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Background

Metabolic syndrome (MetS) is a group of conditions (high blood pressure, high blood lipids, high blood sugars, insulin resistance & large waist size, see figure 1) that increases the risk of heart disease, stroke and diabetes⁽¹⁾.

Controlled studies have shown that diet and exercise can reverse MetS and improve outcomes related to these diseases, however the uptake in primary care remains suboptimal⁽²⁾.

We designed an evidence based diet and exercise program aimed at reducing the components of MetS in primary care, i.e. The **C**anadian **H**ealth **A**dvanced by **N**utrition and **G**raded **E**xercise, CHANGE Program. The results of the recently published CHANGE feasibility study are presented which support the ongoing efforts aimed at creating several partnerships to disseminate the CHANGE program in real life primary care settings across Canada.

CHANGE Feasibility Study⁽³⁾

Hypothesis

The team-based CHANGE Program led by the family physician that educates patients about the risks of MetS, and with a dietitian and exercise specialist, empowers them to undertake an individualized supervised program of diet modification and exercise, would be feasible, improve aerobic capacity and diet quality, reverse MetS and improve its components at 12 months.

Methods

Prospective, longitudinal before-after feasibility study conducted from 2012-2015 at 3 Canadian clinics: Edmonton Oliver Primary Care Network; Unité de médecine familiale Laval, Québec & Polyclinic Family & Specialty Medicine, Toronto. **Inclusion criteria:** 1) at least 18 yrs age and 2) Presence of 3 out of 5 criteria for MetS. **Exclusion Criteria:** inability to adhere to longitudinal study due to medical, safety or logistic reasons and those deemed not to benefit from the intervention

Program Overview

Eligible patients were approached for consent, placed in the CHANGE Program and followed for 12 months (see figure 2).

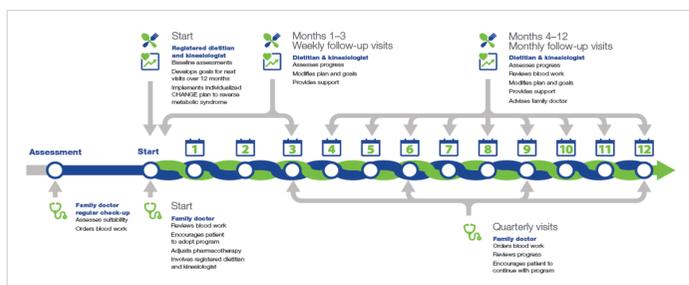


Figure 2. CHANGE Program overview

Individualized diet and exercise counselling and ongoing encouragement was provided to support the patient in making lifestyle changes based on progress achieved in MetS components.

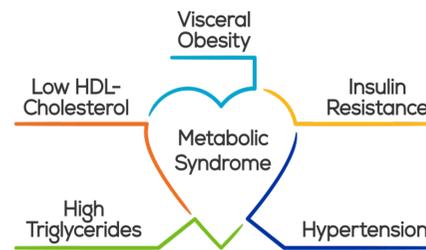


Figure 1. Metabolic syndrome components

Results

From 2012-2014, of 305 patients enrolled, 293 met the inclusion criteria at baseline. Baseline characteristics (table 1), changes in aerobic capacity, diet quality (figure 3), MetS reversal rates (figure 4) and participant experiences (figure 5) are shown.

Baseline patient characteristics	All patients (n=293)
Age (years)	59.1±9.7
Female	152 (52%)
Height (meters)	1.7±0.1
Weight (kg)	90.8±14.7
BMI (kg/m ²)	31.9±3.3
Metabolic Syndrome Criteria Met n (%)	
1. Blood pressure or pharmacotherapy	256 (87%)
Systolic blood pressure (mmHg)	133.5±14.5
Diastolic blood pressure (mmHg)	80.6±9.1
On pharmacotherapy for blood pressure	218 (74%)
2. Fasting blood glucose or pharmacotherapy	240 (82%)
Blood glucose (mmol/L)	6.6±1.4
On pharmacotherapy for blood glucose levels	129 (44%)
3. Triglyceride or pharmacotherapy	187 (64%)
Triglyceride level (mmol/L)	2.2±1.7
On pharmacotherapy for triglycerides	11 (4%)
4. High density lipoprotein cholesterol	138 (47%)
HDL-C (mmol/L)	1.2±0.3
5. Waist circumference	277 (95%)
Waist circumference (cm)	108.1±9.4

Continuous outcome data at each time point are presented as raw mean and standard deviation (SD)

Table 1. Patient baseline characteristics

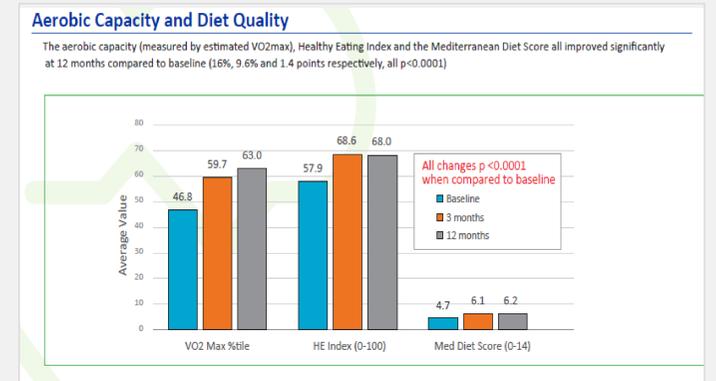


Figure 3. Changes in Aerobic Capacity & Diet Quality

Metabolic Reversal

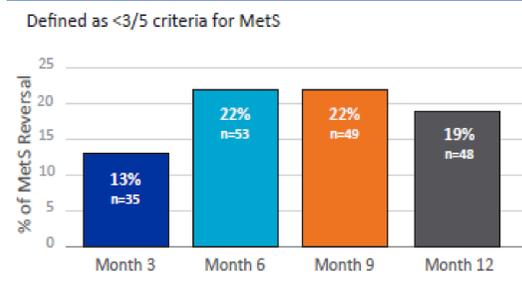


Figure 4. Metabolic syndrome reversal rates

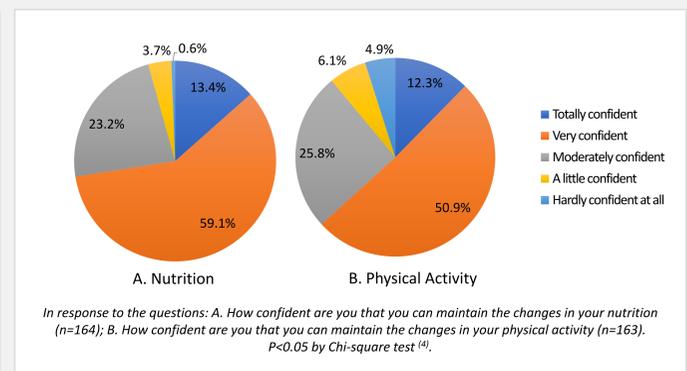


Figure 5. Participant ratings of confidence at end of program

At 12 months, 42% patients (n = 253) had a decrease in the number of MetS criteria compared to baseline. Also, at 12 months, the PROCAM 10 yr risk of myocardial infarction (MI) or acute coronary event was decreased by 1.4% (95% CI 0.9%-2.0%, p < 0.0001) from a baseline risk of 8.4%. Patients with the highest risk at baseline had the most substantial reduction in risk.

Conclusions

The CHANGE Program:

- improved blood pressure, blood sugars, lipids and waist circumference
- resulted in a 19% reversal rate in MetS at 12 months
- improved diet quality and fitness levels (p < 0.0001)
- resulted in a 17% relative risk reduction in the 10 yr. risk of acute MI
- improved patient confidence in maintaining changes in diet and exercise



References

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Efforts are in place to create multiple partnerships to disseminate the CHANGE Program in primary care