NATIONAL CLINICAL GUIDELINES

THE MANAGEMENT OF OBESITY IN ADULTS

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المبادئ الإرشادية السريرية لدولة قطر
NATIONAL CLINICAL GUIDELINES FOR QATAR

State of Qatar
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Abbreviations

The abbreviations used in this guideline are as follows:

BMI	Body mass index
GCC	Gulf Cooperative Council
HBA_{1C}	Glycated haemoglobin level
MDT	Multidisciplinary Team
WHO STEPS	World Health Organization Stepwise Approach to Surveillance Protocol

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1 Information about this Guideline

1.1 Objective and Purpose of the Guideline

The purpose of this guideline is to define the appropriate diagnosis and management of obesity in adults. The objective is to guide the appropriate investigation, prescribing and referral of patients presenting to provider organisations in Qatar. It is intended that the guideline will be used primarily by healthcare professionals in primary care and outpatient settings.

1.2 Scope of the Guideline

This guideline covers the following aspects of care:

- The diagnosis, assessment, and management of obesity in adults (aged 18 years and older), including:
  - Risk stratification.
  - Investigations.
  - Addressing barriers to weight loss and psychological factors.
  - The assessment of complications and comorbidities.
  - Lifestyle advice and behavioural interventions.
- Referral indications to specialised obesity services.
- Pharmacological treatment options.
- Endoscopic bariatric therapies.
- Surgical treatment options.

Aspects of care not covered in this guideline are:

- Patients younger than 18 years of age.
- Population screening.
- Medical management of related medical conditions.

1.3 Editorial Approach

This guideline document has been developed and issued by the Ministry of Public Health of Qatar (MOPH), through a process which aligns with international best practice in guideline development and localisation. The guideline will be reviewed on a regular basis and updated to incorporate comments and feedback from stakeholders across Qatar.

The editorial methodology, used to develop this guideline, has involved the following critical steps:

- Extensive literature search for well-reputed, published evidence relating to the topic.
- Critical appraisal of the literature.
- Development of a draft summary guideline.
- Review of the summary guideline with a Guideline Development Group, comprised of practising healthcare professionals, subject matter experts and patient representatives, from across Qatar.
- Independent review of the guideline by the National Clinical Guidelines & Pathways Committee, appointed by the MOPH, from amongst stakeholder organisations across Qatar.

Whilst the MOPH has sponsored the development of the guideline, the MOPH has not influenced the specific recommendations made within it.

1.4 Sources of Evidence

The professional literature published in the English language has been systematically queried using specially developed, customised, and tested search strings. Search strategies are developed to allow efficient yet comprehensive analysis of relevant publications for a given topic and to maximise retrieval of articles with certain desired characteristics pertinent to a guideline.

For each guideline, all retrieved publications have been individually reviewed by a clinical editor and assessed in terms of quality, utility, and relevance. Preference is given to publications that:

1. Are designed with rigorous scientific methodology.
2. Are published in higher-quality journals (i.e. journals that are read and cited most often within their field).
3. Address an aspect of specific importance to the guideline in question.

Further information about the literature search and appraisal process is included in the *Appendix*.

1.5 Evidence Grading and Recommendations

Recommendations made within this guideline are supported by evidence from the medical literature and where possible the most authoritative sources have been used in the development of this guideline. In order to provide insight into the evidence basis for each recommendation, the following evidence hierarchy has been used to grade the level of authoritativeness of the evidence used, where recommendations have been made within this guideline.

Where the recommendations of international guidelines have been adopted, the evidence grading is assigned to the underlying evidence used by the international guideline. Where more than one source has been cited, the evidence grading relates to the highest level of evidence cited:

- **Level 1 (L1):**
  - Meta-analyses.
  - Randomised controlled trials with meta-analysis.
  - Randomised controlled trials.
  - Systematic reviews.

- **Level 2 (L2):**
  - Observational studies, examples include:
    - Cohort studies with statistical adjustment for potential confounders.
    - Cohort studies without adjustment.
    - Case series with historical or literature controls.
    - Uncontrolled case series.
  - Statements in published articles or textbooks.

- **Level 3 (L3):**
  - Expert opinion.
  - Unpublished data, examples include:
    - Large database analyses.
    - Written protocols or outcomes reports from large practices.

In order to give additional insight into the reasoning underlying certain recommendations and the strength of recommendation, the following recommendation grading has been used, where recommendations are made:

- **Recommendation Grade A (RGA):** Evidence demonstrates at least moderate certainty of at least moderate net benefit.
- **Recommendation Grade B (RGB):** Evidence is insufficient, conflicting, or poor and demonstrates an incomplete assessment of net benefit vs harm; additional research is recommended.
- **Recommendation Grade C (RGC):** Evidence demonstrates potential harm that outweighs benefit; additional research is recommended.
- **Recommendation of the GDG (R-GDG):** Recommended best practice based on the clinical experience of the Guideline Development Group members.

1.6 Guideline Development Group Members

The following table lists members of the Guideline Development Group (GDG) nominated by their respective organisations and the Clinical Governance Group. The GDG members have reviewed and provided feedback on the draft guideline relating to the topic. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

Guideline Development Group Members		
Name	**Title**	**Organisation**
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Dr Ahmed M. Hussein Babiker	Head of Registration Section & Clinical Pharmacist	Dept of Pharmacy and Drug Control, MOPH[1]
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[1] Dr Ahmed Babiker attended the MOPH in his capacity as a Clinical Pharmacist and advisor on the availability of medications in Qatar.

1.7 National Clinical Guidelines & Pathways Committee Members

The following table lists members of the National Clinical Guidelines & Pathways Committee (NCGPC), appointed by the MOPH. The NCGPC members have reviewed and provided their feedback and approval of the guideline document. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

National Clinical Guidelines & Pathways Committee (NCGPC) Members		
Name	**Title**	**Organisation**
Ms Huda Amer Al-Katheeri	Chair of the NCGPC, Director of Strategic Planning & Performance Department	Ministry of Public Health
Shk Dr Mohammed Hamad J. Al Thani	Co-Chair of the NCGPC, Director of Public Health	Ministry of Public Health
Prof Anthony Akobeng	Chair Clinical Practice Guidelines Committee	Sidra Medicine
Dr Alshaymaa Mohammed A. M. Al-Motawa	Consultant Family Medicine	Qatar Petroleum
Dr Basil Bashqawi	Accreditation Coordinator, Dept of Health Professions	Ministry of Public Health
Dr Abi Khalil Charbel	Associate Professor of Medicine Consultant Cardiology	Weill Cornell Medicine-Qatar
Dr Paul Dijkstra	Director of Medical Education	Aspetar
Dr Mohamed Elrishi	Consultant Endocrinology and Internal Medicine	Al Ahli Hospital
Dr Dalia Mustafa Hassan	Consultant Family Medicine	Primary Health Care Corp
Dr Ghassan Youseph Hommos	Consultant Endocrinology	Al Emadi Hospital
Dr Chris Kenny	Executive Director Clinical and Service Development, Office of the Chief Medical Officer	Hamad Medical Corporation
Dr Egon Toft	VP and Dean of College of Medicine	College of Medicine, Qatar University

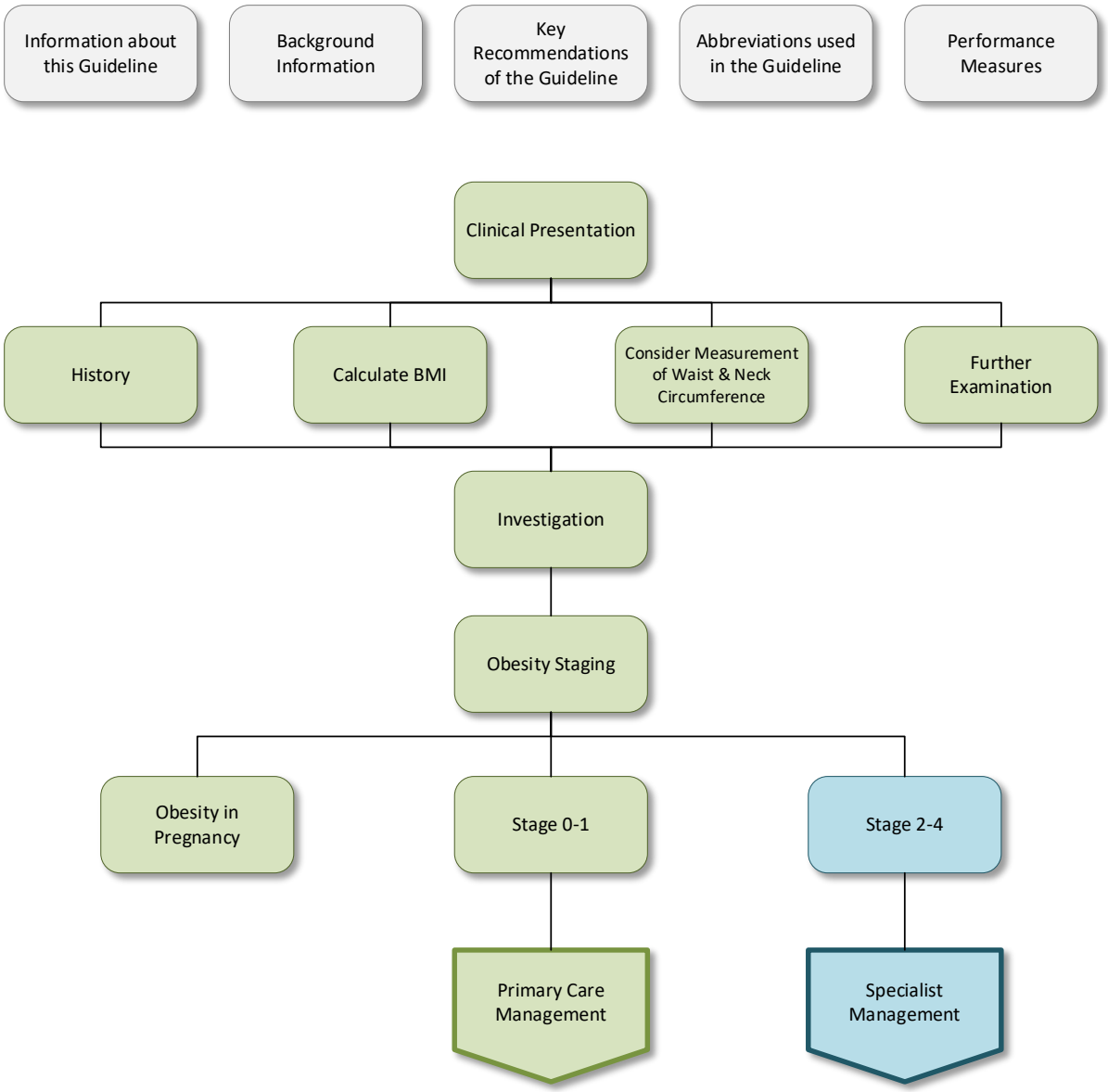
1.8 Responsibilities of Healthcare Professionals

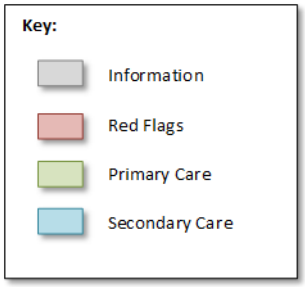
This guideline has been issued by the MOPH to define how care should be provided in Qatar. It is based upon a comprehensive assessment of the evidence as well as its applicability to the national context of Qatar. Healthcare professionals are expected to take this guidance into account when exercising their clinical judgement in the care of patients presenting to them.

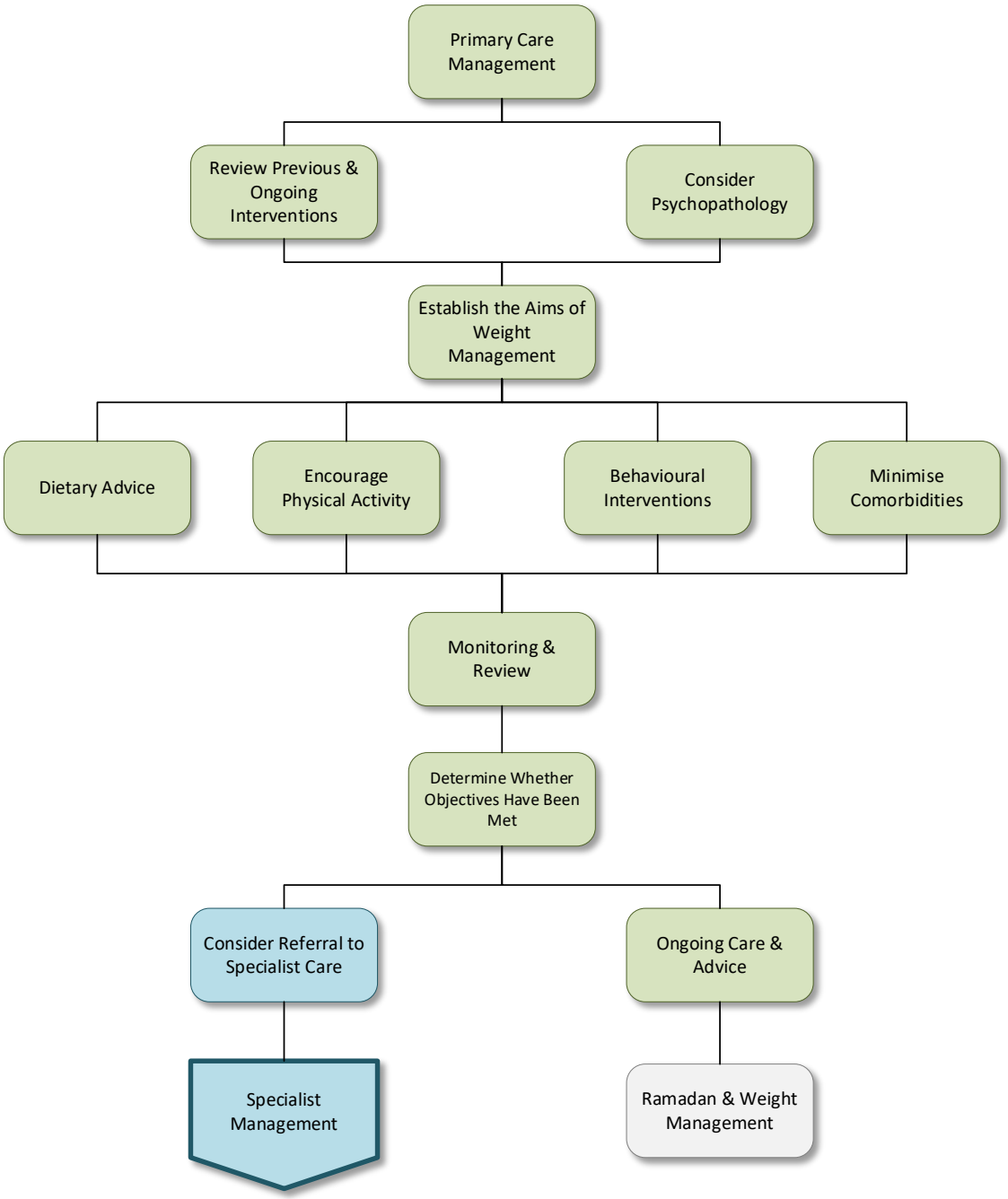
The guidance does not override individual professional responsibility to take decisions which are appropriate to the circumstances of the patient concerned. Such decisions should be made in consultation with the patient, their guardians, or carers and should consider the individual risks and benefits of any intervention that is contemplated in the patient's care.

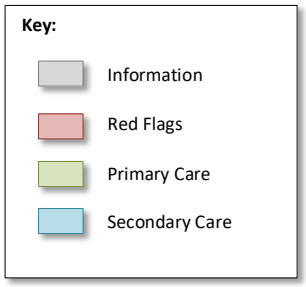
2 Obesity Management Pathway

Click on a box below to see the relevant page of the Pathway.






Primary Care Management
Review Previous & Ongoing Interventions
Consider Psychopathology
Establish the Aims of Weight Management
Dietary Advice
Encourage Physical Activity
Behavioural Interventions
Minimise Comorbidities
Monitoring & Review
Determine Whether Objectives Have Been Met
Consider Referral to Specialist Care
Ongoing Care & Advice
Specialist Management
Ramadan & Weight Management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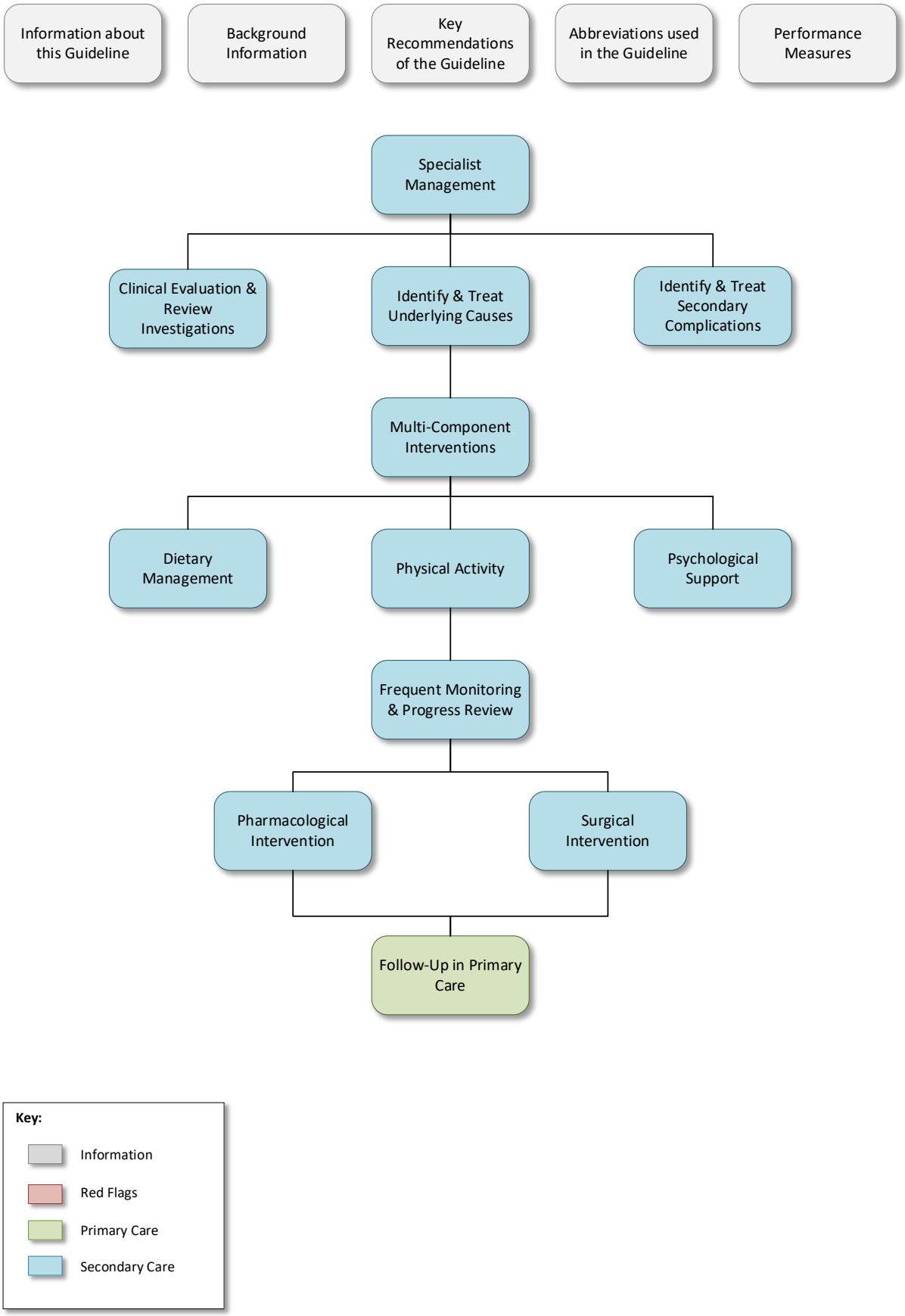
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Abbreviations used in the Guideline
Performance Measures
Specialist Management
Clinical Evaluation & Review Investigations
Identify & Treat Underlying Causes
Identify & Treat Secondary Complications
Multi-Component Interventions
Dietary Management
Physical Activity
Psychological Support
Frequent Monitoring & Progress Review
Pharmacological Intervention
Surgical Intervention
Follow-Up in Primary Care
Key:
Information
Red Flags
Primary Care
Secondary Care

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3 Key Recommendations of the Guideline

The key recommendations of this guideline are:

Measurement of Waist Circumference:

- Consider measuring waist circumference in patients with a BMI of less than 35 kg/m^2 [1] [**L1**, **RGA**].
- For screening and risk assessment purposes in people of Middle Eastern ethnicity, use a waist circumference threshold of ≥90 cm (35 inches) in men and ≥80 cm (31.5 inches) in women for diagnosing central adiposity [**R-GDG**].

Severity Staging:

- The Edmonton Obesity Staging System should be used to grade the severity of obesity in those with a BMI greater than or equal to 25 kg/m^2, in order to assess disease severity and guide appropriate management[2].

Service Provision:

- Services that should be provided in a primary care setting[1,3,4]:
  - Universal services, such as health promotion.
  - Lifestyle interventions.
  - Dietetic services
  - Physiotherapy/physical activity training.
  - Nurse-led education.
  - Psychological support.
- Additional services that should be provided in specialist care setting[1,3,4]:
  - Specialist weight management services, comprising of:
    - Pharmacological treatments.
    - Endoscopic procedures.
    - Bariatric surgical procedures.
- A multidisciplinary and multi-professional approach is required to treat obesity[5,6].
- Any planned interventions should be individualised to patient's history, comorbidities, previous experiences, and expectations. A baseline focused assessment of the patient history is required to provide individualised management [**R-GDG**].

Low Energy Diets:

- Only nutritionally complete diets should be used.
- Low-energy diets (LED) can be as effective as very low-energy diets (VLED) in weight loss[7].
- Consider VLED only as part of a multicomponent weight management strategy for patients who have a clinically assessed need to rapidly lose weight and improve complications and comorbidities, e.g. if undergoing surgery or planning fertility treatment[1] [**L1, RGA**].
- LED approach may be considered as a key intervention in those with early type 2 diabetes mellitus[7–11] [**L1, RGA**].

Referral to Specialist Care:

- See *Section 12* for specific referral criteria to specialist care.

Pharmacological treatment of obesity:

- May be considered:
  - In patients with BMI 30 kg/m^2 or BMI 27 kg/m^2 with weight-related complications and comorbidities[5].

  - Only after dietary, exercise, and behavioural approaches have been started and evaluated in patients who have not yet reached their target weight loss (or have reached a plateau) by the date set for attaining their goal[1] [**L1**].

- Physicians prescribing weight management medication should [**R-GDG**]:
  - Have undergone accredited training in the management of patients with obesity and its associated complications.
  - Be familiar with and prescribe in accordance with the drug's Summary of Product Characteristics and relevant guidelines.
  - Work within a multi-disciplinary and multi-professional team that can assess the full extent of obesity complications and provide individualised lifestyle advice.
  - Reassess patients on at least a three-monthly basis, or more frequently, as determined by the medication prescribed or the patient's complications and comorbidities.
  - Conduct and report an audit of their weight management outcomes.

Bariatric Surgery:

- Consider bariatric or metabolic surgery and endoscopic procedures as an option for patients resistant to other interventions[1,12] [**L1, RGA**].
- Refer to the NCG on *Bariatric Endoscopy and Surgery in Adults and Children* by MOPH[12].

Obesity in Pregnancy:

- See *Section 14* for specific recommendations for women with obesity who are planning to become pregnant or who are pregnant.

4 Background Information

4.1 Definition and Classification

Overweight and obesity are increasing challenges that lead to deleterious health, psychological and social consequences[1,3]:

- Obesity is a disease characterised by excessive adipose fat accumulation with multiple organ-specific complications.
- Excessive fat deposits occur within the subcutaneous adipose tissue
- Excessive fat accumulation around and within the viscera is associated with the greatest cardio-metabolic risk.

Obesity is commonly defined by a body mass index (BMI) of ≥30 kg/m^2 in Western populations[1], however different ethnic-specific cut points for defining obesity may need to be considered and lower BMI may be associated with significant complications[9].

Body Mass Index (BMI)[1]:

- Is the body weight in kilograms divided by height in metres squared (kg/m^2).
- Is a clinical estimate of excess adiposity in adults.
- Should be interpreted with caution because the calculation alone is not a direct measure of excess adiposity and its impact on health.

The degree of overweight and obesity can be classified as[1,13]:

- BMI 25.0-29.9 kg/m^2 – Overweight.
- BMI 30.0-34.9 kg/m^2 – Obesity Class I.
- BMI 35.0-39.9 kg/m^2 – Obesity Class II.
- BMI ≥40.00 kg/m^2 – Obesity Class III (*extreme obesity*).

4.2 Prevalence

Obesity, type 2 diabetes mellitus, and related metabolic and cardiovascular diseases are highly prevalent in Gulf Cooperative Council (GCC) countries[14]. In 2011, prevalence of overweight and obesity in adults of the GCC region ranged from 25-50% and 13-50%, respectively[14,15]. Ethnic differences exist in the prevalence of obesity[1,16].

In 2007-2008, prevalence of overweight and obesity in Qatari men was 31.9% and 45.2%, respectively[15]. The prevalence of obesity remained similar (40-50%) in 2012[17] and 2014[18]. Given the high prevalence of childhood and adolescent obesity and sedentary behaviours in Qatar, high adult obesity levels are likely to continue[16,19,20].

4.3 Aetiology

Obesity results from an imbalance between energy intake and energy expenditure, which is influenced by many factors, including:

- Lifestyle[3,21–23]:
  - Dietary and nutritional factors.
  - Physical activity.
  - Sleep.
  - Social and psychological factors.
  - Socioeconomic factors.

- Medical conditions[3,24]:
  - Hypothyroidism.
  - Cushing's syndrome.
  - Partial or complete hypopituitarism.
  - Polycystic ovarian syndrome
  - Hypothalamic damage (e.g. tumour, surgery, or radiotherapy).
- Medications that are associated with weight gain[5]:
  - Antidepressants.
  - Antidiabetic medications.
  - Antiepileptics.
  - Antihistamines.
  - Antihypertensives.
  - Antipsychotics.
  - Contraceptives and hormones.
  - Steroids.
- Genetics[23,25]:
  - Inherited factors may contribute to differences in body weight and fat mass.
  - Monogenic disorders include:
    - Leptin deficiency due to Leptin gene or receptor mutations
    - Melanocortin-4 receptor mutation.
    - Pro-opiomelanocortin (POMC) deficiency.
  - Genetic syndromes include:
    - Alström syndrome
    - Bardet-Biedl syndrome.
    - Cohen syndrome
    - Froehlich syndrome
    - Prader-Willi syndrome.
    - Ahlstrom syndrome.

4.4 Risk Factors

The risk factors for the development of obesity in adults, include:

- Individual potentially modifiable risk factors[3,26,27]:
  - High intake of energy-dense food or drink including alcohol, confectionary, and sugar drinks.
  - Sedentary lifestyle and low levels of physical activity (e.g., frequent use of television, computer games, internet, and telephone).
  - Nutrient composition of foods consumed.
  - Sleep loss.
  - Psychological factors (e.g., stress, comfort-eating, depression).
  - Cultural acceptance of overweight and obesity.
  - Epigenetic factors.
- Individual non-modifiable risk factors[1,3,28,29]:
  - Female gender.
  - Increasing age.
  - Genetic and ethnicity.
  - Family history of overweight, obesity, obesity complications and comorbidities.
  - Physical disability, learning disability, or enduring mental health difficulties.
  - Childhood psychological trauma.
  - Intrauterine, antenatal, and postnatal factors, e.g.:
    - Low or high birth weight.
    - Maternal obesity.

        - Maternal gestational weight gain.
        - Maternal gestational diabetes mellitus or maternal diabetes mellitus.
        - Maternal smoking in pregnancy.
        - Absence of breast-feeding.
- Environmental cofactors[1,3,29]:
    - Low public health awareness.
    - Transportation (e.g. high dependence on cars).
    - A wide and easy availability of cheap processed foods.
    - Lack of nutrition labelling.
    - Sedentary work or built environments.
    - Night-shift work.

4.5 Complications and Comorbidities

Obesity reduces life expectancy and quality of life[1,3,26,30]. It has also been associated with the following[30,31]:

- A higher frequency of hospital admissions.
- Longer hospital stays and greater costs.
- Higher prescription medication costs.

Complications of obesity in adults include [3]:

- Cardiovascular[3,30,32,33]:
    - Coronary artery disease.
    - Hypertension.
    - Stroke.
    - Cardiomyopathy.
    - Atrial fibrillation.
- Respiratory[3,30,34]:
    - Obstructive sleep apnoea.
    - Obesity hypoventilation syndrome.
    - Asthma.
    - Breathlessness.
    - Pulmonary hypertension.
- Metabolic and Endocrine [1,3,30,33]:
    - Pre-diabetes mellitus and type 2 diabetes mellitus.
    - Dyslipidaemia.
    - Hyperuricaemia.
    - Thyroid nodules.
- Gastrointestinal[3,5,30]:
    - Gastro-oesophageal reflux disease.
    - Non-alcoholic fatty liver disease.
    - Gallstone disorders.
    - Pancreatitis.
- Renal and urological[3,26]:
    - Chronic kidney disease.
    - Urinary incontinence.
- Haematological[3]:
    - Thromboembolic disease (e.g., deep vein thrombosis and pulmonary embolism).
- Reproductive[3,5]:
    - Reduced fertility.
    - Polycystic ovary syndrome.
    - Hypogonadism.
    - Pregnancy complications.

    - Birth complications.
- Musculoskeletal[3,5,26]:
    - Osteoarthritis.
    - Lower back pain.
- Psychological[3,5,30]:
    - Low self-esteem.
    - Anxiety.
    - Depression.
    - Decreased libido.
- Neurological[3]:
    - Benign intracranial hypertension.
    - Cognitive decline.
- Cancers[3,5]:
    - Breast cancer.
    - Endometrial cancer.
    - Colon cancer.
    - Prostate cancer.
    - Papillary thyroid carcinoma.
- Other[1,3,35]:
    - Cellulitis and oedema.
    - Fungal infection (e.g., tinea).
    - Lymphoedema.
    - Pressure ulcers.
    - Hearing loss.

5 Clinical Presentation

There are several potential presentations, which may determine the treatment pathway. These include the following[3]:

- Self-presentation requesting advice on how to lose weight.
- Self-presentation with the concern that they have an underlying medical problem causing weight gain.
- Opportunistic identification of obesity during a consultation.
- Patient is advised to lose weight for the management of underlying conditions.
- Weight reduction is required for a specific intervention, e.g.:
    - Fertility treatment.
    - Surgery including:
        - Organ transplantation.
        - Orthopaedic interventions.
        - Abdominal contouring.

6 History

As part of the routine assessment of patients with obesity, enquire about the following[3]:

- Weight history, including[1,3,5,26] [**L1, RGA**]:
    - Previous weight loss attempts.
    - Weight loss medication use.
    - Previous weight loss surgery.
    - Seeing other weight loss professionals or organisations.
    - Use of alternative therapies.
- Find out what has already been attempted, how successful this has been, and what was learned from the experience[1,3,5] [**L1**].
- Current symptoms (e.g., breathlessness, snoring).
- Underlying antecedent and causes of being overweight or obese.
- Eating pattern and behaviours[5].
- Diet and physical activity levels[5].
- Sleep behaviours and sleep patterns.
- Relevant complications and comorbidities (see *Section 4.5*).
- Psychological problems and psychosocial distress.
- Medication history[5].
- Any environmental, social, and family factors, including[5]:
    - Family history of overweight, obesity, obesity complications and comorbidities.
    - Alcohol consumption and smoking status.
    - Occupation and home environment.
    - Marital status.
- Social support structures.
- The patient's willingness and motivation to change their lifestyle.

7 Examination and Assessment

7.1 Calculate BMI

Calculate the BMI by dividing a person's weight in kilograms by the square of their height in metres[1,5] [**L1**, **RGA**] i.e.:

$$\text{Body weight (kg) / Height (m}^2\text{).}$$

Ensure that height and weight are measured accurately using standard operating procedures. Once height is measured accurately, this value should be used moving forward. [**R-GDG**]

NB: BMI should be interpreted with caution because the calculation alone it is not a direct measure of adiposity, especially in highly muscular adults[1] [**L1**]. Do not use bioimpedance analysis as a substitute for BMI as evidence to support its use is lacking at present[1] [**L1**, **RGB**].

7.2 Consider Measurement of Waist Circumference

Consider measuring waist circumference in patients with a BMI of less than 35 kg/m^2 [1][**L1**, **RGA**]. Waist circumference or waist-to-hip ratio along with BMI can be used as a measure to assess risk [5]; however, if the BMI is greater than 35 kg/m^2, the waist circumference does not add to the absolute measure of risk[1,3,13].

Use the following International Diabetes Federation thresholds for waist circumference as a measure of central adiposity[36].

At present there are no definitive waist circumference thresholds established for Middle Eastern ethnicities. It is therefore recommended that for screening and risk assessment purposes, use a threshold of ≥90 cm (35 inches) in men and ≥80 cm (31.5 inches) in women of Middle Eastern origin [**R-GDG**].

European	Men	≥ 94 cm (37 inches)
	Women	≥ 80 cm (31.5 inches)
South Asian, Chinese or Japanese	Men	≥ 90 cm (35 inches)
	Women	≥ 80 cm (31.5 inches)
Ethnic South and Central American	*Use South Asian data until more specific data are available*	
Sub-Saharan African	*Use European data until more specific data are available*	

Table 7.2: Waist circumference thresholds for central adiposity in different ethnic groups[36].

7.2.1 Measurement of Waist Circumference

The World Health Organization Stepwise Approach to Surveillance Protocol (WHO STEPS) protocol for measuring waist circumference[37]:

- Measurement should be made at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest, when the patient is in the standing position.

Alternatively, waist measurement can be made at the level of the umbilicus[38]; however, some studies indicate that umbilical level measurements underestimate true waist measurement[37]. A consistent means of measurement should therefore be used in serial measurement with the same patient [**R-GDG**].

7.3 Consider Measurement of Neck Circumference

Neck circumference of ≥43 cm in men and ≥40 cm in women is associated with an increased risk of obstructive sleep apnoea and cardiometabolic risk[5,39,40].

7.4 Further Examination

Assess for signs of the following[1,3–5][**L2, RGA**]:

- Cardiovascular disease, including blood pressure measurement – ensure large blood pressure cuff is available.
- Any underlying causes of being overweight or obese, e.g.:
  - Acanthosis nigricans (associated with insulin resistance).
  - Hirsutism (associated with polycystic ovarian syndrome).
  - Thin, atrophic skin (associated with Cushing's disease).
  - Hypothyroidism.
  - Polycystic ovarian syndrome.
  - Growth hormone deficiency.
- Any suspected obesity complication and comorbidities (see *Section 4.5*).

8 Investigation

Perform the following routine investigations[1,3,5,41][**L1**, **RGA**]:

- Check lipid profile – a fasted sample is not necessary.
- Measure glycated haemoglobin (HBA_{1C}).
- Urea and electrolytes.
- Liver function tests.
- Thyroid function tests.
- Complete blood count.
- Ferritin, iron studies.
- Folic acid.
- Vitamin B12.
- Vitamin D.

Consider other tests as appropriate, on the basis of history and examination findings[41], e.g.:

- Resting echocardiogram, as guided by risk factors for cardiovascular disease.
- Ultrasound/elastography for non-alcoholic fatty liver disease in conjunction with fatty liver risk scores e.g. Fibrosis-4 (FIB-4) Index for Liver Fibrosis.
- Sleep studies for suspected obstructive sleep apnoea.
- Colonoscopy for colon cancer[5].

A nutrition evaluation should be performed[5]. Note that many obese individuals are malnourished.

View Pathway

9 Obesity Staging

The Edmonton Obesity Staging System should be used to grade the severity of obesity in those with a BMI greater or equal to 25 kg/m^2 in order to assess severity and guide appropriate management[2].

Edmonton Obesity Staging System		
Stage	**Description**	**Management principles**
Stage 0	No apparent obesity-related risk factors Examples include: • BP, lipids, fasting glucose etc. within normal range. • No physical symptoms. • No psychopathology. • No functional impairment. • No impairment of wellbeing.	• Identification of factors contributing to increased body weight. • Counselling to prevent further weight gain through lifestyle measures, including: ○ Healthy eating. ○ Increased physical activity.
Stage 1	Presence of: • Obesity-related subclinical risk factors, e.g.: ○ Borderline hypertension. ○ Impaired fasting glucose. ○ Elevated liver enzymes. • MILD physical symptoms, e.g.: ○ Dyspnoea on moderate exertion ○ Occasional aches and pains. ○ Fatigue. • MILD psychopathology. • MILD functional limitation. • MILD impairment of wellbeing.	• Investigation of other (non-weight-related) contributors to risk factors. • More intense lifestyle interventions including diet and exercise to prevent further weight gain. • Monitoring risk factors and health status.
Stage 2	Presence of: • Established obesity-related chronic disease, e.g.: ○ Hypertension. ○ Type 2 diabetes mellitus. ○ Sleep apnoea. ○ Osteoarthritis. ○ Anxiety disorder. • MODERATE limitations in Activities of Daily Living. • MODERATE impairment of well-being.	• Initiation of obesity treatments, including consideration of all behavioural, pharmacological, and surgical treatment options. • Close monitoring and management of complications and comorbidities as needed.
Stage 3	Presence of: • Established end-organ damage, e.g.: ○ Myocardial infarction. ○ Heart failure. ○ Diabetic complications. ○ Incapacitating osteoarthritis. • SIGNIFICANT psychopathology. • SIGNIFICANT impairment of well-being.	• More intensive obesity treatment including considerations of all behavioural, pharmacological, and surgical treatment options. • Intensive management of complications and comorbidities as needed.
Stage 4	Presence of: • SEVERE disabilities from obesity-related chronic diseases (potentially end-stage). • SEVERE disabling psychopathology. • SEVERE functional limitations. • SEVERE impairment of well-being.	• Aggressive obesity management as deemed feasible. • Palliative measures including: ○ Pain management. ○ Occupational therapy. ○ Psychosocial support.

Table 9: Edmonton Obesity Staging System[2].

10 Service Provision and Training

Services that should be provided in a primary care setting (see *Section 11*)[1,3,4]:

- Universal services, such as health promotion.
- Lifestyle interventions.
- Dietetic services.
- Physiotherapy/physical activity training.
- Nurse-led education.
- Psychological support.

Additional services that should be provided in specialist care setting (see *Section 13*)[1,3,4]:

- Specialist weight management services, comprising of:
  - Pharmacological treatments.
  - Endoscopic procedures.
  - Bariatric or metabolic surgical services.

All healthcare professionals dealing with obesity and its complications should undergo training in the diagnosis, management, and follow up of obese patients [**R-GDG**].

A multidisciplinary and multi-professional approach is required to treat obesity[5,6]. The composition of the multidisciplinary team (MDT) and roles of specialists may vary depending on the basis of their expertise and resources available in clinical setting[5].

In general, an MDT should include the following specialists:

- Physician with training in obesity medicine or gastroenterologist with expertise in nutrition.
- Bariatric surgeons
- Endoscopists.
- Other specialists as needed e.g. cardiologist.
- Physician assistant.
- Nurse practitioner or nurse.
- Dietitian nutritionist.
- Psychiatric social worker.
- Psychiatrist or psychologist.
- Medical assistants.

Any planned interventions should be individualised to patient's history, complications, comorbidities, previous experiences, and expectations. A baseline focused assessment of their history is required in order to provide individualised management [**R-GDG**].

11 Primary Care Management

The management of obese adults in primary care applies to patients at Edmonton Stage 0-1[2]. All of the following recommendations are also applicable to patients at Edmonton Stage 2-4, who will primarily be managed in a secondary care setting[2].

11.1 Review Previous and Ongoing Interventions

As part of the routine assessment of patients with obesity, enquire about the following:

- About their weight history, including[3,26] [**L1, RGA**]:
  - Previous weight loss attempts.
  - Weight loss medication use (past and current).
  - Previous weight loss surgery.
  - Seeing other weight loss professionals or organisations.
  - Expectations regarding weight and health.
- Find out what has already been attempted, how successful this has been, and what they learned from the experience[1] [**L1**].

11.2 Consider the Presence of Psychopathology

11.2.1 Binge Eating Disorder

Consider the possibility of a binge eating disorder in patients who have difficulty losing weight and maintaining weight loss[3] [**L1**, **RGA**].

Patients with binge eating disorder are generally[3]:

- Heavier.
- More likely to have been overweight as a child.
- Prone to 'weight cycling', defined as:
  - The repeated loss and subsequent re-gain of body weight in those who repeatedly follow weight loss regimens[3].
- At higher risk of developing psychological comorbidities (e.g., anxiety, depression, personality disorders).

Assess for an eating disorder by asking the patient[41] [**L1**]:

- If they eat large amounts of food in a short period of time.
- If they ever feel like they cannot stop eating even when full.
- If they react to overeating by attempting to 'get rid' of extra calories, e.g. by:
  - Laxatives/diuretics use.
  - Tobacco use.
  - Inducing vomiting.

If the patient answers positively to any of the above questions, consider further evaluation or a referral to[41] [**L1**]:

- A dietitian; or
- A behavioural health specialist specialised in eating disorders.

NB: Do not exclude patients with binge eating disorder from weight management programmes[3] [**L1**, **RGA**]:

- Patients with a binge-eating disorder should be given treatment for their eating disorder concurrently with weight loss interventions.

- Patients may demonstrate unusual eating patterns which may indicate behavioural issues, depression, and anxiety.

11.2.2 Depression

Consider whether depression is present[3] [**L1**, **RGA**]:

- There is a strong association between mood disorders and obesity:
  - Obese patients are more likely to become depressed over time.
  - People with depression are more likely to become obese.
  - Stress and underlying personal issues can lead to a lack of energy, lack of motivation, and increased food consumption.
- Other psychological disorders should also be considered, including anxiety.
- Use a validated depression score such as PHQ9 or the Hospital Anxiety Depression Score (HADS) to aid the diagnosis of depression and evaluate its severity[3,26,42].
- If patients score highly on depression and anxiety scores they should be referred, after assessment, to available mental health services.

NB: Patients with ongoing depression should be excluded from weight loss medications that may exacerbate their mental health condition; however, such patients should not be excluded from other weight management treatments [**R-GDG**].

11.3 Establish the Aims of Weight Management

The ideal aims of weight management should include[3,4,18] [**L1**, **RGA**]:

- Improve pre-existing obesity-related complications.
- Reduce the future risk of obesity-related complications.
- Improve physical, mental, and social well-being.
- Improve quality of life.

Make patients aware of the following potential health benefits associated with maintained modest weight loss with lifestyle change[2–4,27,30]:

- Improved quality of life.
- Reduction of incidence of cardiovascular disease, including myocardial infarction.
- Reduced osteoarthritis-related disability.
- Lowered all-cause and diabetes mellitus mortality.
- Reduced blood pressure.
- Improved glycaemic control.
- A reduction in the risk of developing type 2 diabetes mellitus.
- Improved lung function in patients with asthma.

In order to determine the next steps [**R-GDG**]:

- Ask about readiness to change lifestyle.
- Advise in designing a programme to achieve weight control.
- Assist in establishing an appropriate intervention.
- Arrange follow-up.

Provide patients, and their families and/or carers, individually tailored, relevant information on the following aspects of weight management[1,4] [**L1**]:

- General information on being overweight and obesity, including related health risks.
- An agreed weight loss target.

- Understanding the distinction between weight loss and weight maintenance, and the importance of developing skills for both:
    - Advise that the change from losing weight to maintenance typically happens after 6-9 months of treatment.
- Realistic targets for outcomes other than weight loss, such as increased physical activity and healthier eating habits.
- Diagnosis and treatment options.
- Healthy eating in general.
- Medication and side effects.
- Surgical treatments.
- Self-care.
- Voluntary organisations and support groups and how to contact them.

11.4 Dietary Advice

11.4.1 General Dietary Advice

Consider the following dietary advice[1,4] [**L1**, **RGA**]:

- Tailor dietary changes to individual food preferences.
- Allow for a flexible and individual approach to reducing energy intake.
- Do not use unduly restrictive and nutritionally unbalanced diets as these are ineffective in the long term and can be harmful.
- Encourage patients to improve their diet even if they do not lose weight, as there are health benefits from dietary improvement alone.
- Inform patients that to lose weight, their total energy intake should be less than their energy expenditure.

Advise patients to:

- Reduce their intake of[3] [**L1**, **RGA**]:
    - High energy-dense foods, particularly large portions, including foods containing:
        - Animal fats.
        - Other high fat foods.
        - Confectionery.
    - Sugary drinks including alcohol.
    - 'Fast foods'.
- Select low energy-dense foods, e.g.[3,6,18] [**L1, RGA**]:
    - Wholegrains.
    - Cereals low in sugar.
    - Fruits.
    - Vegetables – particularly greens.
- Institute portion control[18] [**L2**].
- Grill or boil foods rather than fry foods[26] [**L2**].
- Having a regular eating pattern [6].
- Avoid extreme fad diets that may result in serious nutritional deficiencies.
    - Lowering fat content of food can potentially lead to deficits in good fats, such as omega-3 fatty acids.
- Encourage the use of mobile applications that allow monitoring/tracking of dietary intake and activity. Several applications are now available with culturally-relevant foods included [**R-GDG**].

11.4.2 Weight-Loss Eating Plans

Recent studies have found weight loss differences between individual named diets to be minimal[43]. In order to achieve a weight loss of 10% of initial weight, and in combination with expert support and intensive follow-up, the following energy goals are recommended[44]:

- 1200-1500 kcal/day for individuals weighing ≤114 kg at baseline.
- 1500-1800 kcal/day for individuals who weigh >114 kg.

If patients do not lose weight satisfactorily with the above calorie goals, reduce calorie intake to[44]:

- 1000-1200 kcal/day for individuals weighing ≤114 kg at baseline.
- 1200-1500 kcal/day for individuals who weigh >114 kg.

NB: Reduce calories by lowering the carbohydrate and unhealthy fat content[3,44]. Energy intake can include meal replacements[44].

11.4.3 Low-Energy Diets and Very Low-Energy Diets

Do not routinely use very low-energy diets (VLED; 450–800 kcal/day) to manage obesity[1] [**L1**, **RGA**]. Low-energy diets (LED) can be as effective as VLED in weight loss[1].

Consider nutritionally complete VLED only as part of a multicomponent weight management strategy for patients who are obese and have a clinically-assessed need to rapidly lose weight, e.g. if undergoing surgery or planning fertility treatment [1][**L1**, **RGA**]. Refer to specialist services when considering a VLED, as medical supervision is necessary (especially for patients with type 1 diabetes)[1,3,6] [**L1**, **RGA**].

Low energy diets (LED) incorporating nutritionally complete meal replacement products and gradual food introduction and structured behaviour support have been shown to be effective in achieving significant weight loss and diabetes remission in those with early type 2 diabetes mellitus[7–10]. This approach should be considered in those with excess adiposity and type 2 diabetes [**R-GDG**].

11.5 Encourage Physical Activity

11.5.1 Patient Education on Health Benefits of an Active Lifestyle

Ensure patients are aware of the significant health benefits associated with an active lifestyle, many of which are independent of weight loss[3] [**L1**, **RGA**].

These include[3,45]:

- Decreased risk of cardiovascular disease.
- Improved self-efficacy and confidence.
- Reduced breathlessness.
- Improved fitness.

11.5.2 Evaluating Patient's Physical Fitness and Ability for Activity

Take into account the patient's current physical fitness and ability for all activities[1] [**L1**].

Incorporation of specific physical activity plans using an exercise prescription approach will depend on degree of obesity, obesity complications, and medications used. In most individuals with higher classes of

obesity with complications, the initial focus should be the reduction of sedentariness followed by walking [**R-GDG**].

Physical activity and exercise assessment should include parameters listed below[5]. Exercise stress test is not required unless cardiovascular disease is suspected[5].

- Completion of the PAR-Q questionnaire is advised. The test is available from: http://www.csep.ca/view.asp?ccid=517):
    - If patients answer 'yes' to one or more questions on the form, clearance from a physician should be sought prior to commencement of a physical activity program[44].
- Exploration of the patient's usual degree of physical activity.
- Limiting factors (e.g., joint disease or previous injuries).
- Types of physical activity the patient finds enjoyable and has access to.
- Measurement of the current fitness level.

Advise patents of the following key points regarding exercise:

- To reduce sedentary behaviour[3,46] [**L2**, **RGA**].
- Encourage walking where possible, as no equipment or change of clothing is required[5]:
    - Increase number of steps gradually over several weeks.
    - >10,000 steps per day is necessary for weight loss.
    - Patients should be encouraged to use pedometers or fitness trackers to self-monitor their daily activity.
- To be physically active[3,5,6,46] [**L1**, **RGA**]:
    - Moderate intensity exercise performed for at least 30 minutes ≥5 days per week, or vigorous intensity aerobic exercise done for at least 20 minutes ≥3 days per week is recommended for maintaining health and preventing disease.
    - To promote or maintain weight loss, ≥50-60 minutes per day of daily exercise is recommended.
    - Intermittent exercise of at least 10 minutes in duration (to accumulate the minimum duration recommended above) is an effective alternative to continuous exercise.
- Those with a BMI over 35 kg/m^2 and/or joint problems should consider moderate intensity non-weight bearing activities, e.g.[3] [**L2**, **RGA**]:
    - Cycling.
    - Swimming.
    - Water aerobics.
- Sedentary patients should build up to their physical activity targets over several weeks by[3] [**L1**, **RGA**]:
    - Starting with 10-20 minutes of physical activity every other day during the first one to two weeks of the programme.
- Those who wish to incorporate vigorous intensity physical activity[3] [**L1**, **RGA**]:
    - To introduce vigorous activity gradually after an initial 4-12-week period of moderate intensity activity.

11.6 Behavioural Interventions

Consider behavioural interventions that are appropriate for the individual, such as[3] [**L2**, **RGA**]:

- Goal setting.
- Self-monitoring of behaviour and progress.
- Stimulus control:
    - Where the patient is taught how to recognise and avoid triggers that prompt unplanned eating.
- Cognitive restructuring:

  - Modifying unhelpful thoughts or thinking patterns.
  - Eating slowly.
  - Finding social support.
  - Problem solving.
  - Assertiveness training.
  - Reinforcing changes.
  - Considering how to prevent relapse.
  - Strategies for dealing with weight regain.
- Consider other techniques such as mindfulness, meditation, and relaxation for stress eaters [**R-GDG**].

Consider referral to a psychologist for a mental health assessment if there is suspicion of depressive disorder or an eating disorder associated with overweight and obesity[26] [**L2**].

11.7 Sleep

Screen patients for obstructive sleep apnoea. Initial screening for asymptomatic individuals should use the STOP-BANG questionnaire (http://www.stopbang.ca/osa/screening.php) following home/in-lab sleep study.
For those without sleep apnoea, sleep patterns and behaviours should be assessed. Aim is to ensure regular sleep patterns and improved sleep quality by instituting sleep hygiene measures (https://www.sleepfoundation.org/articles/sleep-hygiene).

11.8 Minimise Complications if No Attempt at Weight Management

If a patient does not feel this is the right time for them to engage in weight management intervention[1]:

- Discuss the health benefits of healthy diet and increased physical activity irrespective of weight management.
- Explain that advice and support will be available in the future whenever they need it[1] [**L1**].
  - Ensure that optimal management of associated risks and diseases takes place despite lack of weight loss [**R-GDG**], e.g. a patient with diabetes mellitus may benefit from reducing their sugar intake even if there is no weight loss.
- Consider how to optimise medications, such as[47]:
  - Metformin.
  - Changing weight promoting medications to those that are either weight neutral or support weight loss. E.g. Weight-neutral antihypertensives.
- Advise to reduce alcohol intake[3][**L1**, **RGA**].
- Discuss the benefits of weight monitoring and maintenance[48] [**L2**].
- Encourage them to return at any point if they decide they need help[48] [**L2**].
- Provide contact details so that they are able to make contact when they are ready[1] [**L1**].

11.9 Monitoring and Progress Review

A suggested schedule of review by the primary care team is [**R-GDG**]:

- After 2-4 weeks initially.
- Then monthly for 3 months.
- Then every 3 months, for the first year.

Weight loss programmes should be individualised and more frequent review by individual members of the primary care team may be required. At each review, measure [**R-GDG**]:

- Weight.
- Waist circumference.
- BMI.
- Blood pressure.
- Heart rate.

11.10 Determining Whether Objectives Have Been Met

Medical objectives are considered successful if[1,3,26,41]:

- There is a weight loss of 5-10% of initial body weight and maintenance.
- Weight loss targets are achieved.
- There is a measurable improvement in pre-existing complications and comorbidities and the future risk of obesity-related complication is reduced, e.g.:
    - Cardiovascular disease.
    - Type 2 diabetes mellitus.
    - Cancer.

11.11 Ongoing Care and Advice on the Prevention of Obesity

Ongoing support/care to be offered in primary care, includes:

- Offer regular, non-discriminatory, long-term follow-up[1] [**L2**].
- Provide ongoing reinforcement of behaviour strategies[41] [**L2**].
- Provide continuity of care through MDT[1,5] [**L1, RGB**].
- Review the patient every 3 months for two years after weight loss has been achieved [**R-GDG**].

Encourage patients to[45]:

- Establish and maintain a combination of increased physical activity and healthier dietary habits to achieve and maintain energy balance.
- Avoid extreme physical activity or dietary behaviours, as they are difficult to sustain and may not be accompanied by wider improvements in health, e.g.:
    - Obsessively exercising.
    - Aiming to avoid all carbohydrates.
- Identify perceptions, habits, or situations that may undermine efforts to maintain a healthy weight or prevent excess weight gain in the long term:
    - Offer patients practical examples of helpful alternatives, e.g.:
        - Drink water instead of sugary drinks.
        - Do not overestimate the amount of physical activity being done.
        - Avoid overeating after physical activity.
        - Maintaining healthier physical activity and dietary habits most days, including weekends and holiday.

11.12 Ramadan and Weight Management

Ramadan can be an opportunity to change lifestyles in obese patients who wish to fast, as it can result in weight loss and improvements in complications and comorbidities. It is best if this is addressed as part of a structured and consistent programme of lifestyle modification in patients without contraindications[49].

12 Referral to Specialist Care

Consider referral to specialist care if[1] [**L1**]:

- The underlying causes of being overweight or obese need to be assessed[1], e.g.:
  - Medical problems.
  - Medication.
  - Psychological problems and psychosocial distress.
- The patient has complex disease states or needs that cannot be managed adequately in primary care, e.g.[1]:
  - The additional support needs for patients with learning disabilities.
- The patient has a BMI of[48]:
  - ≥40 kg/m^2.
  - ≥35 kg/m^2 and an obesity-related complication.
  - 30.0-34.9 kg/m^2 with poorly controlled type 2 diabetes mellitus.
- The patient has already had bariatric surgery and presents with a problem, such as weight regain or nutritional deficiency, or where revisional surgery might be considered[48].
- Specialist interventions may be needed, such as[1]:
  - Low and very-low-energy diets.
  - Evidence-based endoscopic procedures (these can be considered in patients with a BMI of 30 kg/m^2 and above).
- Bariatric or metabolic surgery is being considered[1].
- Patient has a long history of cyclical weight loss and gain[48].
- Patient needs to lose weight for[1]:
  - A surgical procedure that is not directly related to obesity, e.g. knee replacement.
  - Fertility treatment.
- There is clinical suspicion of an eating disorder, such as binge eating disorder[41].
- Medical objectives have not been met, e.g. [**R-GDG**]:
  - There has been weight loss of less than 5% of initial body weight, or the patient has gained weight, despite active intervention over the previous 6 months.

Assess how engaged a patient is with the process before a decision is made about referral[48] [**L2**].

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13 Specialist Management

13.1 Clinical Evaluation and Review Investigations

In addition to assessments recommended for primary care, assessments in the specialist weight management clinic should include[1,48] [**L1**, **RGA**]:

- Review of dietary history.
- Weight and height measurement and assessment of BMI trend.
- Assessment of feelings and expectations.
- Identification of risk factors and vulnerabilities.
- Smoking cessation advice.
- Psychological/psychiatric assessment.
- Family history of overweight or obesity.

Given the high prevalence of psychiatric complications and comorbidities, screen the patient for psychological issues which may interfere with engagement, including[48] [**L2**, **RGA**]:

- Anxiety and depression.
- Self-harm and suicidal behaviours.
- Eating disorders, e.g. binge eating and bulimia nervosa.
- Borderline personality disorders.
- Alcohol/substance misuse.
- Childhood adversity and blocks for voluntary weight, which are not clearly understood.

Psychological assessment is necessary to identify who may need additional long-term support or be at risk of self-harm after surgery[48].

13.2 Identify and Treat Underlying Causes of Obesity

Possible underlying causes and exacerbating factors include[3,22–24]:

- Hypothyroidism.
- Cushing's syndrome.
- Growth hormone deficiency.
- Polycystic ovary syndrome.
- Hypothalamic damage, e.g. tumour or surgery.
- Genetic syndromes associated with hypogonadism.
- Medication:
    - If the patient requires medication associated with weight gain to treat comorbidities[26]:
        - Provide specific advice and support for weight loss.
        - Consider substitution with an alternative medication or a change in dosage.

13.3 Identify and Treat Obesity Complications

Investigate for previously undiagnosed obesity-related complications and comorbidities[1,48] [**L1**](see *Section 4.5*)

- Manage complications when they are identified, do not wait until weight loss has been achieved.
- Optimise and modify all identified risks.
- Ensure that patients referred for surgery are as fit as possible.
- Consider referral to a cardiologist and respiratory physicians for specialist management of end-organ disease or complications.

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13.4 Multicomponent Interventions for Patients at Edmonton Stage 2-4

13.4.1 General Considerations

Multicomponent interventions are the treatment of choice[1,50] [**L1, RGA**]:

- Combining diet and physical activity tends to be more effective for weight loss over 12 months than interventions based on diet or physical activity alone.
- Ensure weight management programmes include behaviour change strategies to:
  - Improve eating behaviour and the quality of their diet.
  - Increase the patient's physical activity levels or decrease inactivity.
  - Improve sleep patterns and sleep quality
  - Reduce energy intake.
- Ensure that all medications are optimised to support weight loss.

Discuss the choice of interventions for weight management with the patient[1,2,37,38] [**L1**]:

- The initial level of intervention should be based on level of risk determined by:
  - Edmonton Staging (see *Section 9.2*).
  - Waist circumference if appropriate.
  - Complications and comorbidities (see *Section 4.5*).
- Tailor the components of the planned weight management programme to the patient's [**R-GDG**]:
  - Preferences.
  - Initial fitness.
  - Health status and comorbidities.
  - Lifestyle and social circumstance.
  - Encourage support from the patient's family.

When setting goals:

- Base weight loss targets on the individual's complications and risks, rather than their weight alone[3] [**L1**, **RGA**]:
  - For patients at Edmonton Stage 0-1 [**R-GDG**]:
    - A 5-10% weight loss is required for cardiovascular disease and metabolic risk reduction.
  - For patients at an Edmonton Stage of 2 or more:
    - Target weight loss interventions to improve complications and comorbidities.
    - A greater than 10% weight loss will often be required to obtain a sustained improvement in complications and comorbidities.
  - NB: Patients from certain ethnic groups, such as South East Asians, are more likely to have related complications at a lower BMI[3] [**L1**, **RGA**].
- Encourage regular self-weighing[3] [**L1**, **RGA**].
- Consider setting short-term realistic goals[26] [**L1**, **RGA**], e.g.:
  - Becoming more mobile.
  - Improved self-esteem.
- Set both short-term and long-term targets with patients – not all need to be weight related [**R-GDG**].

Tailor weight management interventions and physical activity advice[3] [**L2**, **RGA**]:

- Tailor messages to specific groups, e.g.[45] [**L2**]:
  - Age group.
  - Socioeconomic group.
  - Ethnic group.
  - Gender group.
  - Patients with disabilities.
- Ensure all messages are clear, consistent, specific, and non-judgemental[45] [**L2**].
- Note that certain patients are at increased risk for weight gain, such as[3] [**L2**, **RGA**]:

    - Those prescribed medications associated with weight gain.
    - Pregnant and postnatal women.
    - Menopausal women.
    - When stopping smoking:
        - Those who quit smoking for at least one-year experience greater weight gain than their peers who continue to smoke.
        - The amount of weight gained after smoking cessation may differ by age, social status, and certain behaviours.
- Consider whether/how financial factors may influence intervention selection and goals for patients [**R-GDG**].

Considerations for specific populations:

- Pregnant women (see *Section 14*)
- Older adults[26] [**L1**, **RGA**]:
    - Multicomponent lifestyle interventions are likely to be the most successful.
    - Provide dietary advice for weight loss while emphasising good nutrition.
    - Encourage moderate physical activity:
        - Explain its importance in reducing the risk of bone density loss and lessening other adverse health effects.
        - Tailor to accommodate chronic disease, sensory deficits, or functional limitations.

13.4.2 Dietary Management

Refer to *Section 11.4* for general information on dietary advice.

Dietary advice should be tailored to the individual's circumstances and comorbidities. For example, low-carbohydrate and low-glycaemic index diets may be considered for patients with type 2 diabetes mellitus. These diets may not have a direct impact on body weight but may reduce medication demands, which may support weight loss (e.g. insulin) [**R-GDG**].

13.4.2.1 Low-Energy and Very Low-Energy Diets

Evidence shows that Low-Energy Diets (LED; 800-1200 kcal/day) can be as effective as Very Low-Energy Diets (VLED; <800 kcal/day) for weight loss and improve many complications[51].

Low-Energy Diets should be used for short-term weight management (up to 12 weeks). The use of these diets should be used for a specific purpose, e.g. weight loss prior to surgery and can be used to improve comorbidities in the short-term, whilst behavioural change interventions are implemented for long-term weight loss. These diets can also be used intermittently to help with weight loss maintenance [3,51]. Low-energy and very low-energy diets are not suitable if there has been sustained non-adherence to behavioural change interventions. Consider inclusion of group support sessions to provide a sense of community and competition[51] [**L2, RGA**].

NB: There are many commercial, nutritionally complete meal replacement products available. The choice of the exact products to use will depend on the patient's individual complications and comorbidities [**R-GDG**].

The contraindications to the use of Low-Energy and Very Low-Energy Diets are[51,52]:

- Patients aged 65 and above.
- Pregnant and lactating women.
- Patients with heart failure.

- Cerebrovascular disease.
- Gallstone disease.
- Uncontrolled gout.
- Liver and kidney disease.
- Unstable psychiatric disorders.

13.4.3 Physical Activity

Refer to *Section 11.5* on encouraging physical activity.

13.4.4 Psychological Support

Ideally, a clinical psychologist and liaison psychiatrist should be part of the weight management clinic MDT[5,48] (see *Section 11*) [**L1**].

Patients with eating disorders such as binge eating disorder may benefit from referral for [53][**L2, RGA**]:

- Cognitive behavioural therapy.
- Psychotherapy.
- Pharmacological intervention.

13.5 Frequent Monitoring and Progress Review

Use regular weightings as an opportunity to monitor and review progress toward individual goals[3,4] [**L1**, **RGA**]:

- Measure success based on reduction of complications and comorbidities as well as absolute weight loss.
- Most patients are able to lose weight actively for about 3-6 months:
    - Weight loss at 12 months typically comprises of a mixture of weight loss and weight maintenance.

Consider possible or perceived barriers to successful long-term weight management and lifestyle change, e.g.[3,26,54–57] [**L2**]:

- Physiological adaptation to energy deficit.
- Waning motivation to sustain lifestyle change.
- Resumption of old habits.
- Depressive symptoms.
- Negative peer and family influence.
- Lack of knowledge.
- Healthy eating is considered too time consuming.
- Low self-esteem.
- Specific to healthy eating:
    - Expensiveness of healthy eating.
    - Lack of access to or availability of healthy foods.
    - Individual taste preferences.
- Specific barriers to physical activity:
    - Time management.
    - Work-life balance.
    - Family constraints.
    - Financial constraints.
    - Extreme weather.

- Disability.
- Neighbourhood safety concerns.
- Driving instead of walking, as cars are seen as a symbol of status and security.
- Lack of recreational space.
- Access to facilities and resources.

13.6 Pharmacological Intervention

13.6.1 Pharmacological Treatment

The aims of pharmacological treatment should be [**R-GDG**]:

- Improvement in health and quality of life through modest weight loss.
- Preparation for procedures such as gastric balloon or bariatric surgery, but only in the context of lifestyle change.
- Support for weight loss maintenance.

Pharmacological treatment of obesity can be considered:

- In patients with BMI 30 kg/m^2 or BMI 27 kg/m^2 with weight-related complications[5].
- Only after dietary, physical activity, and behavioural approaches have been started and evaluated in patients who have not yet reached their target weight loss (or have reached a plateau) by the date set for attaining their goal[1] [**L1**].

Physicians prescribing weight management medication should [**R-GDG**]:

- Have undergone accredited training in the management of patients with obesity.
- Be familiar with and prescribe in accordance with the drug's Summary of Product Characteristics and relevant guidelines.
- Work within MDT that is able to assess the full extent of obesity comorbidities and provide individualised lifestyle advice[5].
- Reassess patients on at least a three-monthly basis, or more frequently, as determined by the medication prescribed or the patient's complications and comorbidities.
- Conduct and report an audit of their weight management outcomes.

Decide on whether to start drug treatments after discussing the potential benefits and limitations with the patient, including[1,5] [**L1**]:

- Reasons for drug choice.
- The mode of action.
- Adverse effects and their management.
- Monitoring requirements.
- The potential impact on the patient's motivation:
    - The modified 5 A's (Ask, Advise, Assess, Assist, and Arrange) serve as an effective tool for obesity counselling[5].
- Pregnancy avoidance in female patients.
- Safety monitoring.
- Duration of drug treatment.
- Discontinuation of treatment.

When drug treatment is prescribed[1,3] [**L1**]:

- Do not discontinue pharmacological treatment for complications and comorbidities, unless included in weight management plan.
- .
- Monitor the effect of drug treatment and reinforce lifestyle advice through regular reviews.

General prescribing principles [**R-GDG**]:

- Many drugs are unsafe if prescribed without appropriate assessment and support.
- Evidence of drug efficacy does not equate to suitability for all patients and drug choices should be individualised to each patient's specific circumstances.
- Appropriate patient selection and support are critical to achieving successful outcomes in obese patients who are prescribed medication.
- Drugs cannot cure obesity but can only induce remission of obesity.
- Most anti-obesity drugs are not licenced for long-term use.
- Combinations of drug treatments without evidence should be avoided.
- Discontinue medication if insufficient weight loss is achieved (see below).
- No more than 3-month's supply should be prescribed at any one time.
- Benefits and risk of continued drug treatment should be assessed at every visit.

13.6.2 Pharmacological Treatment Options

Name	Primary Mode of Action
Single drugs	
Phentermine*	Appetite suppression
Orlistat	Malabsorption
Lorcaserin*	Appetite suppression
Liraglutide	Appetite suppression and delayed gastric emptying
Combination drugs	
Phentermine*	Appetite suppression
Naltrexone *	Appetite suppression
Bupropion and Topiramate (registered in Qatar)	Appetite suppression

Table 13.6.2: Drugs used for pharmacological treatment of obesity in Qatar.
*Drugs not presently available in Qatar.

Sympathomimetic agents such as phentermine and phentermine/topiramate extended release are not recommended for patients with a cardiovascular disease[5] [**L1, RGC**]. Instead, consider using lorcaserin and orlistat.

NB: Refer to the Qatar National Formulary for the latest drug information.

13.6.3 Specific Drug Considerations and Duration of Treatment [R-GDG]

- Metformin (1g BID) can be considered to support weight loss and maintenance [**L2, RGA**].
- Unless there is clinical suspicion of thyroid nodules, do not routinely conduct thyroid ultrasound prior to starting and during treatment with liraglutide 3.0 mg.
- Do not routinely measure pancreatic enzymes in patients taking weight loss medications unless there is a strong clinical suspicion of acute pancreatitis.
- Monitor for nutritional deficiencies especially for patients taking orlistat.

- There is a paucity of evidence for use of combination treatments for obesity management. Combination treatments may be used for specific patients after full multidisciplinary assessment.
- Obesity is a chronic condition requiring long-term management. The duration of drug treatment for obesity is likely to vary based on many factors including degree of adiposity, weight loss achieved, weight loss maintenance, and obesity complications. Therefore, the duration of medication usage, weight loss and maintenance targets should be discussed with patients and an individualized plan implemented.

13.6.4 Stopping Pharmacological Intervention

Consider withdrawing drug treatment in patients who have not reached weight loss targets[1] [**L1**]:

- Only continue therapy beyond 3 months if the patient has lost at least 5% of their initial body weight since starting drug treatment:
  - However, consider less strict goals if the patient has type 2 diabetes mellitus or co-morbidities that may hinder weight loss, as rates of weight loss may be slower.
  - Make the decision for drug treatment continuation once agreed target outcomes are met, after discussing potential benefits and limitations with the patient.
- Offer support to help maintain weight loss to patients whose drug treatment is being withdrawn:
  - If patients did not reach their target weight, their self-confidence and belief in their ability to make changes may be low.

13.7 Surgical or Endoscopic Interventions

Consider bariatric surgery and endoscopic procedures as an option for patients resistant to other interventions[1,12] [**L1, RGA**]. For the list of available procedures and detailed referral criteria, check the NCG on *Bariatric Endoscopy and Surgery in Adults and Children* by MOPH[12].

Note that bariatric or endoscopic surgery is currently the most effective therapy for obesity, but long-term outcomes are dependent on continuous professional support and follow-up[51–53].

13.8 Follow-Up in Primary Care

Refer the patient back to the care of their primary care physician if[48] [**L1**]:

- The patient does not engage with the specialist team; or
- Obesity-related diseases have been addressed, ongoing treatment can be continued by a primary care physician, and the patient:
  - Does not want or is not appropriate for referral for assessment for bariatric surgery; or
  - Is not suitable for the weight assessment and management clinic.

In primary care[61,62]:

- Keep a register of bariatric and endoscopic surgery patients:
  - Record the type of procedure in the register:
    - Different procedures have different risks regarding nutritional deficiencies; and
    - Some require more extensive monitoring than others.
- Encourage patients to:
  - Check their own weight regularly.
  - Attend an annual BMI diet review with a health professional.

    - Attend their annual blood tests.
- Continue reviewing obesity complications and comorbidities.
- Review regular medications:
    - Formulations may need adjusting post-surgery to allow for any changes in bioavailability.

14 Obesity in Pregnancy

Obesity in pregnancy[63]:

- Defined as a BMI of ≥30 kg/m^2 at the first antenatal consultation.
- Associated with an increased risk of several serious adverse outcomes, including:
  - Miscarriage.
  - Foetal congenital anomaly.
  - Thromboembolism.
  - Gestational diabetes mellitus.
  - Pre-eclampsia.
  - Dysfunctional labour.
  - Postpartum haemorrhage.
  - Wound infections.
  - Stillbirth.
  - Neonatal death.
  - Foetal macrosomia.
- May be a risk factor for maternal death.

Management of maternal obesity – pre-pregnancy[63] [**L2**, **RGA**]:

- All women of childbearing age should get the opportunity to optimise their weight before pregnancy.
- Provide advice on weight and lifestyle during family planning consultations.
- Regularly monitor weight, BMI, and waist circumference.
  - All measurements should be recorded.
- For all women of childbearing age with a BMI of ≥30 kg/m^2:
  - Provide information and advice about the risks of obesity during pregnancy and childbirth.
  - Support them to lose weight before conception and between pregnancies.
  - If they wish to become pregnant, advise them to take 5mg folic acid supplements daily, starting at least 1 month before conception and continuing during 1st trimester.

Management of maternal obesity – during pregnancy[26,64] [**L2**, **RGA**]:

- Ensure women are made aware of the importance of healthy eating and appropriate exercise during pregnancy in order to prevent excessive weight gain and gestational diabetes mellitus.
- Ensure dietetic advice is provided in early pregnancy.
- Measure height, weight, and calculate BMI.
- Provide accurate and accessible information about the risks associated with maternal obesity and how this may be minimised.
- The goals of weight management in pregnancy are:
  - To avoid excessive maternal weight gain.
  - Optimise care to improve pregnancy outcomes for both mother and baby.
- Weight loss diets are contraindicated.
- Anti-obesity or weight loss drugs are not recommended.
- May need specialist obstetric care to ensure improved outcomes for mother and baby.
- Breast feeding should be encouraged.
- A clear follow up plan should be defined.
- Maintain physical activity if there is no obstetric contraindication.

All pregnant patients with BMI ≥30 kg/m^{2}should be screened for gestational diabetes and mental health problems[63].

Antenatal assessment should be considered for all pregnant patients with BMI ≥40 kg/m^2. They should be referred to an obstetric anaesthetist and have a documented risk assessment in the third trimester of pregnancy[63].

Consider prescribing 150 mg aspirin daily from 12 weeks of gestation until delivery for women with more than one moderate risk factor[63] [**L1, RGB**]:

- BMI of ≥35 kg/m^2.
- First pregnancy.
- Maternal age of more than 40 years.
- Family history of pre-eclampsia.
- Multiple pregnancy.

15 Key Considerations for Patient Preferences

Patient preferences refer to patient perspectives, beliefs, expectations, and goals for health and life, and to the steps employed by individuals in assessing the potential benefits, harms, costs, and limitations of the management options in relation to one another. Patients may have preferences when it comes to defining their problems, identifying the range of management options and selecting or ranking the outcomes used to compare these options.

It is important for healthcare professionals to develop an understanding of the patient as an individual and the unique way in which each person experiences a condition and its impact on their life.

The following recommendations are therefore made for physicians and other healthcare professionals regarding general principles of patient care in Qatar:

- **Respect Patients:** Treat patients with respect, kindness, dignity, courtesy and honesty. Ensure that the environment is conducive to discussion and that the patient's privacy is respected, particularly when discussing sensitive, personal issues. Ask the patient how they wish to be addressed and ensure that their choice is respected and used.

- **Maintain Confidentiality:** Respect the patient's right to confidentiality and avoid disclosing or sharing patients' information without their informed consent. In this context, students and anyone not directly involved in the delivery of care should first be introduced to the patient before starting consultations or meetings, and let the patient decide if they want them to stay.

- **Clarify Third-Party Involvement:** Clarify with the patient at the first point of contact whether and how they like their partner, family members or carers to be involved in key decisions about their care or management and review this regularly. If the patient agrees, share information with their partner, family members or carers.

- **Obtain Informed Consent:** Obtain and document informed consent from patients, in accordance with MOPH policy and guidance.

- **Encourage Shared Decision Making:** Ensure that patients are involved in decision making about their own care, or their dependent's care, and that factors that could impact the patient's participation in their own consultation and care including physical or learning disabilities, sight, speech or hearing impairments and problems with understanding, reading or speaking English are addressed.

- **Disclose Medical Errors:** Disclose errors when they occur and show empathy to patients.

- **Ensure Effective Communication:** Explore ways to improve communication including using pictures, symbols or involving an interpreter or family members. Avoid using medical jargon. Use words the patient will understand and confirm understanding by asking questions.

- **Ensure Continuity of Care:** Provide clear and timely sharing of patient information between healthcare professionals especially at the point of any transitions in care.

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16 Performance Measures

A list of potential performance measures is given below in *Table 17.1*.

Number	Numerator	Denominator
OBA01	The number in the denominator who were informed of their BMI.	The number of adult patients who have had their BMI calculated.
OBA02	The number in the denominator who had a discussion with their healthcare professional about their associated health risks in relation to their BMI.	The number of adult patients informed of their BMI.
OBA03	The number in the denominator who were recorded with Edmonton Obesity Staging System score.	The number of adult patients with BMI≥30 kg/m^2.
OBA04	The number in the denominator who had their waist circumference measured.	The number of adult patients with BMI 25-35 kg/m^2.
OBA05	The number in the denominator who had been referred to specialist care.	The number of adult patients with Edmonton Obesity Stage 2, 3, or 4.
OBA06	The number in the denominator who had been referred to at least one professional other than a physician (psychologist, exercise specialist, dietician, etc.) in the first 3 months following initial diagnostic.	The number of adult patients with a BMI ≥30 kg/m^2.
OBA07	The number in the denominator who received an appropriate follow-up (at least 4 times/year according to guidelines to monitor progress).	The number of adult patients with BMI ≥30 kg/m^2 followed in primary care.
OBA08	The number in the denominator who achieved a weight loss greater than 10% within 6 months, 12 months, 24 months of initial diagnosis.	The number of adult patients with BMI ≥30 kg/m^2 followed in primary care.

Table 16.1: Performance Measures.

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Appendix: Detailed Description of the Literature Search

A systematic search for existing literature on obesity in adults was performed in the period September 24th - October 7th, 2019.

The search for clinical practice guidelines on dementia diagnosis and/or management was performed in the *PubMed* database and websites of relevant organisations and societies including the *American Society for Metabolic and Bariatric Surgery, International Physician Society for Obesity, British Obesity and Metabolic Surgery Society (BOMSS), World Health Organization (WHO),* and other.

Peer-reviewed scientific publications were found in PubMed and via *Google Scholar* Internet search engine. Non-peer reviewed studies were identified in *bioRxiv*. Books were checked on PubMed. Information published on medical websites and drug prescribing information sheets were found via Google search engine.

The included publications were identified using the term "obesity AND adult" and specified with the following terms in combinations:

Management, update, causes, comorbidities, depression, ethology, presentation, classification, stage, score, behavioural intervention, nutrition, diet, pharmacological treatment/pharmacotherapy, exercise, physical activity, primary/secondary care, multidisciplinary, follow-up.

The date limit for the search was set up as March 19th, 2017 based on the last update of the present guideline.

Figure A.1 on the next page demonstrates graphically the results of the search and application of exclusion criteria.

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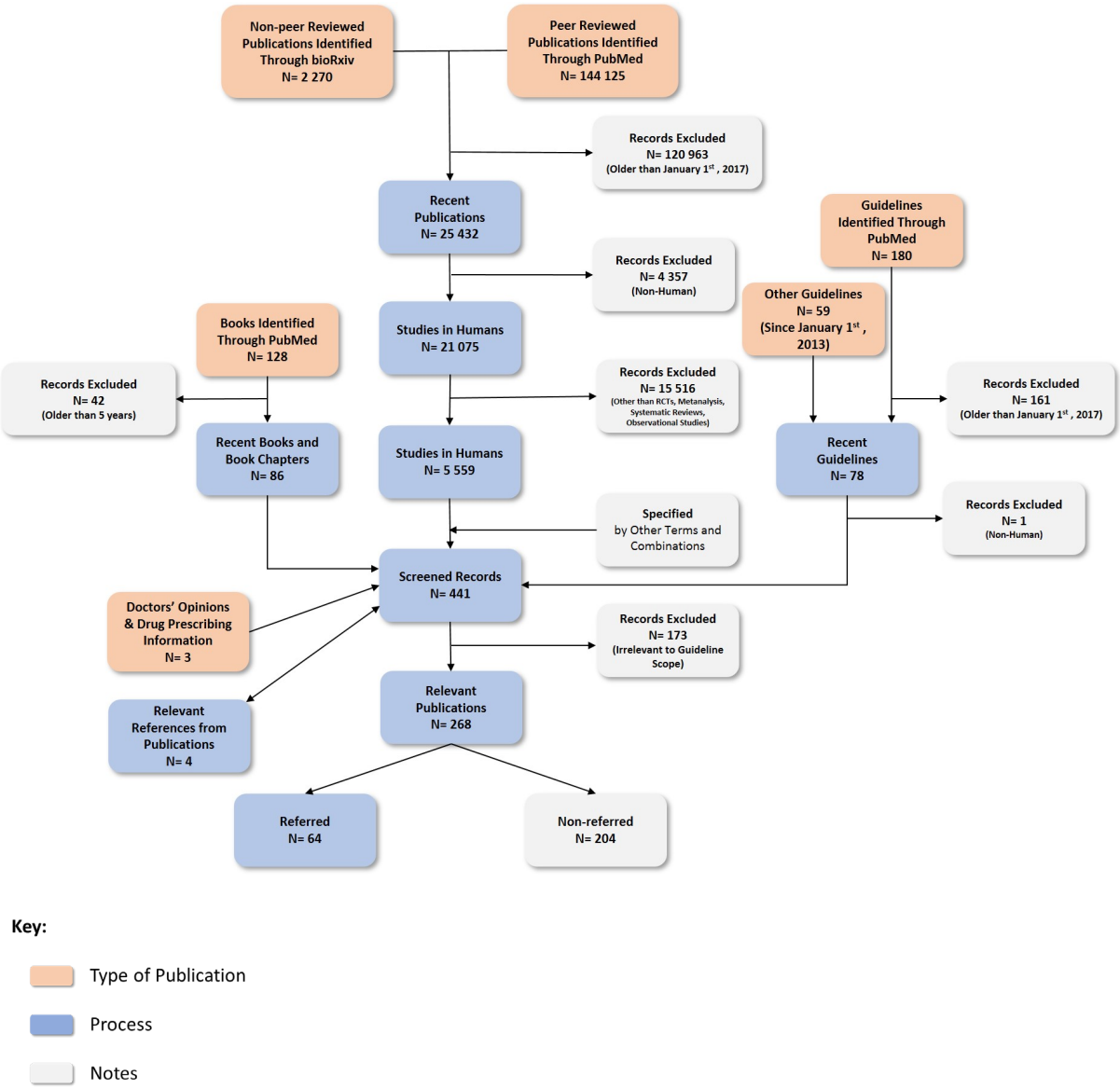

Fig A.1: Literature search results and application of exclusion criteria.

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