actively working to sustain use of the applied knowledge
Readiness for Change: levels

- Individual
- Group
- Unit
- Department
- Organization
- Policy
Organizational Readiness for Change

Change Commitment
Change Efficacy
‘ought to’
‘have to’
‘want to’
Willing, confident & able”

Change-Related Effort
Initiation
Persistence
Co-operative Behavior

Implementation Effectiveness
ADHD & the educational system

- ADHD is diagnosed (& treated) within healthcare system
- ADHD is rarely recognized as a special needs category within the educational system
- As a consequence, initial teacher training does not include ADHD
- Teachers receive little inservice professional development about ADHD
- In terms of readiness for change with respect to ADHD:
  - Educational system
  - Departments, Units, Groups
  - Individual teachers:
KT IN ADHD: FIRST STEPS

Knowledge application: an example
1A. IDENTIFY A PROBLEM THAT NEEDS ADDRESSING

• A clinical diagnostic interview is the gold standard tool for use in the diagnosis of ADHD

• Up to the 2000’s, if clinicians wished to obtain information about the child’s behavior at school, they asked the parent or sent the teacher a standardized rating scale to complete, but often ignored the information if it did not agree with that from the parent

• The Problem: Lack of a clinical diagnostic interview for teachers
1B. IDENTIFY, REVIEW, & SELECT THE KNOWLEDGE OR RESEARCH RELEVANT TO THE PROBLEM (E.G., PRACTICE GUIDELINES OR RESEARCH FINDINGS)

- American Academy of Child and Adolescent Psychiatry’s (1997) *Practice parameters for Attention Deficit Hyperactivity Disorder (ADHD)*, state:
  - It is essential to obtain reports of behavior, learning, and attendance at school, as well as grades and test scores.

- American Academy of Pediatrics’ (2000): *Clinical Practice Guideline: Diagnosis and Evaluation of the Child with Attention-Deficit/Hyperactivity Disorder*, recommend that
  - the assessment of ADHD requires evidence directly obtained from the classroom teacher (or other school professional) regarding the core symptoms of ADHD, duration of symptoms, degree of functional impairment, and associated conditions.
1B. Evidence from primary studies

- Research indicates that reliance on data from a single informant (generally the mother) may be of questionable validity, since parent ratings of the child’s behavior at school correlate with their own ratings of the child at home and not with the teacher’s ratings of child’s behavior at school.
- Discrepancies between information from parents & teachers reflect real differences in behavior in the different contexts.
- Thus, information is required from both parents and teachers (Mitsis et al 2000; de Nijs et al, 2004; Sayal & Taylor, 2005)

Knowledge-to-action gap: How to develop a clinical diagnostic interview for teachers, which will be accepted and used by teachers and clinicians
Integrated KT for developing TTI

- Psychiatrists & Psychologists
- Researchers
- Psychologists & Educators

Interview Content & Process

Contexts & Types of Probes

TTI
2. Adapt the identified knowledge or research to the local context & users

- Clinicians in Neuropsychiatry: ADHD Clinical Team, The Hospital for Sick Children, Toronto
  - Highly experienced in conducting semi-structured clinical interview with parents to assess ADHD & related disorders

- Teachers in elementary school boards in Greater Metropolitan Toronto, Ontario, Canada
  - Under model of inclusion, students with ADHD are placed in mainstream classrooms
  - Teachers had little or no knowledge about ADHD; many myths; frustrated with requests to complete long rating scales, which did not allow them to articulate THEIR concerns about the student
3. Assess barriers to using the knowledge

• Need parental consent to contact teachers about child

• Not feasible for clinicians to visit child’s school

• Clinicians required that an interview probe & score presence/absence of ADHD symptoms (& related disorders) & provide diagnostically useful information
3. Assess barriers to using the knowledge

Teachers
• required the interview be brief (about 30 min) & allow them an opportunity to voice their concerns about the student
• do not think of the child in terms of symptoms: language of psychiatric rating scales/interviews is alien to them
• think about a child throughout the school day in various classroom contexts:
  • Arrival & early morning routines; whole class instruction; small group work; individual seat work; transitions; peer relations etc

The problem: Teacher interview cannot use same format as most clinical interviews for parents (conducted face-to-face & organized around symptoms rather than contexts)
4. Select, tailor & implement intervention to promote use of knowledge

• Face-to-face interview was not feasible, so we developed a telephone-based interview

• Teacher Telephone Interview (TTI)
  • developed in consultation with an advisory group of educators, clinical psychologists, & child psychiatrists
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TTI differs from most clinical interviews

1. A semi-structured interview which applies a context-driven rather than a symptom-driven approach: the interview protocol is organized around specific classroom contexts, such as school arrival, group lessons, independent seatwork, and transitions.

2. Provides operational definitions for each of the DSM-IV symptoms of ADHD, ODD, and CD as they may manifest in the school setting.

3. Provides the interviewer with specific guidelines for rating symptoms.

4. Probes for academic performance, social relationships, aggression, & motor skills that may influence symptom expression, as well as impact of the child’s problems.
4. Select, tailor, & implement interventions to promote use of knowledge

• Developed a detailed manual; scoring sheet to summarize ADHD symptoms for clinicians; Provided synopsis of description of child at school as described by teachers

• Evaluated psychometric properties of the TTI

• *Initial implementation:* TTI’s were conducted by the clinical research team; one member of the team guided clinicians in their interpretation & use of information from the TTI (coaching)

• *Current implementation:* Clinical team assumes responsibility for TTI; interviews conducted by trained psychologists, social workers, case managers etc
TTI Manual is available at the Hospital for Sick Children


- The TTI is now the intellectual property of The Hospital for Sick Children; it is available at no cost
5. Monitor knowledge use

- The TTI continues to be used by
  - the clinical team at The Hospital for Sick Children as one of several tools for the diagnosis of ADHD & related disorders
  - psychiatrists & psychologists across Canada
  - psychiatrist in Iceland (translated)
- Modified by one Canadian psychiatrist into a format that can be mailed to teachers – this has been adopted for use in Canadian Guidelines for ADHD

Steps 6 & 7: Evaluate outcome; Sustain knowledge use

- An outcome evaluation study conducted by the clinical team at SickKids Hospital found that compared to their reports on the TTI, teachers were more likely to give high ADHD ratings on a standardized rating scale (Conners) to:
  - girls with cognitive and language impairments;
  - young boys who show oppositional behaviours

- These findings suggest that use of information from teacher rating scales might inflate ADHD symptoms at school; by contrast, use of information from the TTI might reduce diagnostic misclassification
MAJOR POINTS

• KT helps bridge the long time gaps between knowledge creation & its uptake by practitioners (&policy-makers)

• KT is a complex but essential multi-step process by which researchers help users to become aware of scientifically sound knowledge & guide & support them in its use to enhance practice and outcomes (health, education).

• Beware the ‘KT imperative’: judicious use of KT

• KT in the field of ADHD necessitates bridging the gap between the silos of health/mental health & education, as well as within the health field; Integrated KT

• KT in ADHD requires co-construction of a monologue by researchers, clinicians, teachers, administrators, policy-makers!
“Information is knowledge, knowledge is power, and *sharing* knowledge is empowerment”