Diabetes and Obesity – Diabesity
As GPs what can we do?
What works?

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Disclosures: Professor John B Dixon

Apollo Endosurgery  Consultant, Research Support
Bariatric Advantage  Consultant, Speakers fees
Nestle Australia  Medical Advisory Board, Speakers Bureau, Research Support
ResMed  Research Support
I-Nova  Consultancy, Speaker and educational material
Dendrite Clinical Systems  Speaker fees
RACGP  Research Support
BUPA  Research Support
NHMRC  Research Support
Nestec Ltd  Consultant
Coviden  Meeting-speaker support
"Patient Access to Evidence-Based Obesity Services"

- Overnight
- American Medical Association (AMA) passes a resolution to help in the fight to improve patient access to evidence-based obesity treatments including:
  - Intensive behavioural counselling
  - FDA-approved obesity drugs
  - Bariatric and metabolic surgery.

June 12 2014
Diabesity – Chronic disease management

• The global & local issue
• How good are we at treating diabetes?
• Why is obesity so difficult to tackle?
• Determinants - Physiology
• How good are we at treating obesity?
**Australian's with type 2 Diabetes 2011**

Clinical Terms Used to Describe Various Levels of Body Fat*

<table>
<thead>
<tr>
<th>BMI</th>
<th>NORMAL</th>
<th>12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.5 – 24.9</td>
<td>OVERWEIGHT</td>
<td>29%</td>
</tr>
<tr>
<td>25 – 29.9</td>
<td>Class I</td>
<td>29%</td>
</tr>
<tr>
<td>30 – 34.9</td>
<td>Class II</td>
<td>16%</td>
</tr>
<tr>
<td>35 – 39.9</td>
<td>Class III</td>
<td>14%</td>
</tr>
</tbody>
</table>
| BMI ≥ 40 | * 30% in the severely obese categories

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

HbA1c  
Medications  
Eyes  
Feet  
Urine  
Follow-up  

Diet  
Physical activity  

Less important  
Poor uptake  
Greater barriers
Obesity Is Linked to a Large Number of Serious Medical Conditions

Obesity-related Co-morbidities¹

- Pulmonary Disease
  - Abnormal Function
  - Obstructive Sleep Apnea
  - Hypoventilation Syndrome
  - Asthma
- Nonalcoholic Fatty Liver Disease
  - Steatosis
  - Steatohepatitis
  - Cirrhosis
- Gall Bladder Disease
- Gynecologic Abnormalities
  - Abnormal Menses
  - Infertility
  - Polycystic Ovarian Syndrome
- Skin Problems
- Gout
- Idiopathic Intracranial Hypertension
- Stroke
- Cataracts
- Coronary Heart Disease
  - Dyslipidemia
  - Hypertension
- Diabetes
- Severe Pancreatitis
- Cancer
  - Breast, Uterus, Cervix,
  - Colon, Esophagus,
  - Pancreas, Kidney, Prostate
- Osteoarthritis
- Phlebitis
  - Venous Stasis

¹ J Manag Care Med. 2008
Which health professional do you rely on most for your diabetes care?

Dixon, et al, AFP 2014
How good are we at treating type 2 diabetes?
Age-adjusted cardiovascular mortality
Deaths/1000 people

Where do these improvements come from?

- Steady improvement in quality and the organization of care
- Models of chronic disease management
- Promotion of self management behaviors
- Pharmacotherapy
  - Hypertension
  - Hyperlipidemia
- Reductions in
  - Lower limb amputations
  - End stage renal disease
  - Cardiovascular hospitalization
  - Smoking prevalence

Results similar in Norway, Finland, & Australia

Chronic Care Management Model

1. Community
   Resources and Policies

2. Health System
   Health Care Organization
   - 3. Self-Management Support
   - 4. Delivery System Design
   - 5. Decision Support
   - 6. Clinical Information Systems

1. Informed, Activated Patient

2. Prepared, Proactive Practice Team

3. Productive Interactions

Improved Outcomes


Right thing
Right patient
Right time
The lessons from a glucocentric approach!

Having a focus on glucose as the cause of a condition - to the exclusion of other factors

Clinicians may need to reprioritise their efforts in diabetes management to better reflect the current evidence base.
Is lower better? U-shaped curve between HbA1c and mortality

ACCORD – ADVANCE – US VA trial changed the landscape

**Figure 1:** Adjusted hazard ratios for all-cause mortality by HbA1c deciles in people given oral combination and insulin-based therapies
Cox proportional hazards models were used, with the HbA1c base case scenario. Vertical error bars show 95% CIs, horizontal bars show HbA1c range. Red circle = reference decile. *Truncated at lower quartile. †Truncated at upper quartile. Metformin plus sulphonylureas (A); and insulin-based regimens (B).

Currie et al Lancet 2009
Bariatric Medicine

Professor John B Dixon, MBBS PhD

NHMRC Senior Research Fellow
Head, Clinical Obesity Research
Baker IDI Heart & Diabetes Institute
Melbourne, Australia
The top 5 myths about obesity

1. Obese people are less physically active
2. Body weight is a good measure of health
3. All obese people eat unhealthy foods
4. Anyone can control their weight with diet and exercise
5. Obese people lack motivation and self control

Clinical Obesity June 2014
An emerging area of medicine to prevent and manage clinically severe obesity

- Understand the determinants of, and the disrupted regulation leading to obesity
- Understand how obesity impairs health, quality of life, and causes complications
- The management of obesity with a chronic disease model of care

Aiming to improve function, quality of life, psychological wellbeing, prevent complications, end-organ damage, and reduce mortality related to obesity
## Genes and Obesity

<table>
<thead>
<tr>
<th>Type</th>
<th>Correlation Men</th>
<th>Correlation Women</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monozygotic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reared apart</td>
<td>0.70</td>
<td>0.66</td>
</tr>
<tr>
<td>Reared Together</td>
<td>0.74</td>
<td>0.66</td>
</tr>
<tr>
<td><strong>Dizygotic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reared Apart</td>
<td>0.15</td>
<td>0.25</td>
</tr>
<tr>
<td>Reared Together</td>
<td>0.33</td>
<td>0.27</td>
</tr>
</tbody>
</table>

“Early years are critical in setting the pattern for overweigh and obesity by secondary school the die-dye may be cast”
Oh, if it were as simple as energy in
energy out and will power!

This notion is fundamentally flawed, for one simple reason: it assumes that weight is the “dependent” variable in this equation. Indeed, everything we know about human physiology points to the fact that it is as much (if not more) body weight itself that determines energy intake and output as vice versa.

The first law of thermodynamics is of little practical used in an open biological system.
Chronic Care Management Model

1. Community Resources and Policies

2. Health System Health Care Organization
   - 3. Self-Management Support
   - 4. Delivery System Design
   - 5. Decision Support
   - 6. Clinical Information Systems

3. Improved Outcomes
   - Right thing
   - Right patient
   - Right time

The 5 “A”s of obesity care

- **ASK** and **ASSESS** current lifestyle and behaviour, BMI, co-morbidities and risk

- **ADVISE** and promote the benefits of a healthy lifestyle and weight management

- **ASSIST** in development of a program that includes individually tailored lifestyle interventions based on BMI, risk, comorbidity and plan subsequent review and monitoring

- **ARRANGE** regular follow-up visits, referral to secondary care providers as required, and support for long-term weight management

Clear permission to engage chronic disease management
Edmonton Obesity Staging System (EOSS)

Stage 0
- Absent
- Absent
- Absent

Stage 1
- Pre-clinical risk factors
- Mild

Stage 2
- Co-morbidity

Stage 3
- End-organ damage

Stage 4
- End-stage

Obesity

Sharma AM & Kushner RF, *Int J Obes* 2009
The US Obesity Society – Key messages to the FDA

- Obesity is not a lifestyle disease or a lifestyle choice
- It is NOT a willpower issue
- Modest weight loss has profound health benefits
- We need better therapy
Obesity Treatment Pyramid

Current

Interim

Future

- Diet
- Physical Activity
- Lifestyle Modification
- Combination Pharmacotherapy
- Devices (Lap Band, EndobARRIER)
- Surgery

Baker IDI

Page 32: Baker IDI
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 an obese patient has lost weight following surgery.
Dose response curve
“A change in regulation”

LEAN

OBESE

Meal Size

Physiological range

Satiety

Bariatric surgery or effective medical therapy
England NHS 2014
“Commissioning of Tier 3 services”
Additive Effects of Behavior and Meal Replacement Therapy With Pharmacotherapy for Obesity

Currently limited

- Orlistat
- Phentermine

"Xenical"
"Duromine"

- Diabetes therapy
  - Exenitide
  - Liraglutide
  - SGLT-2 blockers

Several new preparations have been approved by the FDA in the US – And many more are in the pipeline
The currently accepted four bariatric operations

Adjustable Gastric Band
Gastric Bypass
Gastric Sleeve
Duodenal Switch

Efficacy – Weight Loss

![Graph showing percentage change in weight over time for different treatments.](image)

- T2DM Surgical
- T2DM Conventional
- ModBMI Surgical
- ModBMI Medical
- Adol Surgical
- Adol lifestyle
- OSA Surgical
- OSA Conventional

References:
Where does surgery fit in?
Eligibility and prioritisation for bariatric surgery based on failed non-surgical weight loss therapy, BMI, ethnicity and disease control

<table>
<thead>
<tr>
<th>BMI Range</th>
<th>Eligible for surgery</th>
<th>Prioritised for Surgery</th>
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<tbody>
<tr>
<td>&lt; 30</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>30 –35</td>
<td>YES-Conditional*</td>
<td>No</td>
</tr>
<tr>
<td>35–40</td>
<td>YES</td>
<td>YES-Conditional*</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

*HbA$_{1c}$ > 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)

IDF- Bariatric Surgical and Procedural Interventions in the Treatment of Obese Patients with Type 2 Diabetes
The lessons from a glucocentric weightcentric approach!

Having a focus on glucose weight as the cause of a condition - to the exclusion of other factors

Clinicians may need to reprioritise their efforts in diabetes and weight management to better reflect the current evidence base.

The profound benefit of modest weight loss – no matter where you start

QOL, Function, prevent complications, end-organ damage, disability, psychological wellbeing, Morbidity and mortality
Managing clinically severe obesity

- Obesity is a chronic serious relapsing disease needing chronic disease management – morbidity, mortality and cost
- Weight loss is the perfect storm for weight regain – “We do not cure obesity – we manage it and its comorbidity and complications”
- Weight management has a major role, but quick fixes, unrealistic expectations and prejudice distort the chronic disease management process
Report card: Diabetes & Obesity

- Diabetes 7%
  - CDM approach in place and objective evidence based therapies are generating improved health outcomes
  - 7/10 doing well but always room for improvement

- Clinically severe obesity 6% most women
  - Distortion
  - Blame game
  - Sloth & gluttony
  - Motivation and willpower
  - CDM approach with few exceptions non-existent
  - Negligent
  - Fail
1. Community
   Resources and Policies

2. Health System
   Health Care Organization
   3. Self-Management Support
   4. Delivery System Design
   5. Decision Support
   6. Clinical Information Systems

   Informed, Activated Patient
   Prepared, Proactive Practice Team
   Productive Interactions

   Improved Outcomes

Pre-op assessment
Specialist assessment
Identification & primary assessment
Prevention & reinforcement of healthy eating & physical activity messages

Tier 1
Universal interventions
Tier 2
Lifestyle interventions
Tier 3
Specialist services
Tier 4
Surgery

Bariatric medical and surgical MDT
Multi-disciplinary team
Multicomponent weight management services
Environmental & population-wide services and initiatives
"I'll be right there in the room, and no one even acknowledges me"