A novel diet and exercise intervention to reverse metabolic syndrome

Get Moving! Physical Activity for Better Quality Care
AFHTO Workshop March 7 2017
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Metabolic Syndrome Canada
The CHANGE Program
Unique lifestyle Intervention program created by leading health professionals at Metabolic Syndrome Canada www.metsc.ca to provide family health clinics with the tools they need to offer effective, lasting lifestyle intervention to patients with metabolic syndrome

Based on the best evidence from diet and exercise research, the CHANGE Program focuses on long-term changes and overall well-being
Program Overview

**Assessment**
- Family Doctor regular check-up
  - Assesses suitability
  - Blood work for blood sugars, lipids

**Start**
- Registered dietitian and kinesiologist
  - Baseline assessments
  - Develop goals for next visits over 12 months
  - Implement individualized CHANGE plan to reverse Metabolic Syndrome
- Family Doctor
  - Reviews blood work
  - Encourages patient to adopt program
  - Adjusts pharmacotherapy
  - Involves registered dietitian and kinesiologist

**Months 1-3**
- Weekly Follow up visits
  - Dietitian & kinesiologist
  - Assess progress
  - Modify plan and goals
  - Provide support

**Months 4-12**
- Monthly Follow up visits
  - Dietitian & kinesiologist
  - Assess progress
  - Review blood work
  - Modify plan and goals
  - Provide support
  - Advise Family Doctor

**Quarterly visits**
- Family Doctor
  - Every 3 month visits
  - Orders blood work
  - Reviews progress
  - Encourages patient to continue with program
What is CHANGE so different?

5 Keys to Success

What makes the CHANGE Program more effective at reversing metabolic syndrome (MetS) than other diets or workout plans? The difference can be summarized in five key ways:

- **Your Family Doctor**
- **A team approach**
- **Personalized diet-exercise plan**
- **Gradual intervention**
- **Close follow-up over 12 months**
The CHANGE Program
What is the impact on patients?
Clinicians and health team?
Patient outcomes: Reversal of Metabolic Syndrome

When 3 of these are present:

- High blood pressure (≥ 130/85 mm Hg, or receiving medication)
- High blood glucose levels (≥ 5.6 mmol/L, or receiving medication)
- High triglycerides (≥ 1.7 mmol/L, or receiving medication)
- Low HDL-Cholesterol (< 1.0 mmol/L in men or < 1.3 mmol/L in women)
- Large waist circumference (≥ 102 cm in men, ≥ 88 cm in women; ranges vary according to ethnicity)

www.metabolicsyndromecanada.ca
Patient outcomes:
Metabolic Syndrome Reversal and Improvement

Improvements seen in
- Blood pressure (systolic and diastolic)
- Fasting blood sugars
- Blood lipids
- Waist circumference
- Risk of 10 year cardiovascular event
- Reduction in medication use
- Patient Experiences (see slide #26 for patient testimonial's and success stories)

Improvements seen despite lack/modest weight loss!
Feasibility Study (Jeejeebhoy et al CMAJ Open in press 2017)

- December 2012-2014
- n =305 patients
- 3 Primary Care clinics across Canada
- Diet and exercise intervention over 1 year
- Data collection on MetS variables, diet and exercise
- Genetic analyses
- Training provided by MetSC Team
- Coordinated by Queens University
Feasibility Study Results

MetS Reversal (<3/5 criteria) compared to baseline

<table>
<thead>
<tr>
<th>Month</th>
<th>% of MetSyn Reversal</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month 3</td>
<td>13%</td>
<td>35</td>
</tr>
<tr>
<td>Month 6</td>
<td>22%</td>
<td>53</td>
</tr>
<tr>
<td>Month 9</td>
<td>22%</td>
<td>49</td>
</tr>
<tr>
<td>Month 12</td>
<td>19%</td>
<td>48</td>
</tr>
</tbody>
</table>
Feasibility Study Results

Patients with fewer MetS Criteria compared to Baseline

- Month 3: 33% (n=87)
- Month 6: 41% (n=100)
- Month 9: 43% (n=98)
- Month 12: 42% (n=106)
### Feasibility Study Results

#### Changes in estimated VO2 max and diet

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>3 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>VO2 Max %tile</td>
<td>46.8</td>
<td>59.7</td>
<td>63.0</td>
</tr>
<tr>
<td>HEIndex (0-100)</td>
<td>57.9</td>
<td>68.6</td>
<td>68.0</td>
</tr>
<tr>
<td>Med Diet Score (0-14)</td>
<td></td>
<td>4.7</td>
<td>6.1</td>
</tr>
</tbody>
</table>

All changes p <0.001
Health Team Outcomes:

Team approach

- More effective at behaviour change
  - “My wife and I tried 6 million (programs) and we thought well why not try another one...but this seemed more realistic.
- Multiple interactions with the patient
- Everyone was on the same page
- Using the right team member for the right work
- Less work for Family MD
The CHANGE Program
the “carrot” in the initiative --
what questions/problems that
teams or patients have will this
initiative help with?
CHANGE Program

Compared to other programs?
✓ Geared towards prevention of chronic disease management rather than reactive approach
✓ Addresses blood pressure, blood sugars, dyslipidemia, large waist size and medications together, not alone
✓ Weight loss is not a goal but instead improved health
✓ Family MD involvement is key
  ✓ Main Pro accredited Family MD Workshop for CHANGE Program

Tailored intervention
✓ Designed for addressing insulin resistance, basic component of MetS

Exercise & Clinical Outcome Reporting
✓ Can be used for reporting to Ministry, program comparison, etc
✓ See Program Evaluation section
The CHANGE Program
Implementation Considerations
CHANGE Program: Clinic resources needed

- **FHT/CHC**
  - interested in reducing risk of diabetes, cardiac disease, chronic diseases

- **Family MD/delegate interested**
  - Willing to follow patients q 3 months X 12 months
  - Could pilot in a sample of patients

- **Access to Registered Dietitian**
  - Weekly follow up visits Q week X 12 Monthly visits X 9
  - Group sessions where possible
  - Potential links to existing nutrition programs at the clinic
  - Exact time needed depends upon existing clinic programs
CHANGE Program: Clinic resources needed

Access to Exercise Specialist/Kinesiologist
- Weekly follow up visits Q week X 12 Monthly visits X 9
- Group sessions where possible
- Potential links to existing programs at clinics
- If no staffing at clinic, partnerships with gyms for supervised exercise and facility
- Exact time needed depends upon existing clinic programs

QIDSS/RNs/delegate
- Program Evaluation and outcomes

Team
- Willingness to engage in discussions around assisting MetSC expand the program beyond initial phase
CHANGE Program: MetSC to provide

- Ongoing training/support related to the program
- Program materials, handouts & toolkits
- Program Evaluation tools
- Link to other teams adopting program
- Building community of practice
Metabolic Syndrome Canada
The CHANGE Program
Talking to Patients
Baseline: Talking to Patients

Fitness Assessment (Aerobic and resistance training assessment)

- The initial fitness assessment is critical to begin developing rapport with the patient.
- Show “understanding” of their lifestyle, medical hx, and priorities.
  - What is important to them?
- Begin to create “urgency” for lifestyle change.
  - Why is the change important to them?
Weekly visits: Talking to Patients

1. Each patient is developed an “individualized” exercise program.
2. They actively assist in the development of the program.
3. Still use fitness principles but the program begins “their own”.
4. It is modified and changed regularly with their help.
Weekly visits: Talking to Patients

1. Reinforce the positives from their program.
   • What is working? What is not?
   • Why?
2. Re-emphasize their original goals.
3. Goal setting and % complete
   • Completed vs. Pass/Fail
Monthly follow up visits: Talking to patients

1. What is their progress from baseline to current?
   - Focus on the positives
   - Do not avoid the challenges:
     - Why and How?
     - Understanding and Urgency

2. Create new goals that challenge the individual
   - Patient centered and they actively choose their next goal

3. Focus on their intrinsic characteristics with their goal attainment vs. being a cheerleader
Talking to Patients – Keys to CHANGE

1. Encourage Accountability
2. Show Understanding
3. Create Urgency
4. Why and How?
5. Blend in education and exercise principles to maximize the outcomes of the exercise program
Patient Testimonials & Success stories

Patient testimonials
https://www.metabolicsyndromecanada.ca/testimonials

Success Stories
https://www.metabolicsyndromecanada.ca/success-stories
The CHANGE Program
Measurement (Program Evaluation)
Program Evaluation

To help MetSC and the participating clinic evaluate the program, a minimal amount of data will need to be collected by the clinic

Needs to be:

- meaningful (evidence based) and
- manageable (easy to collect in primary care setting)

Data streamlined significantly from feasibility study of CHANGE program (Jeejeebhoy et al CMAJ Open 2017)
Program Evaluation: what outcomes?

Each clinic adopting the CHANGE program will report following outcomes to MetSC:

1. % attendance at the Family MD, Exercise Specialist and Dietitian visits
2. Reversal of MetS and it’s components (includes medications)
4. Changes in physical activity & fitness levels
5. Changes in diet
6. Patient experiences

Plus engage in discussions of lessons learned and suggestions for modification
Physical Activity and Fitness Level: what minimum data?

Baseline, 3 and 12 months
- Waist circumference
- Aerobic Treadmill test
  - Speed (mph)
  - Estimated VO2 max
  - Aerobic Fitness Score
  - Health Benefit Zone
- Resistance Training Test
  - # push ups
  - Health Benefit Zone
Physical Activity and Fitness Level: what minimum data?

Weekly visits (week 1-12) and Monthly visits (month 4-12)

• Attendance at visits
• Reason for missed visits
• Group vs. individual visit
• Contact time
The CHANGE Program
Program Evaluation tools
Physical Activity and Fitness Level: how to collect data?

MetSC to provide each participating clinic with the following:

- Worksheets/templates to collect the data
- Tools to help deliver exercise intervention and monitor patient’s progress
- A Program Evaluation Tool (excel spreadsheet) that will help the clinic to create a report for MetSC

Wiling to work with clinic to integrate forms into EMR
Physical Activity and Fitness Level: Worksheets

Exercise Specialist Visits

<table>
<thead>
<tr>
<th>Visit type</th>
<th>Date (YYYY-MM-DD) OR Missed Visit</th>
<th>Setting</th>
<th>Contact Time (Minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly (1-12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week #</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly (4-12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month #</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>YYYY-MM-DD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR Missed Visit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason for missed visit</td>
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</tr>
</tbody>
</table>
## Fitness Assessment

<table>
<thead>
<tr>
<th>Visit</th>
<th>Baseline</th>
<th>Month 3 (Week12)</th>
<th>Month 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: YYYY-MM-DD</td>
<td>(must be same as Exercise specialist Visit Form)</td>
<td>(must be same as Exercise specialist Visit Form)</td>
<td>(must be same as Exercise specialist Visit Form)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waist Circumference (cm)</td>
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</tr>
</tbody>
</table>

### Aerobic Treadmill Test
- Speed (mph)
- Steady State Heart Rate (bpm)
- VO₂ max

### Aerobic Fitness Score

<table>
<thead>
<tr>
<th>Health Benefit Zone - (Aerobic)</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Need Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Check one)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Resistance Training Test
- Push-ups (number)

<table>
<thead>
<tr>
<th>Health Benefit Zone - (Push-up)</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Need Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Check one)</td>
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</tbody>
</table>

**Must be completed for program evaluation**

**Not needed for program evaluation**

**Only for Kinesiologist Assessment**
### Supervised Exercise Worksheet (optional)

<table>
<thead>
<tr>
<th>Visit Date</th>
<th>Type of Exercise</th>
<th>Target Duration</th>
<th>Target Intensity</th>
<th>Measured Duration</th>
<th>Measured Intensity</th>
<th>Perceived Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Visit</td>
<td>Aerobic Exercise: □ Treadmill  □ Elliptic  □ Step Machine  □ Bicycle  □ Rower  □ Other</td>
<td>Minutes</td>
<td>BPM</td>
<td>Minutes</td>
<td>BPM</td>
<td>Borg Scale</td>
</tr>
<tr>
<td></td>
<td>Resistance Training: □ Hand/Forearm/Arm  □ Lower Back/Abdominal  □ Neck/Shoulder/Upper  □ Leg/Thigh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Borg Scale</td>
</tr>
<tr>
<td>Week #1 Visit</td>
<td>Aerobic Exercise: □ Treadmill  □ Elliptic  □ Step Machine  □ Bicycle  □ Rower  □ Other</td>
<td>Minutes</td>
<td>BPM</td>
<td>Minutes</td>
<td>BPM</td>
<td>Borg Scale</td>
</tr>
<tr>
<td></td>
<td>Resistance Training: □ Hand/Forearm/Arm  □ Lower Back/Abdominal  □ Neck/Shoulder/Upper  □ Leg/Thigh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Borg Scale</td>
</tr>
<tr>
<td>Week #2 visit</td>
<td>Aerobic Exercise: □ Treadmill  □ Elliptic  □ Step Machine  □ Bicycle  □ Rower  □ Other</td>
<td>Minutes</td>
<td>BPM</td>
<td>Minutes</td>
<td>BPM</td>
<td>Borg Scale</td>
</tr>
<tr>
<td></td>
<td>Resistance Training: □ Hand/Forearm/Arm  □ Lower Back/Abdominal  □ Neck/Shoulder/Upper  □ Leg/Thigh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Borg Scale</td>
</tr>
</tbody>
</table>

Not needed for program evaluation

Only for Kinesiologist Assessment to help monitor progress
Tool will be provided to clinics adopting CHANGE. It will assist with the calculation of the following outcomes across all patients at the clinic that are in the program:

1. % attendance at visits
2. Visit setting and contact time
3. Waist circumference
4. Aerobic Treadmill test
   - Speed (mph)
   - VO2 max (estimated)
   - Aerobic Fitness Score
   - Health Benefit Zone
5. MetS reversal and components of MetS
6. Cardiovascular risk score
7. Mediterranean Diet Score
Links to references/resources

References
https://www.metabolicsyndromecanada.ca/research

Brochure on CHANGE and MetSC

MetSC team
https://www.metabolicsyndromecanada.ca/team
Questions

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Director of Operations

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