

LAB TEST:

SERUM & RED BLOOD CELL (RBC) FOLATE TESTING

Test Description	
Test Name	Serum & Red Blood Cell (RBC) Folate Testing
Rationale for Reducing Overuse	<p>Since the late 1990s fortifying grain products became mandatory in Canada, rendering folate deficiencies virtually nonexistent in Canada. Despite the condition being rare (<1% of all samples^{1,2} with a recent study citing 0.16%³) many hospitals still include it in their ordering systems.³</p> <p>In the context of low folate deficiency prevalence, clinical indicators (e.g., anemia, dementia, etc.) do not make low serum folate more likely and are not helpful in identifying folate deficient patients.² There is no evidence regarding changes in folate status and folate-related health outcomes following folate testing.⁴</p> <p>If risk factors present → supplement with folate without testing.</p> <p>Risk factors for deficiency include alcohol abuse, poor dietary intake, malabsorption syndromes, medications, and states of increased requirements (e.g., pregnancy).^{1,6}</p>
Scope of the Issue	
<input checked="" type="checkbox"/> Inpatient Setting	<input checked="" type="checkbox"/> Outpatient Setting
	<input checked="" type="checkbox"/> Emergency Department
Additional Details	<p>Internal Medicine</p> <p>Surgery</p> <p>Family Medicine</p>
Recommendations	
Summary of Recommendations	<p>Canadian Association of Medical Biochemists⁵</p> <p>Do not order serum folate testing in the absence of the following: anemia with RBC macrocytes or hyper-segmented polynuclear neutrophils and a reasonable clinical suspicion of a nutritional deficiency such as unsupplemented restrictive diet, severe Alcohol Use Disorder, or malabsorption (supplementing folate without testing is often sufficient).⁵</p>
Additional Information	No significant clinical impact of removing folate from order panel was found across various healthcare settings. ^{3,4}
Summary of existing metrics/indicators for appropriate use (further details below) (e.g., PT/PTT, % time test conducted, if applicable)	Canadian studies showed a 94-98% decrease in folate test ordering as listed in studies below. ^{3,7,8}

Success Stories

Highlights	Summary of Implementation Strategy	Barriers to Change and Facilitators of Success
University Health Network, Toronto, Ontario: 94.4% decrease in serum folate orders and \$78k in savings per year.³	<ul style="list-style-type: none">• Conducted across a healthcare network looking at outpatient, inpatient and emergency department folate test numbers• Data on RBC folate low utility was presented to the hospital's medical advisory committee.• The medical advisory committee restricted RBC folate testing to clinicians in gastroenterology and hematology in addition to removing the order option from all other physicians in the electronic medical record (EMR). These clinicians could still request RBC folate via paper requisition or phone call to the laboratory.• There were no alerts or messages in the EMR about RBC folate ordering.	<p>Identified Barriers:</p> <ol style="list-style-type: none">1. Changing physician behaviour <p>Facilitators of Success:</p> <ol style="list-style-type: none">1. Use of system change rather than behaviour change through education or feedback. Forced function via technology modifications which make undesirable behaviours difficult to perform2. Clear evidence in the literature of RBC folate's low utility resulting in stakeholder support3. Decision to restrict RBC folate was supported via local data4. Intervention was invisible to the user5. There was no ongoing financial or HR requirement over time
London Health Sciences Centre, London, Ontario: 98% decrease in RBC Folate test ordering and 95% reduction in monthly folate testing costs, roughly \$12.9k saved per year.⁷	<ul style="list-style-type: none">• Approached city-wide diagnostic utilization committee (medical specialty and lab representation) for support• Audited RBC folate levels for 18mo to identify physicians ordering more than 5 folate tests• Identified physicians were emailed information regarding the infrequency of folate deficiency and intent to discontinue testing in-house plus biochemist approval prior to testing, additionally they were asked for feedback on recommendations• Department chiefs were emailed regarding changes and told to notify staff• After reviewing stakeholder feedback and with general support, RBC folate testing was discontinued. Additionally, a pop-up describing the infrequency of folate deficiency would appear on the EMR whenever RBC folate was ordered (Figure 1). Orders could still be processed with biochemist approval and referred to another facility (Summary Figure 2)	<p>Identified Barriers:</p> <ol style="list-style-type: none">1. Physician aversion to pop-ups in EMR and dislike for restrictions to tests <p>Facilitators of Success:</p> <ol style="list-style-type: none">1. Contacting stakeholders helped physicians feel they were being consulted and involved in the process2. Seeking feedback increased acceptance of changes3. Education and initial communication resulted in greater buy-in

Bluewater Health, Sarnia, Ontario: ~94% decrease in folate test ordering.⁸

- The committee provided physicians with evidence about test misuse before shifting to specific changes
- Implementation strategy involved unbundling the top 7 common lab tests by removing hard check (automatic ordering option) on order sets.

Identified Barriers:

1. Gaining physician buy in and participation (addressed via creating physician committee positions, peer-to-peer interaction regarding CWC recommendations and creating tips of the month)

Facilitators of Success:

1. Physician engagement
2. Value for money (focusing on meaningful outcomes beyond cost savings)
3. Thoughtful committee composition (in addition to physicians, business directors, communications specialists and patient experience advocates were included)
4. Advice for medical lab technologists and medical lab assistants from CWC lab representatives.

Tips on Implementation

Feasible tips or suggestions for [initiating] implementation

(Per recommendation type, e.g., uncoupling, test reduction, etc.)

- Most common effective strategy

In Reducing Testing

- Using forced functions are the single greatest contributor to significant reductions in folate testing rather than education or reminders alone (e.g., removing hard checks, lab test order bundles)
- Using intervention invisible to user (e.g., removing testing option from lab panel)
- No need for ongoing financial or administration
- Clear literature of low-test utility
- Physician support for decision

Choosing Wisely Canada Applicable Toolkits

N/A

Figures

Figure 1: Decision Support Tool on EMR at LHSC

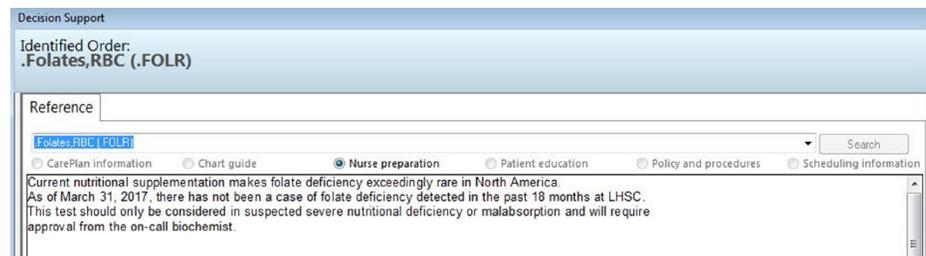


Figure 2: Summary of Intervention at LHSC

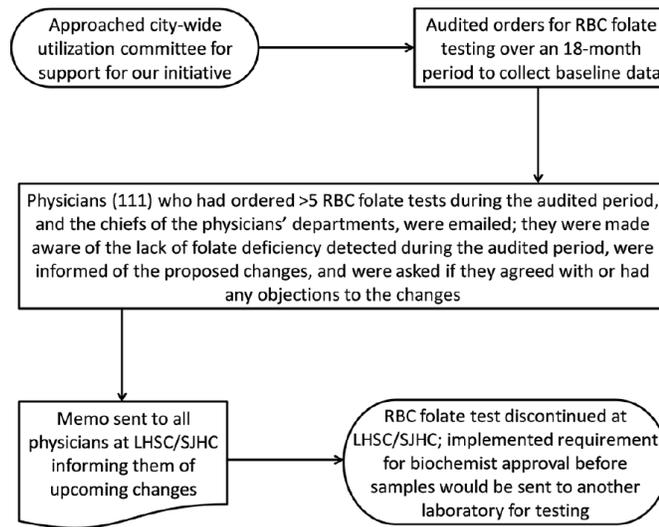


Figure 2 Summary of steps taken to reduce unnecessary RBC folate testing at LHSC/SJHC. LHSC, London Health Sciences Centre; RBC, red blood cell; SJHC, St. Joseph's Healthcare London.

References:

1. Gudgeon, P. and Cavalcanti, R., 2015. Folate Testing in Hospital Inpatients. *The American Journal of Medicine*, 128(1), pp.56-59. Accessed from: <https://pubmed.ncbi.nlm.nih.gov/25196989/>
2. Gilfix, B., 2014. Utility of measuring serum or red blood cell folate in the era of folate fortification of flour. *Clinical Biochemistry*, 47(7-8), pp.533-538. Accessed from: <https://pubmed.ncbi.nlm.nih.gov/24486651/>
3. MacMillan, T., Gudgeon, P., Yip, P. and Cavalcanti, R., 2018. Reduction in Unnecessary Red Blood Cell Folate Testing by Restricting Computerized Physician Order Entry in the Electronic Health Record. *The American Journal of Medicine*, 131(8), pp.939-944. Accessed from: <https://pubmed.ncbi.nlm.nih.gov/29729235/>
4. CADTH., 2015. **Folate Testing: A Review of the Diagnostic Accuracy, Clinical Utility, Cost Effectiveness and Guidelines**. Canadian Agency for Drugs and Technologies in Health. Accessed from: <https://cadth.ca/folate-testing-review-diagnostic-accuracy-clinical-utility-cost-effectiveness-and-guidelines>
5. Canadian Association of Medical Biochemists, 2020. **Five Things Clinicians and Patients Should Question**. Choosing Wisely Canada. Accessed from: <https://choosingwiselycanada.org/medical-biochemistry/>
6. Sharma, D., Mcritchie, D., Thompson, H., Huynh, T., 2019. Diving into Overuse in Hospitals. *Choosing Wisely Canada*. Accessed from: https://choosingwiselycanada.org/wp-content/uploads/dlm_uploads/2019/01/CWC_Diving-into-Overuse-in-Hospitals.pdf
7. Ismail, O., Chin-Yee, I., Gob, A., Bhayana, V. and Rutledge, A., 2019. Reducing red blood cell folate testing: a case study in utilisation management. *BMJ Open Quality*, 8(1), p.e000531. Accessed from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6440601/>
8. Vanspronsen, A., 2020. Building a Culture of Resource Stewardship at Bluewater Health. *The Journal of Medical Laboratory Science* 82(1), p8. Accessed from: https://labwisely.ca/wp-content/uploads/2020/09/CJMLS_Spring20_ebook-pages-8-9.pdf