Preventing Cardiovascular Disease in a Large Client Population Through Proactive, Cost-Effective and Enhanced Diagnosis of Cardiovascular Risk Using a Novel Laboratory Test

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Medcan Healthcare Inc. | Toronto, Ontario, Canada

3.4-fold reduction in physician review and interpretation time required for CVD risk assessment

48 individuals with no signs or symptoms of acute coronary syndrome were identified for urgent follow up

350,000 CAD savings in public healthcare cost per year

Cardiovascular disease commonly goes undetected until the later stages of progression. Therefore, early and accurate diagnosis is imperative to improving the outcomes of patients with heart-related conditions, as is identification of patients at risk so that preventive measures may be undertaken. In these pages, we spotlight a group of stakeholders who successfully approached this clinical challenge by harnessing the power of innovative laboratory insights.

Detecting cardiovascular disease early in its course – and assessing each individual's risk so that preventive measures may be initiated – continue to be ongoing challenges for healthcare providers. This group of conditions, which affects the heart and blood vessels, can be present in patients for years before symptoms manifest. This often means cardiovascular disease evades detection until it has progressed to a stage where preventative measures may no longer be effective.

"The high-sensitivity troponin was a test introduced as part of our blood panel, allowing us to continue to offer the ability to advise our clients with regard to their cardiac health."

– Yogini Walli, director of clinic services, Medcan

Both early detection of cardiovascular disease and identification of increased cardiovascular risk can be life-changing for the thousands of individuals impacted by these conditions. Various tests are used to assess and diagnose cardiac disease including electrocardiograms and exercise stress tests, but these test results tend to identify cardiac disease only after the disease progression is already advanced.

Medcan is a large inter-disciplinary ambulatory care center in Toronto, Canada, that inspires improved health and wellbeing among thousands of clients per year with a focus on prevention and early treatment.

"A lot of patients are concerned about underlying things lurking in their systems that they don't know about," said Dr. Farrell Cogan, senior medical consultant for Medcan. "We want to try and prevent disease rather than treat it."

(Left to right) Peter Baxter, director, clinic and corporate application services, Neil Mahon, chief information officer, Shaun Francis, chair and CEO, Yogini Walli, director of clinic services, Dr. Peter Nord, chief medical officer

"The result triggered a series of steps and medical interventions that literally would save somebody's life. It was just a matter of days, weeks, or months until they were going to have a heart attack – and we were able to intervene."

– Dr. Peter Nord, chief medical officer, Medcan

Medcan performs client cardiac risk assessments which had traditionally included exercise stress testing. During the COVID-19 pandemic, however, it was not possible to conduct cardiac stress testing. Medcan changed their procedures to no longer include stress testing but continuing with the other testing performed in their assessments. Additionally, the cross functional team decided to incorporate the use of high-sensitivity troponin I (hsTnI) blood screening into their assessments. The decision was grounded in prior research, as large studies had demonstrated an association between troponin levels in apparently healthy individuals with the likelihood that they would at some point experience a major cardiac event.

As part of their initiative, the care team at Medcan ordered high-sensitivity troponin on a blood sample that the clients would have provided anyway during their annual visit for the other biomarker testing traditionally done. The change fit easily into workflows with Medcan performing approximately 20,000 unique health assessments a year, enabling improved risk identification at scale.

"High-sensitivity troponin is able to pick up on disease earlier than we would have found with exercise stress testing," said Dr. Peter Nord, Medcan's chief medical officer. "A week doesn't go by that we're not seeing a high result that drives interventions that we would never have thought about before."

Success Markers

- **In this Medcan model,** high-sensitivity troponin was introduced as part of the blood panel, requiring minimal time, administrative effort and physical space in the clinic.
- **Annual high-sensitivity troponin testing** can give clinicians the ability to monitor trends over time, and when risk increases, to intervene swiftly with appropriate lifestyle and medical interventions.
- **High-sensitivity troponin testing** appears to accurately detect cardiovascular risk while minimizing false positive results in women. Comparison of these measures was conducted using historical results.

High test sensitivity and specificity can allow detection of cardiac issues long before clients might begin experiencing or showing symptoms. As a result, over the course of its cardiovascular disease prevention initiative using high-sensitive troponin, Medcan identified 48 seemingly healthy individuals who were immediately referred for further urgent cardiovascular follow-up evaluation. Providers were empowered to expeditiously intervene.

"Lives are being saved, just like that," said Dr. Nord.

With a full ecosystem of services created based on the annual assessment, Medcan is well-positioned to support clients at any risk level. In cases where cardiac risk is low or moderate, Medcan's care team coordinates medical and lifestyle interventions to reverse the trend and prevent further progression of disease.

"One of my relatives that came through Medcan has been identified with a mild cardiac AFIB issue that could never have been found elsewhere."

– Peter Baxter, director of digital product development and automation, Medcan

But the benefits don't end there. Medcan reports that with the use of high-sensitivity troponin, health assessments are much faster and more convenient for patients, who may be visiting the clinic in the middle of their day. Clinicians were also able to determine risk more efficiently and effectively, a strong satisfier in a profession where disengagement and burnout are ever-present concerns. Medcan physicians and clinical support staff performing cardiovascular disease risk assessments have noticed an impressive 3.4-fold reduction in review and interpretation time.

Medcan stakeholders determined that:

- **Cardiovascular disease often progresses for years** before the patient exhibits symptoms.
- **Annual testing of blood samples using high-sensitivity troponin** used together with patient clinical and diagnostic findings may allow care teams to identify cardiovascular disease much earlier in its progression, enabling interventions that extend and/or save lives.
- **Early and patient-centered lifestyle and medical interventions** can dramatically influence the trajectory of cardiovascular disease progression.

They also observed a reduction in costs associated with unnecessary follow-up interventions. Due to earlier identification of true positives, there is a minimized need for expensive late-stage interventions, hospitalizations, or mortality, translating to more than $453,000 in public healthcare savings per year.

Overall, the use of high-sensitivity troponin has transformed the way Medcan detects cardiovascular risk and supports the greater Toronto community in preventing a deadly disease.

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