

The logo for the Vernon Jubilee Hospital Physician Society. It features two vertical bars on the left, one light blue and one orange. To the right of these bars is a dark blue rectangular box containing the text "VERNON JUBILEE HOSPITAL" in white, uppercase, sans-serif font. Below this box, the text "PHYSICIAN SOCIETY" is written in a smaller, dark blue, uppercase, sans-serif font.

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SOCIETY

## Reducing Redundant Laboratory Testing in Interior Health - 2023 Update -

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# Present lab test ordering in IH

- MDs manually write orders on paper (with the exception of RIH ER)
- Orders are manually entered into Meditech by unit clerks
- MDs may enter any order repeating at any interval of their choice
- If the MD does not cancel repeating orders, such orders can unintentionally repeat in perpetuity until discharge or death of patient
  - Potential waste of resources
  - Potential of iatrogenic anemia

# Present lab test ordering in IH

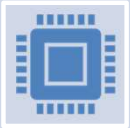
- Redundant laboratory testing is widely perceived as pervasive, but quantitation remains elusive
- In the literature, numerous attempts to curtail redundant laboratory testing have not documented sustained results
- Educational efforts directed at changing MD practice have demonstrated a 25% or smaller decrease in lab test ordering, but such decreases are transient

# Various remedies proposed in the literature



## **Temporally restricting recurrent lab testing**

The repeat order expires after a pre-defined time



## **Computerized provider order entry (CPOE) in Meditech**

MD enters the lab test orders directly into Meditech



## **CPOE with clinical decision support (CDS) in Meditech**

Pop up windows direct lab test ordering, based upon previous ordering

# Temporally restricting recurrent lab testing

- “Reducing unnecessary inpatient laboratory testing in a teaching hospital”
  - May T, et al. *Am J. Clin Pathol.* 126:200-206. 2006
    - San Francisco General Hospital
    - Multidisciplinary committee proposal to limit phlebotomy-laboratory test requests to occur singly or to recur within one 24 h window
    - Any laboratory order would expire at 24 h

# Temporally restricting recurrent lab testing

- Parameters agreed to at SFGH:
  - Single order valid for a single occurrence only
  - Orders for multiple serial testing within a 24 h period would remain valid within the 24 h window
  - Serial phlebotomies limited to q 4, 6 or 12 h
  - Serial phlebotomies performed by ward personnel ordered as single one-time only events
  - MD orders spanning >24 h would not be honored
  - Orders entered for future days – orders valid only for that occurrence or ensuing 24 h period

# Temporally restricting recurrent lab testing

- Anticipated problems in implementation:
  - Lack of MD consensus on temporal windows
    - Anecdotally, agreement seems possible
  - Lack of IT support
    - IH IT is stretched – lacks the resources to assist
  - Lack of Meditech capabilities
    - Meditech cannot place temporal restrictions on lab ordering at one site in IH – all of IH or none
    - Amplifies the problems of obtaining consensus among even more physicians and services

# Temporally restricting recurrent lab testing

- Potential for rapid implementation at VJH:
  - **Consensus** among VJH MDs is achievable – fewer people and familiarity among staff
  - **Unit clerks** (at least at VJH) allegedly had a gatekeeping function – they are aware of and maintain restrictions on certain orders
  - Utilization of VJH unit clerks to enforce the agreed-upon lab ordering rules
  - **Analysis** of lab utilization before and after implementation to assess degree of success



# Inpatient Lab Tests Restricted to 3 days recurrent

|             |                                 |                   |                                |                              |                        |                  |
|-------------|---------------------------------|-------------------|--------------------------------|------------------------------|------------------------|------------------|
| CBC         | · Lytes4 (Na, K, Cl, CO2, AGAP) | · Lytes2 (Na, K)  | · Sodium                       | · Potassium                  | · Chloride             | · Carbon Dioxide |
| · Urea      | · Creatinine (incl GFR)         | · Bilirubin Total | · Aspartate transaminase (AST) | · Alanine transaminase (ALT) | · Alkaline phosphatase | · Calcium        |
| · Magnesium | · Phosphorous (PO4)             | · Lipase          | · Lactate dehydrogenase (LDH)  | · Haptoglobin                | · Troponin I           | · Protein Total  |
| · Albumin   | · INR                           | · PTT             | · Fibrinogen                   | · D-dimers                   | · GGT                  |                  |

# Evolution of Timeline

Research: commenced summer 2016

## Initial Information:

- Meditech already set up for recurrent orders to expire after 3 days, but unit clerks were manually extending the orders indefinitely every 3 days (shown later to be erroneous)
- Education: unit clerks were told not to manually extend 3-day orders

Implemented: December 2016 (VJH only)

# Evolution of Timeline

## Preliminary results after 3 months

- Lab utilization actually increased slightly

## Re-assess after 12 months (Dec 2017)

- Became apparent that Meditech was NOT set up for recurrent orders to expire after 3 days
- Unit clerks were NOT manually extending the orders at all, ever (we were provided with incorrect information)

So, now it is mid 2018 and nothing has been accomplished.....

# Evolution of Timeline

Work commenced in partnership with Andi Kyle (Lab IMIT IH) to place the 3-day limit on recurrent orders (“series orders”) in Meditech (late 2018)

Meditech is re-tooled (late 2019)

SARS-CoV-2 completely disrupted hospital inpatient utilization (Mar 2020)

Implementation delayed until hospital inpatient utilization normalized

# Evolution of Timeline (VJH only)

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No temporal restriction on  
recurrent orders (<June 16, 2020)

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Meditech changes implemented  
(June 16, 2020)

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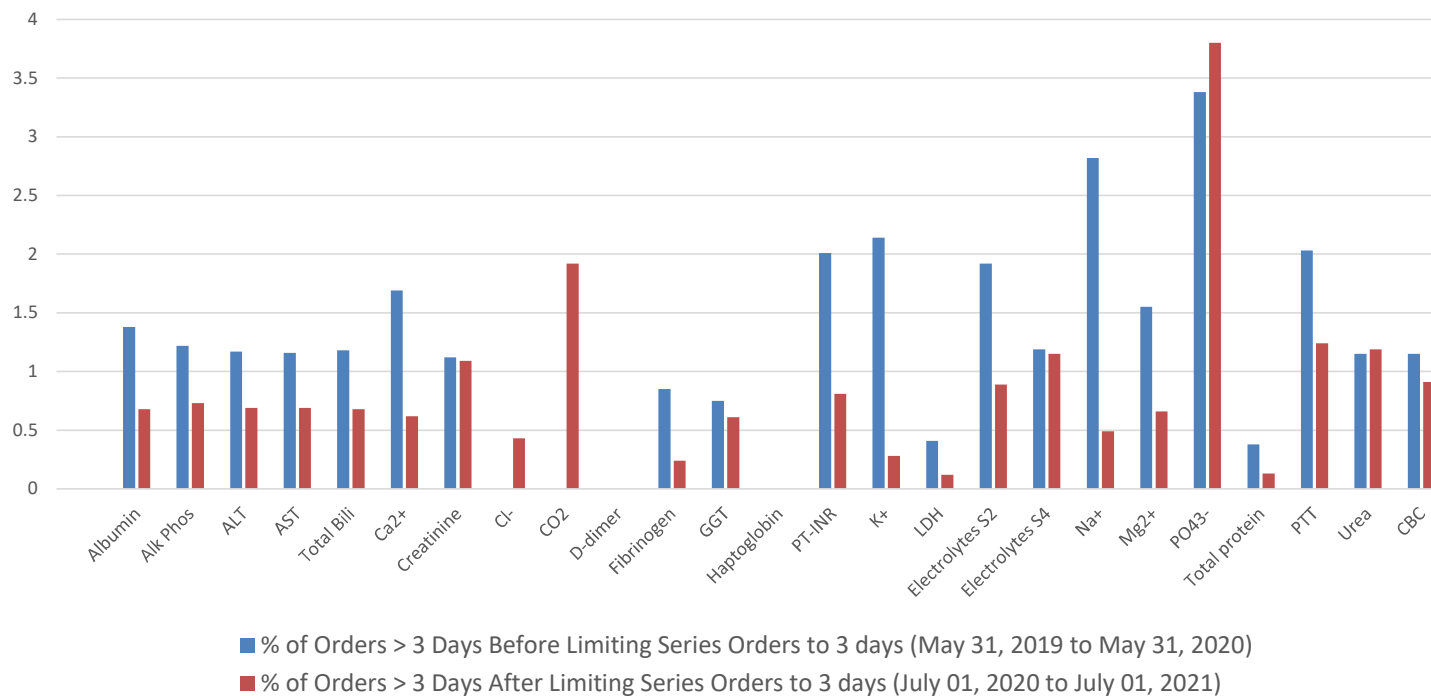
Lab utilization followed after 1  
year (July 2021)

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Data compilation completed (May  
2022)

# Percentage of Orders for Recurrent Lab Testing > 3 Days (VJH only)

Reducing Redundant Lab Testing VJH - 2019 - 2021



# Statistical Analysis

- Wilcoxon signed rank test (non-parametric)
  - W value: 41.5
  - Mean difference: 0.57
  - Z value: -2.935
  - Mean (W): 138
  - Standard deviation (W): 32.88
  - Sample size (N): 23
  - ***p-value: 0.00328***
  - ***Results are significant at  $p < 0.05$***

## Conclusions

Setting a 3-day maximum for so-called “series orders” (repeating a lab test for 3 consecutive days and not more) resulted in a statistically significant reduction in inpatient lab testing over a 2-year time span (1 year prior and 1 year following the change in policy) at the Vernon Jubilee Hospital site.





# Moving Forward

- Expand the rules to apply to inpatients for all of IH and for outpatient lab testing IH-wide
- Apply restrictions on ordering other repeat testing
  - Serum protein electrophoresis (not more than q 4 weeks)
  - TSH (not more than q 3 months)