

Biochemical Test Ordering in Inpatient Units in the Eastern Region of Newfoundland and Labrador

Objectives

Compare laboratory test ordering practices between inpatient units and hospital facilities in Newfoundland and Labrador (NL). Analyze observed trends with regards to organizational factors such as hospital size, focusing on tests with high volume.

Practice Points

1. In many clinical areas, up to 30% of laboratory tests are unnecessary.
2. While variability in ordering practices can be explained in part by differing requirements between medical specialties, there are also modifiable influences such as workplace culture, practices of convenience, and inappropriate historical practices.
3. Reducing unnecessary tests may prevent patient harm, save limited resources, and curb waste and emissions.

Data

1. Data on laboratory use in regional health authorities (RHAs) were obtained from Meditech and provided by NL Health Services (NLHS) for the period from 1 Jan 2018–31 Dec 2023. Laboratory data were linked to the provincial Client Registry to access patient demographics.
2. Data on hospitalizations and inpatient days at the level of hospital units were provided by NLHS, which were used to calculate the number of tests per inpatient day.

Results

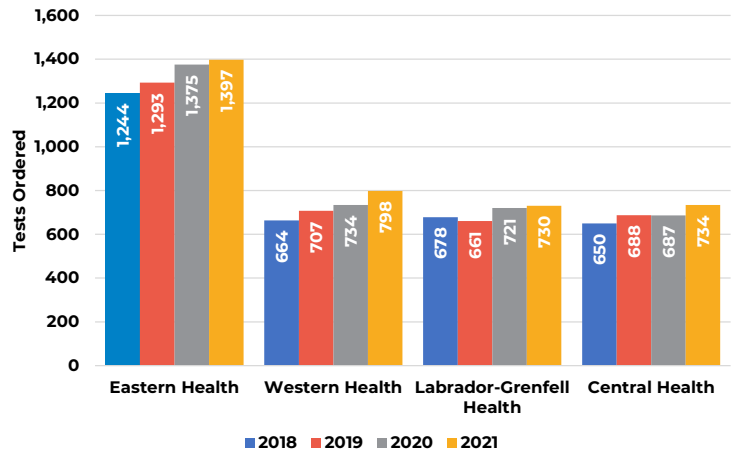


Figure 1. Number of Tests Ordered per 1,000 Inpatient Days in Surgery and Medicine Units in Each RHA in NL, Jan 2018–Dec 2021

- From 2018–2021, tests per 1,000 inpatient days increased by 153, 134, 53 and 84 in Eastern Health (EH), Western Health (WH), Central Health (CH) and Labrador-Grenfell Health (LGH), respectively.

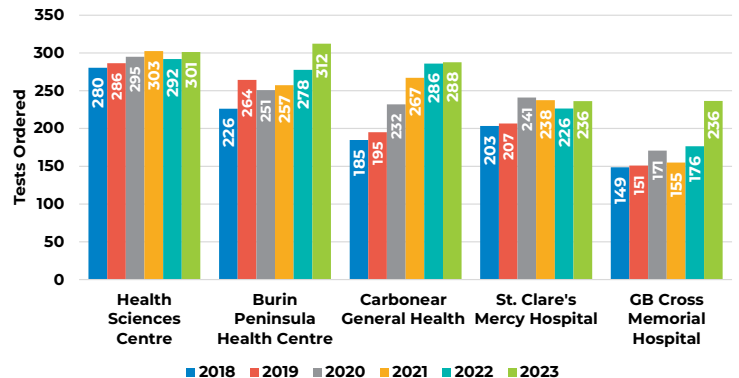


Figure 2. Number of Tests Ordered per 1,000 Inpatient Days in Five Facilities in EH, Jan 2018–Dec 2023

- From 2018–2023, tests per 1,000 inpatient days in EH increased by 21, 86, 103, 33 and 87 at the Health Sciences Centre (HSC), Burin Peninsula Health Centre, Carbonear General Hospital, St. Clare's Mercy Hospital (SCM), and Dr. G. B. Cross Memorial Hospital, respectively.
- In EH, facilities situated close to large urban centres had the greatest increase in tests per inpatient day.

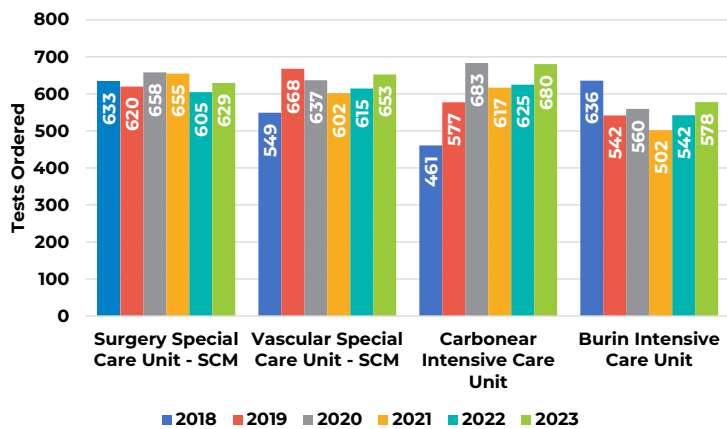


Figure 3. Number of Tests Ordered per 1,000 Inpatient Days in Four Hospital Units in EH, Jan 2018–Dec 2023

- From 2018 to 2023, the number of tests done for every 1,000 days patients spent in hospital changed across different units. In the surgery special care unit at SCM, there was a decrease of four tests, while in the vascular special care unit there was an increase of 104 tests. The biggest increase, by 219 tests per 1,000 inpatient days, was seen in the intensive care unit at Carbonear General Hospital.

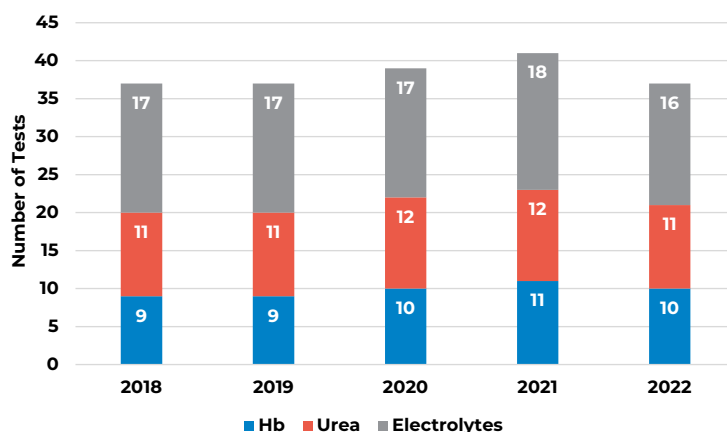


Figure 4A. Median Number of Tests per Hospitalization for Patients Staying at Least Three Days in Surgery and Medicine Units in Health Science Centre, Jan 2018–Dec 2022

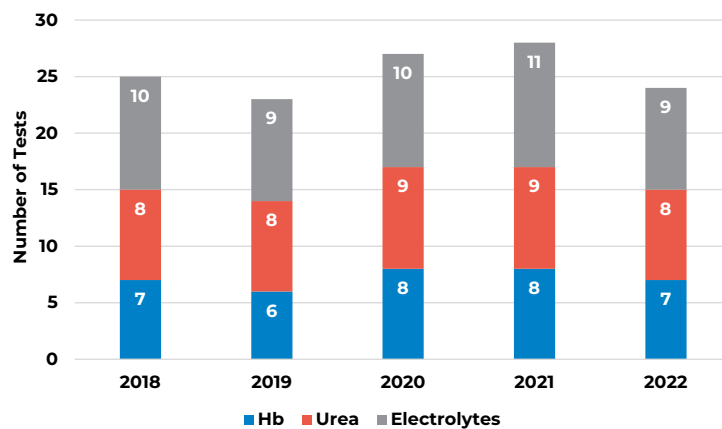


Figure 4B. Median Number of Tests per Hospitalization for Patients Staying at Least Three Days in Surgery and Medicine Units in St. Clare's Mercy Hospital, Jan 2018–Dec 2022

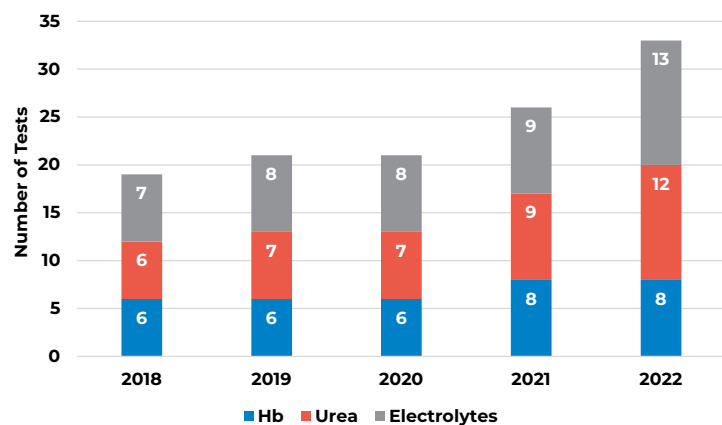


Figure 4C. Median Number of Tests per Hospitalization for Patients Staying at Least Three Days in Surgery and Medicine Units in Carbonear General Hospital, Jan 2018–Dec 2022

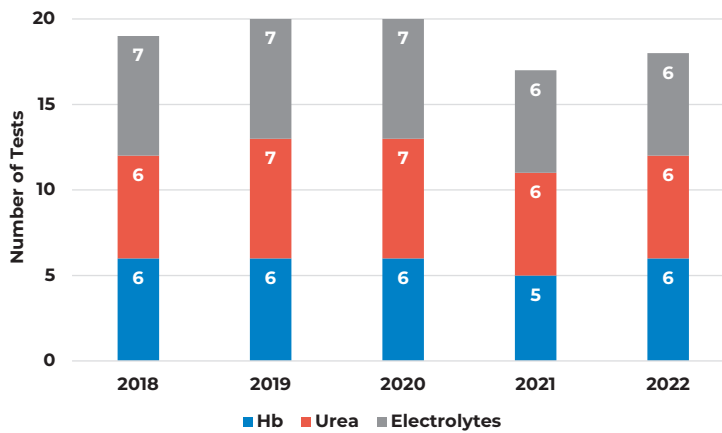


Figure 4D. Median Number of Tests per Hospitalization for Patients Staying at Least Three Days in Surgery and Medicine Units in Burin Peninsula Health Centre, Jan 2018–Dec 2022

- Larger facilities had higher tests per hospitalization and comprised greater proportions of electrolytes tests.
- Carbonear General saw an increase in testing over the five-year period, especially for urea and electrolytes tests.

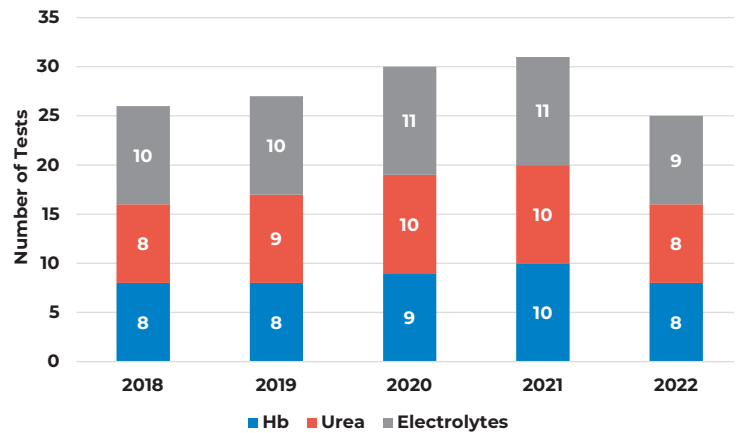


Fig 5B. Median Number of Tests per Hospitalization for Patients Staying at Least Three Days in Surgery Unit in EH, Jan 2018–Dec 2022

- From 2018–2022, medicine units had slightly greater tests per hospitalization than surgery units, with median numbers of tests decreasing by one in surgery and increasing by six in medicine.
- Length of stay in medicine units was slightly longer compared to surgery units, which could explain the difference in number of tests per hospitalization.

Conclusions

1. The overall trend of inpatient testing in the province has been inconsistent in recent years, decreasing in units with historically high rates (e.g., surgery) while increasing across facilities and regions.
2. Surgery and medicine units in large facilities have some of the highest test ordering in the province, especially for common tests such as electrolytes (i.e., sodium and potassium).
3. While it is possible that excess inpatient testing exists at larger facilities that comprise more medical staff including trainees, there are also sicker patients in those settings, obscuring a more direct measurement of unnecessary testing caused by organizational processes.
4. Large discrepancies between ordering practices in different facilities and hospital units are indicative of opportunities to reduce testing.
5. Inpatients with admission sodium values within the reference range should generally not have repeat tests within the average length of stay of four days.

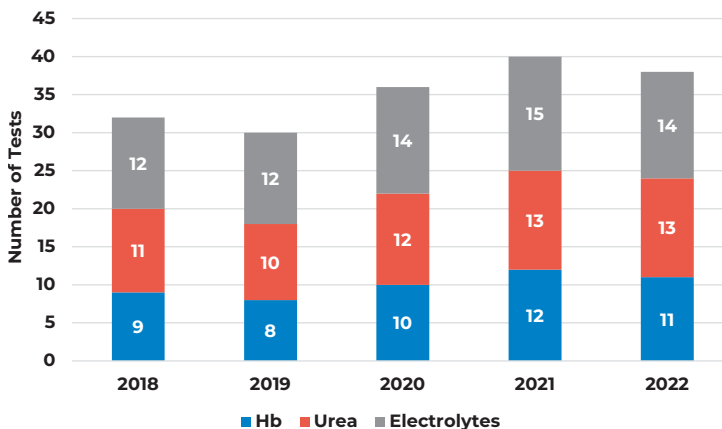


Fig 5A. Median Number of Tests per Hospitalization for Patients Staying at Least Three Days in Medicine Unit in EH, Jan 2018–Dec 2022