Welcome to CADTH’s recently revised Health Technology Update newsletter. If you’ve read previous editions of this newsletter you’ll notice many similarities. Inside this edition, you’ll find informative content on new and emerging health care technologies, in addition to emerging issues with not-so-new technologies in Canada. This revised newsletter also looks at how policy and health care decision makers are using health technology assessment information to help inform policy and practice decisions. This issue of Health Technology Update also includes an article on tools for colorectal cancer screening programs in Canadian jurisdictions, as well as current updates and links related to health technology assessment and clinical practice guidelines in Canada.

We hope you find this issue informative and useful. Once you’ve had a chance to read this newsletter, please take a few minutes to reply to the feedback section and tell us what you think.
Primary Screening Programs for Colorectal Cancer in Canada Using Non-invasive Home Tests

In Canada, two different types of fecal occult blood tests (FOBTs) are used for non-invasive colorectal cancer (CRC) screening: the traditional gFOBT and the newer FIT. These tests detect hidden (occult) blood in stool, which may be an indicator of CRC, bleeding polyps (a precursor to CRC), or other gastrointestinal diseases. FIT is intended to offer numerous improvements that are leading to its wider acceptance by CRC screening programs. The FITs currently available in Canada include Hemoccult ICT and OC-Auto Micro 80 FOB Test System. There are a number of commercially available gFOBTs available in Canada. These include: Dencoccult III, Tri-Slide, ColoScreen, ColoScreen ES, Colocare, FOB Test Slide, Hema-Screen, One-Step FOBT, Hemoccult Sensa, Hemoccult, Rapid Response One-Step, Innovaon FOB One-Step, and Tremblay Harrison Minute Lab FOBT.

How it works

FIT differs from gFOBT in that it does not require patients to smear stool samples onto test cards with a spatula. Rather, toilet water samples are collected by dipping a brush in the water surrounding stool.

FIT also uses antibodies specific to human blood. This is intended to increase its sensitivity and specificity and eliminate dietary and drug restrictions. A table of comparisons is presented below.

**Evidence**

While there are numerous claims that FIT offers better performance than gFOBT, there are few randomized comparisons to support this assertion. The sustained popularity of gFOBT may be attributed to the fact that there is strong evidence that it reduces CRC mortality when followed with appropriate diagnostic treatment. A recent systematic review concluded that no definitive statement regarding the choice between gFOBT and FIT for use in CRC screening programs could be derived.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>FIT</th>
<th>gFOBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary restrictions</td>
<td>None</td>
<td>Some manufacturers recommend avoidance of red meats, certain fruits and vegetables, and vitamin C for 3 days before taking the test and during the collection period.</td>
</tr>
<tr>
<td>Drug restrictions</td>
<td>None</td>
<td>Some manufacturers recommend the avoidance of certain drugs that may result in gastrointestinal blood loss, such as corticosteroids, chemotherapeutics, aspirin, and other NSAIDs for up to 7 days before taking the test and during the collection period.</td>
</tr>
<tr>
<td>Sample requirements</td>
<td>2 samples from 2 successive bowel movements</td>
<td>3 samples from 3 successive bowel movements</td>
</tr>
<tr>
<td>Cost</td>
<td>$9.00 to $12.00</td>
<td>$3.00 to $5.00</td>
</tr>
<tr>
<td>Patient compliance</td>
<td>Direct contact with stool is not required. Patient compliance is reported to be higher with this method.</td>
<td>Some patients find the handling of stool difficult and unpleasant.</td>
</tr>
<tr>
<td>Automated laboratory development</td>
<td>Some FITs can be developed by automated developers and readers. This allows for the management and standardization of a larger numbers of tests.</td>
<td>None</td>
</tr>
</tbody>
</table>

FIT=fecal immunochemical (blood) test; FOBT=fecal occult blood test; gFOBT=guaiac-based fecal occult blood test; NSAID=non-steroidal anti-inflammatory drugs.
Primary Screening Practices Across Canadian Jurisdictions

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Screening Program</th>
<th>Target Population</th>
<th>Screening Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>Under consideration</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>Considering • FIT • Colonoscopy (follow-up to positive FIT)</td>
</tr>
<tr>
<td>Alberta (Edmonton)</td>
<td>Full program in 2009</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>• FIT • Colonoscopy (follow-up to positive FIT)</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>Proposal submitted in June</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>• FIT • Colonoscopy or other method recommended by physician</td>
</tr>
<tr>
<td>Manitoba</td>
<td>2007</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>• gFOBT • Colonoscopy (follow-up to positive gFOBT)</td>
</tr>
<tr>
<td>Ontario</td>
<td>2007</td>
<td>Individuals at increased risk and average risk Individuals aged 50 and older</td>
<td>• gFOBT • Colonoscopy (follow-up to positive gFOBT)</td>
</tr>
<tr>
<td>Québec</td>
<td>Under consideration</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>• gFOBT • Colonoscopy (follow-up to positive gFOBT)</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>Under consideration</td>
<td>Considering individuals aged 50 to 74 at average risk</td>
<td>Considering • FIT and gFOBT • Colonoscopy (follow-up to positive FIT)</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>In development</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>Considering • FIT • Colonoscopy (follow-up to positive FIT)</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>In development</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>Considering • FIT and gFOBT</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>In development</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>Considering • FIT • Colonoscopy (follow-up to positive FIT)</td>
</tr>
<tr>
<td>Northwest Territories</td>
<td>Yes (2008) Pilot project</td>
<td>Individuals aged 50 to 74 at average risk</td>
<td>• FIT • Colonoscopy (follow-up to positive FIT)</td>
</tr>
<tr>
<td>Yukon</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

FIT=fecal immunochemical (blood) test; gFOBT= guaiac-based fecal occult blood test; NA=not applicable.

It was noted that in order to properly assess the performance of FOBTs, there is a need for research trialing FOBTs in a Canadian population.5

**Cost**

The cost of a three-day gFOBT is between $3 and $5 and a two-day FIT is between $9 and $12. The cost of manually processing these kits is approximately $7. Some FITs can be processed using automated analyzers that cost between $30,000 and $45,000. This allows for the processing of a larger volume of tests.

**Screening programs across Canada**

In the spring of 2009, Alberta will be launching Canada's first regional CRC program using FIT. Manitoba and Ontario established pilot CRC screening programs in 2007 using gFOBT. In 2008, the Northwest Territories set up a pilot program using FIT. The provinces of Nova Scotia, Prince Edward Island, Newfoundland and Labrador, and British Columbia have screening programs in development, with each of them considering FIT. In other jurisdictions, CRC screening is done on an ad hoc basis, with provincial governments planning to develop screening programs using either FIT or gFOBT.

**National Canadian guidelines and recommendations**


**References**

Reusing Single-Use Medical Devices

For at least two decades, patient safety concerns have surfaced about the reprocessing and reuse of single-use (medical) devices (SUDs). While those concerns have led some countries to regulate hospital and third-party activities on reprocessing or ban SUD reuse altogether, in some Canadian jurisdictions the practice still occurs with little or no regulation.

With the issue in front of federal and provincial governments, regional health authorities, hospitals, and health care associations, Health Canada proposed that CADTH conduct an HTA to explore the issue of reprocessing SUDs.

In February of this year, CADTH published a two-part report that is helping decision makers at many levels understand current reprocessing practices in Canada and the clinical, economic, ethical, and legal ramifications of reprocessing.

At the federal level, the report was shared with a federal/provincial/territorial working group established to draft a pan-Canadian framework on the reuse of SUDs. The framework, which has been reviewed by the provincial and territorial health ministries and regional health authorities, refers to the CADTH study as a basis for its recommendations.

It should be pointed out that a number of provincial and territorial jurisdictions have already developed their own policies or advisories on SUDs, the most stringent being that of the Northwest Territories which, in 2005, banned the reuse of any device labelled as single use.

For the Ontario Hospital Association (OHA), the survey portion of the CADTH report provided new data on SUD reprocessing practices in acute care hospitals in Canada, including specific data for Ontario. The OHA had issued a position paper in 2004 recommending that hospitals stop reprocessing SUDs in their facilities within two years. A 2001 survey indicated that 40% of Canadian hospitals reused SUDs, and OHA was keen to know if that number had changed.

Although the survey statistics show that SUD reprocessing is on the decline, 28% of the survey respondents still reuse SUDs; and larger hospitals and academic centres were significantly more likely to do so. Of the 28% that do reprocess, most do so in-house. This practice may not be supported by jurisdictional directives, which mostly state that critical and semi-critical SUDS should not be reused unless reprocessed by a third-party reprocessor licensed by a regulatory authority.


Non-steroidal Anti-inflammatory Drugs for Pain Management in Fractures

When the Southlake Regional Health Centre in Newmarket, Ontario, reached an impasse over a drug treatment protocol, CADTH was contacted for some unbiased, evidence-based assistance.

The Medical Advisory Committee of this health care centre was developing a new medical directive for pain management of patients in the emergency department. An issue arose when it came to patients with fractures. While some physicians believed non-steroidal anti-inflammatory drugs (NSAIDs) should be incorporated into the treatment protocol, others held the view that NSAIDs impair fracture healing.

To help the committee come to a decision, Dr. Stephen Cluff, their Emergency Program Medical Director, requested that CADTH’s Health Technology Inquiry Service (HTIS) provide an evidence-based report on the relationship between NSAIDs and fracture healing.
CADTH’s analysis of the literature published on the topic since 2000 revealed that the evidence of a relationship between non-union of fractures and NSAID use is weak. The number of studies on the topic is small and there are methodological shortcomings within each study. It also revealed that concern about fracture healing and NSAID use appears to be based on animal studies, with little human data to support these concerns.

CADTH’s summary of acute pain management guidelines suggested NSAIDs were recommended as an initial treatment option for mild to moderate pain. When used concurrently with opioids in patients with moderate to severe pain, NSAIDs can reduce opioid requirements, thereby translating to lower incidences of opioid-related adverse effects such as nausea, vomiting, dizziness, and constipation.

The CADTH report, said Dr. Cluff, provided the information the Medical Advisory Committee needed to make an informed decision. The majority of committee members voted in favour of incorporating NSAIDs into their new Medical Directive for Pain in the Emergency Room.

Scores are assigned to each proposal, and topics are ranked based on the importance of the decision. The third step involves deliberation during biannual in-person meetings at which Canadian health ministry, hospital, and federal government representatives consider the ranking of topic proposals, along with contextual information related to the technology to be assessed. This includes the expected level of interest, the potential controversial nature of the topic, access and reimbursement information, variation in the rate of use, and related jurisdictional research initiatives across Canada.

A topic prioritization process that uses criteria-based deliberation is intended to lead to HTA topics that are of most importance and most relevance to Canadians. This approach also ensures that resources available for HTA work are used effectively. The HTA process: http://cadth.ca/index.php/en/hta/programs/health-technology-assessment/process

**Selecting Topics for Health Technology Assessment**

In response to the vast number of eligible health technologies, CADTH’s HTA directorate has developed a structured process to prioritize and select topic proposals.

Priority setting occurs twice a year, in the spring and fall, and includes three key steps. The first step involves screening proposals; only those linked to a relevant public or practice policy decision are considered. The second step uses a criteria-based approach. Six criteria important to Canadian decision makers are used to help prioritize topics:

- burden of the health condition for which the technology is intended
- availability of alternative technologies
- potential clinical impact of the technology
- potential economic impact of the technology
- potential budgetary impact of funding the technology
- availability of recent technology assessment information.

**Health Technology Assessment South of the Border**

For him, home is the US, where examining costs and the cost-effectiveness of health interventions is traditionally overlooked or resisted.

In 2006, Dr. Pearson received funding to support the creation of the Institute for Clinical and Economic Review (ICER).
The institute produces appraisals of the clinical effectiveness and cost-effectiveness of medical innovations, with the goal of providing new information to decision makers who are intent on improving the value of health care services.

ICER has evolved its efforts into an open and transparent process guided and supported by stakeholders in health care delivery. To date, ICER has produced two technology assessments and appraisals and has prioritized three additional assessments. ICER appraisals involve a comprehensive look at how coverage decisions impact health and resources.

ICER is already showing signs that it is making inroads into an environment that does not traditionally embrace HTA. In January 2008, the ICER appraisal of CT colonography (virtual colonoscopy) was presented to the Washington State Health Care Authority and used as the basis for its coverage decision for the state Medicaid program, Veterans Affairs, state employees, and Department of Corrections. The Washington State Health Care Authority voted that its judgment concurred with the ICER rating of comparative clinical effectiveness: Although CT colonography was judged to have a similar clinical impact to optical colonoscopy, coverage was denied on the basis of poor comparative value.

In February 2008, Dr. Pearson presented an overview of ICER to CADTH staff. He has since presented at the 13th annual meeting of the International Society for Pharmacoeconomics and Outcomes Research (May 2008) and was most recently an invited plenary speaker at the 5th Annual Health Technology Assessment International Meeting (July 2008). His published work includes the book *No Margin, No Mission: Health Care Organizations and the Quest for Ethical Excellence*, published in 2003 by Oxford University Press.


Washington State Health Care Authority HTA program: http://www.hta.hca.wa.gov/assessments.html

Canada’s only human milk bank is located in Vancouver. In the 1980s, there were more than 20 across Canada, but fears of HIV infection led to their closure.

North American milk banks now screen, pasteurize, and dispense donated human milk to babies who have severe allergies or intolerance to formula.


*Donor breast milk versus infant formula for preterm infants: systematic review and meta-analysis.* Arch Dis Child Fetal Neonatal Ed. 2007;92:F169-F175. http://fn.bmj.com/cgi/content/full/92/3/F169


**Increasing cost of nitric oxide**

Inhaled nitric oxide is currently available through a Canadian licensed manufacturer, INO Therapeutics. In 2005, the cost of inhaled nitric oxide increased from $7.50 per hour to $95 per hour.

Inhaled nitric oxide improves the blood supply to the lungs in premature babies when used in conjunction with ventilator support and other agents. It is intended to help some full-term babies suffering respiratory failure who have not responded to the usual methods of support. It is also believed to reduce the need for extracorporeal membrane oxygenation, a costly and highly invasive surgical procedure.
In Canada, inhaled nitric oxide is indicated for the treatment of near and full-term babies (≥34 weeks) who are suffering from respiratory failure.

**Nitric oxide for respiratory failure in infants born at or near term.** Cochrane Database of Systematic Reviews 2006, Issue 2. [http://www.cochrane.org/reviews/en/ab000399.html](http://www.cochrane.org/reviews/en/ab000399.html)

**Biliary atresia**

Biliary atresia is a leading cause of death from liver disease, affecting about one in every 10,000 to 20,000 infants in Canada. Without treatment, biliary atresia can progress to liver failure and death within the first two years of life. Early detection and prompt intervention is critical to the success of treatment. However, late referral and diagnosis are still observed in Canada.

An infant screening stool card, consisting of photos of different-coloured stool samples, is being used by parents and medical staff to observe the stool colour of infants.

Universal screening in Taiwan using the stool card has lead to earlier diagnosis and better outcome in infants with biliary atresia.


**Sudden arrhythmia death in the young**

Sudden arrhythmia death (SAD) is a genetic heart condition that can cause sudden and unexpected death in young, apparently healthy, Canadians. Recognizing the early warning signs and seeking early medical attention can reduce the risk of SAD.

Community screening programs operating in the UK, using electrocardiogram tests, have been effective in reducing rates of SAD. These programs are also raising public awareness of inherited cardiac rhythm disorders, which are reported in as many as one in 625 live births.

While there are no screening programs in Canada, three studies involving genetics and arrhythmias in 10 centres across Canada, including three pediatric centres, are underway.

**Cardiac risk in the young: mobile screening programme:** [http://www.c-r-y.org.uk/mobile_screening.htm](http://www.c-r-y.org.uk/mobile_screening.htm)

**Recent HTAs**

**CADTH HTAs**

These reports are available without cost at the websites shown below:

- Hip Protectors in Long-Term Care: A Clinical and Cost-Effectiveness Review and Primary Economic Evaluation; May 2008. [http://cadth.ca/media/pdf/13015_Hip_Protectors_Long_Term_Care_tr_e.pdf](http://cadth.ca/media/pdf/13015_Hip_Protectors_Long_Term_Care_tr_e.pdf)
- Management of Neovascular Age-related Macular Degeneration: Systematic Drug Class Review and Economic Evaluation; April 2008. [http://cadth.ca/media/pdf/460_Neovascular-Age-Related-Macular-Degeneration_tr_e.pdf](http://cadth.ca/media/pdf/460_Neovascular-Age-Related-Macular-Degeneration_tr_e.pdf)
- Liquid-based Techniques for Cervical Cancer Screening: Systematic Review and Cost-effectiveness Analysis; February 2008. [http://cadth.ca/media/pdf/333_LBC-Cervical-Cancer-Screening_tr_e.pdf](http://cadth.ca/media/pdf/333_LBC-Cervical-Cancer-Screening_tr_e.pdf)
- Real-Time (Synchronous) Telehealth in Primary Care: Systematic Review of Systematic Reviews; January 2008. [http://cadth.ca/media/pdf/427A_Real-Time-Synchronous-Telehealth-Primary-Care_tr_e.pdf](http://cadth.ca/media/pdf/427A_Real-Time-Synchronous-Telehealth-Primary-Care_tr_e.pdf)
- Asynchronous Telehealth: Systematic Review of Analytic Studies and Environmental Scan of Relevant Initiatives; January 2008. [http://cadth.ca/media/pdf/427B_Asyncronous-Telehealth_tr_e.pdf](http://cadth.ca/media/pdf/427B_Asyncronous-Telehealth_tr_e.pdf)
- Telehealth for Acute Stroke Management (Telestroke): Systematic Review of Analytic Studies; January 2008. [http://cadth.ca/media/pdf/456_Telestroke_tr_e.pdf](http://cadth.ca/media/pdf/456_Telestroke_tr_e.pdf)
HTAs from other organizations


- Cardiac Resynchronization Therapy and Implantable Cardiac Defibrillators in Left Ventricular Systolic Dysfunction. University of Alberta, Evidence-Based Practice Center, 2007: http://www.epc.alberta.ca/icd_crt.html


New Canadian practice guidelines


Production Notes

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