IMPROVING THE CAPACITY OF CANCER SYSTEMS TO IMPLEMENT RESEARCH EVIDENCE INTO PRACTICE
Overview of Session

1. Introduction to knowledge translation and its application to cancer control
2. Tools to facilitate evidence implementation
3. Case study: integrated knowledge translation
4. Value, standards and innovation in an optimal cancer system
5. Panel discussion
   - audience to share implementation challenges
   - Q+A with the panelists
Overview of presentation

**Title:** Introduction to knowledge translation and its application to cancer control.

- Introduction to knowledge translation: what is it and why is it important?
- Use of theories, models and frameworks to improve knowledge translation
- Challenges and Questions
Knowledge Translation: definition

“ A dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically sound application of knowledge.

- Canadian Institutes of Health Research
Knowledge Translation Research:

- The scientific study of the determinants, processes, and outcomes of translation.
- Objective is to develop a generalizable empirical and theoretical basis to optimise translation activities.
- Interdisciplinary – clinical, health services research, social sciences, design and engineering, methodologists
Terms encountered to connote research use

- applied health research
- capacity building
- co-optation - cooperation - competing
- diffusion*
- dissemination*
- getting knowledge into practice
- impact
- Implementation*
- knowledge communication
- knowledge cycle
- knowledge exchange
- knowledge management
- knowledge translation*

- knowledge mobilisation
- knowledge transfer
- linkage and exchange
- popularization of research, research into practice
- research mediation
- research transfer
- research translation
- science communication
- teaching
- “third mission”
- translational research
- transmission
- utilisation

* cited most frequently
Clinical & Translational Research: Valleys of Death

Copyright University of Pittsburgh 2006
Reis et al. Clin Transl Sci 2008
Of 100 major findings important for human health, 
5% translated for human use
Clinical & Translational Research: Valleys of Death

Of 100 major findings important for human health: 1% lead to important health impacts
-Am J Med 2003

Basic Biomedical Research

Valley 1

Clinical Science & Knowledge

Valley 2

Clinical Practice & Health Decision Making

Translational Continuum

Copyright University of Pittsburgh 2006
Reis et al. Clin Transl Sci 2008
Translational Blocks in Clinical Research

Institute of Medicine; Clinical Research Roundtable,
Sung et al. JAMA 289:1278, 2003
The Translational Imperative

- Consistent evidence of failure to translate research findings into clinical practice
- “Failing to use available science is costly and harmful; it leads to overuse of unhelpful care, under-use of effective care, and errors in execution.” (Donald Berwick, 2003)
  - 30 to 40% patients do not get treatments of proven effectiveness
  - 20 to 25% patients get care that is not needed or potentially harmful
- Suggests that knowledge translation of research findings is fundamental challenge for healthcare systems to optimize care, outcomes and costs

Grol R (2001). Med Care
The latest research shows that we should do something with all this research.
Classification of different categories of research

- **Curie quadrant**: Pure basic research without consideration of relevance to practical issues (Approx. 60%)
- **Pasteur quadrant**: Use-inspired basic research to address important practical questions (Approx. 13%)
- **Waste quadrant**: Low relevance to immediate application
- **Doll quadrant**: Pure applied research to address important practical questions (Approx. 27%)

Percentages estimated from UK health research analysis: public and charitable funds
Source: Chalmers et al. The Lancet 2014
What is the value of knowledge translation theories, models or frameworks

- **Theories:** explaining or understanding aspects of implementation
  - e.g. Rogers’ Theory of Diffusion of Innovations

- **Models:** guiding the steps or processes of implementation
  - e.g. Graham’s Knowledge-to-Action cycle

- **Frameworks:** understanding or explaining influences on implementation outcomes or evaluating implementation efforts
  - e.g. Damschroder’s Consolidated Framework for Implementation Research

*Source: Strifler et al. J Clin Epid 2018*
Everett Rogers, Diffusion of Innovations (1962)

4 main influencing elements:
- The innovation itself
- Communication channels
- Time
- Social systems
KNOWLEDGE CREATION

Identify Problem
Identify, Review, Select Knowledge
Action Cycle

Knowledge Inquiry

Select, Tailor, Implement Interventions
Assess Barriers to Knowledge Use
Adapt Knowledge to Local Context

Monitor Knowledge Use
Evaluate Outcomes
Sustain Knowledge Use

Synthesis
Products/Tools

Knowledge Creation
 Enough theories already

- Consolidated Framework for Research Implementation (CFIR) incorporated 19+ theories/models
- Summarized as 5 domains; 37 constructs

<table>
<thead>
<tr>
<th>Domain</th>
<th>Number of Constructs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention characteristics</td>
<td>8</td>
</tr>
<tr>
<td>Outer setting</td>
<td>4</td>
</tr>
<tr>
<td>Inner setting</td>
<td>12</td>
</tr>
<tr>
<td>Characteristics of individuals</td>
<td>5</td>
</tr>
<tr>
<td>Process of implementation</td>
<td>8</td>
</tr>
</tbody>
</table>
Consolidated Framework for Implementation Research (CFIR)
Scoping review of knowledge translation theories, models and frameworks

159 KT theories, models or frameworks used to inform 627 KT interventions

- 60% used only once; limited evidence base describing their use in practice
- Used to influence behaviour change at the level of: individual (100%), organization (48%), community (33%) or system (17%)
- Stage: planning/design (81%), implementation (67%), evaluation (55%), dissemination (32%) sustainability/scalability (23%)

Conclusion: Little information available to guide decisions by end users as to which theory/model/framework is best for their specific KT activity

Source: Strifler et al J Clin Epid 2018
Challenge: context, context, context


Context + Mechanism = Outcomes
Academic health institutions – Average 49 press releases/year
44% promote animal or lab research; 74% claim relevance to human health
47% were about primary health research
23% omitted study size
34% failed to quantify
40% reported results of weak design (58% lacked relevant caution)
17% promoted studies with strongest design

Conclusion: Often focus on research that has uncertain relevance to human health and do not provide key facts or acknowledge important limitations.
Other challenges:

- Politics trumps evidence
- Alternative facts
- Public’s and politicians’ distrust of science
Is knowledge translation a linear process?
Implementation processes are complex and non-linear.
What is the right sports metaphor for knowledge translation?

Pass the baton

Skate to where the puck is going
Thank You
Creating KT Tools

• Who is the target?
• Engage relevant stakeholders
• Include relevant disciplines
• Integrate qualitative and quantitative methods
• Evaluate impact, sustainability

• Based on work done with: Jayna Holroyd-Leduc, Sasha Jovicic, Monika Kastner, Ryan Kealey, Laure Perrier
MRC Framework
BMJ 2008;337:979-83

Feasibility and piloting
- Testing procedures
- Estimating recruitment and retention
- Determining sample size

Development
- Identifying the evidence base
- Identifying or developing theory
- Modelling process and outcomes

Implementation
- Dissemination
- Surveillance and monitoring
- Long term follow-up

Evaluation
- Assessing effectiveness
- Understanding change process
- Assessing cost effectiveness
Creating the knowledge and Identifying the problem

- Systematic review(s) of relevant evidence
- Identify gap between evidence and decision making
Clinical Decision Support Tools for Osteoporosis Disease Management: A Systematic Review of Randomized Controlled Trials
Monika Kastner, PhD and Sharon E. Straus, MD, FRCPC
J Gen Intern Med 23(12):2095–2105

**Clinical Decision Support Tools for Osteoporosis Disease Management: A Systematic Review of Randomized Controlled Trials**

*Monika Kastner, PhD¹ and Sharon E. Straus, MD, FRCPC²*

¹Department of Health Policy, Management and Evaluation, Faculty of Medicine, University of Toronto, Toronto, ON, Canada; ²Department of Medicine, University of Calgary, Calgary, AB, Canada.

**BACKGROUND:** Studies indicate a gap between evidence and clinical practice in osteoporosis management. Tools that facilitate clinical decision making at the point of care are promising strategies for closing these practice gaps.

**KEY WORDS:** osteoporosis; disease management; decision making; randomized controlled trials.

© Society of General Internal Medicine 2008
Management of Urinary Incontinence in Women
Scientific Review

Jayna M. Holroyd-Leduc, MD
Sharon E. Straus, MD

Context  Urinary incontinence is a common health problem among women that negatively impacts quality of life. Therefore, it is important that primary care physicians have an understanding of how to manage urinary incontinence effectively.

Objective  To review the most recent, high-quality evidence regarding the etiology and management of urinary incontinence in women.

Data Sources and Study Selection  Searches of MEDLINE, EMBASE, The Cochrane Library, and the ACP Journal Club were performed to identify English-language articles published between 1998-2003 that focused on the etiology or treatment of urinary incontinence in adult women. The references of each retrieved article were reviewed and an expert in the field was contacted to identify additional relevant articles.
Effects of self-management intervention on health outcomes of patients with heart failure: a systematic review of randomized controlled trials

Aleksandra Jovicic1, Jayna M Holroyd-Leduc2,3 and Sharon E Straus*2,3,4

Address: 1Department of Mechanical and Industrial Engineering, University of Toronto, 5 King’s College Road, Toronto, Ontario, M5S 3G8, Canada, 2Knowledge Translation Program, Faculty of Medicine, University of Toronto, 500 University Avenue, Suite 300, Toronto, Ontario, M5G 1V7, Canada, 3St. Michael’s Hospital, University Health Network, Toronto, Ontario, Canada and 4Department of Medicine, University of Calgary, Calgary, Alberta, Canada

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This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/2.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
Adapting the knowledge

• Create conceptual model with input from end users and consideration of the evidence
  – engage relevant end users and those from relevant disciplines/expertise

• Use focus groups, interviews, surveys, workflow analysis as necessary to understand needs of the end users and context
Assessing the barriers and facilitators to using the knowledge tool

- Design the prototype based on the results from the previous phase
- Use focus groups, interviews, workflow analysis with end users as needed
Tailoring the tool

• Usability testing of the tool
  – Heuristic
  – Individual usability testing
Breast Cancer Prevention 2011

Is it time to be screened?

How old are you?

40-49
- Craft wording for this.

50-74
- Schedule a mammogram every 2-3 years.

75+
- Craft wording for this.

Who is considered at High Risk?

High risk refers to women who have a personal or family history of breast cancer, the known BRCA1 or 2 mutation, or prior chest wall radiation.

Want to learn more? Visit our website for more information and take our Breast Cancer Risk Assessment Quiz:
www.canadiantaskforce.ca
Should you be screened with mammography for breast cancer?

Are you high risk?
High risk refers to women who have a personal or family history of breast cancer, the known BRCA1 or 2 mutation, or prior chest wall radiation.

No

How old are you?

40-49
We suggest not screening with mammography.

50-74
We suggest scheduling a mammogram every 2-3 years.

75+
We suggest discussing the benefits and harms of mammography with a family physician.

Yes

Talk to a doctor about the best screening options for you. This guideline does not apply to women with a high risk of breast cancer.

What to do

Why?

The chance of breast cancer is lower and chance of false positive results is higher in women 40-49 years.

The benefits outweigh the harms and more lives are saved in women in the 50-74 age group.

For screening in the 75+ age group, the impact of the woman’s overall health should be taken into account and discussed with a doctor.

Want to learn more?
Visit our website at www.canadiantaskforce.ca for our FAQ for Patients

*Breast cancer screening is trying to find cancer when symptoms are not present.*
Should I be screened with mammography for breast cancer?

For women between 50 and 69 years of age:

Among women who do not screen, the risk of dying from breast cancer is: 1 in 155
With regular screening your risk of dying of breast cancer is: 1 in 196

However, with regular screening:
... your risk of having a false positive mammogram requiring further screening is: 1 in 4
... your risk of having a biopsy: 1 in 28
... your risk of having part or all of a breast removed unnecessarily is: 1 in 200

Be informed!

You may hear the risks or benefits of breast cancer screening described as either absolute or relative. But what does all this mean and how does it apply to you?

The main difference is that absolute risk takes into consideration the fact that whether or not you get screened or treated, you still have a baseline risk of dying of breast cancer: 1 in 155 or 0.64%. With regular screening that risk changes to: 1 in 196 or about 0.51%. Relative risk does not consider baseline risk in the same way and may lead to confusion about how regular screening reduces risk.

The absolute risk is simply the difference in risk between regular screening (0.47%) and no screening (0.64%).

0.64% - 0.51% = 0.13%

Therefore screening in women aged 50-69 reduces your absolute risk of dying of breast cancer by 0.13%.

So the absolute benefit of screening is 0.13%.

Relative risk only looks at the reduction in risk as a proportion of the total risk (so it doesn’t consider that you are already at risk of cancer, this can lead to larger values than absolute risk).

0.13%/0.64% = 21%

Thus, screening in women aged 50-69 reduces your relative risk of dying of breast cancer by 21%. So the relative benefit of screening is 21%.

So how does this translate into actual numbers? Among 100,000 women aged 50 to 69 who are:

Screened EVERY 2 years for 11 years:
- 510 would die of breast cancer
- 28,200 would experience a false alarm
- 3700 would have a biopsy
- 500 would have part or all of a breast removed without having cancer
- 138 would escape a breast cancer death

NOT screened for 11 years:
- 640 would die of breast cancer
- 99,360 would not

For more information visit: http://www.canadiantaskforce.ca
Implementing and monitoring the use of the tool

• Pilot study of implementation
• Acceptability of the tool
• Feasibility of use of the tool
  – Can the person complete the tool on their own?
  – How long does it take? What resources does it require?
Evaluating the impact of the tool

- Larger scale evaluation
  - Qualitative and quantitative methods
  - Include economic analysis
Sustaining use of the tool

• Post implementation surveillance
• Maintenance of the tool
• Scalability
Osteoporosis Questionnaire

Please “touch” 

START
What is your last name?
(Please touch the letter keys below to spell out your last name in the empty box)

LAST NAME:
How many **alcoholic drinks** do you usually drink per week?

- None
- 1-7 drinks / week
- 8-20 drinks / week
- More than 20 drinks / week

**For your information:**

One alcoholic drink is equal to:

- One, 12-oz bottle of beer
- One, 5-oz glass of wine
- One, 1.5-oz shot of spirits such as vodka, rum, gin, whiskey
Are you currently taking any of the following osteoporosis medications? (Please choose all that apply)

- Alendronate (e.g. Fosamax®)
- Teriparatide (e.g. Forteo®)
- Alendronate + Vit D (e.g. Fosavance®)
- Nasal calcitonin (e.g. Miacalcin NS®)
- Risedronate (e.g. Actonel®)
- Etidronate (e.g. Didrocal®)
- None of the above

Back

Play Sound

Stop Sound

Next
Your current osteoporosis risk...

<table>
<thead>
<tr>
<th>Your Responses to the Questionnaire</th>
<th>You are AT RISK for osteoporosis because:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age more than 65 years</td>
<td><strong>You are postmenopausal</strong>—this means that you no longer have periods because your body does not produce hormones such as estrogen. Without these hormones your bones can get weak and brittle, which can increase your chances of getting osteoporosis.</td>
</tr>
<tr>
<td>Previous broken bone</td>
<td><strong>Your mother had a broken hip</strong>—this means that you also have a greater chance of breaking a bone.</td>
</tr>
<tr>
<td>Postmenopausal: Age 53 years</td>
<td><strong>You have been taking a steroid medication for more than 3 months</strong>—this medication reduces the amount of calcium that your body can absorb, so you have a greater chance of getting osteoporosis.</td>
</tr>
<tr>
<td>Diagnosed with osteopenia</td>
<td><strong>Your doctor has told you that you have osteopenia</strong>—this is a condition that is not as severe as osteoporosis but it does mean that your bones are thinner and weaker than normal.</td>
</tr>
<tr>
<td>Taking hormone replacement therapy (HRT)</td>
<td><strong>You drink more than 4 cups of coffee, tea, or cola per day</strong>—too much caffeine increases your chances of getting osteoporosis because your body has a harder time absorbing calcium and vitamin D.</td>
</tr>
</tbody>
</table>

What you can do...

- You had a BMD test done over 2 years ago, but you should have this test done again so your doctor can see the condition of your bones right now—This is important because if your bones have become weaker, you could break a bone very easily and there are treatments that can help to prevent this—Please discuss this with your doctor.
- It's great that you are taking *Calcium and vitamin D, and Fosamax*—these vitamins and medication will help prevent your bones from getting weaker.
- Another treatment option that may help is a medication called "Evista", which is recommended for postmenopausal women to prevent and treat osteoporosis. *Evista* can be taken any time during the day as a single tablet (60 mg/day). However, you should not take this medication if you ever had a blood clot in the vein—Please discuss this treatment option with your doctor.
RAQ Summary:
- BMD test done 3 years ago
- ORAI score = 16
- 4 Major and 1 Minor risk factors for OP
- T-score: -1.5 (osteopenia)
- Exceeds threshold for BMD testing (score > 5)
- Indicates high risk for OP

Best Practice Recommendation

**DIAGNOSIS:**
- Refer for BMD testing (BMD done over 3 years ago)

**TREATMENT** (postmenopausal women with low BMD):
- Bisphosphonates – 1st line prevention of OP (already taking – Fosomex)
- Raloxifene – 1st line prevention for further bone loss
- Calcium 1500 mg/d + Vitamin D 800 IU/d (already taking)
- Physical activity: ≥30 min, at least 3 times/wk

Using data entered by patients on the tablet PG questionnaire, the best practice recommendation was generated by a disease management algorithm that was adapted from the current clinical practice guidelines in osteoporosis.

<table>
<thead>
<tr>
<th>Risk factor (according to ORAI)</th>
<th>Response</th>
<th>ORAI score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>59 years</td>
<td>5</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>&lt; 60</td>
<td>9</td>
</tr>
<tr>
<td>Estrogen intake</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL ORAI score (Threshold for BMD testing: ORAI score &gt; 5)</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk factor (in accordance to guidelines)</td>
<td>Response</td>
<td>Risk Level</td>
</tr>
<tr>
<td>BMD test in the last year</td>
<td>NO</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Smoker</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Incessive alcohol intake</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Excessive caffeine intake</td>
<td>YES</td>
<td>MINOR</td>
</tr>
<tr>
<td>Fall in the last year</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Previous fracture</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Fractures diagnosed with OP</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Family history of fracture</td>
<td>YES</td>
<td>MAJOR</td>
</tr>
<tr>
<td>Postmenopausal age (Dx of menopause ±5 years)</td>
<td>YES</td>
<td>MAJOR</td>
</tr>
<tr>
<td>Osteoporosis diagnosis</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Osteoporosis diagnosis</td>
<td>YES</td>
<td>MAJOR</td>
</tr>
<tr>
<td>Rheumatoid Arthritis diagnosis</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iopacine</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Aspirin</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Ibida</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Valproic acid</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Brocadioloxis</td>
<td>YES (+ 3 month use)</td>
<td>MAJOR</td>
</tr>
<tr>
<td>Parathyroid hormone</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Calcium ++ Vitamin D</td>
<td>YES</td>
<td></td>
</tr>
</tbody>
</table>


ORAI = Osteoporosis risk assessment instrument.
Dear Mary Smith,

Thank you for filling out the osteoporosis questionnaire at the beginning of your visit at the clinic today. The table below shows your responses to the questionnaire, which was also given to your physician.

<table>
<thead>
<tr>
<th>Questionnaire Item</th>
<th>Your Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>58 years</td>
</tr>
<tr>
<td>Weight</td>
<td>96.4 kg (212.8 lb)</td>
</tr>
<tr>
<td>Estrogen intake</td>
<td>No</td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>Yes</td>
</tr>
<tr>
<td>Family history of fracture</td>
<td>Yes (maternal hip fracture)</td>
</tr>
<tr>
<td>&gt; 3 months use of prednisone</td>
<td>Yes</td>
</tr>
<tr>
<td>Excessive caffeine intake</td>
<td>Yes</td>
</tr>
<tr>
<td>Smoker</td>
<td>No</td>
</tr>
<tr>
<td>Previous fracture</td>
<td>No</td>
</tr>
<tr>
<td>Tendency to fall</td>
<td>No</td>
</tr>
<tr>
<td>Previous BMD test</td>
<td>Yes (5 years ago)</td>
</tr>
<tr>
<td>Excessive alcohol intake</td>
<td>No</td>
</tr>
<tr>
<td>Calcium + Vitamin D</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Your responses to these questions indicate that you are at risk for osteoporosis. These risk factors are related to your postmenopausal status, your family history of broken bones, and the fact that you are taking steroids (prednisone) for more than 3 months [More info on osteoporosis and prevention here].

Although you had a bone mineral density (BMD) test done 5 years ago, your current risk factors indicate that you should have another test done now [More info on BMD test here].

The fact that you are also taking prednisone means that you are at even greater risk for osteoporosis. This is because extended use of steroid medications can harm your bone density. If you haven’t already, you should discuss treatment options with your doctor because of your steroid use. Treatment options include medications that can decrease your chances of having osteoporosis or broken bones. These treatment options are: [List according to guidelines].
A SELF-HELP TOOL for WOMEN
MANAGING URINARY LEAKAGE

Do you leak urine when you do not want to?

If so, you are not alone. Urine leakage (urinary incontinence) is a common problem for women. Up to 50% of women have urine leakage.

Urine leakage can happen when you cough or sneeze. This is called stress incontinence.

You can also have a sudden urge to pass urine and not be able to reach the toilet before leaking urine. This is called urge incontinence.

Urine leakage is not just a part of getting older. You do not have to live with it. There are factors that can worsen your urine leakage. This tool will help you to change some of these factors.
Factor 1

Pelvic Floor Muscle Strength

1. Do you regularly do pelvic floor muscle exercises (or Kegel exercises)?
   - Yes
   - No
   - Not Sure
Your risk factors for urinary incontinence

The first thing to do...

...is to track how often you are leaking urine. Use a piece of paper or note pad to keep track of your urine leakage before and after you change a factor. This is called a bladder diary. In the diary you will want to record the following each day:

<table>
<thead>
<tr>
<th>Time</th>
<th>Accidentally leaked urine</th>
<th>Used toilet</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8 am</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-10 am</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 am-12 pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-2 pm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4 pm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Blood pressure
Blood sugar management
Cholesterol
Coping with diabetes
Eye disease
Foot complications
General information
Heart attack and stroke risk
Kidney disease
Medications
Nutrition
Physical activity
Smoking
Teeth
Weight management

For people with diabetes, it is important to keep track of various things, such as blood sugars, blood pressure, what you eat and your activity. Keeping track of these things can help you and your health care provider learn about your diabetes and how you respond to food, exercise, medications, and stress.
References

Osteoporosis tool:
• Implement Sci. 2011 Jul 22;6:77
• Implement Sci. 2010 Dec 10;5:96
• BMC Med Inform Decis Mak. 2010 Jul 22;10:40.

UI Tool

Diabetes tool:
A Case Study of Integrated Knowledge Translation in Cancer Health Services Research

Mary Ann O’Brian, PhD
Scientific Associate,
Knowledge Translation Research Network
Ontario Institute for Cancer Research,
and
Assistant Professor, Department of Family and Community Medicine University of Toronto
Conflict of Interest

- Scientific Associate, Knowledge Translation Research Network (KT-Net), Ontario Institute for Cancer Research
- Knowledge Translation Section Editor, *Current Oncology*
- No affiliations with a commercial entity
Learning Objectives

By the end of my presentation, participants will understand:

1. The principles of integrated knowledge translation (IKT)
2. Facilitators and barriers to IKT in cancer health services research
What is **Integrated** Knowledge Translation?

- Approach in which knowledge users co-produce research
- Knowledge user: “an individual who is likely to be able to use research results to make informed decisions about health policies, programs and/or practices”


Gagliardi et al. 2017
Kothari et al. 2017
What is Integrated Knowledge Translation? (2)

Applies principles of KT to entire research process

- Design
- Analysis
- Implementation of findings

Aims of Integrated Knowledge Translation (IKT) Case Study

1. To learn how IKT activities were conducted within five projects of a cancer health services research network between 2010 and 2013;

2. To identify key IKT activities deemed to be either successful or unsuccessful by researchers and knowledge users; and

3. To describe the key contextual factors that led to either successful or unsuccessful IKT.

O’Brien et al. 2018, under review. BMC Medical Research Methodology
Methods

Study context

- Health Services Research Network, Ontario Institute for Cancer Research, Ontario, Canada

https://oicr.on.ca/research-portfolio/health-services-research/
Methods (2)

Multiple embedded descriptive case study design
Methods (3)

Cancer Network Studies

- Case Costing of Cancer
  - Researchers
  - Knowledge Users

- Lung Cancer Policy
  - Researchers
  - Knowledge Users

- Patient and Provider Reported Outcomes
  - Researchers
  - Knowledge Users

- Colorectal Cancer Screening
  - Researchers
  - Knowledge Users

- Women’s Cancer Survivorship Team
  - Researchers
  - Knowledge Users

Other stakeholders of cancer network
Results

- Documents: 3-4 per case
- Interviews
  - 25 participants contacted (5 cases)
    - 18 agreed (4/5 cases)
    - 5 researchers
    - 11 knowledge users (1-3 per case)
    - 2 stakeholders
Description of knowledge user involvement by study phase

<table>
<thead>
<tr>
<th>Study Phase</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involved in planning (defining research question, designing study)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Involved in methods and/or analysis</td>
<td>No</td>
<td>Proposed, did not occur</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Provided feedback on results</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Shared results with:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cancer system organization</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>b) Other audiences</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Implemented study results in policy/practice</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Across-case analysis (main themes)

- Lack of clarity about expectations of knowledge user role (3 cases)
- Perceived lack of alignment between research goals and organizational priorities (2 cases)
- Frequent knowledge user turnover significantly impacted IKT activities (all 4 cases)
Lack of clarity about expectations of knowledge user role

“I might have thought that there would be a somewhat higher level of engagement…”

Knowledge User

“...To be completely honest I don’t know that I had thought it out that well... I saw them [Knowledge User] as being facilitators and in charge of the program.”

Researcher
Perceived lack of alignment between research goals and organizational priorities

“...So the academic thinks they are doing a wondrous thing and in fact ... the messages just aren’t getting through to the users and maybe the research...may not be solving a very important and practical problem either at the clinical level or at the administrator level.”

Knowledge User
Frequent knowledge user turnover significantly impacted IKT

“[name of organization] is notorious for having high rates of staff turnover. Having continuity of person and memory across the life of the project can be a problem... It is hard to have the same person doing the same thing for any stretch of time that you can build a meaningful relationship.”

Researcher
<table>
<thead>
<tr>
<th>Facilitators of IKT</th>
<th>Described by Researchers</th>
<th>Described by Knowledge Users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Goals align with organizational priorities</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Research Team</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Team discusses roles (at beginning of project)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Researchers engage knowledge users throughout project</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Researcher has existing role within cancer system organization</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Cancer System Organization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Knowledge users have decisional authority to consider/ implement results</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Barriers to IKT

Project
- No clear plan to implement findings
- Lack of alignment between research and organizational goals

Research Team
- Lack of knowledge of IKT
- Lack of clarity about role of knowledge users

Cancer System Organization
- Lack of transparent KT processes/receptor sites
- Frequent turnover of knowledge users
- Internal work on same topic by organization
Discussion

- Knowledge users may take on role of advisors or experts but less like IKT

- Knowledge users: Involving Directors, Managers may ensure project history and help to consider / implement study findings

- Limitations
  - Memory of details of involvement
  - Different perspectives of those who declined?
  - Uncertain how findings would apply to internal projects by organization
Fit with other models

**FOUR ELEMENTS OF ORGANIZATIONAL LEARNING**

- **Supportive Leaders**
  - Leaders are committed to organizational learning:
    - Clear vision and goals for organizational learning
    - Champions and role models

- **Culture of Continuous Improvements**
  - Culture values organizational learning:
    - Aligned beliefs and values
    - Reinforcing incentives
    - Commitment to measurement of results

- **Intuitive Knowledge Processes**
  - Organizational learning processes are embedded into daily workflows:
    - Defined processes to set learning agenda and capture, distill, apply, and share knowledge
    - Technology platforms

- **Defined Learning Structure**
  - Organizational structure is aligned to support organizational learning:
    - Defined roles and responsibilities for capturing, distilling, applying, and sharing knowledge
    - Networks and coordination

Milway and Saxton https://organisational-learning-angelogroup1.wikispaces.com/3-Elements+of+Organisational+Learning
Fit with other models (2)

Ready, Set, Change!
Introduction

Ready, Set, Change! is a decision support tool designed to guide users in the selection of an appropriate readiness for change assessment measure for their setting. The tool has been developed for use by frontline implementers and decision-makers in healthcare settings including but not limited to acute care, long-term care, public health, mental health, and healthcare policy. Ready, Set, Change! decision support tool is based on a framework for organizational readiness for change comprised of 4 key constructs:

Individual Psychological
Individual Structural
Fit with other models (3): Consolidated Framework for Implementation Research (CFIR)

Damschroder et al. 2009
Conclusions

- Challenging to implement IKT in cancer health research network
- Missed opportunities for organization to benefit from research funded by others
- Facilitators and barriers to IKT
  - Project, research team, and cancer system organization
- Multiple types of knowledge users may be needed in large cancer system organization
Take-Home Messages

- **Project**
  - Align with organization’s priorities

- **Research team**
  - Open discussion of roles of all team members including knowledge users; consider terms of reference
  - Make plans for knowledge user turnover

- **Cancer system organization**
  - Support project at multiple levels in organization
  - Consider knowledge user role as part of job description
  - Have/create transparent KT processes/receptor sites across organization
Learning Objectives

By the end of the presentation, participants will understand:

1. The principles of integrated knowledge translation (IKT)
2. Facilitators and barriers to IKT in cancer health services research
Selected References


Funding for the Ontario Institute for Cancer Research is provided by the Government of Ontario
maryann.obrien@utoronto.ca
http://www.ktnet.oicr.on.ca/
Value, Standards and Innovation in an Optimal Cancer System: Can They All Co-Exist?

Geoff Porter, MD, FRCS(C), FACS
Professor of Surgery and Ramia Chair in Surgical Oncology
Dalhousie University, Halifax, Nova Scotia
Expert Lead, Clinical Care, Canadian Partnership Against Cancer
• Conflicts of Interest – none
• This talk – disjointed, will come together
• Value, Standards and Innovation in an Optimal Cancer System: Can They All Co-Exist?
  – Answer - YES
  – Words matter – value, standards, innovation
  – An example of a significant implementation issue in cancer
Worry – Incremental cancer outcome improvements will slow with increasing emphasis on the economics
Principles of Health Economics

1. Effective strategies exist to improve health
2. Resources are both precious and scarce;
   – they are insufficient to support all effective strategies
3. Difficult decision need to be made regarding #1 and #2

These apply to cancer care
The Opportunity for Value

What if Value was “front and center”? 

Value = \frac{\text{Health outcomes (e.g. QALY)}}{\text{Resource expended (e.g.$)}}

Want this to be a big “number”

Value = \text{Unifying goal}

Porter ME, NEJM 2010
Emphasis so far in cancer....

Increased $$

Drug X
Colorectal cancer

Drug Y
Colorectal cancer

Drug Z
Kidney cancer

Increased QALYs

= current chemotherapy
THE DEBATE RAGES ON ALIGNING COST WITH VALUE IN ONCOLOGY

As treatment costs throughout the oncology spectrum continue to sky-rocket, all stakeholders – patients, physicians, payers, and drug manufacturers – are both grappling with how best to define value, and developing and debating the merits of competing value frameworks. Organizations, such as NCCN, ASCO, Oncde, and others, have developed cutting-edge metrics that measure value by incorporating factors including clinical benefits, toxicity, cost, novelty, and research costs.

This briefing, featuring insights from thought leaders at Amgen, Eli Lilly, Eisai, and Texas Oncology, will help you to better understand all aspects of value in cancer care, in order to either challenge or justify the high prevailing costs of many of today’s oncology therapeutics, and choose the most appropriate treatment regimen. Read on to better evaluate the benefits of the new value frameworks, establish a definition for value and provide patients and payers with better evidence for your price.

www.eyeforpharma.com/oncology
Robotic surgery
$2 million USD
$3000-6000 additional per case

Proton beam therapy
>$25 million USD
Choosing Wisely Canada Cancer List: Ten Low-Value or Harmful Practices That Should Be Avoided In Cancer Care

By Gunina Mitra, PhD (C), Craig Earle, MD, MSc, Steven Latosinsky, MD, MSc, Christopher Booth, MD, FRCPC, Andrea Bezjak, MD, MSc, FRCPC, Christine Desbiens, MD, Guila Delouya, MD, MSc, FRCPC, Kara Laing, MD, FRCPC, Natasha Camuso, MSc, and Geoff Porter, MD, MSc

Canadian Partnership Against Cancer; Ontario Institute for Cancer Research; Cancer Care Ontario; Canadian Society of Surgical Oncology; Canadian Association of Medical Oncologists; and Canadian Association of Radiation Oncology, Toronto, Ontario, Canada
Let’s broaden this....

- Increased resources
- Increased $\quad$ QALYs
- Better outcomes

Threshold(s)
Value: The Implementation Challenge

- Setting the overarching goal as *high value for patients*:
  - A framework incorporating patient, payer, public and provider perspectives that could be applied across components of cancer care

Worry – Emphasis on standards will stifle innovation and discovery
What Drives the Need for Standards?

• Variation

• In Canada, we know about it....
Cancer Mortality Rates by Province/Territory
2016 (est.)

Adapted from CCS Cancer Statistics 2016
## High Intensity Cancer Surgery in Canada: 2004-2012

<table>
<thead>
<tr>
<th>Province</th>
<th>Esophagus (%)</th>
<th>Lung (%)</th>
<th>Liver (%)</th>
<th>Ovarian (%)</th>
<th>Pancreas (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta (AB)</td>
<td>311 (11.1)</td>
<td>2,946 (9.7)</td>
<td>1,241 (14.9)</td>
<td>2,182 (12.9)</td>
<td>648 (16.2)</td>
<td>7,328</td>
</tr>
<tr>
<td>British Columbia (BC)</td>
<td>508 (18.0)</td>
<td>4,691 (15.5)</td>
<td>1,516 (18.2)</td>
<td>3,051 (18)</td>
<td>674 (17)</td>
<td>10,440</td>
</tr>
<tr>
<td>Manitoba (MB)</td>
<td>114 (4.0)</td>
<td>1,986 (6.5)</td>
<td>345 (4.1)</td>
<td>895 (5.2)</td>
<td>164 (4.1)</td>
<td>3,504</td>
</tr>
<tr>
<td>New Brunswick (NB)</td>
<td>84 (3.0)</td>
<td>1,518 (5)</td>
<td>59 (0.71)</td>
<td>526 (3.1)</td>
<td>85 (2.1)</td>
<td>2,272</td>
</tr>
<tr>
<td>Newfoundland (NL)</td>
<td>29 (1.1)</td>
<td>455 (1.5)</td>
<td>155 (1.8)</td>
<td>362 (2.1)</td>
<td>80 (2.0)</td>
<td>1,080</td>
</tr>
<tr>
<td>Nova Scotia (NS)</td>
<td>171 (6.1)</td>
<td>1,734 (5.7)</td>
<td>505 (6.0)</td>
<td>731 (4.3)</td>
<td>181 (4.5)</td>
<td>3,322</td>
</tr>
<tr>
<td>Ontario (ON)</td>
<td>1,472 (52.3)</td>
<td>15,732 (52)</td>
<td>4,315 (51.7)</td>
<td>8,340 (49.2)</td>
<td>2,053 (51.5)</td>
<td>31,912</td>
</tr>
<tr>
<td>Prince Edward Island (PEI)</td>
<td>* (0.4)</td>
<td>* (0.4)</td>
<td>62 (4.2)</td>
<td>--</td>
<td>--</td>
<td>69</td>
</tr>
<tr>
<td>Saskatchewan (SK)</td>
<td>119 (4.3)</td>
<td>1,218 (4.02)</td>
<td>194 (2.3)</td>
<td>800 (4.7)</td>
<td>105 (2.6)</td>
<td>2,436</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,810</strong></td>
<td><strong>30,284</strong></td>
<td><strong>8,333</strong></td>
<td><strong>16,949</strong></td>
<td><strong>3,990</strong></td>
<td><strong>62,366</strong></td>
</tr>
</tbody>
</table>

*Numbers suppressed (<5 surgeries)
High Intensity Cancer Surgery in Canada: 2004-2012

Figure 4.2.2g: Age-adjusted mortality rates for pancreatic cancer surgeries (2004-12)

Finley et al, Approaches To High-Risk, Resource Intensive Cancer Surgical Care In Canada; 2015 CPAC Report
Colectomy for Colon Cancer in Canada – Province A

Hoogerboord and Porter; CMAJ Open 2018
Colectomy for Colon Cancer in Canada – Province B

Hoogerboord and Porter; CMAJ Open 2018
A Solution to Variation: Standards

• What is the optimum organization for the delivery of care for ________?

• Example – cancer surgery standards
Advanced Cancer Surgery Standards: Ovarian, lung, colorectal, hepatobiliary

Current State

• There is no unified approach that exists for cancer surgical care in Canada.

• Surgery is not integrated into most provincial cancer bodies and there is no explicit roles to oversee the systematic evaluation and regulation of cancer surgery in most provinces.

• Inability to enact change or to formally track and evaluate outcomes.

 Desired State

Standard Setting

• Nationally-implemented standards of care should be developed for each cancer surgery.

• Purposeful regionalization of cancer surgical services.

Benchmarking

• A structured benchmarking process for each specialty should be supported to improve surgical outcomes and inform policy decisions.
Standards: Implementation

“You must be at least this tall to ride.”

“It’s not the standard I object to, it’s the implementation!”
Thoracic Oncology Standards: Ontario

• Surgeon criteria
  – Qualitative
  – Training

• Hospital criteria
  – Equipment, services, human resources
  – Volume
  – Other processes
Cancer Surgery Standards in Ontario: Implementation

• Hospital declares “in” or “out”
  • If “in”
    – Hospital commits to standards
    – Target volumes for cancer surgery, incremental hospital funding for additional cases
  • If “out”
    – Claw back of hospital provincial funding for every case performed
Application of Standards for Thoracic Surgery in Ontario - Impact

Thoracic Cancer Surgery Standards
Percentage of thoracic (lung and esophageal) cancer surgeries performed in designated thoracic surgery centres, by disease site, Ontario, FY 2006/07-2009/10

- Esophageal
- Lung

Report date: January, 2011
Data source: Discharge Abstract Database (CIHI), National Ambulatory Care Reporting System (CIHI)
Prepared by: Cancer Care Ontario, Cancer Informatics

http://www.csqi.on.ca/ptjourney/treatment
Application of Standards for Thoracic Surgery in Ontario - Impact

Finley et al, Approaches To High-Risk, Resource Intensive Cancer Surgical Care In Canada; 2015 CPAC Report
Application of Standards for Thoracic Surgery in Ontario - Impact

Mortality 3.4%

Mortality 1.5%
Worry – There is still so much we do not know about cancer, we cannot stifle innovation....
Innovation: Definitions

• Business Dictionary:
  “The process of translating an idea or invention into a good or service that creates value or for which customers will pay.”

• Wikipedia:
  “.. something that is new, better and has been adopted and proven to create positive value”
A Question

What is the next “big innovation” in cancer care?

Something we don’t currently know

or

How to (best) implement what we already know
Innovative Approaches to Optimal Cancer Care in Canada

Focus:
Innovations in the delivery of quality cancer care across Canada

Final Plenary:
“5 Things We Should Do Right Away”
Dr. Craig Earl
Top 5, in order of cancer journey

1. Expand Diagnostic Assessment Programs
2. Organize cancer surgery
3. Have patient portals everywhere
4. Link, share, and use existing data
5. Integrate palliative care earlier

Standards and Value in all
All Innovative
Can Value, Standards and Innovation Co-Exist?

- Yes - They **must** for an Optimal Cancer System

- Knowledge Translation/Implementation Science is common theme