**Metabolic Surgery Update**

**Patients selection and choice of procedure**

Professor John B Dixon MBBS, FRACGP, FRCP Edin, PhD
NHMRC Senior Research Fellow
Head of Clinical Obesity Research, Baker IDI Heart and Diabetes Institute
Adjunct Professor – School of Primary Health Care, Monash University

**Disclosures:** Professor John B Dixon
Apollo Endosurgery
Bariatric Advantage
BUPA
Dendrite Clinical Systems
H reflects
Medtronic
NHS/NIH
Novo Nordisk
RACGP
Nova
Medtronics
BUPA
Dendrite Clinical Systems
I-Nova
Medtronics
Nestle
NHMRC
Medtronics
Nestle
NHMRC
Medtronics
Nova Nordisk
RACGP

---

**Metabolic surgery v traditional**

**Bariatric surgery**

- Metabolic surgery – GI surgery designed with the intent to treat type 2 diabetes and obesity
- It requires a diabetes based model of clinical practice consistent with international standards of diabetes care
- Surgery should be performed in high volume centres that understand and are experienced in the management of diabetes and GI surgery
- Standard procedures should be used

**Accepted conventional techniques**

- This has always been a clear message from non-surgeons
- All have their own risks and benefits
- There are now multiple new “diabetes” procedures, however in Australia we appear to be largely followers not leaders in new self-styled variants

---

**BMI trends in Australian adults**

- 2013 Adult Obesity
  - 28%

**Global & Regional Obesity**

- High income
- English speaking
- Light Blue

**Global & Regional Severe obesity**
Let’s look at those with diabetes in Australia

Australian’s with type 2 Diabetes 2011
Clinical Terms Used to Describe Various Levels of Body Fat

NORMAL
BMI 18.5 – 24.9

OVERWEIGHT
BMI 25 – 29.9

Class I
BMI 30 – 34.9

Class II
BMI 35 – 39.9

Class III
BMI ≥ 40

In press Dixon et al, DRCP 2013

30% in the severely obese categories

* BMI (Body Mass Index): A measurement of an individual's weight in relation to height (kg/m²).

Management and Impact for Long-term Empowerment and Success

70% Women
The compounding stressors of severe obesity in patients with diabetes

- Depression
- Education
- Disability
- Employment
- Women
- Severe Obesity
- Household Income

Along with obesity related disease this presents complex management issues

Dixon et al, DRCP 2013

SO WHY DO WE NEED SURGERY TO PROVIDE SUSTAINED WEIGHT LOSS AND TREAT OBESITY RELATED COMPLICATIONS LIKE TYPE 2 DIABETES?

Every essential for a functional life must be carefully regulated

- Temperature
- Oxygen saturation
- Blood pressure
- Blood glucose
- Fuel stores

The regulation of energy stores is still working when a obese patient has lost weight following bariatric surgery

Dose response curve “A change in regulation”

There is a dose response curve showing a change in regulation with Bariatric surgery or effective medical therapy.

Meal Size

Satiety

Physiological range

Bariatric surgery or effective medical therapy

Per Carel Le Roux

Obesity Treatment Pyramid

Current

Interim

Future

Diet

Physical Activity

Pharmacotherapy

Surgery

Combination Pharmacotherapy

VLCD

Physical Activity

Current

Interim

Future

Average weight for participants is approximately 100kg

Look at the groups that did not get effective therapy – Diet & Exercise and a placebo therapy

Average weight for participants is approximately 100kg
Effective therapies are rarely used
Therapeutic – clinical inertia +++

Surgical therapy v Lifestyle-Medical
11 randomized controlled trials

The evidence – 11 RCTs

Efficacy – Weight Loss

WHAT IS THE EVIDENCE?

Surgical therapy superior for weight loss and HbA1c

Diabetes Care in press 2016
**HbA1c**  
LAGB 73% v 13% remission

When should Metabolic Surgery be performed?

- The indications for surgery have two levels of eligibility
- Surgery is an option for this patient
- **Surgery is recommended for this patient**
- In the second case a trained caring physician should alert the patients to the recommendation and refer if and when appropriate

When is Metabolic Surgery performed?

- The indications for surgery have two levels of eligibility
- Surgery is an option for this patient
- **Surgery is recommended for this patient**
- In the second case a trained caring physician should alert the patients to the recommendation and refer if and when appropriate

The classification of weight category by BMI

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI Range</th>
<th>Eligible for surgery</th>
<th>Prioritised for surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>18.5 – 24.9</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Pre-obese</td>
<td>25.0 – 29.9</td>
<td>Yes, Conditional</td>
<td>No</td>
</tr>
<tr>
<td>Obese class I</td>
<td>30.0 – 34.9</td>
<td>Yes</td>
<td>Yes, Conditional</td>
</tr>
<tr>
<td>Obese class II</td>
<td>35.0 – 39.9</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Obese class III</td>
<td>≥40</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*HbA1c > 7.5 despite fully optimised conventional therapy, especially if weight is increasing, or other weight responsive comorbidities not achieving targets on conventional therapies (e.g. blood pressure, dyslipidaemia, obstructive sleep apnoea)

Eligibility and prioritisation for bariatric surgery based on failed non-surgical weight loss therapy, BMI, ethnicity and disease control

BMI Range | Eligible for surgery | Prioritised for Surgery
---|----------------------|-------------------------|
< 30 | No | No
30 – 35 | YES-Conditional* | No
35 – 40 | YES | YES-Conditional*
> 40 | YES | YES

*HbA1c > 7.5 despite fully optimised conventional therapy, especially if weight is increasing, or other weight responsive comorbidities not achieving targets on conventional therapies (e.g. blood pressure, dyslipidaemia, obstructive sleep apnoea)

Eligibility and prioritisation for bariatric surgery based on failed non-surgical weight loss therapy, BMI, ethnicity and disease control

- HbA1c > 7.5 despite fully optimised conventional therapy, especially if weight is increasing, or other weight responsive comorbidities not achieving targets on conventional therapies (e.g. blood pressure, dyslipidaemia, obstructive sleep apnoea)

National and international guidelines for eligibility for bariatric surgery (adults)

<table>
<thead>
<tr>
<th>Year</th>
<th>NIH (USA)</th>
<th>European</th>
<th>ADA (USA)</th>
<th>SGAN (Scotland)</th>
<th>WHMRC (Australia)</th>
<th>MACE (UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>2007</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Historic

- BMI > 30
- If Diabetes is poorly controlled
- Within 10 years of diagnosis

The guidelines above are qualified by the following common elements:

- Appropriate non-surgical weight loss measures have been tried and failed; there is the provision for, and a commitment to, long term follow-up; and individual risk to benefit ratio needs to be evaluated

DSS II

<table>
<thead>
<tr>
<th>Table 1: International societies that have ratified and/or endorsed the DSS-II consensus statements and guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>---------</td>
</tr>
</tbody>
</table>

The guidelines above are qualified by the following common elements:

- Appropriate non-surgical weight loss measures have been tried and failed; there is the provision for, and a commitment to, long term follow-up; and individual risk to benefit ratio needs to be evaluated

DSS II

Eligibility and prioritisation for bariatric surgery based on failed non-surgical weight loss therapy, BMI, ethnicity and disease control

BMI Range | Eligible for surgery | Prioritised for Surgery
---|----------------------|-------------------------|
< 30 | No | No
30 – 35 | YES-Conditional* | No
35 – 40 | YES | YES-Conditional*
> 40 | YES | YES

*HbA1c > 7.5 despite fully optimised conventional therapy, especially if weight is increasing, or other weight responsive comorbidities not achieving targets on conventional therapies (e.g. blood pressure, dyslipidaemia, obstructive sleep apnoea)
Algorithm for the treatment of T2D, as recommended by DSS-II voting delegates

Accepted conventional techniques

Diabetes Care 2016;39:861–877


Surgery is impressive and benefits extend well beyond a glucocentric approach

- Reduced mortality
  - Cardiovascular
  - Cancer
  - Diabetes
- Improved QOL in both physical and mental domains
- Improvement or remission of all obesity related complications
- Highly cost effective especially for diabetes

Obesity Is Linked to a Large Number of Serious Medical Conditions

Who responds well?
Key determinants of diabetes remission

- Duration of Diabetes
  - Adequate beta-cell function
- Fasting C-peptide
  - Insulin resistant and adequate beta-cell function
- BMI
  - You must have weight to lose
- (% Weight Loss)
  - You must lose weight


SOS study - IDF Melbourne 2013

- 31% still in remission at 15 years
- Diabetes complications cases v controls
  - Adjusted OR 0.53 (0.37 – 0.76)
- Those with diabetes that had a reduction in micro & macrovascular complications are treated within 3 years of a diagnosis of type 2 diabetes

Peltonen et al. Diabetes remission and complications over 15 years in SOS study IDF 2013

Chronic Care Management Model

1. Community Resources and Policies
2. Health System
   1. Self Management Support
   2. Delivery System Design
   3. Decision Support Information Systems
3. Community-Health System Interface
4. Production Support
5. Prepared, Proactive Practice Teams

Informed, Activated Patient

Right thing
Right patient
Right time

Improved Outcomes


The serial accumulation of impressive data

- 2006 Data from 4 studies indicating that bariatric surgery saves lives – Cardiovascular, Diabetes, Cancer.
- The evidence that the risks of surgery have plummeted with the laparoscopic approach and quality training – the technology used in surgery has been revolutionised
- Risk less than gall bladder surgery – No deaths in UK last year.
- The durability of weight loss – SOS and many more
- The 11 randomized controlled trials
- Health economic data – highly cost effective and for those with type 2 diabetes possibly dominant
- Change underway, but the systems to implement the needed changes are not established

Conclusion

- Chronic disease management is integrated health not “medicine v surgery”
- Surgery compliments conventional therapy
- Endocrinologists and diabetologists need to engage bariatric-metabolic surgical teams to assist with the management of their numerous patients who are eligible or prioritized for surgery
- We have done this oncology, other endocrine disorders, cardiology – Why not Bariatric-Metabolic surgery?