Is Bariatric Surgery Effective for Treating Morbid Obesity?

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Overview

- Rationale for the Literature Review
- Methods
- Results of the Literature Review
- Limitations of the Literature Review
- Conclusions

Take Home Message

Bariatric surgery is a cost effective intervention for people with morbid obesity, especially those with concomitant medical comorbidities such as diabetes, arthritis, respiratory and cardiovascular risk factors

Rationale

- Incidence of obesity in Australia have doubled since 1980
- In 1999 –2000 ~ 60% of the adults and up to 23% of children and adolescents in Australia were overweight or obese
  - 9 million adults
  - 1 million children/adolescents
- 20% of adults (2.6 million) - Body Mass Index (BMI) > 30kg/m^2
- In 2002-2004, 48.6% Victorians were overweight/obese

Rationale:
Consequences of Morbid Obesity

BMI > 40 (Class 3) or BMI > 35 (Class 2) with other comorbidities, and is associated with:

- Diabetes
- Hypertension
- Dyslipidemias
- Obstructive sleep apnoea
- Coronary artery diseases
- Musculoskeletal disorders
- Psychological disorders
- Higher all-cause mortality (life expectancy is reduced by up to 22%)
- Lower quality of life
- Heavy burden on health care system

Rationale:
Benefit of Weight Reduction (10 kg)

- **Hypertension:**
  Fall in 10mmHg SBP, 20mmHg DBP
- **Angina:**
  91% reduction in symptoms, 33% increase in exercise tolerance
- **Dyslipidemia:**
  10% fall in total cholesterol, 15% fall in LDL, 30% fall in triglycerides, 8% increase in HDL
- **Diabetes:**
  50% reduction in disease development, 30-50% fall in blood glucose, 15% fall in HbA1C

Purpose of the Review

- There is evidence that conservative therapies and pharmacological therapies do not have sustained benefit for this morbidly obese population

- The aim of this review was to assess the benefit of bariatric surgical interventions for people with morbid obesity and comparative effectiveness of different bariatiric surgical procedures

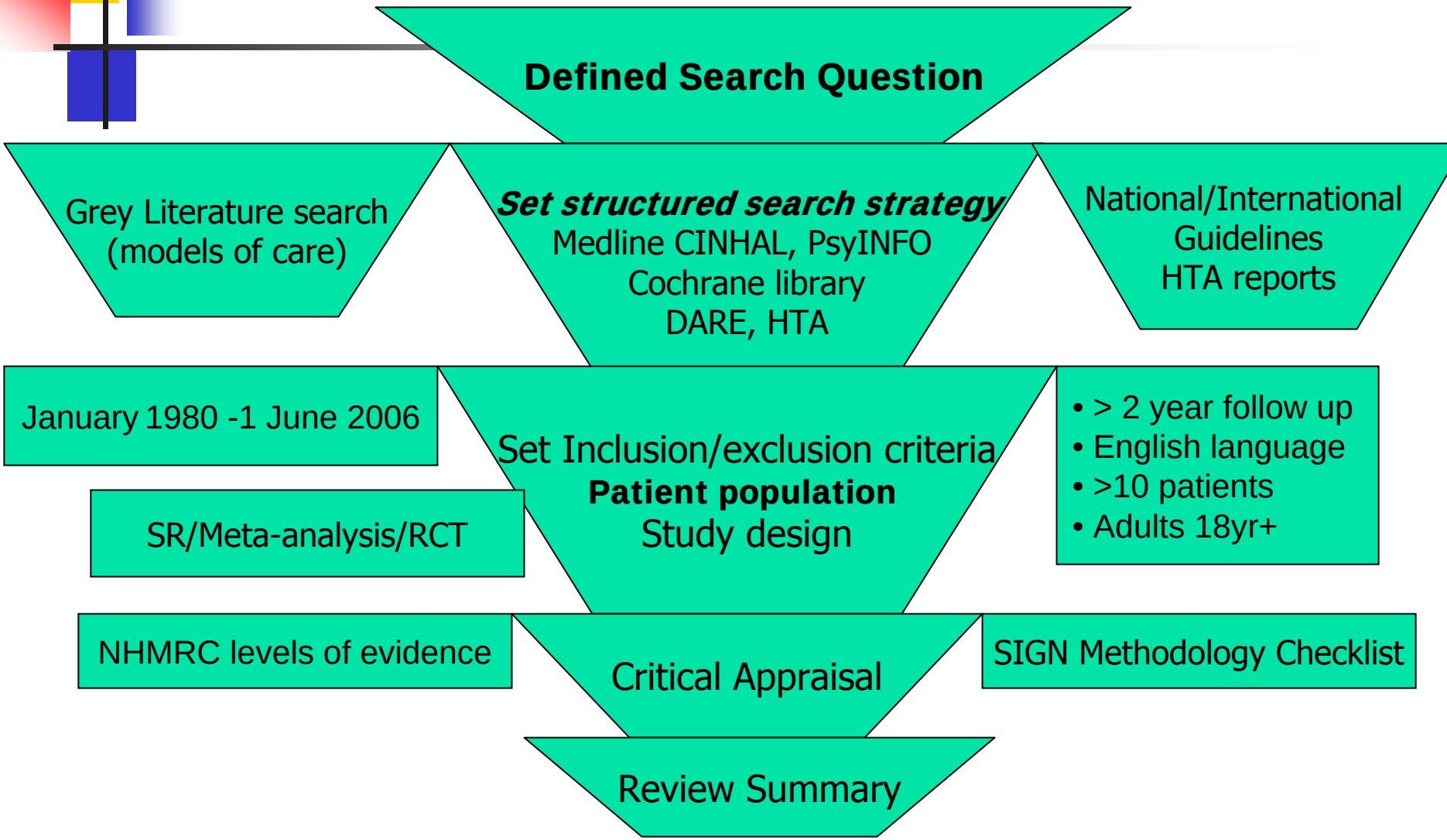
Scope of the Review

- Evidence to support the effectiveness, potential risk and benefits of bariatric surgical procedures
- Evidence for the impacts of surgery on other obesity related comorbidities, quality of life
- Evidence to support the effectiveness of maintaining weight loss in the long term
- Identify patient selection criteria for access to bariatric surgery
- Identify emerging trends in surgical models

Definition of Bariatric Surgery

- **Restrictive procedures**:
  - **Vertical Banded Gastroplasty (VBG),**
  - **Laparoscopic Gastric Banding (LAGB)**
- **Malabsorptive procedures**:
  - Jejunoileal Bypass
  - Biliopancreatic Diversion (BPD)
  - BPD with Duodenal Switch (BPD/DS)
- **Combined**:
  - **Roux-en-Y Gastric Bypass (RYGB)**
- **Other surgical procedures**: Liposuction, Sleeve Gastrectomy, Intragastric Balloon, Gastric Electrical Stimulation

Methods of the review



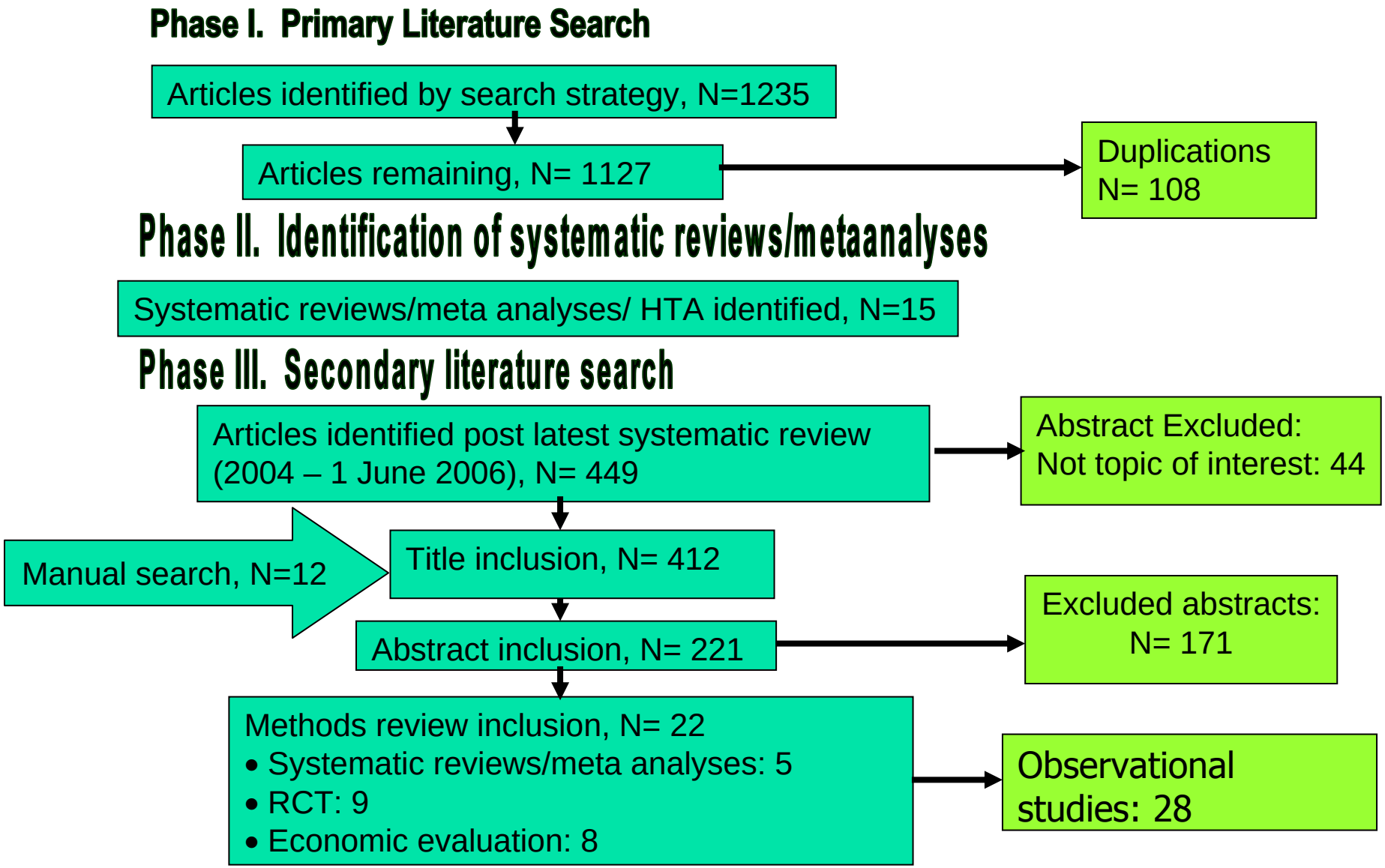
Outcomes Measures of Interest

- Measures of weight change (absolute/percentage)
- Excess Weight Loss (EWL)
- BMI
- Waist hip ratio, girth measurement
- Quality of life
- Obesity related comorbidities

Additional outcome measures:

- Intervention related adverse effects (complications)
- Intervention related mortality
- Costs and healthcare utilization

Article retrieval results



Summary of Weight Loss by Type of Bariatric Surgery

	LAGB	RYGB	VBG
%EWL (95% CI)			
• ASERNIP-S (Chapman et al 2004) (at 3 years)	38 ± 27% – 64%	59 ± 17% – 89%	33 ± 6% – 76 ± 12%
• Buchwald et al 2004	47.5% (40.7 – 54.2)	61.6% (56.7 -66.5)	68.2% (61.5 – 74.8)
• Ontario Health Technology Advisory Committee 2005 [35]	42 –60%	60 – 90%	58 – 87%
Weight-loss (95% CI)			
• Maggard et al 2005	34.77 kg (29.47 - 40.07)	41.46 kg (37.36 - 45.56)	32.03 kg (27.67 - 36.38)
• Shekelle et al 2004	34.77 kg (29.47 – 40.07)	41.46 kg (37.36 – 45.56)	32.03 kg (27.67 – 36.38)

Relationship between bariatric surgical procedure comorbidity outcomes

Co-morbidities	LAGB, % (95% CI)	RYGB % (95% CI)	VBG % (95% CI)
Diabetes			
•Resolved/Improved	80.8 (72.2– 89.4)	93.2 (79.3-100)	90.8 (76.2-100)
•Complete resolution	47.9 (29.1 –66.7)	83.7 (77.3-90.1)	71.6 (55.1-88.2)
Hypertension			
•Resolved/Improved	70.8 (61.9-79.6)	87.2 (78.4-95.9)	85.4 (74.1-96.7)
•Complete resolution	43.2 (30.4-55.9)	67.5 (58.4-76.5)	69.0 (59.1-79.0)
OSA			
•Resolved/Improved	68.0 (26.2-100)	94.8 (91.5-98.1)	0.7 (78.5-100)
•Complete resolution	95 (88.8-100)	80.4 (68.4-92.3)	78.2 (53.6-100)
Dyslipidaemia (improvement)			
•Hyperlipidemia	58.9 (28.2-89.6)	96.9 (93.6-100)	73.6 (60.8-86.3)
•Hypercholesterolemia	78.0 (61.1-94.9)	94.9 (90.7-99.1)	38.4 (25.4-51.4)
•Hypertriglyceridemia	77.0 (54.1-99.9)	91.2 (83.6-98.9)	72.4 (53.4-91.4)

Source: Buchwald et al 2004 , Ontario Health Technology Advisory Committee 2005

Relationship between Bariatric Procedures, Morbidity and Mortality

AE	LAGB	RYGB	VGB
Overall Mortality	0.22%	0.98%	0.77%
Short term mortality (95%CI)	0.05% (0.01 – 0.11)	0.50% (0.36–.64)	0.31% (0.11–0.52)
Long-term mortality	0.17%	0.49%	0.45%
Overall morbidity(median range)	11.3% (0 – 68.0%)	27.4% (0 –76.7%)	23.6% (0-93.3%)
Iatrogenic morbiditiy	0.8%	0.35%	0.18%
Gastro-intestinal symptoms	7%	6.9%	17.5%
Anastomotic leak	0%	2.2%	1.0%
Anastomotic stenosis	0%	4.6%	6.0%
Bleeding	0.3%	2.0%	0.7%
Re-operation	7.7%	1.6%	11.3%
Medical complications	0.7%	4.8%	4.7%

Source: Chapman et al 2004, Maggard et al 2005

Net cost per QALY gained for LAGB, RYGB and VBG in comparison to non-surgical management (UK)

	LAGB	RYGB	VBG
Additional QALYs	45	45	26
Additional cost (£)	383,102	280,020	266,725
Net cost per QALY gained (£)	8527	6289	10,237

Source: Clegg et al, 2002

- In the Australian context (2003), incremental cost per patient of **LAGB was $912 higher compared to RYGB,** and **$3,665 higher compared to open VBG** per patients. These figures did not consider the cost related to pre-operative care, revision and complications.

Criteria for Patient Selection for Bariatric Surgery

Most criteria commonly include consideration of:

- The degree and duration of obesity
- Resistance to conservative therapy
- Adequately informed and motivated patients
- General surgical risk
- Prevalent psychiatric disease

Example of Patient Selection Criteria

- **National Institute of Health (NIH) 1991**
- BMI ≥ 40 kg/m²
- BMI ≥ 35 kg/m² in association with major medical complications of obesity, such as cardiovascular disease, type 2 diabetes of sleep apnoea
- Well-informed and motivated patient
- A strong desire for substantial weight loss
- Failure of other non-surgical approaches to long-term weight loss
- Acceptable operative risk

Models of Care for Bariatric Surgery

Multi-disciplinary Models of Care

Best practice care for bariatric surgery patients include:

- Appropriate patient selection
- Need for a multi-disciplinary treatment team
- Adequate facility staffing, equipment, and administrative support
- Appropriate follow-up and monitoring for early recognition and management of complications
- Optimization of nutrition and physical activity

Limitation of the Review

- Study quality was often poor, largely as a result of poor study design
- Most systematic reviews and, meta-analyses included studies with short- term follow-up and small sample sizes
- Limited numbers of comparative studies on which to base conclusions about comparative effectiveness and cost effectiveness
- Heterogeneity amongst published studies

Summary

Bariatric surgery …….

- is an effective treatment for morbid obesity
- showed greater and more sustained weight loss compared to those receiving non-surgical interventions. Post-surgical weight loss sustained up to 3-8 yrs
- improves and/or resolve, obesity-related co-morbidities such as diabetes, hypertension, obstructive sleep apnoea, and dyslipidaemia
- is associated with low mortality and morbidity
- is cost-effective compared to no treatment or use of other conservative management

LAGB may be effective and safe than RYGB and VBG, however, this literature review did not find any significant difference. Further research is warranted.

Conclusion

- Bariatric Surgery should be considered for management of people with morbid obesity, with BMI>40 or with BMI>35 and co-existent comorbidities, in whom conservative management has failed

Acknowledgements

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