

# Folate and Folic Acid: An Expert Consultation

Health Quality Ontario

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Health Quality Ontario strives to promote health care that is supported by the best available scientific evidence. Health Quality Ontario works with clinical experts, scientific collaborators, and field evaluation partners to develop and publish research that evaluates the effectiveness and cost-effectiveness of health technologies and services in Ontario.

Based on the research conducted by Health Quality Ontario and its partners, the Ontario Health Technology Advisory Committee (OHTAC)—a standing advisory subcommittee of the Health Quality Ontario Board—makes recommendations about the uptake, diffusion, distribution, or removal of health interventions to Ontario's Ministry of Health and Long-Term Care, clinicians, health system leaders, and policy makers.

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In addition, Health Quality Ontario collects and analyzes information about how a health intervention fits within current practice and existing treatment alternatives. Details about the diffusion of the intervention into current health care practices in Ontario can add an important dimension to the review. Information concerning the health benefits, economic and human resources, and ethical, regulatory, social, and legal issues relating to the intervention may be included to assist in making timely and relevant decisions to optimize patient outcomes.

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# Background

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Overuse, underuse, and misuse of interventions are important concerns in health care and lead to individuals receiving unnecessary or inappropriate care. In April 2012, under the guidance of the Ontario Health Technology Advisory Committee's Appropriateness Working Group, Health Quality Ontario (HQO) launched its Appropriateness Initiative. The objective of this initiative is to develop a systematic framework for the ongoing identification, prioritization, and assessment of health interventions in Ontario for which there is possible misuse, overuse, or underuse.

For more information on HQO's Appropriateness Initiative, visit our website at [www.hqontario.ca](http://www.hqontario.ca).

## Objective of Analysis

The objective of this expert consultation was to review current folate testing practices in Ontario and identify areas of inappropriate testing, if possible.

## Clinical Need and Target Population

### Description of Condition

Folate or folic acid is essential to the normal development of a baby's spine, brain, and skull. (1) Women who are folate-deficient during pregnancy are at risk of having offspring with neural tube defects. (1) Folate is also needed for red blood cells to form and grow; folate-deficiency anemia is a decrease in red blood cells due to a lack of folate. (2) Eating a well-balanced diet is one way of ensuring adequate levels of folate and folic acid; dietary sources include dark green vegetables (e.g., broccoli, spinach, peas, and Brussels sprouts), corn, dried peas, beans, lentils, oranges and orange juice, whole-grain breads, and foods fortified with folic acid. (3)

### Prevalence and Incidence

The prevalence of neural tube defects decreased from 1.58 per 1,000 births to 0.86 per 1,000 births during the full fortification period in Canada (1998 to 2002), (4) and fewer than 1% of Canadians are folate-deficient (< 305 nmol/L). (4)

## Technology/Technique

Folate testing in the community and hospital setting includes red blood cell folate, hematocrit, and serum folate on request. In 2011/2012, the 5 specialties that ordered the most folate testing in the community were family practice/general practice (81.8%), internal medicine (4.5%), nurse practitioners (2.4%), neurology (2.4%), and gastroenterology (1.8%). (5)

# Expert Consultation

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## Research Questions

What are current folate testing practices in Ontario? Are there any areas of inappropriate folate testing?

## Research Methods

### Expert Opinion

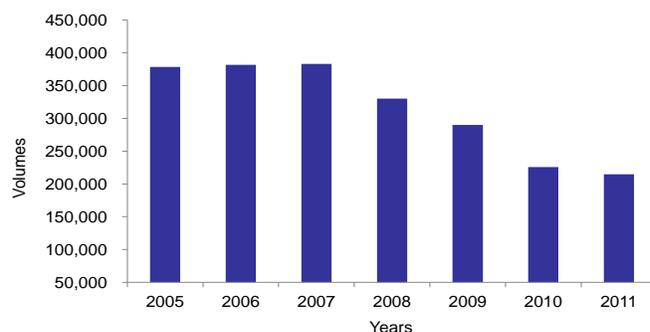
In July 2012, an Expert Advisory Panel on Appropriate Use of Vitamin B12, Folic Acid, and Iron Testing was struck. Members of the panel included physicians, personnel from the Ministry of Health and Long-Term Care, and representation from the community laboratories.

The role of the Expert Advisory Panel on Appropriate Use of Vitamin B12, Folic Acid, and Iron Testing was to contextualize the evidence produced by Health Quality Ontario and provide advice on the appropriate use of vitamin B12, folic acid, and iron testing in the Ontario health care setting. However, the statements, conclusions, and views expressed in this report do not necessarily represent the views of all Expert Advisory Panel members.

## Findings

### Ontario Context

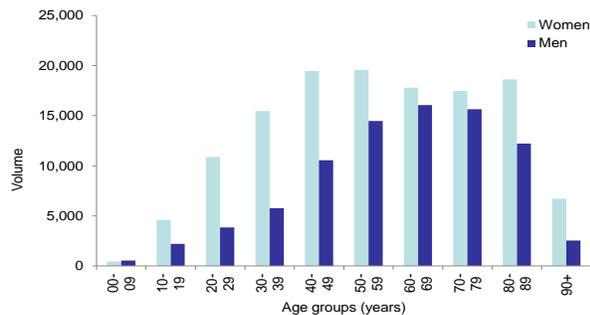
Folate testing in the community has decreased in Ontario since 2007 (Figure 1), when vitamin B12 and ferritin were added to the laboratory requisition form (Ministry of Health and Long-Term Care, written communication, September 2012). In 2011/2012 (projected to September 30, 2012), 214,886 folate tests were conducted, at a cost of \$4,999,323 (Cdn). (6)



**Figure 1: Folate Testing in Community Laboratories in Ontario 2005–2011<sup>a</sup>**

<sup>a</sup>Red blood cell folate, hematocrit, and serum folate on request. Years are fiscal years as prespecified by the Ministry of Health and Long-Term Care. Source: Claims History Database, aggregate data.(6)

In 2011/2012, women had a higher number of folate tests at all ages, except at very young ages, and a steeper increase in testing volume than men (Figure 2). For women, folate testing plateaued at around age 40 and older and dropped significantly in the very elderly. In men, there was less of a dramatic increase in folate testing at younger ages and the number of tests slowed at an older age than in women—at about age 50 years and older. Similar to women, the number of folate tests dropped dramatically in very elderly men. (7)



**Figure 2: Folate Testing in Community Laboratories in Ontario by Age and Sex, 2011/2012<sup>a</sup>**

<sup>a</sup>Red blood cell folate, hematocrit, and serum folate on request.  
 Source: Claims History Database, aggregate data. (7)

## Guidelines

Existing guidelines related to folate testing include the Joint Society of Obstetricians and Gynecologists of Canada (SOGC)—Motherisk clinical practice guideline. (8) Based on level II-2-A evidence, the authors recommended that women with no personal health risks, planned pregnancy, and good adherence require a diet of folate-rich foods and daily supplementation with a multivitamin that includes folic acid (0.4–1.0 mg) for at least 2 to 3 months before conception, throughout pregnancy, and during the postpartum period (4–6 weeks and as long as breastfeeding continues). They also stated that examination or laboratory investigations are not required prior to initiating supplementation.

In the United States, the U.S. Preventive Services Task Force (9) recommended that women planning a pregnancy or capable of becoming pregnant take a daily multivitamin supplement containing 0.4–0.8 mg of folic acid beginning at least 1 month before conception and continuing through the first trimester to reduce the risk of neural tube defects (Grade A evidence).

## Expert Consultation

Expert consultation identified the health conditions where folate deficiency may be a concern and where folate testing may be appropriate; this included individuals with a low hemoglobin level and a high mean corpuscular volume and individuals with suspected gastrointestinal disorders causing malabsorption or suspected malnutrition of any cause.

# Conclusions

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The relationship between folate and folic acid and pregnancy is well established, and in this instance, inappropriate folate testing is not a concern. Certain health conditions may be related to folate deficiency and play a role in folate testing. Volumes are expected to decline if folate testing is restricted to the parameters outlined in the following OHTAC recommendation:

- OHTAC recommended that red blood cell folate testing be restricted to individuals with:
  - low hemoglobin levels and a high mean corpuscular volume
  - individuals with suspected gastrointestinal disorders causing malabsorption or suspected malnutrition of any cause

# Acknowledgements

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## **Editorial Staff**

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