

ACHIEVING MEASURABLY
BETTER HEALTHCARE
PERFORMANCE

Identifying Cardiovascular Risk and Maximizing Population Wellness Through a Novel and Cost-Effective Approach Developed During the Pandemic Using a Cardiac Biomarker

MEDCAN ONTARIO, CANADA

Cardiovascular disease is currently the second leading cause of death in Canada and significantly burdens the Canadian Healthcare System.¹ Thus, preventative care is vital to achieving improved health outcomes, reducing disease burden, and preserving health resources. For over 25 years, Medcan has been providing comprehensive annual health assessments (AHA) to proactively identify opportunities for individual health improvements, including identification of cardiovascular risk. While initial cardiovascular assessments regularly included a stress test, lipid analysis, and Framingham risk score, stress testing was not feasible during the COVID-19 pandemic.

During the COVID-19 pandemic, an integrated clinical care team at Medcan in Ontario, Canada, sourced and implemented high-sensitivity troponin I (hs-cTnI) to help improve and enhance

identification of future risk for cardiovascular disease. The benefits of the new approach included time savings of 38 minutes per patient AHA and over 45 minutes per day for each attending physician compared to the pre-pandemic process when stress testing was feasible and conducted. Additional benefits included reduced false positivity associated with traditional measures of EKG interpretation/stress testing, which translated to an annual savings of \$284,400 CDN for Medcan and \$357,500 CDN for the Canadian Healthcare System. The impact from a population health perspective was significant; in the first six months, Medcan has reported 7,392 “low risk” results, 451 “moderate risk” results, and 204 “high risk” results. Many of these high-risk results, along with other clinical and diagnostic findings, triggered a medical response that has the potential to be life saving.



PATIENT/PRE-PATIENT CONSUMER (CLIENT)

Health savvy individuals who undergo cardiac health assessments to proactively monitor, protect, and ensure favorable cardiac health



HEALTH SYSTEMS/ ADMINISTRATION

Senior leadership team including but not limited to the Chief Executive Officer, Chief Financial officer, and the Chief Medical Officer



CLINICIAN

Patient care teams including cardiologists, primary care physicians, nurses, and the paramedical staff



PAYOR

A decentralized, universal, publicly funded health system Canadian Medicare

KEY PARTNERS/STAKEHOLDERS



Dr. Peter Nord
Chief Medical Officer



Dr. Beth Abramson
Clinical Director Cardiology



Dr. Jason Abrams
Associate Medical Director



Diana Caceres
Senior Manager of Client
Services and Operations

SITUATION ANALYSIS

Health wellness programs are getting increasingly more common with the intent of improving the health and fitness of employees, clients and communities. Health wellness programs may include health screenings, fitness programs and preventative care.²

Early detection of risk and/or disease, ideally before symptoms develop, can greatly contribute to a high-quality life, even in old age.

New and emerging tools for screening cardiovascular disease are helping to more accurately predict which asymptomatic individual is likely to be at low, moderate or elevated risk for future adverse cardiac events.^{3,5}

DISCOVERY

Medcan’s corporate wellness and executive health clinics help clients focus on diet and nutrition, physical activity and mental health as the three most important factors in maintaining a healthy lifestyle.⁴

Every year, Medcan performs approximately 20,000 wellness checks including an Annual Health Assessment for cardiovascular disease. Limitations existed, however, early in 2021 when stress testing, a key diagnostic used for real-time risk assessments of cardiovascular health assessments, could not be performed during the COVID-19 pandemic.

Therefore, Medcan explored other alternatives to meet or even exceed client expectations. The latter included sourcing and implementing a novel laboratory test using the biomarker high-sensitivity troponin I (hs-cTnI) in lieu of the unavailable stress testing, to improve and enhance identification of the risk for cardiovascular disease and to assess future risks as well.

HYPOTHESIS

Medcan hypothesized that the incorporation of high sensitivity troponin into their cardiovascular health assessments during the COVID-19 pandemic, would be an effective addition to the valued outcomes to assess existing cardiovascular risk objectively and more accurately. Moreover, since biomarker testing and the associated interpretation of the results are faster than stress testing, the valued outcomes would also include less time for clients and physicians.

	STRESS TESTING	hsTnI TESTING
Current Risk	✓	✓
Future Risk		✓
Patient Convenience/ Time/Preference		✓
Physician Convenience/ Time/Preference		✓

PARTNERS

Cardiac troponin is the preferred biomarker for the aid in diagnosis of heart attacks in acute settings.⁵ Because the use of cardiac troponin for risk assessments among apparently healthy populations is still relatively new, education is a crucial success factor for acceptance and wide-spread

adoption. Medcan led multiple cross-functional educational efforts to align on the new process with stakeholders that included, but were not limited to laboratory medicine, cardiology, primary care and administrators.

SUCCESS FACTORS

High sensitivity cardiac troponin assays are both sensitive and specific for the detection of cardiac injury, making them a powerful tool in cardiovascular risk assessments.⁵

Incorporating hsTn-I into annual cardiovascular health assessments, in place of and/or in addition to stress testing, can enhance the detection of individuals at risk for heart disease and/or future cardiovascular risk.

Education and outcome sharing across clinical stakeholders is vital for enhanced program acceptance and optimization of best practices.

EXECUTION

The clinical thresholds used at Medcan to support risk assessment with high sensitivity cardiac troponin are outlined below. Different cut-offs are used for men and women, based on sex differences, to better stratify the risk⁵

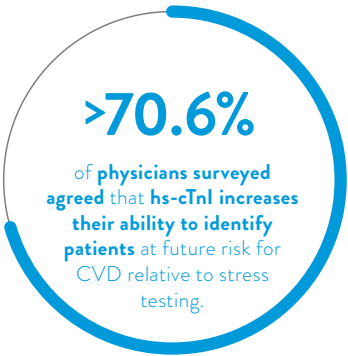
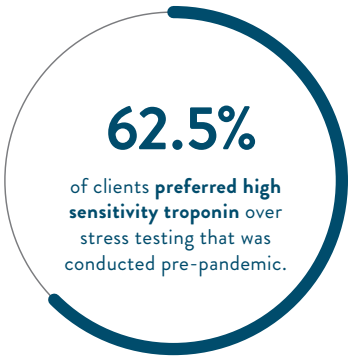
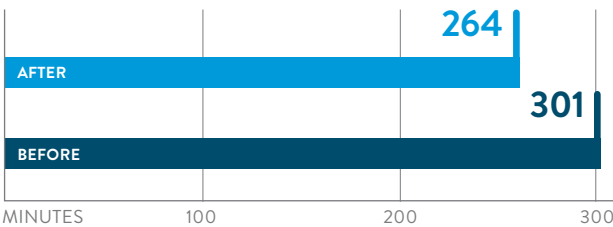
RISK STRATIFICATION CUT-OFFS

RISK LEVEL	TROPONIN LEVEL MALE (ng/L)	TROPONIN LEVEL FEMALE (ng/L)
Low risk	<6	<4
Moderate risk	≥6 – ≤12	≥4 – ≤10
Elevated risk	>12	>10

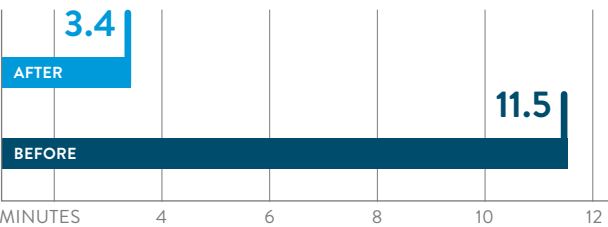
PROOF OF VALUE

Incorporation of high sensitivity troponin into the cardiovascular health assessment resulted in enhanced client experience, increased physician confidence and significant time savings for both the clients and the physicians.

Time to complete Annual Health Assessment:
Reduced by 37 minutes.



Time spent by the physicians to review and assess cardiovascular risk per patient: Reduced by 8.1 minutes.



STAKEHOLDER IMPACT



PATIENT/PRE-PATIENT CONSUMER (CLIENT)

IMPROVED EXPERIENCE	<p>Average time for completion of annual health assessment reduced by 37 minutes (12.3%), going from 301 (\pm 72) minutes to 264 (\pm 65) minutes. (p-value <0.001).</p> <p>62.5% of all client survey respondents with a test method preference associated with their annual health assessment (AHA) at Medcan preferred the hs-cTnI test over stress testing.</p>
INCREASED WELLNESS	<p>48 seemingly healthy individuals who underwent annual health assessments were identified as needing urgent cardiovascular follow up.</p> <p>Metric: <i>"The change from stress testing to high sensitivity troponin in health assessments is an innovative step forward for women's health. Stress testing is known to have more false positives in women,⁶ and high sensitivity troponin is well known for its enhanced accuracy and precision in detecting low levels of myocardial injury. These advances help enable improved risk assessments and care, especially for women."</i></p> <p>– Beth Abramson, MD, MSC, FRCPC, FACC Preventative Cardiologist</p>



CLINICIAN

INCREASED CLINICIAN CONFIDENCE	<p>>70.6% of surveyed physicians at Medcan agreed that hs-cTnI increased their ability to identify patients at future risk for CVD relative to stress testing.</p>
ENHANCED TIME EFFICIENCY	<p>Average time per patient for physician review and interpretation of cardiovascular risk assessment was reduced by 8.1 minutes (from 11.5 minutes to 3.4 minutes), translating to 48.6 minutes saved each day, allowing for the ability to see an extra patient per day.</p>
DECREASED CLINICAL UNCERTAINTY	<p>>73.3% of surveyed Medcan physicians felt hs-cTnI added value to health check assessments in patients with a high pretest probability. 66.7% and 60% of these same Medcan physicians also felt hs-cTnI added value in health check assessments in patients with medium and low pretest probability, respectively.</p>



HEALTH SYSTEMS/ADMINISTRATION

ENHANCED RESOURCE UTILIZATION	<p>Medcan realized an annualized savings of \$284,400 CDN following headcount reduction in full-time (55.6%) and casual employees (44.4%) that were previously dedicated to stress test operations.</p> <p>Reduction of the need of 6 rooms per day, allowing the use of the rooms for other services.</p>
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PAYOR

REDUCED HEALTHCARE COSTS	<p>Based on a 5% reduction in false positives for clients >45 years of age, the use of hs-cTnI in place of stress testing translates to a cost savings of \$357,500 CDN per year.</p>
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3. Sigurdardottir FD, Lyngbakken MN, Holmen OL, et al. Relative prognostic value of cardiac troponin I and C-reactive protein in the general population (from the Nord-Trøndelag Health [HUNT] Study). Am J Cardiol. 2018;121(8):949–55. doi.org/10.1016/j.amjcard.2018.01.004).
4. <https://medcan.com/keeping-communities-healthy/>. Last Accessed: Mar 2022
5. Alinity I STAT High Sensitive Troponin-I Reagent Kit H05938R03
6. Fitzgerald Benjamin T; Female False Positive Exercise Stress ECG Testing – Fact Versus Fiction; <https://doi.org/10.1016/j.hlc.2018.02.010>

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