Reducing Inappropriate Lab Draws on Unit 5A4 – A Quality Improvement Initiative

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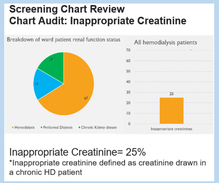
Presentation PDF

DEFINE OPPORTUNITY

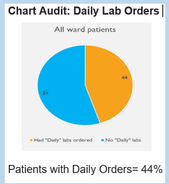
Background: A retrospective study of 17 676 patients, researchers determined that nearly 20% of hospitalized patients developed "moderate to severe hospital-acquired anemia" (hemoglobin decrease from normal to <11 g/dL) and that the volume of phlebotomy in hospitalized patients is directly related to the occurrence of anemia. The development of hospital-acquired anemia is associated with increased blood transfusions, extended length of stay, higher hospital charges, and mortality[1]. Lower levels of kidney function are associated with a lower hemoglobin and an increased prevalence and severity of anemia[2] (AT RISK POPULATION). Drawing blood for lab tests that do not contribute any useful information to the diagnosis or management of a patient is inappropriate. Such labs unnecessarily add to the volume of phlebotomy, which is in turn associated with worsening anemia. They also add unnecessary costs to the system.
By improving appropriateness of lab draws, we hope to improve efficiency of care and safety for patients. In conjunction with other QI initiatives regarding overuse of lab draws, our QI team hopes to promote a culture of mindfulness and compound the effectiveness of improvement strategies.

Problem: It is widely accepted among nephrologists that, aside from the generally accepted monthly labs, routine ureas and creatinines in chronic dialysis patients do not contribute any information towards their diagnosis or management. Moreover, it has been shown in other quality improvement initiatives that labs ordered as 'daily' are often left unchecked and contribute to unnecessary labs draws[3]. A screening chart review on unit 5A4 done in December 2017 showed that almost one quarter of patients admitted to 5A4 have inappropriate creatinines ordered and over half of patients admitted to 5A4 have daily labs ordered. Addressing these inappropriate lab ordering practices could reduce the volume of phlebotomy and therefore the burden of hospital acquired anemia as well as eliminate spending on these unnecessary tests.

Baseline:



Inappropriate Creatinine= 25%
*Inappropriate creatinine defined as creatinine drawn in a chronic HD patient



Patients with Daily Orders= 44%

Lab Data: Unit 5A4 October 2016-2017

	CBC	CBC-D	CR	Lyte	PT	Urea
Number of Tests	2459	3936	3821	19320	1288	3509
Cost	$12,295	$27,552+	$19,105	$96,600	$10,304	$17,545
Cost per Month	$1,025	$2,296	$1,592	$8,050	$859	$1,462

0.25*0.67=0.1675
0.1675 *1,592= 266.66
$266.66 monthly spent on inappropriate creatinine
$3,199.92 spent annually on inappropriate creatinine in Unit 5A4

Aim: By Sept 1, 2018:

- 50% reduction of inappropriate creatinine and urea lab orders on chronic hemodialysis patients
- 25% reduction of daily lab orders
- Improve residents and physician awareness of lab test ordering practices.
- Establish a standardized, integrated unit process and resident process to review and assess the ordered lab blood tests
- Create an algorithm for ordering ureas and creatinines on hemodialysis patients that can be used by residents.
- 100% of lab tests ordered upon admission to 5A4 will be reviewed and flagged as daily/standing/creatinine orders if required
- 100% of lab tests ordered as daily will be reviewed during the inpatient care
- Inappropriate creatinine will not be ordered for 100% of applicable hemodialysis patients admitted to unit 5A4 in the last 6 months

BUILD UNDERSTANDING

Process Assessment: Brief literature review was conducted along with the completion of QI tools to assist with identifying root causes and arising areas of opportunity.

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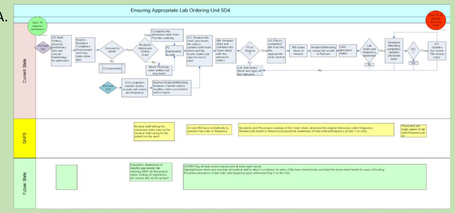

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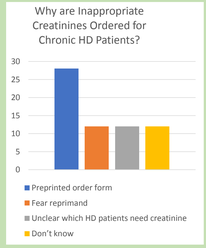

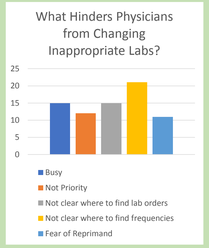

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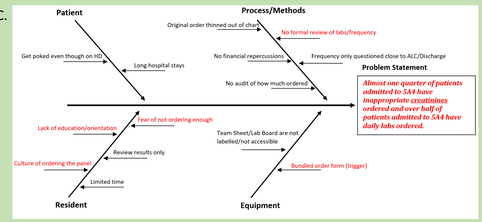
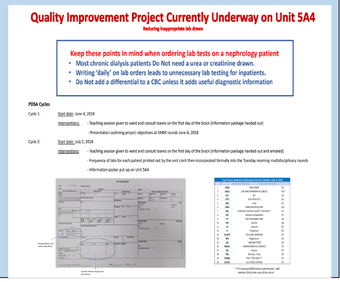


A. Process Map. The process of patient admission to blood draws for lab work is outlined. In yellow, gaps in the process that lead to inappropriate labs. In green, interventions to reduce the ordering of inappropriate labs.
B. Resident Survey. An 8 item 'check all that apply' survey was cast, 43 residents responded. The results indicate that the majority of residents attributed the cause of inappropriate creatinine orders to the preprinted admission form. Additionally, inappropriate orders are not changed due to a variety of reasons including: busy schedules, lack of priority, lack of understanding as to how to check orders and frequencies, and fear of reprimand for changing an attending's orders.
C. Cause and Effect Diagram. Potential root causes contributing to the problem were identified, key factors appear in red

MANAGE CHANGE

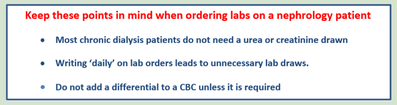
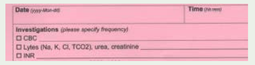
Collaboration & Communication Strategies: Here we list what we did to engage the stakeholders;

- Multidisciplinary QI team: Melissa Wright (Unit Manager), Krissa Sidoroff (Patient Care Manager), Kim Morrison (Unit Clerk), Kevin Zhang (Resident). Jordan Garside (Medical Student), Barb Brown (Charge Nurse), Priyanka Mysore (Fellow), Majid Sikosana (Fellow), Pam Mathura (QI Coordinator), Uwais Qarni (Nephrologist).
- A meeting was held with UC, PCM, UM, Resident to review and walk the current process such that all could learn what was being done and why – therefore together identifying gaps.
- Focus groups: Two focus groups were held with members of the multidisciplinary QI team to build understanding of the problem and subsequently to facilitate interventions on the ward.
- An informal meeting was conducted with a few of the residents impacted by the first PDSA to identify any suggestions for improvement that could be incorporated into the second intervention.
- A poster was developed and displayed on the unit outlining the QI project, the PDSA cycles, and key points addressing the gaps in the process.

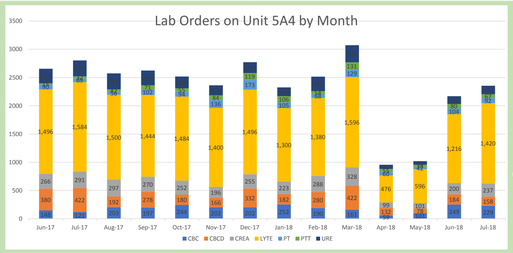


ACT TO IMPROVE

Improvement Selection and Implementation Plan: June 4 – September 1, 2018

Gaps	Interventions
Lack of resident education on proper lab ordering	Developed educational package including: description of appropriate vs inappropriate uses of creatine and urea for hemodialysis patients, an algorithm for ordering creatinine and urea, laboratory costs chart, orientation for the unit, and key points for ordering labs. This package was presented at the beginning of new resident blocks starting June 4, 2018. Starting July 3, the package was emailed to the residents prior to the training. **Creatinine Ordering Algorithm**  **Key Points for Ordering Labs** 
No formal review of labs by physicians	A formal review of the lab frequencies was inserted into Tuesday AM multidisciplinary rounds beginning July 3, 2018. The Unit Clerk prints off the lab frequencies Monday night, and the Charge Nurse brings the information to rounds. Thus, bringing any frequency issues to the attention of the physician. Additionally, the Unit Clerk highlights lab frequencies that appear to have issues; started July 3, 2018.
Lack of unit orientation	Included in the educational package is a map of the unit with the location of the Team Sheets. There was also a picture of a Team Sheet with instructions as to how to find the hemodialysis status of the patient, the frequency of labs, and the date that the labs were ordered. 
Bundled order form	The units switched to an admission form that the lab order section supported the unbundling of the lab tests promoting mindful physician ordering practices. (Old admission form with lytes, urea creatinine bundled is shown) 
Educational presentation only once per block	Posters with the information about the QI project were placed on the unit. The posters were put up by the QI team July 3, 2018.

A.



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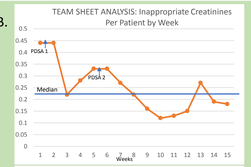

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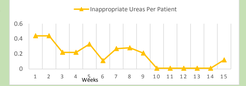

RESULTS

A. Increase in ordering CBC instead of CBC-d
B. Trend towards fewer inappropriate creatinines
C. Inappropriate ureas per patient

Limitations

- *The ward was shut down for renovations April and May 2018*
- *Team sheets from July 13th were replaced by July 18th*

SUSTAIN RESULTS

Reinforce Ownership, Measurement, & Continuous Improvement: To sustain the improvements:

- Added the educational information (Creatinine Ordering Algorithm, etc.) package to the emails sent to the residents at the start of each block
- On unit review of the ordering practice and Team Sheets – the Charge RN will bring Team Sheets to Tuesday AM rounds for review.
- Continue the chart audit monthly until Aug 31, 2018. Quarterly unit creatinine lab test total will be reviewed via AHS tableau scorecard
- Share data with the Nephrology Quality Committee to impact lab ordering and support continual mindful ordering lab practices
- Suggestions for upcoming Electronic Medical Records: include lab order dates and frequencies with the results of the tests for convenient review by physicians

SHARE LEARNING

Lessons Learned:

- Unit 5A4 moved locations (due to renovations) in May, this move impacted our initial results.
- In an informal meeting with residents, they reported that it was hard to keep track of the printed version of our orientation package. The orientation package is now emailed to the residents.
- We learned that culture (a main driver of inappropriate ordering) is not an easy thing to change; the review of lab appropriateness and frequencies during Tuesday AM rounds will hopefully change the culture to one of mindful ordering.
- The medical team often will order inappropriate lab tests even if they are aware that the patient on hemodialysis. This ordering practice is supported by a operational culture of 'ordering the current panel' on the admission paper order set.
- A lack of a standard process to review lab order frequency supports the continuation of inappropriate lab orders post admission.
- Some staff physicians had strong preferences towards ordering specific labs or daily labs for all inpatients. This supports the information given by residents that fear of repercussion is a driver of inappropriate lab ordering and leads to a culture of ordering broad and frequent labs to avoid being reprimanded. This points to a need to develop a consensus among staff and/or guidelines as to which labs are appropriate.

Why This Quality Improvement Matters

To patients
Reducing inappropriate lab orders and blood draws can help alleviate some of the pain, stress, and anxiety associated with needle draws and repeated tests.

To Albertans
This initiative aims to improve the efficiency of care and safety for patients. Thus affording Albertans confidence in their health care system.

To the Healthcare System
Reducing inappropriate lab orders decreases unnecessary health spending, and the burden on the health care team; allowing more effective allocation of the system resources.

References
1. Eaton KP, Levy K, Soong C, Pahwa, AK, Petrilli C, Ziemba JB, Cho HJ, Alban R, Blanck F, Parsons AS. Evidence Based Guidelines to Eliminate Repetitive Laboratory Testing; *JAMA Intern Med.* 2017;177(12):1833-1839
2. Fishbane S, Spinowitz B. Update on Anemia in ESRD and Earlier Stages of CKD: Core Curriculum 2018: *Am J Kidney Dis.* 2017 1-13
3. Iturrate E, Jubelt L, Volpicelli F, Hochman K. Optimize Your Electronic Medical Record to Increase Value: Reducing Laboratory Overutilization; Am J Med. 2016;129(2): 215-219
4. Choosing Wisely Canada

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