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- Evidence based and easy to use
- Developed for local health professionals, by local health professionals
- Clear, local and relevant referral options
Trusted information at the point of care

Register and access ACT & SNSW HealthPathways today

https://actsnsw.healthpathways.org.au
Dave Turner
Accredited Exercise Physiologist

Exercise Is Medicine
Focus on Obesity
Accredited Exercise Physiologists

• Accredited Exercise Physiologists (AEPs) and Physiotherapists are both allied health professionals, however AEPs primary focus is to use exercise to prevent, manage and treat complex medical conditions.

• AEPs will utilise their skills in exercise prescription, combined with their training in behaviour change, to empower clients and assist them to manage their health independently.
Stage of Change

ARE YOU REGULARLY PHYSICALLY ACTIVE?

NO ➔

DO YOU INTEND TO IN THE NEXT THIRTY DAYS?

NO ➔

DO YOU INTEND TO IN THE NEXT SIX MONTHS?

NO ➔

PRECONTEMPLATION

NO ➔

PREPARATION

YES ➔

CONTEMPLATION

YES ➔

ACTION

YES ➔

MAINTENANCE

HAVE YOU BEEN DOING SO FOR MORE THAN SIX MONTHS?

NO ➔

Note: For activity to be regular, it must add up to a total of 30 minutes or more per day and be done at least 5 days per week.
A Drug Called Exercise

• **Generic name:** Physical Activity

• **Other brand names:** Walking, jogging, swimming, aerobics, biking, dancing, aquaerobics, weight training, yoga, tai chi, gardening, Zumba etc

• **Dosage:** Moderate-vigorous intensity; noticeable huff and puff or moderate challenge to the muscles

• **Frequency:** **Adults:** Minimum 30 mins/day, ≥5 days/week
  **Children:** Minimum 60 mins/day

Lower dosages can still show benefit. Advance as tolerated
A Drug Called Exercise

- **Side effects:** Decreased BP, pulse and blood sugar; stronger muscles and bones, weight loss; improved mood, energy levels, confidence, self-esteem and independence. Reduced risk of future health conditions

- **Adverse Reactions:** Sweating, injury (overdose), sudden death (extremely rare)

- **Administration:** self administer, or with others. Start off slowly, add minutes and intensity PRN. Change formulations to decrease boredom and improve compliance. Take outdoors or indoors any time of day.
Exercise For Obesity

• It’s not about weight loss. Physical activity is very beneficial to an individual’s health, whether or not they lose weight.

• Mental health and confidence
• Energy and pain levels
• Mobility and balance
• Long Term Health
Exercise For Mental Health

Boost Happy Chemicals
Exercise releases endorphins which create feelings of happiness. Studies have shown that exercise can even alleviate symptoms among the clinically depressed.

Reduce Stress
Exercise increases concentrations of norepinephrine, a chemical that can moderate the brain’s response to stress.

Improve Self-Confidence
On a very basic level, physical fitness can boost self-esteem and improve positive self image.

Be More Productive
Research shows that workers who take time for exercise on a regular basis are more productive and have more energy than their more sedentary peers.

Enjoy the Outdoors
Vitamin D acquired from soaking up the sun (while wearing sunscreen of course) can lessen the likelihood of experiencing depressive symptoms.

Increase Relaxation
For some, moderate workout can be the equivalent of a sleeping pill, even for people with insomnia.

Prevent Cognitive Decline
Diet and exercise can help shore up the brain against cognitive decline that begins after age 45. Working out, especially between 25 and 45, boosts chemical in the brain that support and prevent degeneration of the hippocampus, an important part of the brain for memory and learning.

Sharpen Memory
Regular physical activity boosts memory and the ability to learn new things by increasing the production of cells in the hippocampus responsible for memory and learning.

Alleviate Anxiety
The warm and fuzzy chemicals that are released during and after exercise can help people with anxiety disorders calm down.

Boost Brainpower
Various studies have shown that cardiovascular exercise can create new brain cells (aka neurogenesis) and improve overall brain performance.
Exercise in Youth

- Students are 20% more likely to earn an A+ in math or English when they have the chance to be physically active.
- Students’ standardized test scores jumped 6% after physical activity was incorporated into their school day.
- Discipline referrals dropped 57% following a program that starts the school day for elementary students with 10-20 minutes of teacher-led physical activity.
- Teachers report 43% less bullying at recess when kids have an organized recess environment.
- Children lower their insulin levels by 33% when they break up 3 hours of sedentary time with short, moderate-intensity walking.
- Children living within 2/3 mile of a park with a playground are 5x more likely to have a healthy weight.
- 41% of kids who spend more time outdoors are 4x less likely to be overweight.

Robert Wood Johnson Foundation
Overcoming Barriers

Cost

Time

Weather

Pain

I can’t be bothered

I don’t know where to start

I don’t have anybody to go with
Further Resources

RACGP Resources:
Handbook of Non-Drug Interventions

Clinician-based

Patient-based
Need a Specialist?

Consider subsidy options such as Chronic Disease Management Plans.
Questions?
Intensive Management of Obesity

VLED
Weight loss medications
Bariatric Surgery

Dr Miriam Blackburn
Staff specialist (endocrinology)
Primary Care is critical to addressing Australia’s obesity problem.

Body mass index distribution, persons aged 18 and over by gender, 2011–12

Effectiveness of current treatment options for obesity

Potency includes many factors, such as the amount, rate, and sustainability of weight loss, and the long-term resolution of adiposopathy and fat mass disease. Potency varies greatly for each individual (i.e., long-term adherence to a lifestyle program can be as potent as gastric bypass surgery).

Surgery
(In order of lowest risk/cost and potency): LAGB<VSG<RNY

Very Low Calorie Diet

Lifestyle + Medication
Includes lifestyle, and anti-obesity medications

Lifestyle
Includes nutrition, physical activity, and behavioral programs

Risk/Cost

Reference(s): [1]
The Australian Obesity Management Algorithm

Australian Diabetes Society (ADS)
Australian and New Zealand Obesity Society (ANZOS)
Obesity Surgery Society of Australia and New Zealand (OSSANZ)
Definitions of different diets
The Australian Obesity Management Algorithm

- Reduced energy diet (RED)
  - Energy deficit of 2000-4000 kJ/day (480-960 kcal/day)
  - More nutrient rich food
    - Vegetables, fruit, wholegrains, legumes, nuts, seeds, lean meat poultry, fish, eggs and low fat milk, cheese and yoghurt
  - Less energy dense food and drink
    - Biscuits, cakes, confectionary, pastries, pies, processed meats, fried foods and chips
    - Sugar sweetened drinks, such as fruit juices, soft drinks, energy drinks, alcohol
  - Reduce snacking and portion size
Exercise
The Australian Obesity Management Algorithm
Refer to RACGP guidelines

- Aerobic training for a minimum of 30 minutes on most days of the week
  - $\geq 150$ minutes per week
- Type 2 diabetes, impaired fasting glucose, impaired glucose tolerance
  - 210 minutes per week of moderate intensity exercise
  - Or 125 minutes of vigorous exercise per week
  - No more than 2 consecutive days with out training
Reduced Energy Diet
The Australian Obesity Management Algorithm

Energy dense, nutrient poor  Nutrient rich, reduced energy

Australian Guide to Healthy Eating
“IF IT CAME FROM A PLANT, EAT IT; IF IT WAS MADE IN A PLANT, DON’T.”

-MICHAEL POLLAN
Definitions of different diets
The Australian Obesity Management Algorithm

• Low energy diet (LED)
  – Reduce total daily energy intake by 4200-5000 kJ (1000-1200 kcal)
• Meal plan
• Commercial meal plans
  – Lite n Easy, Weight watchers, substituting 1-2 meals with meal replacements
Definitions of different diets

The Australian Obesity Management Algorithm

• Very Low Energy Diet (VLED)
  – Reduce energy intake to less than 3300 kJ/day (800 kcal/day)
  – Low carbohydrate meal replacement
    • Optifast
    • Mild ketosis has an anorexic effect
  – Weight loss 1-1.5 kg per week
Figure 1  Australian algorithm for the management of obesity
4.2 Management of individuals with BMI 30–40 kg/m² with obesity-related complications or BMI >40 kg/m² without complications (Figure 3)
Figure 3
BMI 30-40 kg/m² with obesity-related complications or
BMI >40 kg/m² without obesity-related complications
Management flow diagram

Very Low Energy Diet [VLED]
Target weight loss achieved

Yes
Weight maintenance diet
Weight loss maintained

Yes
Continue diet
No
VLED

No
Add Pharmacotherapy

Target weight loss achieved

Yes
Weight maintenance diet
No
Consider Bariatric Surgery

Weight loss maintained

Yes
VLED + Pharmacotherapy
No
Continue diet
Figure 4  BMI >40 kg/m² with obesity-related complications

Management flow diagram

Very Low Energy Diet [VLED] and pharmacotherapy

Target weight loss achieved

Yes

Weight maintenance diet

Weight loss maintained

Yes

Continue diet

No

VLED + Pharmacotherapy

Target weight loss achieved

Yes

Weight maintenance diet

No

Consider Bariatric Surgery
Obesity is a chronic, relapsing progressive disease

- In May 2017, the World Obesity Federation released a position statement in the journal *Obesity Reviews* recognising obesity as a “chronic, relapsing, progressive disease process.”
- Medications used to treat obesity need to be used life-long
- Using medications to prevent weight regain rather than cause weight loss
Pharmacotherapy for the treatment of obesity
<table>
<thead>
<tr>
<th>Drug</th>
<th>Phentermine Duromine® Metermine®</th>
<th>Orlistat Xenical®</th>
<th>Liraglutide Saxenda®</th>
<th>Topiramate</th>
<th>Phentermine-Topiramate</th>
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<tr>
<td>TGA status</td>
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<td>Approved*</td>
<td>Approved</td>
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<td>25 – 50 – 100 mg</td>
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<td>120 mg tds</td>
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<td>12.5 mg mane</td>
<td>Phe 15 mg mane Top. 12.5 mg mane</td>
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<td>Anorexia</td>
<td>History of Pancreatitis or medullary cell thyroid cancer</td>
<td>Glaucoma renal stones</td>
<td>Severe hypertension cardiac disease Glaucoma History of drug abuse MAO inhibitors SSRI use</td>
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<td>Pregnancy</td>
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<td>Glaucoma</td>
<td>Vitamin deficiency</td>
<td>Pregnancy (if used for weight loss)</td>
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<tr>
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<td>History of drug abuse</td>
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<td>History of drug abuse</td>
<td>Glaucoma</td>
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<td>MAO inhibitors</td>
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<td>Nausea</td>
<td>Paraesthesia</td>
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<td>Dry mouth</td>
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<td>Nausea</td>
<td>Paraesthesia</td>
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<td></td>
<td></td>
<td></td>
<td>Vomiting</td>
<td>Confusion</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Pancreatitis</td>
<td>Memory loss</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Glaucoma</td>
</tr>
<tr>
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<td>120 mg¹</td>
<td>3 mg</td>
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<td>Cost/month</td>
<td></td>
<td></td>
<td></td>
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</table>
GLP-1 receptor agonists

- Exenatide (Byetta) **Diabetes**
- Exenatide XR (Bydureon) **Diabetes**
- Liraglutide (Victoza) **Diabetes**
- Liraglutide (Saxenda) **Weight loss**
Mechanism of action of GLP-1 receptor agonists
Side-effects of GLP-1 agonists

• Nausea, vomiting and diarrhoea
  – Common, abates over time
  – Cease GLP-1 agonist if persistent vomiting

• Hypoglycaemia
  – If used in conjunction with insulin, sulphonylureas

• Weight loss
  – -3kg for Exenatide (Byetta)

• Injection site reactions
  – Exenatide once weekly
    • abscess, cellulitis, subcutaneous nodules
Contraindications to GLP1 agonists

• Avoid in patients with Type 1 diabetes
• Case reports of acute renal failure
  – Avoid if eGFR<30 ml/min (Byetta, Bydureon)
  – Monitor renal function if eGFR 30-50 ml/min (Byetta, Bydureon)
  – Liraglutide
    • Limited data
    • No dose adjustment
• Increased risk of medullary thyroid cancer in rodents (Liraglutide)
  – Species specific, avoid in patients with MEN2A, MEN2B or personal or family history of medullary thyroid cancer
Contraindications to GLP1 agonists

- Acute pancreatitis
  - Avoid use if patient has a history of pancreatitis
  - Avoid use if patient had risk factors for pancreatitis
    - Severe hypertriglyceridaemia, alcohol abuse or cholelithiasis
- Avoid in patients with gastroparesis
- Avoid in pregnancy
Liraglutide (Saxenda)

• Once daily injection
• TGA approved for weight loss
  – BMI>=30kg/m2 or BMI>=27kg/m2 with one weight related co-morbidity
• Not PBS approved
• Starting dose
  – 0.6mg daily for one week
  – 1.2 mg daily for one week
  – 1.8 mg daily for one week
  – 2.4 mg daily for one week
  – 3.0 mg daily
Liraglutide (Saxenda)

• Cost: approximately $90/week
• Mild expected weight loss
  – -6kg, placebo subtracted weight loss -4.4kg
• Must be used in conjunction with improved diet and exercise
• Non-responders 30%
• Check weight at 16 weeks, stop Saxenda if less than 5% body weight lost
• Nausea 30% of patients
Liraglutide (Saxenda)

• Side-effects
  – Suicidal thoughts
  – Gallstones
  – Increased heart rate
Phentermine/Topiramate CR
Qsymia

- Effective 8-10% weight loss
- Not TGA approved
- Common side-effects
  - Dry mouth, constipation, cognition (reduced attention), psychiatric (depression/anxiety) and increase in heart rate
- Starting dose
  - Phentermine/topiramate 3.75/23 mg for two weeks
  - Increase dose every two weeks if required
    - 7.5mg/46mg
    - 11.25mg/69mg
    - 15/92mg
Bariatric surgery
ADULTS BMI > 40
ADULTS BMI 35-39.9 AND A SERIOUS COMORBIDITY
Bariatric surgery

• Pre-operatively
• Identify and treat complications of obesity
  – Type 2 diabetes
  – OSA
  – Obesity hypoventilation
  – Hypertension
Bariatric Surgery

• Bariatric surgery reduces
  – Food volume consumed post procedure
  – Patient hunger
• Bariatric surgery may not change
  – Nutritional quality of food consumed
  – Mood eating
  – Exercise behaviour
• Pre-operative and post-operative multidisciplinary management
  – Psychologist
  – Doctor
  – Dietician
  – Exercise physiologist
Metabolic Surgery in the Treatment Algorithm for Type 2 Diabetes: A Joint Statement by International Diabetes Organizations

Cummings, D.E. on behalf of the delegates of the 2nd Diabetes Surgery Summit, Diabetes Care, 2016 Jun; 39(6): 861-877
Endorsed by 45 medical societies, including the ADS
Post-operative follow-up after gastric sleeve


- **Follow-up**
  - 1 month, 3-6 months and 12 months once stable

- **Each visit**
  - Monitor weight and adherence to diet and exercise
  - EUC, LFT, FBC, glucose
  - Avoid NSAIDS
  - Adjust diabetes medications, anti-hypertensive medications
Post gastric sleeve nutrition
AACE/TOS/ASMBS Bariatric Surgery Clinical Practice Guidelines, Endocr Pract. 2013;19(No. 2)

• Regular dietician review
• Protein intake 60-120 gram per day to maintain lean body mass
• Life-long vitamin supplementation
  – 2 multivitamin daily (selenium, copper, zinc)
  – Calcium citrate 1200 mg-1500 mg daily
  – Vitamin D3 3000 IU daily
  – Vitamin B12 injection if required
• Common deficiencies Vitamin B1, B9 (folate), vitamin B12, vitamin D and iron
Post-operative follow-up after gastric sleeve


- Monitor lipids 6/12 months adjust statins
- 24 hour urine Ca2+ excretion at 6/12 then annually
- Dexta BMD 2 years
- Vitamin B12 annually
- Thiamine supplementation if vomiting
- Reassess OSA treatment at 6-12/12
- Body contouring surgery when weight stabilised, 12-18 months post-operative
Who is to Blame?
You've got a problem with avoiding personal accountability. Yaa, and whose fault is that?
Weight bias and Stigma

Blame/Shame
- Moral judgment
- Emotional
- Guilt
- Does not assist with behaviour change
- Negative stereotypes
  - Unmotivated, lazy, unsuccessful, weak-willed, less intelligent, less attractive, overindulgent

Accountability
- Not emotional
- No moral judgment
- Shared decision making
- Assigning responsibility
- Record keeping
  - Steps walked per day
Who is responsible for the obesity epidemic?

- Previous Australian Prime Minister
  - “The only person responsible for what goes in my mouth is me and the only people who are responsible for what goes in to kids mouths are the parents”

- European Charter on Counteracting Obesity November 2006
  - A balance must be struck between the responsibility of individuals and that of government and society
  - Holding individuals alone accountable for their obesity should not be acceptable
Obesogenic Environment
Obesogenic Environment
Obesogenic Environment
Defence of weight set-point
Lee Kaplan analogy
Hormonal regulation of appetite
Permanently resetting weight set-point
The holy grail of obesity management
Gap between expectations and reality for amount of sustained weight loss after life-style change

<table>
<thead>
<tr>
<th>Expectation</th>
<th>Reality</th>
</tr>
</thead>
</table>

![Image showing weight loss comparison]

![Graph showing weight loss over weeks with placebo + lifestyle and orlistat + lifestyle]

*Placebo + lifestyle: p<0.001*
6 year follow-up after “The Biggest Loser”


- Most regained a significant amount of weight loss, 13/14
- Wide degree of individual variation
- 5 subjects were within 1% of their baseline weight
- Mean persistent weight loss 11.9% compared with baseline
- Mean resting metabolic rate after 6 years was 500 kcal/day lower than expected based on the measured body composition and age of subjects
Gap between expectations and reality for amount of sustained weight loss after life-style change

• Lifestyle change is the cornerstone of obesity management
• But diet and exercise do not alter weight set-point
• Like other lifestyle diseases such as Type 2 diabetes and hypertension many obese patients will need the addition of more intensive treatment options, such as medication, VLED and bariatric surgery
Prevention is better than Cure
Strategies to avoid weight regain after weight loss
Avoidance of Weight Regain
Professor Joseph Proietto

• Strategies to avoid weight regain
  – Weight maintenance diet will need to be calculated at the patients new weight and reduced by 1230 kJ (300 calories) per day
  – Use medication to suppress appetite when rapid weight gain has finished if any weight regain occurs (2 kg)
    • Use medication that suppresses hunger (not Orlistat)
      – Liraglutide
      – Phentermine
      – Topiramate
  – Have an agreed action weight if the patient reaches this they will restart Optifast for a 2 week period every 3 months
Successful long term weight loss
National Weight Control Registry

• Approximately 2-20% of the general population are successful in long term weight loss
• National Weight Control Registry
  – 10,000 participants
  – Lost at least 13.6 kg over one year
  – Average weight loss 33 kg
  – Maintained >5 years
• Cohort characteristics
  – 82% college educated
  – 77% female
  – 95% white
Successful long term weight loss
National Weight Control Registry

• Characteristics of patients with successful long term weight loss
  – Physical activity
    • 1 hour moderate intensity physical activity per day
      – 6km walk every day
      – Average Australian walks 3 km per day
  – Diet low in calories and fat
  – Eating breakfast
  – Self monitoring
    • Weight at least weekly
    • Monitoring dietary intake
Successful long term weight loss
National Weight Control Registry

- Catching slips before they turn into larger regains
- Multiple previous weight loss attempts
- Watch less than 10 hours of TV per week
  - Compared with the average American 28 hours/week (4 hours per day)
- Eat most of their meals at home <1 fast food meal per week
  - Compared with the average American 2-3 fast food meals per week
- Longer sleep duration, better sleep quality
Summary

• Obesity is a chronic, relapsing, progressive disease that requires life long management
• General practitioners play a critical role in addressing Australia’s obesity problem
  – Promoting a healthy lifestyle
  – Preventing weight gain
  – Assisting with weight loss
  – Advocating for changes that make the environment less obesogenic
• Maintaining weight loss can be difficult to defyence of body weight set-point
• Preventing obesity is easier than treating obesity
Eat food.
Not too much.
Mostly plants.
-Michael Pollan

move more do something...
Assoc Prof Sivakumar Ganananadha
BARIATRIC AND METABOLIC SURGERY

A/PROF SIVA GANANADHA
SENIOR STAFF SPECIALIST

UPPER GI/HPB AND BARIATRIC SURGEON
TALKING POINTS

- Why bariatric surgery?
- Which patients?
- What are the options?
- What are the risks?
- What are the outcomes?
- What follow up?
JANE

- 51 year old public servant
  - Height 163cms
  - Weight 172 Kgs
  - BMI 64.7
  - Excess weight 109 kgs
- Overweight since age 20 years
  - Large portions
  - Comfort eating
  - Inability to exercise due to arthritis
  - Numerous diets and weight loss attempts

- Background
  - Endometrial cancer
  - Hysterectomy and BSO
  - IGT
  - Hypertension
  - OSA
  - Depression
  - Stress incontinence
OBESITY

• Obesity is a chronic disease and therefore requires life long treatment and follow up

• There is no magic bullet- all treatments can fail with non surgical methods having the highest failure rates

• 63% (11 Million) of Australian adults are overweight or obese

• 28% (4.9 Million) of adults are obese

• 25% of children (2-17 years) are overweight or obese

• 7% of children (2-17 years) are obese
Figure 1. Average weight loss of subjects completing a minimum 1-year weight-management intervention; based on review of 80 studies (N=26,455; 18,199 completers [69%]).
WHY SURGERY?

- Weight loss
  - Bariatric surgery
- Metabolic effects
  - Metabolic surgery
- Effect on Mortality
WEIGHT LOSS

- Swedish obese subjects study
- Case matched prospective study
- 89% open operations
METABOLIC EFFECTS
SWEDISH OBESITY SUBJECTS STUDY

Fig. 3 Diabetes remission and prevention during follow-up for 2 and 10 years in the control and surgery groups of the Swedish Obese Subjects study. Upper panel: Diabetes remission in 248 controls and 342 surgery patients with type 2 diabetes at baseline. Lower panel: Diabetes incidence in 1402 controls and 1489 surgery patients without diabetes at baseline. Calculations based on data available on 1 Jan 2004. Adapted from Sjöström L et al., New Engl J Med 2004 with permission [12].
• Stampede trial
• RCT intensive medical therapy or RYGB or SG
• Type 2 DM (HbA1C >7%)
• BMI 37-43
**A. Glycated Hemoglobin**

- **Glycated Hemoglobin Level (%)**
- **Mean (median) Value at Visit**:
  - Medical therapy: 8.8 (8.6) 7.3 (6.8) 7.5 (7.2) 8.4 (7.7) 8.6 (8.2) 8.5 (8.0)
  - Gastric bypass: 9.3 (9.4) 6.4 (6.2) 6.5 (6.4) 6.8 (6.6) 6.8 (6.8) 7.3 (6.9)
  - Sleeve gastrectomy: 9.5 (8.9) 6.7 (6.4) 6.8 (6.8) 7.0 (6.7) 7.1 (6.6) 7.4 (7.2)

- **Month**
- **Glycated Hemoglobin Level (%)**
- **P < 0.001**

**B. Diabetes Medications**

- **Patients Taking Diabetes Medications (%)**
- **Baseline**
  - Medical Therapy: 53
  - Gastric Bypass: 16
  - Sleeve Gastrectomy: 21
- **Mo 60**
  - Medical Therapy: 40
  - Gastric Bypass: 29
  - Sleeve Gastrectomy: 21

- **P < 0.05 for comparison with medical-therapy group at 60 mo**
- **P < 0.05 for comparison between surgical groups at 60 mo**

- **Legend**:
  - Insulin
  - ≥3 Therapies
  - 2 Therapies
  - Monotherapy
  - None

- **Columns**
  - Baseline
  - Mo 60
**C Body-Mass Index**

- **Medical therapy**
- **Sleeve gastrectomy**
- **Gastric bypass**

<table>
<thead>
<tr>
<th>Month</th>
<th>Change in BMI from Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>-2</td>
</tr>
<tr>
<td>6</td>
<td>-4</td>
</tr>
<tr>
<td>12</td>
<td>-8</td>
</tr>
<tr>
<td>24</td>
<td>-10</td>
</tr>
<tr>
<td>36</td>
<td>-12</td>
</tr>
<tr>
<td>48</td>
<td>-12</td>
</tr>
<tr>
<td>54</td>
<td>-12</td>
</tr>
<tr>
<td>60</td>
<td>-12</td>
</tr>
</tbody>
</table>

- **P < 0.001**
- **P = 0.02**

**D Glycated Hemoglobin According to Body-Mass Index**

<table>
<thead>
<tr>
<th>Month</th>
<th>Glycated Hemoglobin Level (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>36</td>
<td>5</td>
</tr>
<tr>
<td>48</td>
<td>4</td>
</tr>
<tr>
<td>54</td>
<td>3</td>
</tr>
<tr>
<td>60</td>
<td>2</td>
</tr>
</tbody>
</table>

- **Medical therapy (BMI <35; N=17)**
- **Medical therapy (BMI ≥35; N=21)**
- **Surgical therapy (BMI <35; N=32)**
- **Surgical therapy (BMI ≥35; N=64)**

<table>
<thead>
<tr>
<th>Mean Value at Visit</th>
<th>Mean (median)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical therapy</td>
<td>36.4 (34.1)</td>
</tr>
<tr>
<td>Gastric bypass</td>
<td>37.0 (26.9)</td>
</tr>
<tr>
<td>Sleeve gastrectomy</td>
<td>36.0 (26.9)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean (median)</th>
<th>Value at Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical &lt;35</td>
<td>8.8 (8.9)</td>
</tr>
<tr>
<td>Medical ≥35</td>
<td>8.9 (8.5)</td>
</tr>
<tr>
<td>Surgical &lt;35</td>
<td>9.5 (9.1)</td>
</tr>
<tr>
<td>Surgical ≥35</td>
<td>9.4 (9.2)</td>
</tr>
</tbody>
</table>
## Overweight/Obesity Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>23.0* or 25.0-26.9</th>
<th>27.0-29.9</th>
<th>27.5* or 30.0-34.9</th>
<th>35.0-39.9</th>
<th>≥40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet, physical activity &amp; behavioral therapy</td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
</tr>
<tr>
<td>Pharmacotherapy</td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
</tr>
<tr>
<td>Metabolic surgery</td>
<td></td>
<td></td>
<td>✦</td>
<td>✦</td>
<td>✦</td>
</tr>
</tbody>
</table>

* Asian-American individuals

† Treatment may be indicated for selected, motivated patients.

Recommendations: Metabolic Surgery

• Metabolic surgery *should be recommended* to treat T2DM for all appropriate surgical candidates with BMIs $\geq 40$ (37.5*) and those with BMIs 35.0-39.9 (32.5-37.4*) when hyperglycemia is inadequately controlled despite lifestyle & optimal medical therapy. A

• Metabolic surgery *should be considered* for the treatment of T2DM in adults with BMIs 30-34.9 (27.5-32.4*) when hyperglycemia is inadequately controlled despite optimal medical control by either oral or injectable medications (including insulin). B

• Metabolic surgery should be performed in high-volume centers with multidisciplinary teams that understand and are experienced in the management of diabetes and gastrointestinal surgery. C
Algorithm for the treatment of T2D, as recommended by DSS-II voting delegates.

Francesco Rubino et al. Dia Care 2016;39:861-877
©2016 by American Diabetes Association
The combined end point of myocardial infarction and stroke, whichever came first, with fatal cardiovascular events and total (fatal and nonfatal) cardiovascular events are shown. The incidence data are based on observations until December 31, 2009. Follow-up time is truncated at 18 years, because number of persons at risk beyond this point was low. All persons are included in the calculation of hazard ratios (HRs). The incidence rates per 1000 person-years for fatal cardiovascular events were 0.9 (95% CI, 0.6-1.3) in the surgery group and 1.7 (95% CI, 1.3-2.2) in the control group; and for total cardiovascular events, 6.9 (95% CI, 6.0-8.0) and 8.3 (95% CI, 7.3-9.4), respectively. Y-axis regions shown in blue indicate range from 0 to 0.035.
MORTALITY EFFECT

- Swedish obese subjects study
- 30% reduction in mortality
- 13 years before significant difference
Association Between Bariatric Surgery and Long-term Survival

David E. Arterburn, MD, MPH; Karen K. Olsen, PhD; Valerie A. Smith, MS; Edward H. Livingston, MD, MS; Lynne Van Scoyoc; William S. Yancy Jr, MD, MPHc; George Eld, MD; Hollis Weidenbacher, PhD; Matthew L. Madejewski, PhD

Figure. Kaplan-Meier Estimated Mortality Curves for Surgical Patients and Matched Control Patients

Table 2. Number at Risk, Number Who Died, and Number Censored by Time Interval With Hazard Ratios for the Association Between Bariatric Surgery and Survival

<table>
<thead>
<tr>
<th>Time Interval</th>
<th>Surgical Patients (n = 2500)</th>
<th>Matched Control Patients (n = 7462)</th>
<th>Hazard Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline to 1 y</td>
<td>2500 61 0</td>
<td>7462 129 67</td>
<td>1.28 (0.98-1.68)</td>
<td>.07</td>
</tr>
<tr>
<td>&gt;1 to 5 y</td>
<td>2439 86 696</td>
<td>7266 554 2088</td>
<td>0.45 (0.36-0.56)</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>&gt;5 to 14 y</td>
<td>1657 116 1541</td>
<td>4624 594 4030</td>
<td>0.47 (0.39-0.58)</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>


CALLE EE ET AL. N ENGL J MED 2003;348:1625-1638.

CALLE EE ET AL. N ENGL J MED 2003;348:1625-1638.
WHICH PATIENTS?
Candidates for bariatric surgery

Body mass index (BMI) ≥ 40 kg/m² or BMI ≥ 35 kg/m² with significant obesity-related co-morbidities

Acceptable operative risk

Documented failure of nonsurgical weight-loss programs

Psychologically stable with realistic expectations

Well-informed and motivated patient

Supportive family/social environment

Absence of uncontrolled psychotic or depressive disorder

No active alcohol or substance abuse
WHAT ARE THE OPTIONS
SURGICAL OPTIONS

Gastric Band  Sleeve Gastrectomy  Gastric Bypass

Others
- Biliopancreatic diversion (BPD)
- Endoscopic options
- Intragastric balloons
- Endo sleeve
BARIATRIC SURGERY IN AUSTRALIA

- **Lap Band**
- **Lap Sleeve**
- **Lap Bypass**
LAPAROSCOPIC ADJUSTABLE GASTRIC BAND

- Least invasive
- Requires close and regular supervision
- Prone to maladaptive eating behaviour
- Slow weight loss
- Aid to weight loss and requires a significant effort by patients
WHAT IS THE “GREEN ZONE”?
LAP BAND COMPLICATIONS

- Band slippage
- Band erosion
- Band or port infections
- Failure of weight loss
- Loss to follow up
  - Reflux/ regurgitation/dysphagia
Long-Term Outcomes After Bariatric Surgery

*Fifteen-Year Follow-Up of Adjustable Gastric Banding and a Systematic Review of the Bariatric Surgical Literature*

Paul E. O’Brien, MD, FRACS, Leah MacDonald, PhD, Margaret Anderson, BHIM, Leah Brennan, PhD, MApp Sci, and Wendy A. Brown, MBBS, PhD, FRACS

![Graph showing weight loss percentage over time](image)

**FIGURE 1.** The % EWL with 95% CIs for the 15-year period of follow-up after LAGB. The continuous line shows the pattern of weight loss for the complete group. The dotted line shows the weight loss for those within that group who had revisional surgery.
SLEEVE GASTRECTOMY

- Commonest procedure in Australia
- Permanent
- Restrictive procedure
- Volume of 150-200mls
- Decrease of Ghrelin
- Quality of eating
SLEEVE GASTRECTOMY

• Complications
  • Leak < 0-1%
  • Haemorrhage <0-1%
  • Reflux ~20%
  • Weight regain
## SLEEVE GASTRECTOMY

<table>
<thead>
<tr>
<th>Author</th>
<th>%EWL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arman et al. 2016 [15]</td>
<td></td>
</tr>
<tr>
<td>Alexandrou et al. 2015 [36]</td>
<td>56.4 (25)</td>
</tr>
<tr>
<td>Liu et al. 2015 [29]</td>
<td>57.2 (44)</td>
</tr>
<tr>
<td>Lemanu et al. 2014 [22]</td>
<td>40 (55)</td>
</tr>
<tr>
<td>Zhang et al. 2014 [8]</td>
<td>63.2 (27)</td>
</tr>
<tr>
<td>Sieber et al. 2013 [16]</td>
<td>57.4 (37)</td>
</tr>
<tr>
<td>Catheline et al. 2013 [21]</td>
<td>50.7 (45)</td>
</tr>
<tr>
<td>Brethauer et al. 2013 [25]</td>
<td>49.5 (23)</td>
</tr>
<tr>
<td>Eid et al. 2012 [19]</td>
<td>51 (69)</td>
</tr>
<tr>
<td>Rawlins et al. 2012 [20]</td>
<td>86 (49)</td>
</tr>
<tr>
<td>Strain et al. 2011 [18]</td>
<td>48 (23)</td>
</tr>
<tr>
<td>Sarela et al. 2011 [37]</td>
<td></td>
</tr>
<tr>
<td>Himpens et al. 2010 [5]</td>
<td></td>
</tr>
<tr>
<td>Bohdajan et al. 2010 [28]</td>
<td>55 (21)</td>
</tr>
<tr>
<td>Mean</td>
<td>58.4 (1501)</td>
</tr>
</tbody>
</table>

%EWL = percentage excess weight loss.
### SLEEVE GASTRECTOMY AND COMORBIDITIES

<table>
<thead>
<tr>
<th>Author</th>
<th>T2D</th>
<th>Remission and improvement % (n)</th>
<th>AHT</th>
<th>Dyslipidemia</th>
<th>OSA</th>
<th>GERD</th>
<th>DJD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arman et al. 2016 [15]</td>
<td>T2D</td>
<td>28.6 (7)</td>
<td>40 (10)</td>
<td>66 (3)</td>
<td>0 (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alexanadrou et al. 2015 [36]</td>
<td>T2D</td>
<td>66 (3)</td>
<td>63 (11)</td>
<td>80 (21)</td>
<td>80 (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liu et al. 2015 [29]</td>
<td>T2D</td>
<td>70.6 (19)</td>
<td>49.3 (75)</td>
<td>45.8 (48)</td>
<td>70 (75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musella et al. 2014 [3]</td>
<td>T2D</td>
<td>65.3 (26)</td>
<td>90 (37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lemanu et al. 2014 [22]</td>
<td>T2D</td>
<td>79 (14)</td>
<td>61 (31)</td>
<td></td>
<td>73 (15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zhang et al. 2014 [8]</td>
<td>T2D</td>
<td>88.9 (9)</td>
<td>60 (5)</td>
<td>84.6 (13)</td>
<td>100 (7)</td>
<td></td>
<td>100 (2)</td>
</tr>
<tr>
<td>Sieber et al. 2013 [16]</td>
<td>T2D</td>
<td>85 (16)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catheline et al. 2013 [21]</td>
<td>T2D</td>
<td>61.5 (13)</td>
<td>55.5 (18)</td>
<td>58.3 (12)</td>
<td>75 (24)</td>
<td></td>
<td>0 (5)</td>
</tr>
<tr>
<td>Brethauer et al. 2013 [25]</td>
<td>T2D</td>
<td>83 (23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eid et al. 2012 [19]</td>
<td>T2D</td>
<td>77.1 (35)</td>
<td>74.4 (43)</td>
<td></td>
<td>71.7 (53)</td>
<td>31.5 (35)</td>
<td>60.4 (48)</td>
</tr>
<tr>
<td>Rawlins et al. 2012 [20]</td>
<td>T2D</td>
<td>100 (19)</td>
<td>95 (43)</td>
<td>100 (23)</td>
<td>100 (23)</td>
<td></td>
<td>53 (15)</td>
</tr>
<tr>
<td>Mean/Total Patients</td>
<td>T2D</td>
<td>58.9 (40.4)</td>
<td>77.8 (190)</td>
<td>68.0 (270)</td>
<td>65.9 (127)</td>
<td>75.8 (207)</td>
<td>30.6 (62)</td>
</tr>
</tbody>
</table>

AHT = arterial hypertension; DJD = degenerative joint diseases; GERD = gastroesophageal reflux disease; I = improvement; OSA = obstructive sleep apnea; R = remission; T2D = type 2 diabetes.
Laparoscopic gastric bypass
LAP GASTRIC BYPASS

- Gold standard
- Best metabolic operation
- Complex surgery
- Higher operative risk
- Needs long term follow up
LAP GASTRIC BYPASS

COMPLICATIONS

- Anastomotic leaks (1-5%)
- Stomal stenosis (15%)
- Marginal ulcers (13%)
- Dumping syndrome
- Small bowel obstruction
- Internal hernia
- Nutritional deficiencies
RISK OF SURGERY
OPERATIVE MORTALITY

- Bariatric surgery
- Lap cholecystectomy
- Anti reflux
- Appendicectomy
- Colectomy
- Ventral hernia repair
- Pancreatectomy
- Oesophagectomy
JANE

- Underwent laparoscopic sleeve gastrectomy
- Uneventful post op recovery
- Resolution of
  - Hypertension
  - OSA
  - IGT
- Improvement of mobility
**JANE**

<table>
<thead>
<tr>
<th>AGE</th>
<th>ZERO DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>16 Nov 2009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>TOTAL WEIGHT LOSS</strong></th>
<th>61KGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>START WEIGHT</strong></td>
<td>163 KG</td>
</tr>
<tr>
<td><strong>INITIAL BMI</strong></td>
<td>61.3</td>
</tr>
<tr>
<td><strong>CURRENT WEIGHT</strong></td>
<td>102 KG</td>
</tr>
<tr>
<td><strong>TARGET WEIGHT</strong></td>
<td>102 KG</td>
</tr>
</tbody>
</table>

![Graph of weight loss over time](https://www.dotnetcharting.com)
FOLLOW UP

• Critical for the success of any weight loss management plan
  • Weight loss
  • Complications
  • Nutritional deficiencies
  • Comorbidities
AACE/TOS/ASMBS Guidelines

## Postoperative Checklist for Bariatric Surgery

### Early postoperative care

<table>
<thead>
<tr>
<th>Item</th>
<th>LAGB</th>
<th>LSG</th>
<th>RYGB</th>
<th>BPDDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>monitored telemetry at least 24 hr if high risk for MI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>protocol-derived staged meal progression supervised by RD</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>healthy eating education by RD</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>multivitamin plus minerals (# tablets for minimal requirement)</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>calcium citrate, 1200–1500 mg/d</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>vitamin D, at least 3000 units/d, titrate to &gt;30 ng/mL</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>vitamin B₁₂ as needed for normal range levels</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>maintain adequate hydration (usually &gt;1.5 L/d PO)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>monitor blood glucose with diabetes or hypoglycemic symptoms</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>pulmonary toilet, spirometry, DVT prophylaxis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>if unstable, consider pulmonary embolus (PE), intestinal leak (IL)</td>
<td>PE</td>
<td>PE</td>
<td>PE/IL</td>
<td>PE/IL</td>
</tr>
<tr>
<td>if rhabdomyolysis suspected, check CPK</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Follow-up

- visits: initial, interval until stable, once stable (months): 1.1–2, 12, 1.3–6, 12, 1.3, 6–12, 1, 3, 6
- monitor progress with weight loss and evidence of complications each visit
  - SMA-21, CBC/plt with each visit (and iron at baseline and after as needed)
  - avoid nonsteroidal antiinflammatory drugs
  - adjust postoperative medications
  - consider gout and gallstone prophylaxis in appropriate patients
  - need for antihypertensive therapy with each visit
  - lipid evaluation every 6–12 months based on risk and therapy
  - monitor adherence with physical activity recommendations
  - evaluate need for support groups
- bone density (DEXA) at 2 years
- 24-hour urinary calcium excretion at 6 months and then annually
- B₁₂ (annually; MMA and Hcy optional; then q 3–6 months if supplemented)
- folic acid (RBC folic acid optional), iron studies, 25-vitamin D, iPTH
- vitamin A (initially and q 6–12 months thereafter)
- copper, zinc, and selenium evaluation with specific findings
- thiamine evaluation with specific findings
- consider eventual body contouring surgery

*see text for abbreviations; based on general obesity-related risks, GI functional anatomy, and clinical endpoints after specific bariatric surgical procedures.*
• Obesity is a chronic disease
• Prevention remains key
• Surgery is the most effective therapy for obesity
• It is suitable in patients with severe and resistant obesity and for the treatment of obesity related comorbidities
• Surgery is the most effective therapy for obesity related comorbidities
• Patients needs on life long follow up and management
QUESTIONS?
Obesity management in primary care – what is the role of the general practitioner?

Prof Kirsty Douglas
Our team

• Dr Liz Sturgiss (ANU)
• Prof Kirsty Douglas (ANU)
• Dr Emily Haesler (Visiting Fellow, ANU)
• Nicholas Elmitt (Research Officer, ANU)
• Prof Chris van Weel (ANU; Radboud University Medical Center, Nijmegen, The Netherlands)
• Dr Freya Ashman (Academic Registrar, ANU)
• Dr Duncan Mackinnon (ANU Rural Clinical School)
• Diane Percy (Heart Foundation)
• Caroline Salisbury (Dietitian)
• Sue Mackinnon (Practice Nurse, Bega Valley Medical Practice)
• Dr Sonia Res (GP, ACT Health)
• Dr Rebecca Kathage (GP)
• Dr Alex Stevenson (GP)
• David Whalen (graphic design)
Tips and tricks for the GP

• Start with a respectful conversation
• Use all the skills GP’s have & use daily – patient centred approach, readiness for change assessment, long term goals, motivational interviewing, patient education
• Builds on the established relationship, continuity of care, holistic approach
• It may not be appropriate or realistic to refer
Figure 2. Proposed model for the management of obesity within each consultation

Seek permission (Ask)

- If permission given:
  - Assess
  - Inform (Advise)
  - Discuss options (Assist or arrange)

- If permission not given:
  - Today might not be the right time. Let the patient know you are ready to talk when he or she is.

Person-centred approach:
- Consider:
  - Individual priorities
  - Health beliefs
  - Cultural dimensions

Set goals (Agree)

Follow-up
Could this elixir hold the key to weight loss?

Hospital wards shut as cases soar 50% to five-year high

**VOMITING VIRUS SWEEPS BRITAIN**

By Sophie Dorkin
Health Reporter

**BRITAIN is in the grip of a winter vomiting outbreak which has already seen many thousands fall victim to the debilitating virus.**

Cases of the bug have surged to a pre-weather peak and the health service has reported outbreaks at dozens of hospitals in England, Scotland, Wales and Northern Ireland.

Parents at schools and workplaces across the country have reported sick children and staff who have caught the virus which causes nausea, vomiting and diarrhoea. The illness can spread quickly and cause mass sickness outbreaks.

The infection is caused by norovirus, which can live for more than a week on surfaces and survive in the faeces, pose a threat to those in care homes and those with suppressed immune systems, such as pregnant women.

'It's very difficult to control,' said Professor Roger Nunn, head of the University of York's Health Protection Research Unit. 'It can become highly widespread and cause a lot of disruption,'

The problem is exacerbated by the fact norovirus can spread so easily on surfaces and in the air.

The symptoms usually last for one to two days but can last longer in some cases and in the elderly and those with weakened immune systems.

Parents were asked to keep their children at home if they were ill, as not everyone with the virus is ill at the same time.

Parents were also advised to keep their children away from school and nurseries if they have not been vomiting for more than 12 hours.

**Probes into the death pathway bonuses**

A recent report by the Audit Commission has revealed how care home bosses have been offered £10,000 to £20,000 in performance-related bonuses for meeting targets which put patients at risk.

The report found that some care home bosses were being paid significant amounts even when their homes had serious failings.

The investigation was set up to look at how care homes were being paid for meeting targets such as reducing infections.

A probe into the death pathway bonuses found that some care home bosses were being paid significant amounts even when their homes had serious failings.

The investigation was set up to look at how care homes were being paid for meeting targets such as reducing infections.
Weight loss is difficult

• Early recognition of weight gain is essential
Body phenotypes vary widely

BEAUTY COMES IN ALL SHAPES AND SIZES
“Health” not “Weight”

• Can improve overall health and fitness without changing weight

• Goals – need to be “doing” goals, NOT weight related
Therapeutic relationship

Improved outcomes with long term contact with a provider

Realistic goals (>12 months)

Lifestyle change? Medications? Bariatric surgery?

A. <5%
B. 5-10%
C. >10% - 20%
D. >20% - 30%
E. “Healthy” weight range
Time.....

- Often touted as a barrier
- Evidence equivocal in smoking interventions
- Continuity of care over years creates time and knowledge of context that may overcome limitations of time in individual consults
Structure helps

• The Change Program
• Ongoing research…
Summary
Thank You!