

O B E S I T Y

"a chronic condition characterised by an excess accumulation of body fat, typically defined by a chronic condition characterised by an excess accumulation of body fat, typically defined by a body mass index (BMI) $\geq 30 \text{ kg/m}^2$, which is associated with increased morbidity and mortality"

Classification

BMI	Definition
25-29.9	Overweight
30-39.9	Obese
40-49.9	Morbidly Obese
50-59.9	Super Obese
60-69.9	Super super-obese
>70	Hyper-obese

Pathophysiology

Energy intake > Energy expenditure → fat accumulation

Key mechanisms:

Adipose tissue = active endocrine organ

Releases leptin, adiponectin, cytokines

Leptin resistance

Brain fails to recognise satiety → continued eating

Chronic low-grade inflammation

↑ TNF- α , IL-6 → insulin resistance

Insulin resistance

Leads to hyperglycaemia → type 2 diabetes

Neurohormonal activation

Renin-Angiotensin-Aldosterone System+ sympathetic activation → hypertension

Formulae

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height}^2 (\text{m}^2)}$$

Ideal Body Weight (Broca's)

Men: height (in cm) - 100

Women: height (in cm) - 105

Lean Body Weight

$$\text{Men} = \frac{9270 \times \text{TBW}}{6680 + (216 \times \text{BMI})}$$

$$\text{Women} = \frac{9270 \times \text{TBW}}{8780 + (244 \times \text{BMI})}$$

$$\text{Adjusted Body Weight} = \text{IBW} + 0.4 (\text{TBW} - \text{IBW})$$

$$\text{Total Body Weight} = \text{Actual Body Weight}$$

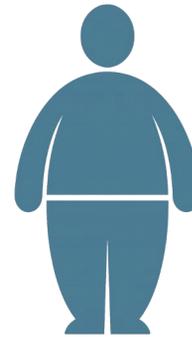
Physiological Changes

Respiratory

- ↑ O₂ consumption and CO₂ production
- ↓ chest wall compliance
- ↓ Function residual capacity
- Obstructive Sleep Apnoea
- Obesity Hypoventilation Syndrome
- Pulmonary Hypertension
- Asthma

Metabolic

- Dyslipidaemia
- Type 2 Diabetes Mellitus
- Metabolic syndrome



Haematology

- Venous thromboembolism

Airway

Difficult face mask ventilation and intubation

Cardiovascular

- ↑ Blood volume
- ↑ Cardiac output
- Ischaemic Heart Disease
- Arrhythmias
- Hypertension
- Hyperlipidaemia
- Heart Failure
- Co-pulmonale

Gastrointestinal

- Hiatus Hernia
- GORD
- Fatty liver and cirrhosis
- Raised intra-abdominal pressure

Risk Assessment Tools

STOP-BANG Questionnaire

Obesity Surgery Mortality Risk Score (OS-MRS)

Edmonton Obesity Staging System (EOSS)

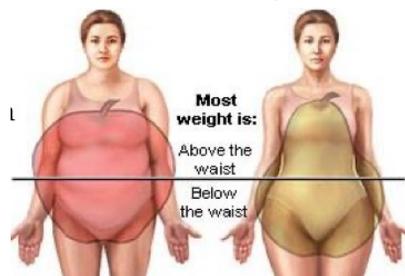
ASA Physical Status Classification.

Anatomical Metrics

Red Flags

- Poor functional capacity
- Abnormal ECG
- Uncontrolled BP, CCF or IHD
- SpO₂ <94% on air
- If bicarbonate >27, OHS likely
- Previous DVT/PE
- STOP-BANG ≥ 5
- OS-MRS >3
- Metabolic Syndrome

Central vs Peripheral



Central obesity carries higher risks of:

- Difficult airway/ventilation
- Cardiovascular disease/thrombosis
- Metabolic syndrome

SOBA app



Management

Lifestyle

- Diet, exercise, behavioural

Pharmacological

- Orlistat
- GLP-1 receptor agonists
- Dual incretin agents
- Centrally acting appetite suppressants

Bariatric Surgery

Manage Comorbidities

Perioperative / ICU Considerations

- Airway planning (difficult intubation)
- Positioning (consider ramped position for intubations)
- VTE prophylaxis
- Drug dosing (lipophilic drugs)
- Respiratory support (↓ FRC, OSA risk)