Evaluation of the SickKids Team Obesity Management Program (STOMP)

BMI Outcomes at 6 and 12 Months

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Overview of STOMP

- Established in January 2010
- 2 year program, 50 new patients per year
- 12 to 17 year olds with severe complex obesity
- Interdisciplinary team
- Lifestyle management program with strong mental health focus
- Subset of participants undergo bariatric surgery
STOMP Referral Criteria

• BMI $>99^{th}$ percentile for age and gender or

• BMI $>95^{th}$ percentile in addition to one of:
  
  – One significant obesity-related co-morbidity requiring specialty care
    • Technology dependent sleep disordered breathing, Type 2 diabetes, severe psychological impairment (school absence, bullying)
  
  – A significant co-existing chronic illness
    • Hypothalamic obesity secondary to craniopharyngioma
Framework for Treatment

- Community
- Medical
- Nutrition
- School
- Psychology (Behaviour/Coping)
- Economics
- Social
- Physical Activity

FAMILY
| Phase 1: Intensive Intervention Months 1-3 | Patient Group Sessions  
*Every Thursday 3-5pm for 6 weeks* | Parent Group Sessions  
*Every Thursday 3-5pm for 6 weeks* | Individual Therapy  
*Every other Thursday for 6 weeks* |
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<tr>
<td><strong>Follow up at 1 month + tests within first month</strong></td>
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</table>

| Phase 2: Ongoing Intervention Months 4-12 | Patient Group Sessions  
*Every other Tuesday 3:30-5pm* | Parent Group Sessions  
*Every other Tuesday 3:30-5pm* | Individual / Family Therapy  
*As needed* |
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<tbody>
<tr>
<td><strong>Follow up 3 months, 6 months, 9 months + tests at 6 months</strong></td>
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</table>

| Phase 3: Maintenance Months 13-18 | Patient Group Sessions  
*Every other Tuesday 3:30-5pm* | Parent Group Sessions  
*Every other Tuesday 3:30-5pm* | Individual / Family Therapy  
*As needed* |
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<td><strong>Follow up 12 months, 18 months + tests at 12 months , 18 months, 24 months</strong></td>
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| Phase 4: Transition Months 19-24 | Patient Group Sessions  
*One Tuesday each month 3:30-5pm* | Parent Group Sessions  
*One Tuesday each month 3:30-5pm* | Transition  
*(Referral to community)* |
|----------------------------------------|-----------------------------------|---------------------------------|----------------------------------|

Surgical group: Monthly support groups and individual appointments, f/u for 2 years with planned transition to Toronto Western Hospital (TWH)
Candidates for Bariatric Surgery

**Inclusion criteria**
- BMI >35 kg/m² with serious co-morbidity or BMI >40 kg/m²
- Tanner IV
- Psychology evaluation
- Family assessments/support
- Assessment of adherence in program- attendance, physical results, weight stabilization

**Exclusion criteria**
- Anesthesia risk
- Acute psychosis, acute mental health issues
- Pregnancy or planned in 2 years
- Structural GI abnormality
- Eating disorder (binge eating uncontrolled, bulimia, NOS)
- Developmental delay
- Alcohol abuse or dependence
Selection Process

- Nominated by team member
- Participation in STOMP >3 months
- Patient expresses interest
- Evidence of behaviour change
- Education with nurse practitioner
- Formal psychological evaluation by psychologist

Move forward for surgery
Study Objectives

• To evaluate BMI and weight outcomes for STOMP patients from baseline to 6 and 12 months

• To evaluate BMI and weight outcomes for STOMP bariatric surgery + lifestyle patients from baseline to 6 and 12 months post-operative
## Baseline Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean ± SD</th>
<th>Range</th>
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<tbody>
<tr>
<td>Age (n=52, years)</td>
<td>15.6 ± 1.8</td>
<td>12 to 18</td>
</tr>
<tr>
<td>Gender (n=52)</td>
<td>69% female, 31% male</td>
<td></td>
</tr>
<tr>
<td>Weight (n=52, kg)</td>
<td>122 ± 25.7</td>
<td>74.1-200</td>
</tr>
<tr>
<td>BMI (n=52, kg/m²)</td>
<td>44.2 ± 7.9</td>
<td>30.5 to 62.4</td>
</tr>
<tr>
<td>BMI percentile (n=52)</td>
<td>99.9 ± 0.1</td>
<td>99.1 to 99.9</td>
</tr>
<tr>
<td>BMI z-score (n=52)</td>
<td>4.33 ± 1.07</td>
<td>2.35 to 6.78</td>
</tr>
<tr>
<td>Waist circumference (n=47, cm)</td>
<td>129.9 ± 21</td>
<td>100 to 186</td>
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</table>
BMI Outcomes – Lifestyle Patients

Change in BMI at 6 months

Overall Δ in BMI = -0.4 ± 2.1 kg/m²
BMI Outcomes – Lifestyle Patients

Change in BMI over time

- **6 months**
  - Δ in BMI: -0.4 ± 2.1 kg/m²
  - N=26

- **12 months**
  - Δ in BMI: +0.1 ± 3.3 kg/m²
  - N=26

- **Program start**
  - Δ in BMI: +0.4 ± 2.1 kg/m²
  - N=26

- **6 months**
  - Δ in BMI: +3.4 ± 2.8 kg
  - N=26

- **12 months**
  - Δ in BMI: +6.6 ± 7.3 kg
  - N=6

- **Program start**
  - Δ in BMI: -2.3 kg
  - N=2

- **6 months**
  - Δ in BMI: -5.1 ± 6.1 kg
  - N=26

- **12 months**
  - Δ in BMI: -8.5 ± 8 kg
  - N=10

- **Program start**
  - Δ in BMI: +7.2 ± 2.4 kg
  - N=11
## Reported Outcomes

<table>
<thead>
<tr>
<th>Program</th>
<th>Mean Δ in BMI (kg/m(^2)) at 6 months</th>
<th>Mean Δ in BMI (kg/m(^2)) at 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin(^1)</td>
<td>N/A</td>
<td>+1 ± 2.7</td>
</tr>
<tr>
<td>Michigan(^2)</td>
<td>-2.3</td>
<td>N/A</td>
</tr>
<tr>
<td>SickKids STOMP</td>
<td>-0.4 ± 2.1</td>
<td>+0.1 ± 3.3</td>
</tr>
<tr>
<td>Pittsburgh (RCT)(^3)</td>
<td>-0.68 ± 0.29</td>
<td>+0.48 ± 0.30</td>
</tr>
<tr>
<td>Connecticut (RCT)(^4)</td>
<td>-2.1</td>
<td>-1.8</td>
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STOMP Treatment Predictors

• Predictors of weight loss after 6 months in STOMP
  
  – Higher initial weight

  – Lower baseline score on Impact of Weight on Quality of Life (IWQOL)-Kids total score
BMI Outcomes – Bariatric Sx Patients

Program start  | 6 months post-op | 12 months post-op

Change in BMI post-operatively

-29.8 ± 11.6 kg  
N=8

-33.6 ± 15 kg  
N=4

% EWL lost from baseline
6 mths-45.2%
12 mths-43.7%
BMI Outcomes by Type of Surgery

BMI change 6 months post-operatively

% EWL lost from baseline
6 mths-45.2%

N=4

N=3

N=1

BMI (kg/m²)

Program start

6 months post-op

Roux-en-Y
LAGB
Sleeve Gastrectomy
BMI Outcomes by Type of Surgery

BMI change 6 and 12 months post-operatively

% EWL lost from baseline
6 mths-45.2%
12 mths-43.7%

N=4
N=3
N=2
N=1

Program start 6 months post-op 12 months post-op

Roux-en-Y LAGB Sleeve Gastrectomy
## Reported Outcomes

<table>
<thead>
<tr>
<th>Surgery Type</th>
<th>Mean % Δ BMI at 6 months Literature</th>
<th>Mean % Δ BMI at 12 months Literature</th>
<th>Mean % Δ BMI at 6 months STOMP</th>
<th>Mean % Δ BMI at 12 months STOMP</th>
</tr>
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<tbody>
<tr>
<td>Roux-en-Y gastric bypass¹</td>
<td>N/A</td>
<td>37.4%</td>
<td>26.3%</td>
<td>24.1%</td>
</tr>
<tr>
<td>Laparoscopic adjustable gastric band (LABG)²</td>
<td>16.4%</td>
<td>27.9%</td>
<td>17.1%</td>
<td>26.6%</td>
</tr>
<tr>
<td>Sleeve gastrectomy³</td>
<td>26.5%</td>
<td>34.5%</td>
<td>21.9%</td>
<td>N/A</td>
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Complications-STOMP Bariatric Sx

- Gastric band not functioning – converted to sleeve gastrectomy

- Gallstones developed post-operatively with weight loss - cholecystectomy
Challenges-Adolescent Bariatric Sx

• Identification of successful candidates

• Family-centered decision

• Adherence to diet and supplements
Conclusions

• SickKids Team Obesity Management Program (STOMP)
  – ‘Real-world’ clinical program effective in reducing and stabilizing BMI at 6 and 12 months

• Predictors of weight loss after 6 months in STOMP
  – Higher initial weight and greater impact of weight on quality of life

• Adolescent bariatric surgery
  – Effective treatment for selective group of severely obese adolescents in STOMP
Future Directions

• Evaluation of outcomes up to 2 years in STOMP
  – Medical and psychosocial outcomes
  – Predictors of weight loss
• Comparison to group of patients not enrolled in STOMP
  – Baseline, 6 and 12 month visits
• Determination of key factors in selection of candidates for adolescent bariatric surgery
Acknowledgements

• STOMP patients and families

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  – Munaza Jamil
  – Rachel Steger