Integrating Services To Achieve Better Outcomes In Obesity Management

Dr Nic Kormas  FRACP
Outline

• Why more resources needed to manage & prevent obesity induced co-morbidities

• Case study demonstrating better outcome with integration of services

• Examples of integration of services in literature

• Examples of integration of services in Australian outpatient setting
The body mass index (BMI)- adults only

**BMI** = \( \frac{\text{Weight (kg)}}{\text{Height (m)}^2} \)

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI (kg/m²)</th>
<th>Risk of co-morbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>18.5–24.9</td>
<td>Average</td>
</tr>
<tr>
<td>Overweight</td>
<td>≥ 25</td>
<td></td>
</tr>
<tr>
<td>Pre-obese</td>
<td>25–29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obese class I</td>
<td>30.0–34.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>Obese class II</td>
<td>35.0–39.9</td>
<td>Severe</td>
</tr>
<tr>
<td>Obese class III</td>
<td>≥40.0</td>
<td>Very severe</td>
</tr>
</tbody>
</table>

World Health Organization, 1998
Edmonton Obesity Staging System (EOSS)

Stage 0
- Medical: absent
- Mental: absent
- Functional: mild

Stage 1
- Pre-clinical risk factors: mild
- Moderate co-morbidity

Stage 2
- End-organ damage
- Severe
- End-stage

Stage 3
- End-stage

Stage 4

Obesity

www.drsharma.ca

Sharma AM & Kushner RF, Int J Obes 2009
Case Study: Desperate Plea For Help From Wife of Severely Obese Man SP Feb 2011

- Unannounced visit by Community Nurse and Head of Chronic Disease Management. Severely obese man > 300kg

- “My husband is dying from his weight and no one will help”

- 40 year old man bed bound for over 2 years

- Nursed by wife and 14 year old son
Barriers to Treating Mr SP

- Location of services able to manage bariatric patients as outpatient

- “Can’t patient simply stop eating?”

- “How is patient obtaining his food?”
What Did We Do?

• Home assessment and care till mobile enough to be able to walk to front door with assistance

• Transfer to Camden Hospital Rehabilitation Ward to improve mobility & integrate entry into outpatient medical obesity management clinic

• Would need to integrate obesity specialist services across Health Districts
Recruited RPAH Team & Liverpool Physio
“Steve”  Feb 2011

- Unemployed, former tow-truck driver
- Weight 374kg
- BMI 117kg/m²
- Lives with wife + 14 yr. old son (wouldn’t attend school)
- “Obesity Immobility Syndrome”
- Bed bound over 2 years
“Steve”  Feb 2011

- Depression, severe bilateral knee OA, GORD

- RPAH team instituted Very Low Energy Diet (Optifast meal replacements)

- Physiotherapy home visits
“Steve” Nov 2011

- Lost 97 kg, & with assistance of 2 able to walk to front door

- Transferred to Camden Hospital Rehabilitation Ward
Nov 2011

- Short admission Camden Hospital Rehabilitation ward to improve mobility

- Simultaneously enrolled into specialised outpatient weight management clinic, “Metabolic Rehabilitation Program”
Metabolic Rehabilitation Program
Camden Hospital Nov 2011

• Comprehensive integrated MDT; medical, nursing, dietetics, psychology, physiotherapy, podiatry, exercise physiology

• On-site supervised group exercise classes
Camden Hospital
MRP Gym
Camden Hospital MRP Gymnasium
“Steve” Dec 2011-12

• Discharged back home after 3 week admission when could “car transfer”

• Weight 264 kg

• Lost further 15kg over 6 months then weight plateaued for 3 months. Improved mobility

• Referral to Public Bariatric Surgery Clinic Concord Hospital
“Steve” Feb 2013-16: Sleeve Gastrectomy 234kg
“Steve” Feb 2016

- Weight 175.1 kg, BMI 55.6 kg/m²
- Skin reduction surgery
- Mobility dramatically improved
- Looking for full time employment, started lawn mowing business in interim
“Steve” & Family Feb 2017
Obesity Integrated Management: Examples in Literature
Components of Weight Management Programs

• Lifestyle Management

• Pharmacological Treatments

• Bariatric Surgery
Seven “S’s” of Obesity Management Programs

• Standard Advice  (diet, exercise, behavioural)

• Specific Advice  (individual patient assessment by dietitian, EP, psychologist, physiotherapist, etc)

• Supervision  (exercise, shopping, cooking)

• Support  (individual, groups, carers)

• Shrinking Meal Sizes & Snacks  (meal replacements, pre-prepared meals & snacks, smaller plates)

• Saxenda & Xenical

• Surgery  (bariatric and skin)
Weight Loss in Look AHEAD Trial

**Weight Change From Baseline (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>DSE</th>
<th>ILI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>-1</td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>3</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>4</td>
<td>-4</td>
<td>-4</td>
</tr>
</tbody>
</table>

DSE, diabetes support and education; ILI, intensive lifestyle intervention.

Conclusions

- Five-year outcome data showed that, among patients with type 2 diabetes and a BMI of 27 to 43, bariatric surgery plus intensive medical therapy was more effective than intensive medical therapy alone in decreasing, or in some cases resolving, hyperglycemia.
Surgical Treatment And Medications Potentially Eradicate Diabetes Efficiently “STAMPEDE” Trial
Schauer P NEJM 2017

- All patients
- Endocrinologist
- Diabetes Educator
- Dietitian
- Research nurses
- Multiple visits
- Early use & titration meds
Obesity Integrated Management in Australian Clinical Setting
MOS Clinic population over time

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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>49 ± 13</td>
<td>47 ± 13</td>
<td>42.9 ± 13</td>
<td>45 ± 17</td>
</tr>
<tr>
<td>%M%F</td>
<td>31% 69%</td>
<td>32% 68%</td>
<td>25% 75%</td>
<td>25% 75%</td>
</tr>
<tr>
<td>Ht</td>
<td>1.66</td>
<td>1.66 ± 0.1</td>
<td>1.66 ± 0.1</td>
<td>1.65 ± 0.1</td>
</tr>
<tr>
<td>Wt</td>
<td>130.3</td>
<td>129.13 ± 32</td>
<td>126.4 ± 30.5</td>
<td>101.5 ± 24.4</td>
</tr>
<tr>
<td>BMI</td>
<td>47.2</td>
<td>46.5 ± 10</td>
<td>45.5 ± 9.2</td>
<td>37.0 ± 8.5</td>
</tr>
</tbody>
</table>
Metabolic Rehabilitation Diabetes Program

- Multidisciplinary medical & allied health review
  - dietetic, psychology, exercise physiology, physiotherapy

- Compulsory Intensive Exercise programme
  - > 3 supervised on-site exercise classes by EP/Physio
  - Overall > 330 minutes prescribed structured moderate intensity activity weekly

- Medications & Meal Replacements
  - Weight neutral diabetes medications (metformin, acarbose)
  - VLED used if appropriate
Metabolic Rehabilitation Clinic Concord
Patient baseline characteristics

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>21 (45%)</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>26 (55%)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>61.3 ± 9.1</td>
<td></td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>104.7 ± 20</td>
<td></td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>38 ± 5.7</td>
<td></td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>113 ± 12.6</td>
<td></td>
</tr>
<tr>
<td>Duration of diabetes (years)</td>
<td>11.0 ± 7.0</td>
<td></td>
</tr>
</tbody>
</table>

- Plus minus values are means ± SD

## Metabolic Rehabilitation Clinic Concord

Patient baseline characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (%)</td>
<td>8.2 ± 1.6</td>
</tr>
<tr>
<td>Systolic blood pressure (mmHg)</td>
<td>137 ± 18.6</td>
</tr>
<tr>
<td>Diastolic blood pressure (mmHg)</td>
<td>79.9 ± 9.1</td>
</tr>
<tr>
<td>Low density lipoprotein (LDL) (mmol/L)</td>
<td>2.54 ± 0.9</td>
</tr>
<tr>
<td>High density lipoprotein (HDL) (mmol/L)</td>
<td>1.34 ± 0.8</td>
</tr>
<tr>
<td>Triglycerides (mmol/L)</td>
<td>2.1 ± 1.1</td>
</tr>
<tr>
<td>No. of co-morbidities</td>
<td>4.8 ± 2.0</td>
</tr>
<tr>
<td>No. of medications</td>
<td>5.9 ± 2.8</td>
</tr>
</tbody>
</table>

- Plus minus values are means ± SD

Bishay RH, et al 2013
% Weight Change MRP Concord

p<0.001, 12 and 30 months  Bishay RH, et al  Clinical Diabetes 2013
MRP Concord Changes in HbA1c  

p<0.001 for both 12 and 30 months
SYSTOLIC BLOOD PRESSURE  Bishay R et al 2013

Annual change in Systolic Blood Pressure (SBP) during Rehabilitation

Reduction in p<0.027 for 12 months and 0.033 for 30 months
# MRP vs Traditional Diabetes Clinic Concord


<table>
<thead>
<tr>
<th></th>
<th>MRP (n=40)</th>
<th>DC care (n=40)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>106.2 ± 18.2</td>
<td>100.8 ± 17.9</td>
<td>0.78</td>
</tr>
<tr>
<td>% Change at 12 months</td>
<td>-7.65 ± 1.74</td>
<td>-1.76 ± 2.60</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>% Change at 30 months</td>
<td>-9.70 ± 2.13</td>
<td>-0.98 ± 2.65</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>8.2 ± 1.6</td>
<td>7.9 ± 1.9</td>
<td>0.56</td>
</tr>
<tr>
<td>% Change at 12 months</td>
<td>-0.95 ± 0.28</td>
<td>-0.35 ± 0.34</td>
<td>0.08</td>
</tr>
<tr>
<td>% Change at 30 months</td>
<td>-0.86 ± 0.31</td>
<td>-0.12 ± 0.33</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Camden Hospital MRP Gymnasium
Metabolic Rehabilitation Program
Camden Hospital 2011
<table>
<thead>
<tr>
<th>Patients</th>
<th>MRP Completers (≥12 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All N=53</td>
</tr>
<tr>
<td></td>
<td>Men n=25</td>
</tr>
<tr>
<td></td>
<td>Women n=28</td>
</tr>
<tr>
<td>P-value</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>59 (11)</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>53%</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>130 (30)</td>
</tr>
<tr>
<td>BMI (kg/m²) n=48</td>
<td>45 (8)</td>
</tr>
<tr>
<td>Waist circumference (WC, cm) n=37</td>
<td>134 (18)</td>
</tr>
<tr>
<td>High WC (≥102 cm men, ≥88 cm women)</td>
<td>100%</td>
</tr>
<tr>
<td>Systolic blood pressure (mmHg) n=50</td>
<td>136 (17)</td>
</tr>
<tr>
<td>Diastolic blood pressure (mmHg) n=51</td>
<td>77 (14)</td>
</tr>
<tr>
<td>No. of years since diagnosis of diabetes n=32</td>
<td>10.8 (7.6)</td>
</tr>
<tr>
<td>HbA1c (as %) n=52</td>
<td>8.1 (1.5)</td>
</tr>
</tbody>
</table>

<0.001
Figure: Within-group mean decrease in clinical outcomes

- 3 months
  - Change in body weight (kg): -5.5
  - Change in HbA1c (as %): n.s.
  - Change in SBP (mmHg): * -0.8

- 6 months
  - Change in body weight (kg): n.s.
  - Change in HbA1c (as %): * -0.9
  - Change in SBP (mmHg): * -8.6

- 12 months
  - Change in body weight (kg): n.s.
  - Change in HbA1c (as %): * -5.7
  - Change in SBP (mmHg): * -11.6

* significant at P<0.001
n.s. not significant at P<0.05

Poster Presentation at the Australian Diabetes Society and the Australian Diabetes Educators Association Annual Scientific Meeting 2016, 24th - 26th August 2016
Integrating Obesity Management Programs across Health Districts
Sydney & SWS LHD Bariatric Surgery Program

First publically funded bariatric surgery program in NSW

Concord Hospital Surgery & Clinic
Publically Funded Bariatric Surgery
Lukas N, et al MJA 2014
Key Points

• **Local integration of services** needed to manage complex Stage 3-4 Obesity Induced Chronic Disorders

• **Intensive lifestyle management** is becoming increasingly needed to prepare patients for bariatric surgery

• **Metropolitan integration of services** needed until specialised units established to manage Stage 4 Obesity Induced Chronic Disorders

• **Cost effectiveness** of intensive integrated obesity management models c/w traditional models of care needs to be studied