Rapid Decision Support

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>
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> *We further caution readers that researchers at the Newfoundland & Labrador Centre for Applied Health Research are not experts on the subject topic and are relaying work produced by others. This report has been produced quickly and it is not exhaustive, nor have any included studies been critically appraised.*

Point-of-Care Testing: Evidence Scan
Focus on Rural and Remote Settings

*This evidence scan focuses on point-of-care testing (POCT) implemented in rural and remote settings. The main source of information on this topic in Canada is the Canadian Agency for Drugs and Technology in Health (CADTH), who have produced an extensive list of evidence synthesis resources on a range of different point-of-care tests (see Gray Literature starting on p3). With regard to the implementation of point-of-care testing in rural and remote settings, CADTH points out that: "POCT is most often performed in emergent and urgent care settings, as well as in the hospital in-patient care setting, and is frequently performed with the intent to reduce turnaround time, increase patient convenience, and **provide access to testing in remote or rural areas**." As such, most of the literature on POCT also includes a focus on care that is being provided in rural and remote healthcare settings.*

Systematic Reviews

Lingervelder D, Koffijberg H, Kusters R, IJzerman MJ. **Point-of-care testing in primary care: a systematic review on implementation aspects addressed in test evaluations**. International Journal of Clinical Practice. 2019 Oct;73(10):e13392. LINK

- "This study reviewed literature pertaining to the evaluation/usage of POCTs in primary care, to investigate whether outcomes being reported reflect aspects previously demonstrated to be important for general practitioners (GPs) in the decision to implement a POCT in practice."
- "From these studies, 83 POCTs across several disease areas (including cardiovascular disease, venous thromboembolism and respiratory-tract-infections) were identified. There was an inconsistency between what is reported in the studies and what GPs consider important. GPs

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perceive clinical utility as the most important aspect, yet this was rarely included explicitly in test evaluations in the literature, with only 8% of evaluations incorporating it in their analysis/discussion."

Other Reviews

Herd, G. C. E., M.AppSci, & Musaad, Samarina M A, MB BS,M.P.H., F.R.C.P.A. (2021). **Point-of-care testing in rural and remote settings to improve access and improve outcomes: A snapshot of the New Zealand experience**. Archives of Pathology & Laboratory Medicine, 145(3), 327-335. LINK

- "Three key guiding principles of rural and remote clinical services are to improve health access, improve outcomes, and reduce inequity. In New Zealand, as in other countries, point-of-care testing and technologies can assist in clinical decision-making for acute and chronic conditions and can help to achieve these key health principles for people living in rural and remote locations."

- Objectives of review: "To provide readers with insights into where and how point-of-care testing devices and tests can be implemented to improve outcomes in New Zealand settings without on-site pathology laboratory support. The settings in which point-of-care testing devices are used, and the success stories associated with these initiatives, include general practices, pharmacies, workplaces, rural hospitals, and sexual health clinics."

- Best practice guidelines: "In recognition of [patients'] rights and the need for quality assurance for POCT in all settings in the interest of patient safety, the New Zealand Point-of-Care Testing Advisory Group was established in 2009 and published its first set of Best Practice Guidelines for Point-of-Care Testing in 2014. These guidelines were reviewed in 2018, and they are used in conjunction with the Australian Government National Pathology Accreditation and Advisory Council Guidelines for Point of Care Testing (PoCT) 2015. Both of these guidelines provide best practice advice and support for health providers who use POCT devices in any setting, including hospitals, the community, and rural or remote locations"

- "A total of 269 POC tests were undertaken for 177 patients. These authors showed that use of the device improved diagnostic certainty from 2.5 diagnoses pretest to 1.3 diagnoses posttest (P < .001). The use of POCT changed patient disposition for 43% of patients (P < .001), by reducing transfers to the Whangarei Hospital by 62% (52 pretest and 20 posttest) and increased discharges by 480% (7 pretest and 34 posttest). Substantial treatment changes occurred in 75% of cases, with some change in 22% and no change in 3% of cases."

- "During the first year of operation, the overall cost to Hokianga Health Rawene Hospital was NZ $90,222. This cost included the POCT implementation, treatment costs, and more and longer bed stays for patients. Note: prior to the POCT service being implemented, these patients would have required transfer by road ambulance to Whangarei Hospital for treatment. The net savings in reduced transfers and costs to Whangarei Hospital was NZ $362,138. The additional benefits include better continuity of care and the fact that patients are not separated from family."

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Randell EW, Thakur V. **Leading POCT Networks: Operating POCT Programs Across Multiple Sites Involving Vast Geographical Areas and Rural Communities**. EJIFCC. 2021 Jun 29;32(2):179-189. LINK

- "This mini review discusses common challenges faced by laboratory leaders poised to implement and operate POCT programs at multiple remote and rural sites. It identifies areas for consideration during the initial program planning phases and provides areas for focus during evaluation and for continued improvement of POCT services at re- mote locations. Finally, it discusses a potential over- sight framework for governance and leadership of multisite POCT programs servicing remote and rural communities."
- *Please note that the first author, Professor Edward W. Randell, led Laboratory Medicine for Eastern Health and was faculty at Memorial University at the time this paper was published.*

Ransohoff JR, Melanson SE. **What's new in point-of-care testing?.** Point of Care. 2019 Sep 1;18(3):92-8.

- "Point-of-care testing (POCT) has the potential to improve turnaround time, increase efficiency, decentralize diagnostics in rural and underserved communities, and advance health care in areas such as space and high-altitude wilderness. In many cases, POCT is accurate and simple to perform and produces results within minutes. However, its implementation can pose logistical and educational challenges, especially if testing does not easily integrate with the end users' workflow. "
- "Relevant literature was grouped into the following categories: transfusion medicine, coagulation, glucose and diabetes, infectious disease and human immunodeficiency virus, emergency medicine, technological advances, and other."

Gray Literature

Vu T, MacDougall D. **CADTH Health Technology Review: Rural Health Care Planning Initiatives and Frameworks**. Ottawa: CADTH, October 28, 2022. LINK

- "Due to the challenges with providing care in rural areas, various strategies have been proposed and implemented to help address health care service delivery in rural areas. The objective of this report is to identify rural health care service planning initiatives that are underway in Canada, Australia, or the UK; and to identify planning frameworks and models of care for providing health care in rural areas, with a focus on emergent, urgent, and community care."
- "Identified frameworks and recommendations for planning rural health care service delivery included components such as taking a community-specific approach, multidisciplinary team-based care, developing and expanding use of telehealth, establishing evaluation methods, and improving the recruitment and retention of health care providers in rural areas."
- "Identified proposals for models of care for rural areas included team-based care, models led by community health workers, and alternatives for hospitals."
- Includes summaries and an annotated reference list with a focus on:
  - **Rural Health Care Service Planning Initiatives**

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- - - o **Frameworks and Proposed Models of Care for Planning Rural Health Care Service Delivery**
    - o **Proposed Models of Care for Rural Health Care Service Delivery**
  - Includes additional references of potential interest with a focus on:
    - o Educational Initiatives and Recommendations
    - o **Key Enablers or Factors Influencing Successful Initiatives and Models**
    - o **Models of Care**
    - o Frameworks: Unclear or Alternative Guidance
    - o Planning Initiatives From the US

CADTH. **Evidence Related to Rural and Remote Health Evidence Bundle**. Ottawa: CADTH, 2023. LINK
- "Best evidence" related to the use of health technologies in rural and remote communities in a variety of formats, including short reports to in-depth systematic reviews, recommendation reports, and implementation tools geared to translating research into action. Includes, but is not limited to, the following reports that **include specific reference to rural and remote settings**:
  - o Blood Transfusions in Rural and Remote Settings: Guidelines (Summary of Abstracts, February 24, 2020)
  - o Community Pharmacist–Led Medication Reviews (Policy Insight, August 9, 2021)
  - o Detection and Diagnosis of Sepsis in Rural and Remote Areas: An Environmental Scan (Environmental Scan, January 9, 2019)
  - o Enablers for Remote Monitoring Programs for Cardiac Conditions: Lessons From the COVID-19 Pandemic (Policy Insight, Apr 22, 2022)
  - o Inotropes and Vasopressors for Septic or Cardiogenic Shock in Rural Settings: Guidelines (Summary of Abstracts, February 24, 2020)
  - o Interferon Gamma Release Assay for the Identification of Latent Tuberculosis Infection in Rural and Remote Settings: Clinical Utility, Cost-Effectiveness, and Guidelines (Summary of Abstracts, August 17, 2020)
  - o Internet-Delivered Cognitive Behavioural Therapy for the Management of Chronic Non-Cancer Pain: A Summary of a Health Technology Assessment (Tool, October 19, 2022)
  - o Internet-Delivered Cognitive Behavioural Therapy in the Treatment of Chronic Non-Cancer Pain (Health Technology Assessment, April 21, 2022)
  - o Palivizumab For Infection Prevention in Inuit Infants: A Review of the Clinical Effectiveness and Cost-Effectiveness
  - o Point-of-Care Ultrasound for Adults in Rural and Remote Healthcare Settings (Reference List, November 11, 2021)
  - o Sepsis in Rural and Remote Areas of Canada (Tools, May 10, 2019)
  - o Smartphone-, Tablet-, or App-Based Portable Ultrasound: A Review of Clinical Effectiveness (Summary with Critical Appraisal, September 27, 2019)
  - o Virtual Care Use in Primary Care or Specialty Care Settings (Rapid Review, August 17, 2022)

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CADTH. **Point-of-care testing**. Ottawa: CADTH; 2017 Oct. (Environmental scan; no. 65).

- Objectives: "The primary goal of this Environmental Scan is to identify and analyze evidence and information regarding **how POCT is implemented and managed in jurisdictions across Canada**. The scope includes POCT performed in urgent and emergency care settings (such as in hospitals and ambulances), in primary care settings, and by patients (self-testing)."
- "**The Current State of Point-of-Care Testing and How It Is Being Implemented or Planned in the Jurisdictions**" summarizes settings, personnel, process (oversight, ordering, recording), training and certification, purpose, funding, and POC tests used in Canada and internationally.
- "**Canadian and International Standards, Guidelines, and Policies on Point-of-Care Testing in Effect or Being Developed in Jurisdictions Across Canada**" summarizes the following:
  - Canadian Standards and Guidelines Related to Point-of-Care Testing
  - Adherence to Standards
  - Governance Structures
  - Point-of-Care Testing Training Standards
  - Canadian Standards Advising Who Can Perform Point-of-Care Testing
  - International Standards and Guidelines Related to Point-of-Care Testing
- "**Issues and Challenges Affecting the Implementation of Point-of-Care Testing**" summarizes the following: Canadian Challenges, including: Staffing-Related Challenges, Lack of Standards, Training-Related Challenges, Quality-Related Challenges, Funding-Related Challenges, Patient-Related Challenges; and International Challenges as well.
- "**Suggested strategies for the use of POC testing**" summarizes Training and Reassessment, and Accuracy in POC Testing.
- Additional materials include:
  - Appendix 1: Settings in Which Point-of-Care Testing is Used Across Surveyed Jurisdictions
  - Appendix 2: Personnel Performing Point-of-Care Testing in the Surveyed Jurisdictions
  - Appendix 3: Respondent-Reported POCT Training/Certification Across Jurisdictions
  - Appendix 4: Respondent-Reported Purpose of Point-of-Care Testing Across Jurisdictions
  - Appendix 5: Respondent-Reported Funding for Point-of-Care Testing Across Jurisdictions
  - Appendix 6: Available Point-of-Care Tests and Point-of-Care Test–Specific Accreditation Requirements Across Jurisdictions
  - Appendix 7: Point-of-Care Tests Identified as Being Used Internationally in Primary Care and Emergency Departments
  - Appendix 8: Publicly Available Laboratory and Point-of-Care Testing Standards Across Canadian Accreditation Bodies and Jurisdictions
  - Appendix 9: Standards Related to the Implementation of Point-of-Care Testing Across Canada Identified Through Publicly Available Information and Survey Responses
  - Appendix 10: National and International Standards Relevant to Point-of-Care Testing in Canada
  - Appendix 11: POCT-Specific Governance Structures, Legislations, Frameworks, Guidelines, Policies, or Processes in Place or Being Developed Across Surveyed Jurisdictions
  - Appendix 12: Challenges to Point-of-Care Testing Implementation Across Surveyed Jurisdictions

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- **Related document**: Point-of-Care Testing: Summary of Evidence January 2019 Update LINK
    - Update on Environmental Scan from 2017 cited above.

CADTH. **Evidence on Point-of-Care Testing Evidence Bundle**. Ottawa: CADTH, 2023. LINK
- "Best evidence" on a broad range of POC testing (see below) in a variety of formats, including short reports to in-depth systematic reviews, recommendation reports, and implementation tools geared to translating research into action. Includes the following reports:
    - Biomarker-Based Point-of-Care Tests for the Evaluation of Mild Traumatic Brain Injury (Emerging Health Technologies, June 23, 2020)
    - ClotChip Portable Blood Clotting Sensor (Health Technology Update, July 31, 2023)
    - Creatinine and Urea Point of Care Testing for Patients with Suspected Renal Failure: Clinical Utility, Cost-Effectiveness and Guidelines (Summary of Abstracts, April 20, 2020)
    - Electrolyte Point of Care Testing for Patients with Dehydration or Electrolyte Abnormalities: Clinical Utility, Cost-Effectiveness and Guidelines (Summary of Abstracts, April 13, 2020)
    - Flash Glucose Monitoring and Continuous Glucose Monitoring for People with Diabetes in Acute Care Settings (Summary of Abstracts, April 6, 2021)
    - Flash Glucose Monitoring System FreeStyle Libre to Monitor Glycemia in Patients With Diabetes (Technology Review, September 24, 2020)
    - Flash Glucose Monitoring Systems in Pediatric Populations with Diabetes (Summary with Critical Appraisal, April 6, 2021)
    - Natriuretic Peptide Testing for Monitoring of Heart Failure Therapy: A Review of Clinical Effectiveness, Clinical Utility, Cost-Effectiveness, and Guidelines (Summary with Critical Appraisal, August 19, 2019)
    - Natriuretic Peptide Testing for Perioperative Risk Assessment: Clinical Effectiveness, Cost-Effectiveness, and Guidelines (Summary of Abstracts, July 31, 2019)
    - Point of Care Rapid Urease Test for Helicobacter Pylori (Summary of Abstracts, August 17, 2022)
    - Point-of-care B-type Natriuretic Peptide Testing for Congestive Heart Failure (Summary of Abstracts, October 13, 2022)
    - Point-of-Care Testing of International Normalized Ratios for People on Oral Anticoagulants: A Reference List (Reference List, December 7, 2020)
    - Point-of-Care Urine Dipstick Testing for Suspected Urinary Tract Infections for Adults: Diagnostic Accuracy (Reference List, February 15, 2019)
    - Portable Stroke Diagnosis Devices for Adults with Stroke Symptoms: Diagnostic Accuracy and Cost-Effectiveness (Reference List, June 17, 2019)
    - Rapid and Simultaneous Tuberculosis and Antibiotic Susceptibility Testing for the Diagnosis of Pulmonary Tuberculosis and Rifampicin Resistance: A Review of Diagnostic Accuracy (Summary with Critical Appraisal, December 10, 2020)
    - Rapid Syphilis Testing (Health Technology Update, November 2, 2022)
    - Rapid Testing for the Diagnosis of Pulmonary Tuberculosis and Rifampicin Resistance: A Review of Cost-Effectiveness (Summary with Critical Appraisal, February 19, 2021)
    - Self-Collection of Nose and Throat Swab Samples for SARS-CoV-2 Antigen Testing (Emerging Health Technologies, June 13, 2022)

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- o Troponin I Point of Care Testing for Patients with Suspected Acute Coronary Syndrome or Myocardial Infarction: Clinical Utility, Cost-Effectiveness and Guidelines (Summary of Abstracts, March 31, 2020)
- o Urinary Dipstick Testing for Bladder Cancer Screening: Diagnostic Accuracy, Clinical Effectiveness and Guidelines (Summary of Abstracts, April 1, 2019)

Department of Health. **Requirements for Point of Care Testing**. Canberra: Government of Australia, 2021 (2nd Edition). [LINK](#)

- Scope: "The Requirements for Point of Care Testing (Second Edition 2021) sets out the minimum requirements for governance, management systems, staff training, safety, environmental issues, and specimen and result integrity related to the performance of point of care testing (PoCT)."
  - o "The document describes the key steps needed to ensure users of point of care technology provide safe, quality-assured PoCT, especially when the results will be used for a patient's healthcare management."

Queensland Health. **Digital Strategy for Rural and Remote Healthcare: 10 Year Plan**. Brisbane: State of Queensland, 2021. [LINK](#)

- "The *Digital Strategy for Rural and Remote Healthcare* aims to support Queensland Health's vision by providing equitable access to healthcare across the state by digitally enabling rural and remote healthcare services to deliver better care now, and for future generations of Queenslanders living in rural and remote areas."

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