

Appendix Item 1: Study brochure

OPTIMIZATION OF LABORATORY TEST UTILIZATION

WHAT IS THE PROBLEM?

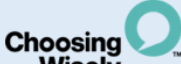
Repetitive inpatient lab testing often provides limited value for patient outcomes while:

- Increasing healthcare costs
- Increasing patient discomfort
- Increasing unnecessary transfusions and prolonging hospitalizations

Canadians receive an estimated one million unnecessary lab tests every year.

6 most commonly ordered lab tests:

CBC	Electrolytes	PT/INR
Creatinine	PTT	Urea





Choosing Wisely Canada recommends **AGAINST** ordering repeated blood counts and chemistry testing in stable inpatients

WHAT IS THE SOLUTION?

Aim Statement: To reduce unnecessary use of the six most common routine tests by 15% on MTUs and the hospitalist service by September 2020.

Our proposed solution contains 2 main approaches:


 **Education with the objective of reviewing optimal utilization of laboratory tests**
Online module: <https://cards.ucalgary.ca/deck/432>

 **Multi-level social comparison**
Audit and feedback review sessions facilitated by the Physician Learning Program

A pilot study conducted on PLC MTU using the above approaches achieved the goals of our aim without causing harm to patients.

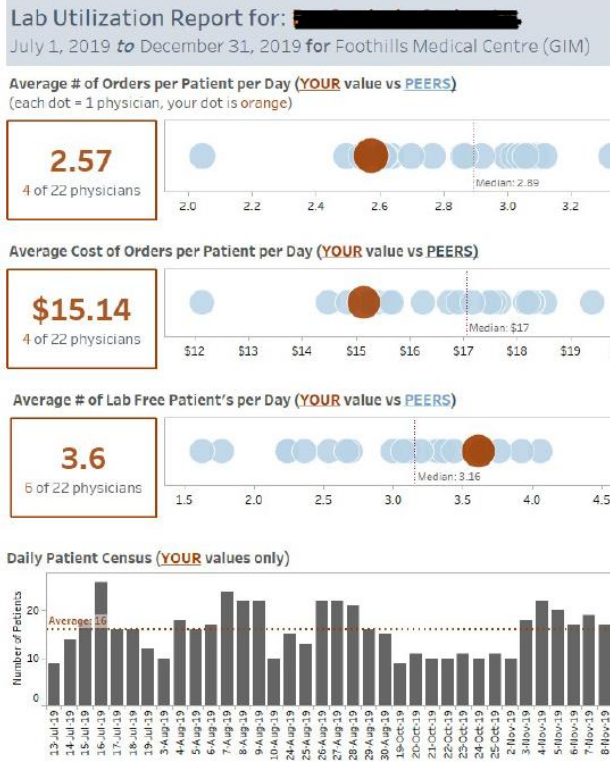
WHAT IS NEEDED FROM YOU?

1. Review testing indications before ordering tests
 - Our online module has been designed to help educate physicians and residents on appropriate use criteria for ordering lab tests
2. Reflect on your laboratory testing habits:
 - Indication for lab test?
 - How will testing change management?
 - Concerned about missing something? Test sequentially; shotgun testing leads to confusion, false positives and patient harm
3. Is my patient stable? Quit the daily blood work.



This study has been approved by the University of Calgary Conjoint Health Research Ethics Board (REB17-1215)

Appendix Item 2: Audit and feedback report



Appendix Item 3: Study Intervention Delivery Tracker

SITE	1st report	Feedback session	Number of Attendees	Resident interim af report	Final resident af report	2nd af report	Interim af report	Feedback session	Final resident af report	Interim af report	Final AF report	3rd af report	Interim af report	Final af report	4th af report
1	11-Jan	21-Jan	7	24-Jan	07-Feb	12-Mar	20-Mar	23-Mar	04-Apr	17-Apr	02-May	17-May	12-Jun	26-Jun	12-Jul
	11-Jan	25-Jan	3	20-Feb	07-Mar										
2	02-Feb	11-Feb	16	20-Feb	07-Mar	09-Apr	17-Apr	19-Apr	02-May	16-May	27-May	09-Jun	12-Jun	26-Jun	
	08-Feb	04-Mar	8	20-Mar	04-Apr										
3	01-Mar	08-Mar	20	20-Mar	04-Apr	07-May	16-May	19-May	27-May	12-Jun	26-Jun				
	08-Mar	22-Mar	2	17-Apr	02-May										
4	05-Apr	13-Apr	2	17-Apr	02-May	09-Jun	12-Jun	15-Jun	26-Jun						
	12-Apr	21-Apr	25	16-May	27-May										
SITE 1			SITE 4												
Link to Module	Reminder Email(Re Reminder email(res)	Link to Attendg)/followup	Link to Module(res)	Reminder Email(Res)	Reminder email(res)	Link to Attendg)/followup									
08-Jan	24-Jan	07-Feb	05-Mar	20-Mar	04-Apr	11-Jan									
						11-Jan									
06-Feb	20-Feb	07-Mar	02-Mar	16-May	27-May	04-Feb									
						09-Feb									
05-Mar	20-Mar	04-Apr	27-May	12-Jun	26-Jun										
02-Apr	17-Apr	02-May													
27-May	12-Jun	26-Jun													
SITE 2			SITE 4												
Link to Module	Reminder Email(Re Reminder email(res)	Link to Attendg)/followup	Link to Module(res)	Reminder Email(Res)	Reminder email(res)	Link to Attendg)/followup									
06-Feb	20-Feb	07-Mar	02-Apr	17-Apr	02-May	01-Feb									
						08-Feb									
05-Mar	20-Mar	04-Apr	02-May	16-May	27-May	08-Mar									
						08-Mar									
02-Apr	17-Apr	02-May	27-May	12-Jun	26-Jun										
27-May	12-Jun	26-Jun													

Appendix Item 4: List of all common laboratory tests
(top 80)

1. ABO_RH_Type__
2. Albumin_LEVEL_
3. Alkaline_Phosphatase__ALP__
4. ALT
5. Ammonia_LEVEL_
6. ANA_Screen_
7. Anti_HBS_
8. Anti_Mitochondrial_Screen_
9. AST
10. Bilirubin_Direct_
11. Bilirubin_Total_
12. Blood_Culture_
13. C_Difficile_Test_
14. C_Reactive_Protein_
15. Calcium__Ca__
16. Chem_Panel_7__Na__K__Cl__CO2__Cr__Glu__
Urea__
17. Chloride__CL__
18. Cholesterol_LEVEL_
19. CK
20. CO2
21. Complete_Blood_Count__CBC__
22. Coronavirus_Testing_
23. Cortisol_LEVEL_
24. COVID_19__RNA__NAT__

25. Creatinine_LEVEL_VALUE
26. Creatinine_VALUE
27. D_Dimer__DVT_PE_and_DIC__
28. Electrolytes__Na__K__Cl__CO2__
29. Ferritin_LEVEL_
30. Fibrinogen_
31. Free_T3
32. Free_T4
33. GGT_VALUE
34. Glucose
35. Haptoglobin_
36. HBsAg
37. HDL_Cholesterol_
38. Hemoglobin_A1C
39. Hemoglobin_

40. Hepatitis_C_Antibody_
41. HIV_Serology__Mixed_Ag_Ab_Detection_
42. INR
43. Ionized_Calcium__
44. Iron_
45. Ketones_
46. Lactate
47. LD
48. Lipase
49. Magnesium__Mg__

50. NT_proBNP_
51. Osmolality_
52. PCO2_Arterial
53. PCO2_Venous
54. Peripheral_Blood_Smear__
55. Phosphate_LEVEL_
56. Platelet_Count_
57. Potassium_
58. Potassium_
59. Protein_Total__
60. PT
61. PT_INR_PTT_Group_
62. PTT
63. Rapid_COVID_19
64. Retic_Absolute
65. Retic_Count_
66. Serum_Folate_LEVEL_
67. Sodium__Na__
68. SPE_Interpretation_
69. Syphilis_Antibody_Test_
70. Thyroid_Stimulating_Hormone__TSH__
71. Total_Hemoglobin_
72. Total_Iron_Binding_Capacity__TIBC_
73. Transferrin_Saturation_
74. Triglycerides_
75. Troponin_T__
76. Urate_

77. Urea_
78. Urine_Bacterial_Culture_
79. Urine_Specific_Gravity_
80. Vitamin_B12_

Appendix 5: Complete list of all critical laboratory test results as defined by our laboratory services

Laboratory Test	Critical lab values
Potassium	Less than 2.60 mmol/L Greater than 6.20 mmol/L
Phosphate	Less than 0.4 mmol/L
Sodium	Less than 120 mmol/L Greater than 155 mmol/L
Hemoglobin	Equal to or less than 60 g/L
Platelet	Platelet Less than $20 \times 10^9/L$
Absolute neutrophil count	Less than $0.6 \times 10^9/L$
White blood cell count	Less than $0.6 \times 10^9/L$ Greater than $99.9 \times 10^9/L$
International Normalized Ratio	Greater than 5
Partial thromboplastin time	Equal to or greater than 120s