

LAB TEST: DAILY LABS

Test Description																															
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Rationale for Reducing Overuse	<p>Multiple studies have shown no difference in readmission rates, transfers to ICUs, lengths of stay, rates of adverse events, or mortality when the frequency of laboratory testing was reduced.^{1,2} As laboratory test results influence 60-70% of medical decisions to admit, discharge or treat a patient, daily labs can have a profound impact on health economics.³</p> <p>Evidence suggests that routine lab testing leads to preventable harm, such as anemia, which in turn lead to further testing and treatment.^{4,5} Additionally, ordering daily labs without consideration of pre-test probability limits their predictive value.^{6,7}</p>																														
Scope of the Issue																															
<input checked="" type="checkbox"/> Inpatient Setting	<input type="checkbox"/> Outpatient Setting																														
	<input checked="" type="checkbox"/> Emergency Department																														
Additional Details	<p>Internal Medicine</p> <ul style="list-style-type: none"> Critical care General Internal Medicine <p>Surgery</p> <ul style="list-style-type: none"> Perioperative 																														
Recommendations																															
Summary of Recommendations	<p>Canadian Society of Internal Medicine⁸ In the inpatient setting, don't order repeated CBC and chemistry testing in the face of clinical and lab stability.</p> <p>Resident Doctors of Canada⁹ Don't order repeat laboratory investigations on inpatients who are clinically stable.</p> <p>Canadian Association of Pathologists¹⁰ Avoid standing orders for repeat complete blood count (CBC) on inpatients who are clinically/laboratorily stable.</p>																														
Additional Information	Several studies have demonstrated that when the frequency of daily labs (CBC, metabolic panel, etc.) are reduced there is no impact on patient outcomes such as readmission rates, mortality, ICU transfer rates and length of stay. ^{1,2,11,12}																														
Summary of existing metrics/indicators for appropriate use (further details below) (e.g., PT/PTT, % time test conducted, if applicable)	<p>A reduction of 6-20% has been recorded across multiple studies assessing daily labs.</p> <table border="1"> <thead> <tr> <th>Test Type</th> <th>Frequency of Unnecessary Tests (Chart Review)</th> <th>Frequency of Unnecessary Tests (per Frontline Providers)</th> </tr> </thead> <tbody> <tr> <td>Laboratory tests</td> <td></td> <td></td> </tr> <tr> <td>PT/PTT</td> <td>67% (87/130)</td> <td>75% (15/20)</td> </tr> <tr> <td>Liver function tests</td> <td>59% (72/122)</td> <td>67% (12/18)</td> </tr> <tr> <td>Urinalysis</td> <td>50% (50/100)</td> <td>45% (9/20)</td> </tr> <tr> <td>Lactate</td> <td>49% (26/53)</td> <td>14% (1/7)</td> </tr> <tr> <td>Troponin</td> <td>29% (15/52)</td> <td>42% (5/12)</td> </tr> <tr> <td>BNP</td> <td>18% (6/34)</td> <td>0% (0/5)</td> </tr> <tr> <td>Chemistry 7 panel</td> <td>3% (6/177)</td> <td>6% (3/47)</td> </tr> <tr> <td>Complete blood count (CBC)</td> <td>3% (5/175)</td> <td>6% (3/47)</td> </tr> </tbody> </table>	Test Type	Frequency of Unnecessary Tests (Chart Review)	Frequency of Unnecessary Tests (per Frontline Providers)	Laboratory tests			PT/PTT	67% (87/130)	75% (15/20)	Liver function tests	59% (72/122)	67% (12/18)	Urinalysis	50% (50/100)	45% (9/20)	Lactate	49% (26/53)	14% (1/7)	Troponin	29% (15/52)	42% (5/12)	BNP	18% (6/34)	0% (0/5)	Chemistry 7 panel	3% (6/177)	6% (3/47)	Complete blood count (CBC)	3% (5/175)	6% (3/47)
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Success Stories		
Highlights	Summary of Implementation Strategy	Barriers to Change and Facilitators of Success
<p>Royal Victoria Hospital, Montreal, QC 32% reduction in per patient costs saving \$50,657 over 14 months¹⁴</p>	<ul style="list-style-type: none"> • 26-bed medical clinical teaching unit • “Mindfulness based laboratory reduction” with regular physician education, forcing functions limiting daily test orders to 2 days and afternoon “time outs” addressing required laboratory testing for the next day 	<p>Identified Barriers:</p> <ol style="list-style-type: none"> 1. Physician culture 2. No end dates for daily blood tests <p>Facilitators of Success:</p> <ol style="list-style-type: none"> 1. Regular education with mandated reassessment and time-outs takes people off “autopilot” and encourages culture change 2. Forcing function addressed end dates for daily lab orders
<p>Calgary Medical Teaching Unit, Calgary, AB 11% reduction beyond control sites saving \$68,877 annually¹⁵</p>	<ul style="list-style-type: none"> • Single medical teaching unit • Identified lab tests which were top contributors to expenditure, developed local consensus among internists on appropriate use criteria for target tests, education and social comparison for attending internists and learners 	<p>Identified Barriers:</p> <ol style="list-style-type: none"> 1. Rotating medical learners at different stages of training order for routine tests 2. Lack of knowledge on costs 3. Absence of feedback on testing 4. Fear of missing diagnoses 5. Utilisation culture of the practice setting <p>Facilitator of Success:</p> <ol style="list-style-type: none"> 1. Generated local consensus on appropriate use criteria 2. Education and social comparison feedback for learners and their attending physicians 3. Education on costs 4. Timely team and individual directed feedback 5. Local appropriate use criteria helped build early stakeholder engagement
<p>St. Michael’s Hospital, ON 23% reduction in blood volume drawn for diagnostic phlebotomy¹³</p>	<ul style="list-style-type: none"> • single-site, 25-bed medical surgical ICU • stake-holder engagement, education sessions, process changes to encourage patient-centered lab ordering, electronic order set modifications to deter open-ended and unnecessary lab ordering, order changes to facilitate add-on testing, and audit and feedback regarding the average volume of blood collected per patient-day in the MSICU. 	<p>Identified Barriers:</p> <ol style="list-style-type: none"> 1. reflexive and repetitive blood testing options on orders 2. ICU patients receive a high volume of blood tests due to intensive intervention and monitoring <p>Facilitator of Success:</p> <ol style="list-style-type: none"> 1. Discouraged reflexive and repetitive ordering 2. Process changes encouraged patient-centered ordering 3. Electronic order modification 4. Feedback was given regarding volume of blood collected per patient to relate testing back to harm due to anemia
<p>Queen Elizabeth II Hospital, NS 32% reduction saving \$210,246 annually¹⁶</p>	<ul style="list-style-type: none"> • Academic tertiary care ED • reviewed existing symptom-prompted nursing blood test guidelines for serum electrolytes and glucose, renal function tests, liver tests, lipase, toxicological tests and beta Human Chorionic gonadotrophin levels. Order sets were revised with tests eliminated from the ‘routine’ panels that were not felt to ‘routinely’ contribute to patient care. The new guidelines were communicated to nursing staff in a series of educational sessions, and the revised guidelines were posted at nursing stations 	<p>Identified Barriers:</p> <ol style="list-style-type: none"> 1. ED guidelines guide blood test ordering using order sets to decrease over crowding <p>Facilitator of Success:</p> <ol style="list-style-type: none"> 1. Multidisciplinary group review of blood test guidelines 2. Removed tests from panels that did not contribute to patient care

Tips on Implementation

Feasible tips or suggestions for [initiating] implementation

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

- Most common effective strategy

Common effective strategies include:

- Education on misuse, consequences, and costs
- Feedback on performance compared to peers
- Removal of daily lab options on EMR or restricting the length of such orders (e.g., tests only done for 2 days and then need to be reordered)

Choosing Wisely Canada Applicable Toolkits

[Give the Test a Rest](#)

[Pause the Draws](#)

[Drop the Pre-Op](#)

Relevant Resource

[Choosing Wisely US: Reduce Unnecessary Labs to Improve Patient Care](#)

Johns Hopkins Medicine:

Are DAILY blood draws truly necessary?

For every patient under your care TODAY please consider whether it is safe and wise to reduce the number of blood tests that have been ordered.


- **Unnecessary blood draws:**
 - are painful / uncomfortable
 - contribute to anemia
 - drive up healthcare costs
 - adds to the phlebotomist / laboratory workload
- Before ordering any blood test, please ask yourself following two questions:
 1. Is this test necessary?
 2. Will it change my management?

Blood is precious so please choose wisely to conserve it.

PI: Rajiv Thakkar, MD, MBA, FACP
JHM eIRB study number NA_00044366


Mount Sinai Hospital:

Indications For Daily Blood Tests



Mount Sinai Hospital
Sinai Health System
Joseph & Wolf Lebovic
Health Complex

Indications For Daily CBC	Indications For Daily Electrolytes	Indications For Daily Creatinine
<ol style="list-style-type: none"> 1. Active Bleeding 2. Febrile Neutropenia 3. HELLP Syndrome (Hemolysis, Elevated Liver enzymes, Low Platelets) 4. HIT (Heparin-Induced Thrombocytopenia) 5. Drug-Induced Thrombocytopenia 	<ol style="list-style-type: none"> 1. Diabetic Ketoacidosis 2. Clinically Significant HYPO/HYPERkalemia or HYPO/HYPERnatremia 3. Acute Kidney Injury 4. Risk of Tumour Lysis 5. Risk of Refeeding Syndrome 6. Acid-Base Disturbances (i.e. Metabolic Acidosis) 7. Active Diuresis 	<ol style="list-style-type: none"> 1. Acute Kidney Injury 2. Rhabdomyolysis 3. Active Diuresis
<p style="margin: 0;">Ask Yourself</p>		
<ol style="list-style-type: none"> 1. Will This Test Affect Patient Care? 2. What Is The Associated Financial Cost? 3. Can You "Add-On" Tests to Previously Collected Blood Samples? 		



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