

Background and Problem

In Alberta, ~80 million laboratory tests are ordered annually (2018-2019). A Provincial Laboratory Utilization Report (2018) identified:

- Blood Urea Nitrogen (BUN) test utilization - top 10 ordered tests for all health zones in Alberta, except Calgary.
- BUN-test ordering was higher in the hospital setting.

In a response, the Edmonton Zone Medicine Quality Council-Physician QI Leadership Coalition completed 4 separate QI projects in the Edmonton zone that identified key sequenced intervention components to reduce BUN test ordering in a paper-based hospital charting process.

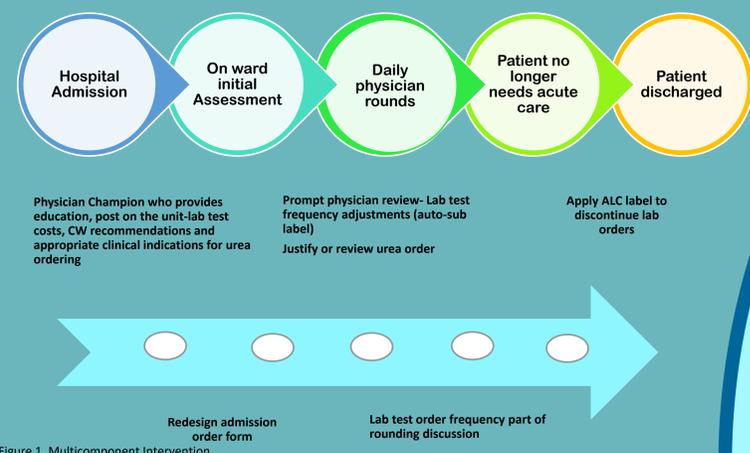


Figure 1. Multicomponent intervention

Challenges

- COVID-19 Pandemic
- Connect Care implementation
- Move to a new hospital building

Interventions

Medicine unit paper-based intervention components could not be trialed due to the COVID-19 disruption.

The planned interventions were abridged to include:

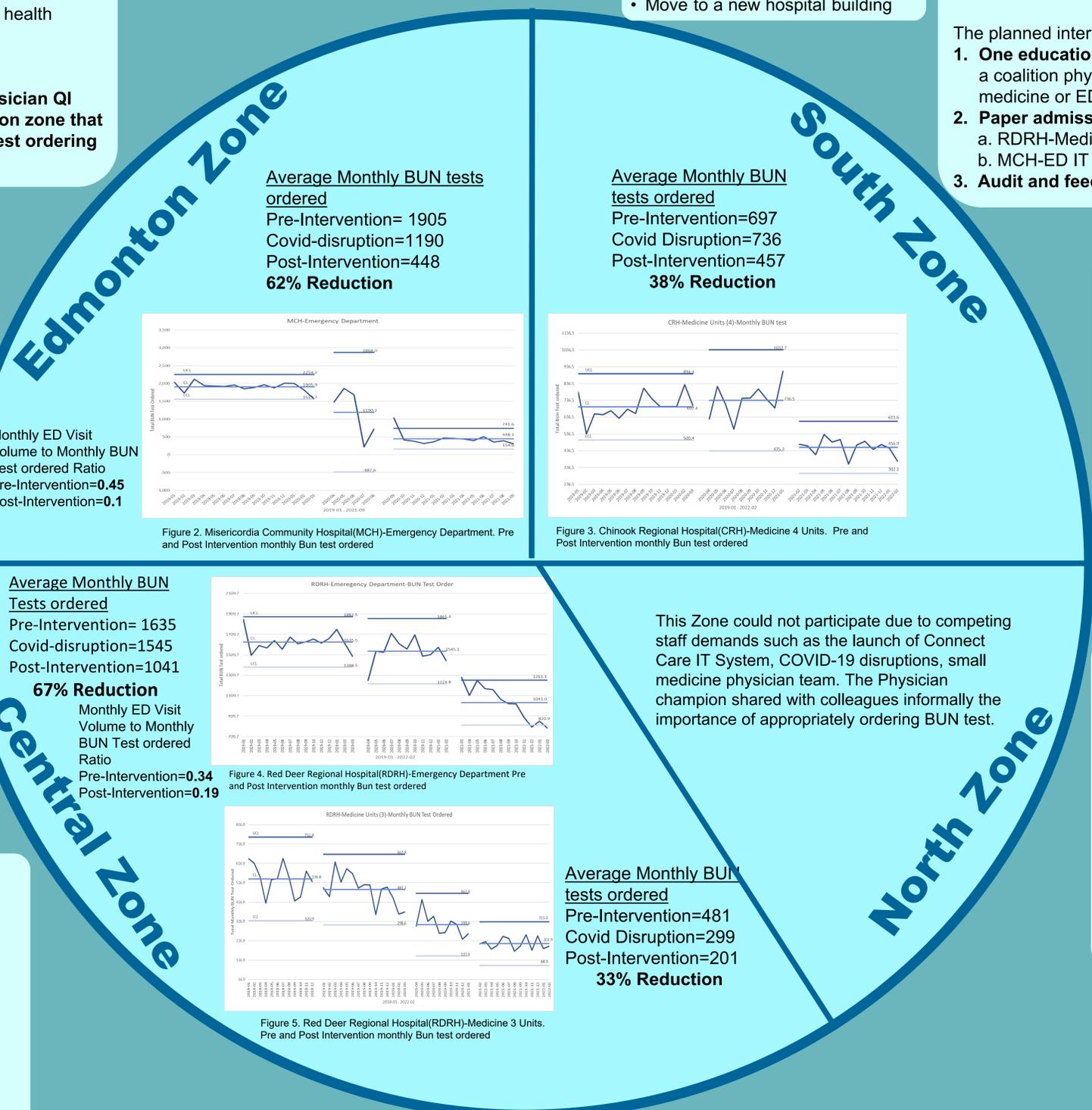
- One educational presentation** from either the coalition physician leader, a coalition physician member with a local physician leader or a local medicine or ED physician leader.
- Paper admission form or IT system updates**
 - RDRH-Medicine Admission paper form-2019
 - MCH-ED IT lab panel-2020.
- Audit and feedback**

Results

- Monthly Bun test ordering declined for all participating hospital medicine units and emergency departments.
- Emergency departments -monthly visit count was compared to the total monthly BUN test ordered to measure a reduction.
- Hospitals that incorporated form or IT system changes where the BUN test was removed from lab panels resulted in higher reductions.
- Medicine units required to frequently switch to COVID units resulted lower BUN test reduction.
- Total cost avoidance approximation for the 3 participating hospitals is \$13,300.00 per month or \$160,000.00 per year

Conclusions

- QI projects focused on lab testing, physician QI leaders are critical for change acceptance.
- Targeting one blood test using brief education, audit and feedback supported BUN test order reductions.
- To encourage physician participation and leadership in QI activities, design interventions that require minimal effort and disruption to clinical processes along with support personnel (QI and analytics).
- For intervention sustainability – incorporate changes to order processes and IT systems, provide laboratory data access (audit and feedback) and provide physicians QI and clinical laboratory education.
- This project made recommendations to the design of Connect Care – (i.e., BUN test was removed from all order sets where appropriate to support sustained reduction.



Monthly ED Visit Volume to Monthly BUN Test ordered Ratio
Pre-Intervention=**0.45**
Post-Intervention=**0.1**

Monthly ED Visit Volume to Monthly BUN Test ordered Ratio
Pre-Intervention=**0.34**
Post-Intervention=**0.19**

Objective

- The primary objective was to reduce the monthly BUN-testing ordering in hospital medicine units and /or emergency departments (ED) in 4 health zones (Edmonton, Central, South, and North) in Alberta.
- The expectation was a physician led initiative that provided targeted education, simple paper-based interventions along with audit & feedback would reduce BUN-testing ordering.

Methods/Approach

- Ethical approval obtained from the University of Alberta REB (study number Pro00099263, April 24, 2020).
- Pre/Post intervention interrupted time series design.
- Adapt the sequenced multicomponent intervention to the following locations:
Edmonton Zone-Misericordia Community Hospital (MCH)-Emergency Department
Central Zone- Red Deer Regional Hospital(RDRH)-Medicine Units and Emergency Department
South Zone- Chinook Regional Hospital (CRH)-Medicine Units
North Zone- Queen Elizabeth II Hospital-Medicine Units

Approach

- Step 1:** Coalition Physician project leader communicated with appropriate local medicine, ED, zone or hospital physician leaders.
- Step 2:** Coalition QI consultant and Research Assistant completed current state review(includes completion of QI tools and review of monthly BUN-test count data) to determine local processes.
- Step 3:** Share current process finding with local hospital physician and operational leaders.
- Step 4:** Develop local QI team led by a local physician champion to adapt interventions to fit local context.
- Step 5:** Provide audit and feedback to physician champions.
- Step 6:** Analysis of the monthly BUN-test count data over time.
- Step 7:**Annual cost avoidance approximation, calculated using a reference median of \$5.00 per BUN test (Ma et al., 2019).

Why this QI Work Matters

- To Patients:** Reduction in possible complications and illnesses as the result of repetitive blood draws.
- To Clinicians:** Reduction in unnecessary components of practice that do not add value to patient care. Practice focus on thoughtful ordering and mindful prescribing for patients.
- To Health System:** Reducing inappropriate laboratory testing would have the dual benefits of making the health system as a whole more efficient and improving patient outcomes and experience.

Acknowledgements

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Reference:
Ma I, Lau CK, Ramdas Z, Jackson R, Naugler C. Estimated costs of 51 commonly ordered laboratory tests in Canada. Clin Biochem. 2019 Mar;65:58-60. doi: 10.1016/j.clinbiochem.2018.12.013. Epub 2019 Jan 5. PMID: 30615855.