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MANAGEMENT OF OVERWEIGHT/OBESITY FOR PRIMARY HEALTH CARE WORKERS



PRIMARY HEALTH CARE SERVICE DELIVERY GUIDELINES

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List of Acronyms

BMI	Body Mass Index
CVD	Cardio – Vascular Diseases
LCD	Low Caloric Diet
MoH	Ministry of Health
MoHE	Ministry of Higher Education
PHC	Primary Health Care
PHCPI	Primary Health Care Project in Iraq
USAID	United States Agency for International Development
VLCD	Very Low Caloric Diet

Introduction

Obesity is a preventable cause of many diseases worldwide; it is reaching epidemic proportions in both developed and developing countries affecting not only adults but also children and adolescents.

Over the last 20 years, obesity became a prevalent nutritional problem; it is a risk factor for many chronic illnesses. According to the national survey in 2006 approximately (63.6%) of adult males and (69.6%) adult females in Iraq were overweight or obese. Weight management invariably involves some form of lifestyle change to reduce energy intake and/or increase energy expenditure; however, there is a range of adjunct treatments—from behavior modification to surgery that can assist in reaching the set target.

Aim of this guideline

Obesity is one of the most complex and difficult problems to deal with in modern disease management. This guide provides a practical summary on how to deal with overweight and obesity.

Below are the main goals for developing this guideline

- Reduce weight
- Sense of wellbeing and improve psychological aspect
- Reduce risk of coronary heart disease
- Decrease possibility of diabetes and other associated comorbidities

Definition

Obesity is defined as abnormal or excessive fat accumulation that presents a risk to health.

Obesity occurs when energy intake from food and drink consumption is greater than energy requirements of the body's metabolism over a prolonged period (positive energy imbalance), resulting in the accumulation of excess body fat

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Six steps for management of overweight/obesity in adults

- **Step one:** Measure BMI and waist circumference
- **Step two:** Assess underlying causes and risk factors for overweight/obesity
- **Step three:** Assess co-morbidities
- **Step four:** Determine the goals and levels of management
- **Step five:** Advice for dietary therapy and physical activity
- **Step six:** Medication or refer for obesity surgery

Step 1: Measure BMI and waist circumference

There are no perfect measures of overweight and obesity in the clinical situation. At this stage discussion with patient about his/her weight should be done as well as measuring body weight, height, body mass index and waist circumference. It would be more comfortable and relieving for many patients to be given the option of losing weight as a baseline treatment for various metabolic disorders; nevertheless, communication is done in a non-judgmental attitude.

Clinical Measures of overweight and obesity

Combining BMI and waist measurement to assess overweight and obesity and diseases (type 2 diabetes, hypertension and CVD) risks in adults

	BMI (Kg/m ²)	Disease risk (relative to normal measures)	
		Waist circumference Men < 102 cm Women < 88 cm	Waist circumference Men >102 cm Women > 88 cm
Normal	< 25		High
Overweight	< 30	Increased	High
Obesity	< 40	High to very high	Very High

Sever Obesity	Over 40	Extremely high	Extremely High
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Body Mass Index (BMI) is defined as weight (kilograms)/height (meters)², this measure is used most often; however, it is not always an accurate predictor of body fat or fat distribution.

$$\text{BMI} = \frac{\text{Weight (Kg)}}{\text{Height (m}^2\text{)}}$$

Waist circumference measures indirectly visceral fat and is a better predictor of health risk in some circumstances; it is measured at the mid-point between the lowest rib and the ileac crest on the umbilicus; therefore, the most useful absolute indicator of risk and relative change is a combination of BMI and waist circumference (table 1)

Fat loss vs. weight loss

Weight loss, in the context of medicine, health or physical fitness, is reduction of the total body mass due to a mean loss of fluid, body fat or adipose tissue and/or lean mass, namely bone mineral deposits, muscle, tendon and other connective tissue. It can occur unintentionally due to an underlying disease or can arise from a conscious effort to improve an actual or perceived overweight or obese state. Fat is a component of weight. Weight loss might or might not mean fat loss. It can also mean loss of tissue, muscle and water whereas the target should be fat loss which is a harmful component of weight. The least intrusive weight loss methods and those most often recommended are adjustments to eating patterns and increased physical activity, generally in the form of exercise. Physicians will usually recommend that their overweight patients combine a reduction of processed foods and caloric content of the diet with an increase in physical activity

Step 2: Assess underlying causes and risk factors for overweight/obesity

Increased body weight always results from imbalance between energy intake (food) and energy expenditure (metabolism, thermogenesis, and physical activity) thus history covering risk factors and causes of the overweight and/or obesity is taken from the patient to identify the causative factors. The health worker should assess the following:

- Unhealthy dietary habits like increased intake of energy-dense food but low in vitamins, minerals and other micronutrients
- Environmental factors; Home, work and social environment can influence weight gain and the inability to lose weight
- Genetic influences: genetic predisposition may affect weight gain and lost. The presence of parental obesity and an early age of onset (e.g. <7 years) can be indications of genetic influences
- Stress may need to be considered as a factor that can cause either weight gain or weight loss, depending on the patient's reaction to stress

- Prescription medications can exacerbate weight gain (in particular, benzodiazepines, corticosteroids, anti-psychotics, tricyclic antidepressants, anti-epileptics, sulphonylurea, and insulin)
- Certain medical conditions (such as hypothyroidism and Cushing syndrome) are known causes of overweight.

Step 3: Assess co-morbidities

There are several co-morbidities associated with overweight/obesity which are either caused by metabolic complications or excess in body weight itself.

Weight loss has beneficial effect in reducing:

- High blood pressure in those with hypertension
 - Elevated blood glucose in those with type 2 diabetes
 - Adverse levels of blood lipids and triglycerides in those with dyslipidemia
- In addition improving both self – esteem and quality of life. (Table 2).

Relative Risk	Associated with metabolic consequences	Associated with excess weight
Greatly increased risk (RR>3)	<ul style="list-style-type: none"> • Type 2 diabetes • Gall bladder diseases • Hypertension • Dyslipidemia • Insulin resistance • Non – alcoholic steatohepatitis (fatty liver) 	<ul style="list-style-type: none"> • Sleep apnea • Breathlessness • Asthma • Social isolation and depression • Day – time sleepiness and fatigue
Moderately increased (RR 2-3)	<ul style="list-style-type: none"> • Coronary heart disease • Stroke • Gout/hyperuricemia 	<ul style="list-style-type: none"> • Osteoarthritis • Respiratory disease • Hemia • Psychological problems
Slightly increased (RR 1-2)	<ul style="list-style-type: none"> • Cancer (breast, endometrial, colon and others) • Reproductive abnormalities/impaired fertility • Polycystic ovaries • Skin complications • Cataract 	<ul style="list-style-type: none"> • varicose veins • musculoskeletal problems • bad pack • stress incontinence • Odema/cellulitis

Adapted from Australian Guideline for general practitioners

Step 4: Determine the goals and levels of management

Weight loss management is recommended for

- Patients with BMI ≥ 25 (Kg/M²) with or without co-morbidities.
- Patients with high risk waist circumference with or without co-morbidities.

Improvements in health should be the main goal of any weight loss program. To reduce the risk of disease, men should aim for a long-term waist circumference of less than 102 centimeters and women for less than 88 centimeters. Achieving a 5 to 10% loss of initial body weight can result in significant improvements in metabolic health. Other achievable short and long term goals, including process goals (such as reduction of food/fat intake, number of steps walked), should be determined in consultation with the patient.

There is no single, best management strategy for long-term weight loss. All successful long-term weight management programs involve some form of lifestyle modification that either reduces an individual's energy intake and/or increases his or her energy expenditure (more physical activity), creating a net energy deficit; However, in many individuals, behavior modification, very low energy diets, pharmacotherapy and/or surgery can be useful adjuncts to lifestyle modification and can significantly improve the success rate over lifestyle changes alone.

A guide for deciding the initial level of interventions to discuss			
BMI classification	Waist Circumference		Co- morbidities present
	Men < 102 cm Women < 88 cm	Men > 102 cm Women > 88 cm	
Overweight 25 - 30 kg/m ²			
Obesity I > 30 kg/m ²			
Obesity II > 35 kg/m ²			
Obesity III ≥ 40 kg/m ²			

General advice on healthy weight and lifestyle.
 Diet and physical activity.
 Diet and physical activity; consider drugs.
 Diet and physical activity; consider drugs; consider surgery.

Step 5: Advise for dietary therapy and physical activity

The main requirement of a dietary approach to weight loss is a reduction in total energy intake that can be sustained over time and provides all essential nutrients in sufficient quantities.

Recommended dietary therapy:

Low-calorie diet (LCD) provides 1200 - 1600 kcal of energy daily, many of these LCDs also promote low fat intake as a practical way to reduce calories. The recommended LCD contains a nutrient composition that will decrease other risk factors. LCDs can reduce total body weight by an average of 8 percent and help reduce abdominal fat content over a period of approximately 6 months. When weight loss occurs, the loss consists of about 75 percent fat and 25 percent lean tissue. A deficit of 500-1,000 kcal/day will produce a weight loss of 70-140 grams/day and a deficit of 300-500 kcal/day will produce a weight loss of 40-70 grams/day. A patient may choose a diet of 1,200 kcal for women and 1,600 kcal for men (Annex 1.a, 1.b and 1.c).

- **Avoid:**
 - Fried food
 - Take away and fast foods
 - Foods high in sugar or saturated fats
 - Drinks and confectionery high in added sugar
 - Minimize alcohol intake
- **Be aware that:**
 - A return to normal body weight may be difficult
 - A 10% weight loss can be an initial realistic goal
 - For some people, weight maintenance may be a more realistic goal
- **Changing eating habits is challenging**
 - Start with two or three specific changes e.g.:
 - Fruit instead of pudding
 - Olive oil, corn oil or sunflower oil instead of butter
- **Daily intake should be roughly divided into:**
 - One quarter fruit
 - One quarter vegetables
 - One quarter carbohydrates
 - One quarter consisting of: milk and dairy, meat, fish and alternatives, fats and sugary food (smallest portion), (Annex 4)

Exercise

The major fraction of daily energy expenditure in the obese comes from their resting metabolism, although exercise can contribute to a substantial portion, lean body mass retention tends to maintain resting metabolic rate. Aerobic exercise enhances the effect of moderate dietary restriction by augmenting the metabolic activity of lean tissue. The combination of moderate energy restriction and either resistance or aerobic exercise induces significant reductions in visceral and subcutaneous adipose tissue and are thus effective means of reducing obesity. The weight loss due to physical exercise is about 2-7kg within short term (6 months). Since many obese individuals are at an increased risk for orthopedic injury, non-weight bearing activities may initially be recommended. Likewise, a variation of exercise modes and modifications in frequency and duration may be required. An intensity of 70% or less of functional capacity or maximal heart rate may be maintained to improve cardiorespiratory endurance. Although weight loss through exercise and modest calorie restriction is slow, the likelihood of achieving successful weight maintenance is greatly enhanced through physical activity. Physical training has been valued in the treatment of obesity for elevating mood, reducing hunger, and improving the likelihood of a successful outcome. It was reported a temporary suppression of the appetite after the initial bouts of a conditioning program. Exercise can result in health and fitness benefits in

the obese independent of weight loss. An increase of fitness can decrease the risk of cardiovascular disease, hypertension, insulin resistance, metabolic abnormalities and type 2 diabetes even if no weight loss is observed. Specifically, patients are instructed to engage in aerobic exercises that involve the muscles of the entire body, e.g., walking, jogging, gymnastic exercises, bicycle ergometer, and swimming, with the latter two particularly suitable for obese patients. Exercise of moderate intensity, generally aiming at pulse rate of 120/min (100/min for patients aged 60–70 years), should be performed for 10–30 min at a time (60 min or more for patients who have sufficient physical strength), at least 3–5 days a week. In regard to exercise intensity, if the patient has no time to carry out a regular exercise regimen, he or she should be instructed to incorporate physical activity into daily life activities, such as using stairs instead of elevators, or getting off the bus one bus stop early and walking to work (Annex 2).

Key points in the implementation of exercise therapy

Exercise alone is not sufficient and needs to be combined with diet therapy.

- Proper warm-up and cool-down should be performed before and after exercise, respectively.
- Since obese patients are likely to suffer injuries to the knee or foot, the use of athletic shoes with thick soles is recommended.
- Exercise should begin at mild intensity and for a short period of time, gradually increase to higher intensity and a longer period.
- Patients should be instructed to eat fruits and vegetables to prevent any increase in free radicals caused by exercise, and vitamins C and E should be administered if necessary.
- Techniques of group therapy and behavior modification therapy should be introduced.
- Exercise for patients with comorbidities should be designed individually and under supervision.

Step 6: Medication or refer for obesity surgery

Pharmacotherapy can be a useful adjunct to lifestyle change for weight loss in patients with a BMI >30 and in patients with a BMI >27 with co-morbidities.

Orlistat (Xenical): is a drug designed to treat obesity. Its primary function is preventing the absorption of fats from the human diet, thereby reducing caloric intake. It is intended to use in conjunction with a physician supervised reduced calorie diet. The amount of weight loss achieved with orlistat varies. Main side effects are steatorrhea, flatus and fecal incontinence, contra indicated in malabsorption, gall bladder disease, pregnancy and lactation.

Lorcaserin (Belviq): is a selective 5-HT_{2C} receptor agonist, promote weight loss through satiety. it induce 5-10% weight loss. Side effects include nausea, headache, sinusitis, pharyngitis.

Phentermine and topiramate combination (Qsymia): Phentermine is an appetite suppressant and stimulant of the amphetamine and phenethylamine class. Topiramate is an anticonvulsant that has weight loss side effects, and has been found to lower blood pressure and cholesterol, its main side effects are dry mouth and constipation.

Sibutramine: is an oral anorexiant a centrally-acting serotonin-norepinephrine reuptake inhibitor structurally related to amphetamines. Not in use now because of its cardiovascular side effects.

Surgery is indicated for patients with a BMI greater than 40, or with a BMI greater than 35 and serious medical co-morbidities, although it is increasingly being used successfully in patients with body mass indices lower than this (Annex)

As the skills and time required to deal with overweight and obese patients vary, clinicians should seek assistance from health professionals in other disciplines with specialist knowledge in obesity management such as dietitians, exercise physiologists and specialist physicians.

Indication for Referral

- 1- Presence of clinical indications of underlying medical causes:
 - Poorly controlled diabetes despite optimal therapy.
 - Risk of CVD.
 - Established CVD on optimum secondary prevention.
 - Poorly controlled hypertension on 3 or more agents (persistent Hypertension above 150/90 mmHg).
 - Sleep apnea.
 - Established significant joint disease.
 - Respiratory disease (significant dyspnea, asthma, etc.).
- 2- Previous attempts of weight loss, evidence of having participated in at least 6 different weight interventions, each for at least 3 months.

Part Two

Overweight and Obesity in Children and Adolescents

Overweight/Obesity is considered a serious problem in children and adolescent that can lead to chronic diseases in adulthood. National studies in Iraq showed that 11% of children below five years of age and 7% of school age children (6 – 12 years old) are either overweight or obese.

Obesity in children is different from obesity in adults in some important aspects:

- First, BMI cannot be used in isolation; instead it should be expressed as a BMI centile in relation to age- and sex-matched population
- Second, when considering the prevention and treatment of childhood obesity, dietary and energy restriction, increase in activity and decrease in sedentary behavior must not compromise normal growth and development.

Therefore, weight maintenance is often a suitable goal, rather than weight loss.

Gradual, measured and sustainable weight loss may be an appropriate target in some cases when the degree of obesity is more severe. More dramatic weight loss goals may be appropriate for post pubertal teenagers with extreme obesity.

A child who is overweight should also be monitored. If a child's weight is consistently above the curved lines on the growth chart, and the height of the child is not above average (children who are much taller than average will probably also show weights above the curved lines), the cause should be investigated.

Significance of obesity in children and adolescent

Although rare in the past, obesity is now among the most widespread medical problems affecting children and adolescents living in the United States and other developed countries. About 15% of adolescents (12-19 years of age) and children (6-11 years of age) are obese in the United States according to the American Obesity Association. These numbers have continued to increase since at least the early 1990s. Pediatric obesity represents one of our greatest health challenges.

Obesity has a profound effect on a patient's life. Obesity increases the patient's risk of numerous health problems, and it also can create emotional and social problems. Obese children are also more likely to be obese as adults, thereby increasing their lifelong risk of serious health problems such as heart disease and stroke.

If your child or teenager is overweight, further weight gain can be prevented. Parents can help their children keep their weight in the healthy range.

A Six-Step Guide to Clinical Management of Weight in Overweight/Obese Children and Adolescents

- **Step one:** Assess the extent of overweight/obesity in the child or adolescent
- **Step two:** Assess co-morbidities associated with overweight/obesity, and treat them independently where appropriate.
- **Step three:** Assess why and how energy imbalance has occurred
- **Step four:** Determine the level of clinical intervention required and treatment goals with the patient and family
- **Step five:** Advice for treatment strategy, including outcome indicators not related to weight
- **Step six:** Review and provide regular assistance for weight management and maintenance.

Step 1: Assess the extent of overweight/obesity in the child or adolescent in relation to other children at the same stage of development.

The initial physical examination should include measurements of height/length and weight.

- **Height/length:** There should be a fixed wall stadiometer and the measurement should be to the nearest millimeter.
- **Weight:** Is measured by standing on scales. It should be to the nearest 0.1 kilogram.
- **Look and ask** for any pubertal abnormalities and refer to a specialist if indicated.

It can be determined whether a child or adolescent is overweight or obese by using the growth chart. Child with a BMI for age above + 2 SD suggests overweight and above + 3 SD suggests obesity. There are no definitions of obesity and overweight for children less than 2 years of age.

Step 2: Assess co-morbidities associated with overweight/obesity and treat them independently where appropriate.

Look for the following:

- **High blood pressure:** Obese children are at approximately three times greater risk of hypertension than non-obese children.
- **Dyslipidemia**
- **Type 2 diabetes:** becoming more common in adolescents

- Orthopedics problems: slipped capital epiphysis is the most serious one.
- Respiratory conditions: These include obstructive sleep apnea.
- Reproductive morbidities: Such as menstrual irregularities
- Psychosocial distress: By the age of seven years, children may already be experiencing teasing and social isolation as a result of their obesity.
- Other morbidities

Step 3: Assess underlying causes and risk factors for overweight/obesity

Not all risk factors can be modified; factors that may influence treatment strategies should be assessed by the clinician. Risk factors include the following:

- **Genetic influence:** Two indicators are suggestive of a genetic predisposition and patients should be referred for specialist assessment :
 - Severe/morbid obesity in first-degree relatives.
 - Rarely very early-onset
- **Family, school and social environments** can influence weight gain and the inability to lose weight.
- **Medical conditions:** There is an association between obesity and number of endocrine disorders (e.g. hypothyroidism, Cushing’s disease, growth hormone deficiency or resistance, hypophosphatemic rickets, and pseudohypoparathyroidism). These disorders are characterized by height-growth failure.
- Numbers of **congenital syndromes** have obesity as a component with intellectual impairment and multiple physical abnormalities as common features. Examples include Prader–Willi, Bardet–Biedl and Cohen syndromes.
- Medical treatments: e.g. steroids, psychoactive agents and other drugs.

The components that lead to energy imbalance like eating and exercise behaviors are difficult to measure accurately in children and adolescents; the following questions may give an indicator about the life style and how energy imbalance has occurred:

- Hours of watching television and other small-screen entertainment
- Time spent in organized physical activity
- Opportunities for participating in activity
- Parental activity and inactivity
- Level of activity compared with peers
- Hunger and requests for food

- Eating in front of TV
- Meal patterns
- Snack choices
- Amount of food eaten at a meal, for example, compared to parent
- Use of food as a reward or comfort

Television Watching

- Television watching has been demonstrated to be linked to the onset of obesity. The more TV one watches, the greater the degree of obesity. TV watching leads to childhood obesity and excess weight in adults. One clinical study of 4,771 adult women examined the relationship between time spent watching TV per week and obesity.
- There are several psychological effects of watching TV that promote obesity. TV watching reduces physical activity. It was also found to lower the resting (basal) metabolic rate to a level similar to that experienced during trance-like states.
- We respond to external stimuli such as light, smell and taste of food which can trigger almost addictive tendencies to eating. We are constantly bombarded by advertising and one of the biggest culprits is television. Around meal times, advertisers promote their fast food products, which triggers memories of sweet, fat, and other stimulatory tastes. Trance-like effect that is created by TV watching leaves the brain thinking, it needs something and not knowing exactly what it wants, it decides that food is the easiest answer.
- People who watch a lot of TV also happen to do the least amount of exercise (couch potatoes). All these factors contribute to obesity and weight gain.

Step 4: Determine the level of clinical intervention required.

Children and adolescents above +2 SD should be considered for intervention, particularly if obesity-related co-morbidity is present.

In general, weight loss diets are not recommended for most children and many adolescents.

Weight maintenance during growth will create a relative weight loss that will allow a satisfactory weight to be reached.

Parents should be involved in the management of overweight/obesity in children and adolescents.

Levels of intervention include:

- Conventional weight management strategies such as avoid high caloric food items, increase energy expenditure, modify behavior, and involve the family in the process of change.
- For extreme degrees of obesity and associated co-morbidity, particularly in adolescents, other weight management strategies (e.g. pharmacotherapy and surgery) can be considered.

Management targets and goals

On the basis of weight-loss recommendations, a reasonable weight-loss goal for children and adolescents would be a BMI below the 2 SD.

Main goals to reach that target:

- Weight maintenance/relative weight loss: Absolute weight loss is generally not necessary in children and many adolescents. In these groups, weight maintenance during height growth will create a relative weight loss that will allow a satisfactory weight to be reached.
- Adolescents with no or limited height-growth potential will need to lose absolute weight to reduce fatness
- Consideration should be given to absolute weight loss in children if they have a BMI well above + 3SD and/or obesity-related medical co-morbidity, which might be expected to respond to a more rapid weight change.
- Half to one kilogram per month is an achievable goal, with the lower range for children and the upper range for adolescents.

Success can also be measured by several outcomes other than change in body weight. For example:

- Changed eating behavior
- Reduced hunger and demands for food
- Increased capacity for self-regulation
- Increased participation in regular, enjoyable physical activity
- Improved exercise capacity and endurance
- Reduced sedentary hours
- Improved self-esteem and confidence
- Improved family support (life style changes in type of food and exercise) and education about metabolic risk factors (cholesterol, triglyceride, glucose, blood pressure).

Step 5: Advice for treatment strategy with the patient and the family.

The conventional components of weight management in children and adolescents are the same as those for adults. They include:

- **A reduction in energy intake** by modifying the energy-dense components of the diet, and avoiding high energy food items.
 - Reducing the serving or portion size
 - Encouraging different eating patterns (e.g. slowing the rate of eating and limiting the time and place of eating).
 - Three meals and three snacks, with an emphasis on healthy snack choices
 - Change the meal composition (with more vegetables, fruits and fibers).
 - It is essential that in a period of rapid growth, such as childhood and adolescence, intakes of vitamins and minerals, such as iron or calcium, are not compromised.
- **An increase in energy expenditure** through an increase in both planned and lifestyle activity, there are at least three types of activity to explore:
 - Structured organized activities such as sporting clubs, swimming lessons and youth clubs.
 - Less structured activities such as outdoors sports family walks, long bike rides
 - Lifestyle activities such as walking part or all of the way to school, using stairs, doing chores around the house.

Additional weight-management strategies used for severe degrees of obesity and associated co-morbidity, particularly in adolescents, it may be necessary to consider other weight management strategies as well as those interventions described above.

- **Pharmacotherapy:** There are enough adult trial data to warrant consideration of orlistat and sibutramine in obese adolescents with obesity-related co-morbidity. Consider metformin therapy in the obese adolescent with significant hyperinsulinaemia and acanthosis nigricans or polycystic ovarian syndrome (particularly if there is a family history of diabetes).
- **Surgery:** There is limited evidence that gastric restrictive or gastric bypass surgery induces a weight loss and a reduction in obesity-related co-morbidity in adolescents that is comparable to the results found in adults. Bariatric surgery should therefore be considered as the last possible option in a severely obese adolescent with obesity-related co-morbidity.

Step 6: Review and provide regular assistance for weight management and maintenance.

Obesity management in children and adolescents is a long-term commitment. Do not expect rapid changes. It would be appropriate to check the patient's weight every month for both weight maintenance and the management of weight loss. Height could be measured every three months. If weight maintenance is the goal, this allows time for adjustments to diet and activity to have an effect if weight is found to be increasing. If weight loss is the goal, the rate of weight loss should be determined monthly.

Indications for referral

- Obesity above +3 SD.
- Suspected secondary cause of obesity
- Suspected single-gene defect.
- Short stature
- Abnormal physical stigmata
- Intellectual disability
- Visual disturbance and headache (central nervous system lesion)
- Height-growth abnormalities.
- Presence of other co-morbidities.

Part Three

Overweight and Obesity in Pregnancy

With the rise of obesity among today's general antenatal population the impact of obesity on pregnancy outcome become clearer. The prevention and management of obesity in women of childbearing age has become a public health issue. Women should be advised to enter pregnancy with a normal BMI of (20-24.9 Kg/m²), they should be weight in preconception care visit

Preconception care Preconception care any intervention provided to women of childbearing age, regardless of pregnancy status or desire, before pregnancy, to improve health outcome for women, newborns and children.

Preconception care ensure a continuum of healthy women, healthy mothers and healthy children; and promote productive health for couples. Preconception care recognize that many male partner are affected by and contribute to many health issues and risk factors that influence the maternal and child health such as STD. preconception health must reach both partner to promote health of mothers and the newborns.

. Overweight women BMI (25 -29.9 Kg/m²) and obese women BMI (≥ 30 Kg/m²) should lose weight by dieting and exercise before conceiving. They may require referral to dietitian. They should be informed of the adverse pregnancy outcomes associated with obesity:

- Maternal risks of obesity: subfertility, miscarriage, hypertensive disease, gestational diabetes, thromboembolism, infection, cardiac disease, instrumental deliveries, caesarean section, postpartum hemorrhage and maternal death.
- Risks of maternal obesity on the infant or newborn: neural tube defects, large for dates, preterm delivery, shoulder dystocia, increase in birth weight, neonatal hypoglycemia and offspring obese as children and adults.
- Even such women may be at risk of post-term pregnancy and obesity being an independent risk factor for late still birth, birth trauma and maternal complications after delivery in women with gestational diabetes.

Women with BMI of (40 kg/m²) or more should be strongly advised to avoid pregnancy until they have lost weight.

With the increase prevalence of polycystic ovarian syndrome (PCOS), it has been shown that 38% of women were overweight BMI (≥ 25 kg/m²) and obesity was significantly associated with an increased risk of hirsutism, menstrual cycle disturbances, an elevated serum testosterone concentration and infertility; 26% of patient with primary infertility and

14% of patient with secondary infertility had a BMI of more than (30 Kg/m²) and such BMI even associated with reduce success rates in assisted conception with increased risk of miscarriage and ovarian hyper stimulation.

Extra food intake requirement during pregnancy

When energy and other nutrient intake do not increase, the body's own reserves are used, leaving the pregnant woman weakened.

- Inadequate weight gain during pregnancy often results in low birth weight, which increases an infant's risk of dying.
- Energy needs (the amount of calories a woman needs to consume) increase in the second, and particularly the third, trimesters of pregnancy and during lactation.
- As much as possible, extra food intake should not be just staple carbohydrates (e.g., rice or bread) but should contain protein, fat and vitamins (e.g., cheese, beans, eggs).

The recommended amounts of extra food are shown in Table 2 below:

Period of Pregnancy or Breastfeeding	Additional Food Needed Each Day
Second trimester (4th–6th month)	One nutritious snack
Third trimester (7th–9th month)	One additional meal plus one nutritious snack, or three snacks
First six months of breastfeeding	One additional meal or two nutritious snacks
Examples of nutritious snacks	Bread with meat, liver, egg, hummous, lebni or cheese; or a combination of any two of the following: pumpkin, carrots, yoghurt and apricots.

Part Four

Overweight/Obesity in Elderly

The prevalence of obesity is rising progressively, even among older age groups. Although cut-off values of BMI, waist circumference and percentages of fat mass have not been defined for the elderly (nor for the elderly of different ethnicity), it is clear from several meta-analyses that mortality and morbidity associated with overweight and obesity only increases at a BMI above 30 kg/m² ; Thus, treatment should only be offered to patients who are obese rather than overweight and who also have functional impairments, metabolic complications or obesity-related diseases, that can benefit from weight loss. The weight loss therapy should aim to minimize muscle and bone loss but also vigilance as regards the development of sarcopenic obesity - a combination of an unhealthy excess of body fat with a detrimental loss of muscle and fat-free mass including bone - is important in the elderly, who are vulnerable to this outcome. Life-style intervention should be the first step and consists of a diet with a 500 kcal (2.1 MJ) energy deficit and an adequate intake of protein of high biological quality together with calcium and vitamin D, behavioral therapy and multi-component exercise. Multi-component exercise includes flexibility training, balance training, aerobic exercise and resistance training. The adherence rate in most studies is around 75%. Knowledge of constraints and modulators of physical inactivity should be of help to engage the elderly in physical activity. The role of pharmacotherapy and bariatric surgery in the elderly is largely unknown as in most studies people aged 65 years and older have been excluded.

Part Five

Prevention of Obesity

Importance of preventing obesity

Obesity has reached epidemic proportions globally, with at least 2.8 million people dying each year as a result of being overweight or obese. Once associated with high-income countries, obesity is now also prevalent in low- and middle-income countries.

Governments, international partners, civil society, non-governmental organizations and the private sector all have vital roles to play in contributing to obesity prevention.

Obesity is:

- **According to the national survey in 2006 approximately (63.6%) of adult males and (69.6%) adult females in Iraq were overweight or obese and 11% of children below five years of age and 7% of school age children (6 – 12 years old) are either overweight or obese.**
- **More than 1.4 billion adults were overweight in 2008, and more than half a billion obese**
- **Globally, over 40 million preschool children were overweight in 2008**
- **Curbing the global obesity epidemic requires a population-based multisectoral, multi-disciplinary, and culturally relevant approach**

Many factors may cause weight gain but with keeping a healthy diet and physically active life style is much easier to maintain healthy weight; generally, the steps to prevent weight gain are the same as the steps to lose weight: daily exercise, a healthy diet, and **a long-term commitment.**

To keep **healthy diet** make sure to:

- Eat healthy meals and snacks. Focus on low-calorie and nutrient-dense foods such as fruits, vegetables and whole grains. Avoid saturated fat and limit sweets



- Base your meals on starchy foods such as potatoes, bread, rice and pasta, choosing wholegrain where possible.
- Eat plenty of fiber-rich foods such as oats, beans, peas, lentils, grains.
- Watch the portion sizes of meals and snacks, and the interval between meals.

To keep an **active life style** make sure to:

- Exercise regularly: 150 to 250 minutes of moderate-intensity activity per week is necessary to prevent weight gain. Moderately intense physical activities include fast walking and swimming.
- Look for opportunities during the day to perform even 10 or 15 minutes of some type of activity, such as walking around the block or up and down a few flights of stairs.
- Avoid sitting for long hours in front of TV or video game
- Regular monitoring of weight (once a week) is more successful in maintaining weight and keeping off excess pounds, as it detects small weight gain before becoming big problem.
- Be consistent. Sticking to healthy-weight plan during the week, on the weekends, and amidst vacation and holidays as much as possible increases your chances of long-term success

Annex One

Body Mass Index in relation to height and weight

Height →	150 cm	153 cm	156 cm	159 cm	162 cm	165 cm	168 cm	171 cm	174 cm	177 cm	180 cm	183 cm	186 cm	189 cm	192 cm	195 cm	198 cm
Weight ↓																	
45 Kg.	20	19	18	18	17	17	16	15	15	14	14	13	13	13	12	12	11
48 Kg.	21	21	20	19	18	18	17	16	16	15	15	14	14	13	13	13	12
51 Kg.	23	22	21	20	19	19	18	17	17	16	16	15	15	14	14	13	13
54 Kg.	24	23	22	21	21	20	19	18	18	17	17	16	16	15	15	14	14
57 Kg.	25	24	23	23	22	21	20	19	19	18	18	17	16	16	15	15	15
60 Kg.	27	26	25	24	23	22	21	21	20	19	19	18	17	17	16	16	15
63 Kg.	28	27	26	25	24	23	22	22	21	20	19	19	18	18	17	17	16
66 Kg.	29	28	27	26	25	24	23	23	22	21	20	20	19	18	18	17	17
69 Kg.	31	29	28	27	26	25	24	24	23	22	21	21	20	19	19	18	18
72 Kg.	32	31	30	28	27	26	26	25	24	23	22	21	21	20	20	19	18
75 Kg.	33	32	31	30	29	28	27	26	25	24	23	22	22	21	20	20	19
78 Kg.	35	33	32	31	30	29	28	27	26	25	24	23	23	22	21	21	20
81 Kg.	36	35	33	32	31	30	29	28	27	26	25	24	23	23	22	21	21
84 Kg.	37	36	35	33	32	31	30	29	28	27	26	25	24	24	23	22	21
87 Kg.	39	37	36	34	33	32	31	30	29	28	27	26	25	24	24	23	22
90 Kg.	40	38	37	36	34	33	32	31	30	29	28	27	26	25	24	24	23

93 Kg.	41	40	38	37	35	34	33	32	31	30	29	28	27	26	25	24	24
96 Kg.	43	41	39	38	37	35	34	33	32	31	30	29	28	27	26	25	24
99 Kg.	44	42	41	39	38	36	35	34	33	32	31	30	29	28	27	26	25
102 Kg.	45	44	42	40	39	37	36	35	34	33	31	30	29	29	28	27	26
105 Kg.	47	45	43	42	40	39	37	36	35	34	32	31	30	29	28	28	27
108 Kg.	48	46	44	43	41	40	38	37	36	34	33	32	31	30	29	28	28
111 Kg.	49	47	46	44	42	41	39	38	37	35	34	33	32	31	30	29	28
114 Kg.	51	49	47	45	43	42	40	39	38	36	35	34	33	32	31	30	29
117 Kg.	52	50	48	46	45	43	41	40	39	37	36	35	34	33	32	31	30
120 Kg.	53	51	49	47	46	44	43	41	40	38	37	36	35	34	33	32	31
123 Kg.	55	53	51	49	47	45	44	42	41	39	38	37	36	34	33	32	31
126 Kg.	56	54	52	50	48	46	45	43	42	40	39	38	36	35	34	33	32
129 Kg.	57	55	53	51	49	47	46	44	43	41	40	39	37	36	35	34	33
132 Kg.	59	56	54	52	50	48	47	45	44	42	41	39	38	37	36	35	34
135 Kg.	60	58	55	53	51	50	48	46	45	43	42	40	39	38	37	36	34
138 Kg.	61	59	57	55	53	51	49	47	46	44	43	41	40	39	37	36	35
141 Kg.	63	60	58	56	54	52	50	48	47	45	44	42	41	39	38	37	36
144 Kg.	64	62	59	57	55	53	51	49	48	46	44	43	42	40	39	38	37
147 Kg.	65	63	60	58	56	54	52	50	49	47	45	44	42	41	40	39	37
150 Kg.	67	64	62	59	57	55	53	51	50	48	46	45	43	42	41	39	38
153 Kg.	68	65	63	61	58	56	54	52	51	49	47	46	44	43	42	40	39
156 Kg.	69	67	64	62	59	57	55	53	52	50	48	47	45	44	42	41	40
159 Kg.	71	68	65	63	61	58	56	54	53	51	49	47	46	45	43	42	41
162 Kg.	72	69	67	64	62	60	57	55	54	52	50	48	47	45	44	43	41

165 Kg.	73	70	68	65	63	61	58	56	54	53	51	49	48	46	45	43	42
168 Kg.	75	72	69	66	64	62	60	57	55	54	52	50	49	47	46	44	43
171 Kg.	76	73	70	68	65	63	61	58	56	55	53	51	49	48	46	45	44
174 Kg.	77	74	71	69	66	64	62	60	57	56	54	52	50	49	47	46	44
177 Kg.	79	76	73	70	67	65	63	61	58	56	55	53	51	50	48	47	45
180 Kg.	80	77	74	71	69	66	64	62	59	57	56	54	52	50	49	47	46
183 Kg.	81	78	75	72	70	67	65	63	60	58	56	55	53	51	50	48	47
186 Kg.	83	79	76	74	71	68	66	64	61	59	57	56	54	52	50	49	47
189 Kg.	84	81	78	75	72	69	67	65	62	60	58	56	55	53	51	50	48
192 Kg.	85	82	79	76	73	71	68	66	63	61	59	57	55	54	52	50	49
195 Kg.	87	83	80	77	74	72	69	67	64	62	60	58	56	55	53	51	50

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Annex Two

A. Low caloric diet for women (Food list contains about 1200 calories)

The list consists of the following meals:

Breakfast

food	Weight/g	Quantity	Carbohydrates/g	Protein/g	Fat/g	Calories
French bread or brown flatbread	50 -60	½ bread	30	6	0.5	133
Skimmed milk	250	1 cup	12	8	-	90
Boiled eggs or low-fat cheese	50 -60	Average egg or 3 slices	1 – 1.8	7 – 8.8	5 – 6.6	81 - 102

10:00 am

food	Weight/g	Quantity	Carbohydrates/g	Protein/g	Fat/g	Calories
Fruit	-	1 exchange	15	-	-	60

Lunch

food	Weight/g	Quantity	Carbohydrates/g	Protein/g	Fat/g	Calories
French bread or brown flatbread	50 -60	½ bread	30	6	-	133
Cooked vegetables (broth) with teaspoon of oil	-	½ cup	5	2	5	65
Various salad+ Teaspoon of olive oil without salt	-	½ cup	5	2	5	70

Dinner

food	Weight/g	Quantity	Carbohydrates/g	Protein/g	Fat/g	Calories
Grilled chicken breast or fish Or Grilled low-fat Beef or lamb	90	Average peace	-	21	3 - 15	105 - 255
Various salad	-	½ cup	5	2	-	25
French bread or brown flatbread	25 – 30	¼ bread	15	3	0.25	66
Cooked legumes with teaspoon of oil	-	¼ cup	15	10	6	160

Before sleep

food	Weight/g	Quantity	Carbohydrates/g	Protein/g	Fat/g	Calories
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Fruit	-		15	-	-	60
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Notes

1.	Teaspoon = 5 cc	6.	30 g of meat can be replaced with ½ cup of salt-free mix nuts Or 1 egg.
2.	1 cup = 250 cc	7.	Fish should be eaten at least 2 times a week
3.	Tea should be drunk without sugar. Sweeteners may be used.	8.	Every (90) g of meat equals at least the volume of a recorder cassette.
4.	8 cups of water should be drunk every day, and even more in a higher temperature.	9.	Various salads include (cucumber, tomato, carrot, cabbage, lettuce, radish, onion, leafy vegetables like celery, peppergrass, and parsley).
5.	For those who suffer cholesterol or hypertension it's not recommended to eat more than 2 eggs a week	10.	Salad should always be eaten without salt.

- ¼ bread equals to 1 slice of toast or ½ cup of rice or macaroni or ground bulgur.

- Exchanges of fruits

B. Low caloric diet for men (Food list contains about 1800 calories)

The list consists of the following meals:

Breakfast

food	Weight/g	Quantity	Calories
French bread or brown flatbread	50 -60	½ bread	133
Skimmed milk	250	1 cup	90
Boiled eggs or low-fat cheese	50 -60	Average egg or 3 slices	81 - 102

10:00 am

food	Weight/g	Quantity	Calories
Fruit	-	1 exchange	120

Lunch

food	Weight/g	Quantity	Calories
French bread or brown flatbread	50 -60	½ bread	133
Cooked vegetables (broth) with teaspoon of oil	-	1 cup	75
Various salad+ Teaspoon of olive oil without salt	-	1 cup	70
Skimmed yogurt or milk	-	1 cup	90

05:00 pm

food	Weight/g	Quantity	Calories
Fruit	-	1 exchange	60

Dinner

food	Weight/g	Quantity	Calories
Grilled chicken breast or fish Or Grilled low-fat Beef or lamb	150	Average peace	175 - 375
Various salad+ teaspoon olive oil	-	½ cup	70
French bread or brown flatbread	50 – 60	½ bread	133
Cooked legumes with teaspoon of oil	-	¼ cup	160
Skimmed yogurt	250	1 cup	90

Before sleep

food	Weight/g	Quantity	Calories
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Fruit	-	مبادلة واحدة	120
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Notes

1.	Teaspoon = 5 cc	6.	30 g of meat can be replaced with ½ cup of salt-free mix nuts.
2.	1 cup = 250 cc	7.	Fish should be eaten at least 2 times a week
3.	Tea should be drunk without sugar. Sweeteners may be used.	8.	Every (90) g of meat equals at least the volume of a recorder cassette.
4.	8 cups of water should be drunk every day, and even more in a higher temperature.	9.	Various salads include (cucumber, tomato, carrot, cabbage, lettuce, radish, onion, leafy vegetables like celery, peppergrass, and parsley).
5.	For those who suffer cholesterol or hypertension it's not recommended to eat more than 2 eggs a week	10.	Salad should always be eaten without salt.

Food exchanges (portions and their equals) according to food groups

1. Grains:

- Include wheat, barley, rice and their products like flatbread, French bread and all kinds of macaroni.
- **Each 1 portion equals:** ¼ bread, which is (30 g).
- **Exchanges of each portion:** ¼ bread which equals to 1 slice of toast or ½ cup of rice or bulgur or cooked oil-free macaroni.

2. Vegetables:

3. Fruits:

- Include all kinds of available fruits; fresh, dried or juices of the fruits.
- **Each 1 portion equals:** mid-sized piece 120 g of the big fruits like apple or banana (small banana).

4. Fats and oils

- Include saturated animal fats found in meats and other animal products as well as milk products and liquid (unsaturated) vegetable oils like olive, corn and sunflower oils.
- **Each 1 portion equals:** 1 teaspoon (5 cc).
- **Exchanges of each portion:**
- **Saturated fats:** 1 teaspoon (5 cc) of butter or 2 tablespoons (15 cc) of cream or 1,¼ tablespoon (15 cc) of cheese with cream or margarine or tablespoon of Mayonnaise.
- **Unsaturated oils:** 1 teaspoon (5 cc) of olive, soybean, corn or sunflower oil, or 10 grains of olive, 10 grains of soybean or 6 grains of almond.

5. Milk products:

- Include milk (skimmed or low-fat) and its product like yogurt and cheese that are full of Calcium.
- **Each 1 portion equals:** 1 cup (250 cc) of milk.
- **Exchanges of each portion:** 1 cup of yogurt or (45 g) of white cheese or (60 g) of processed cheese.

6. Meats & legumes:

- Include beef and lamb meats, skinned chicken as well as fish, egg, legumes, nuts like walnut, almond and peanut.
- **Each 1 portion equals:** (90 g) of skimmed meat.
- **Exchanges of each portion:** it equals (30 g) of meat, which means 1 mid-sized egg (50 g) or ¼ cup of cooked legumes or (15 g) of mixed nuts.
- 30 g of meat equals 1 egg or ½ cup of ground legumes or 15 g of mixed nuts.

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Annex Three

Exercise

In addition to aerobic activity, weight bearing or resistance exercise not only strengthens the muscles and bones, but also raises metabolism by increasing the muscle to fat ratio and burn more calories at rest. Finally exercise program should include stretching exercises for enhanced flexibility and mobility.

Focus on the quantity and quality of the exercise and not on the amount of weight lost. Upon initiation of an exercise program, the body has a tendency to gain lean weight (muscle). Cardiovascular (aerobic) exercise should be the focus of exercise program because it provides overall health benefits, including fat loss, an increase in daily energy levels and a reduction of health risks.

Duration of exercises

- Exercise four to five times per week, 30 to 60 minutes per session at a low to moderate intensity
Note: Be sure not to exceed 70 percent of your target heart rate (target heart rate = $220 - \text{age in years}$).
- Start slowly, the first five minutes should be "warm-up" to give body the necessary time it needs to get used to the activity.
- Continue at a comfortable pace that allows talking without difficulty and not perspire profusely
- Slow down for the last five minutes of workout to allow blood to return from the working muscles to the heart and for body to return to its resting state.
- Finish with stretching exercises.
- Focus on increasing duration first, and then increasing intensity.
- If previously sedentary, may start with two or three 10 minute moderately-paced walks per day. If possible, try to exercise in the morning.
- A conservative resistance-training program recommended for obese.
- Perform exercises that target the major muscles groups, such as chest, back and shoulders. In addition to weight machines and dumbbells, you can use rubber tubing or elastic bands to provide the resistance.
- • Begin with one set of 12 to 15 repetitions per exercise and gradually progress to two sets per exercise
- Slowly warm up body before resistance training. For example, walk for at least 10 minutes.
- Always perform exercises in a slow and controlled manner to ensure the targeted muscle performs the work.

Annex Four

Bariatric Surgery for Obesity

Treatment goals:

Surgical treatment is medically necessary because it is the only proven method of achieving long term weight control for the severely obese; it is not a cosmetic procedure. Surgical treatment of severe obesity does not involve the reservoir, with or without a degree of associated malabsorption.

Patient selection:

Bariatric surgery is recommended as a treatment option for adults with obesity if all of the following criteria are fulfilled:

- They have a BMI of 40 kg/m² or more, or between 35 kg/m² and 40 kg/m² and other significant disease (for example, type 2 diabetes or high blood pressure) that could be improved if they lost weight
- All appropriate non-surgical measures have been tried but have failed to achieve or maintain adequate, clinically beneficial weight loss for at least 6 months
- The person has been receiving or will receive intensive management in a specialist obesity service
- The person is generally fit for anesthesia and surgery
- The person commits to the need for long-term follow-up.

Risks of surgical treatment:

Assessing the risks of surgical treatment of obesity involves operative, perioperative and long term complications. Available published series report that the immediate operative mortality rate for both vertical banded gastroplasty and Roux-en-y gastric bypass is relatively low. Morbidity in the early postoperative period, i.e. wound infections, dehiscence, leaks from staple breakdown, stomal stenosis, marginal ulcers, various pulmonary problems, and deep thrombophlebitis may be as high as ten percent or more. Splenectomy is necessary in 0.3% of patients to control operative bleeding. However, the aggregate risk of the most serious complications of gastrointestinal leak and deep venous thrombosis is less than one percent. In the late postoperative period, other problems may arise and may require reoperation. The mortality and morbidity rates of reoperation are higher than those of primary operations.

Results:

Weight loss usually reaches a maximum between 18 and 24 months postoperatively. Mean percent excess weight loss at five years ranged from 48 to 74 % after gastric bypass and from 50 to 60% after vertical banded gastroplasty

Childbearing:

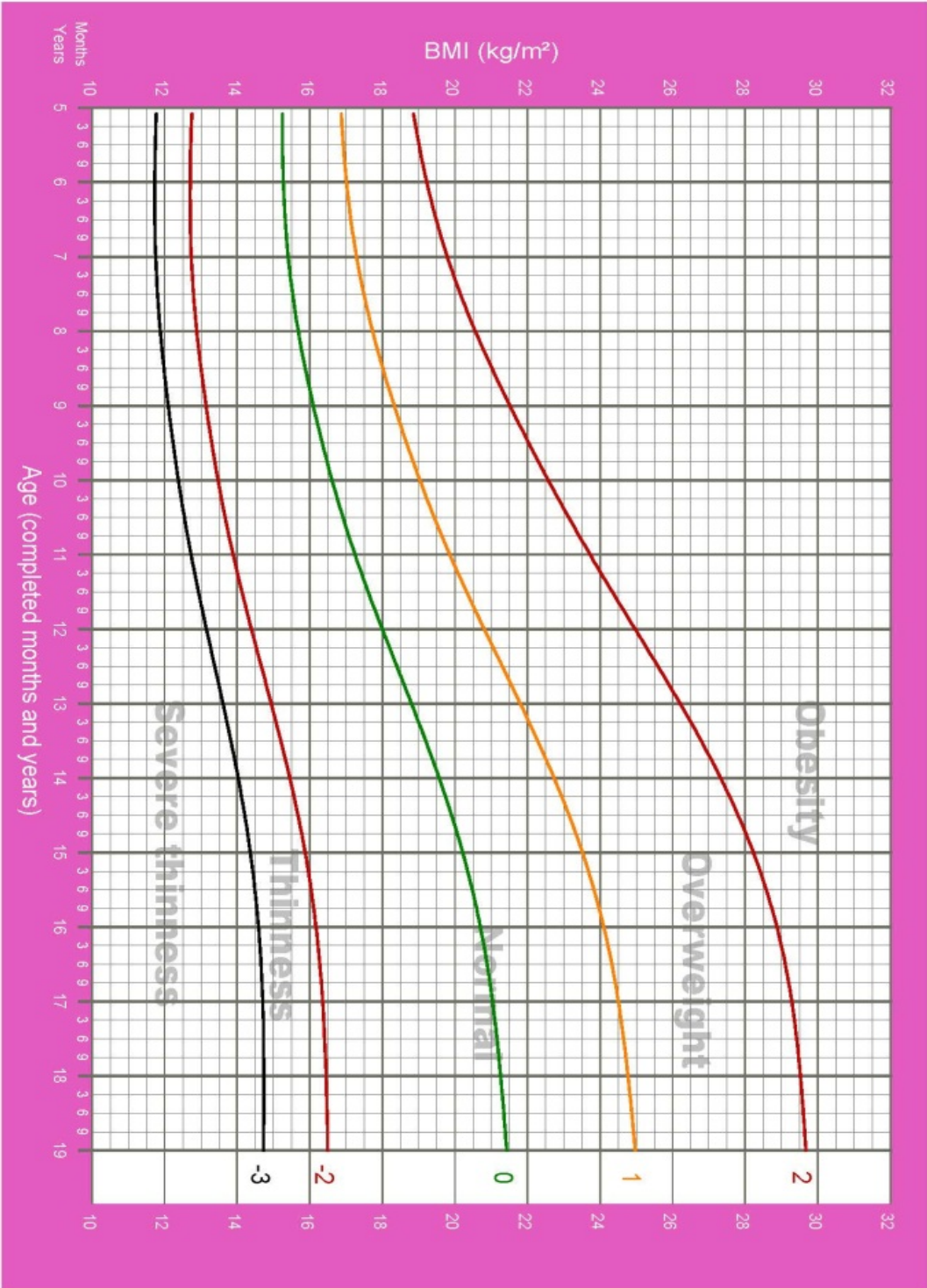
Women of childbearing age who elect to have weight reduction operations must use secure birth control methods during the period of rapid weight loss. They should be informed that maternal malnutrition may impair normal fetal development. This is particularly important to those who may have previously failed to conceive, since fertility may increase following weight loss.

Indeed, failure to conceive in the face of morbid obesity is yet another positive indication for weight loss surgery. Women who become pregnant after these surgical procedures need specific attention from the surgical care team. However, there are several reports in the literature of pregnancy outcomes following gastric bypass without evidence of fetal impairment

Annex Five
BMI (Age 5 – 19)

BMI-for-age GIRLS

5 to 19 years (z-scores)

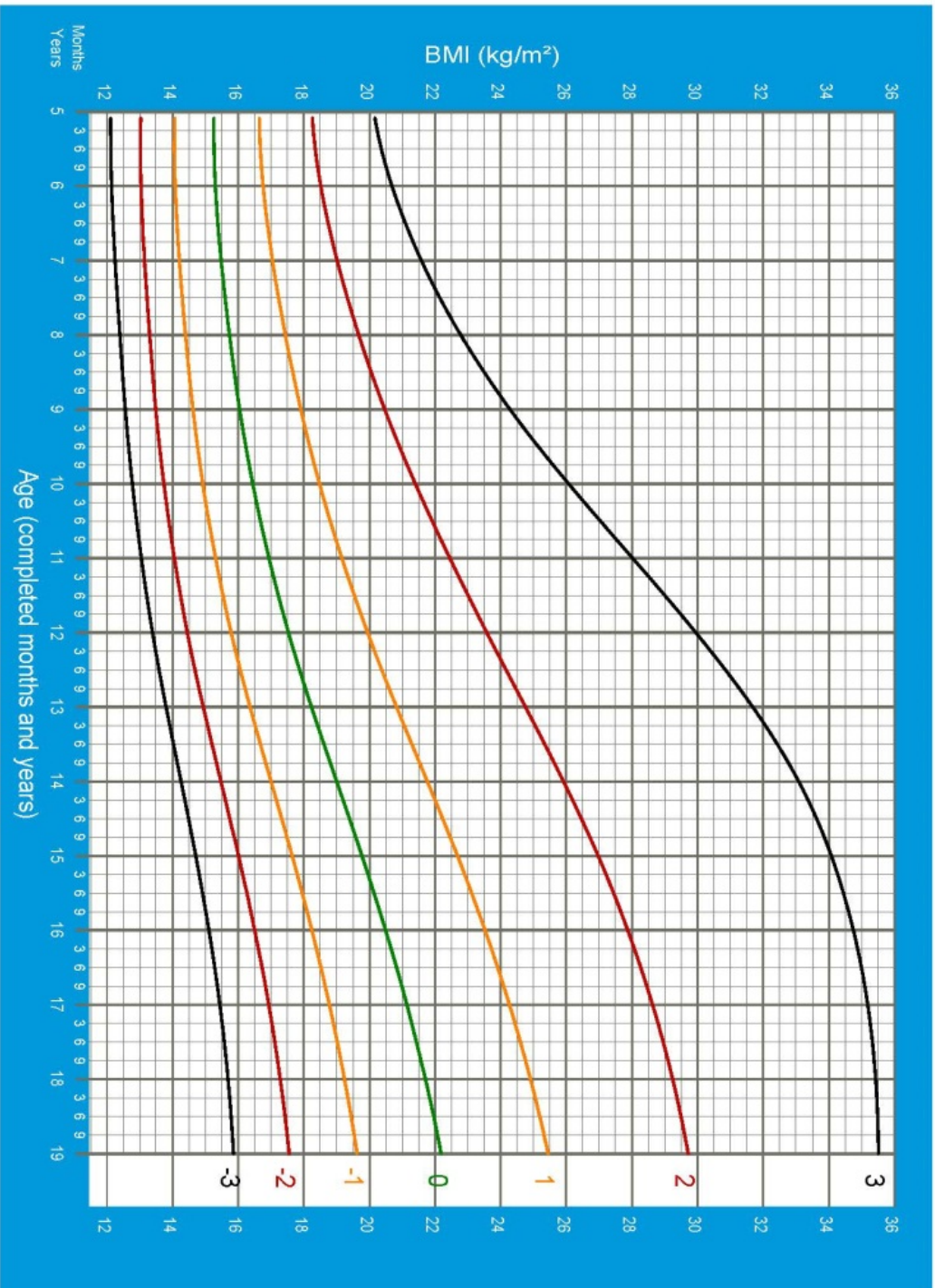


2007 WHO Reference



BMI-for-age BOYS

5 to 19 years (z-scores)



2007 WHO Reference

Annex Six

Performance Checklist:

Task	Achieved?		Comments
	Yes	NO	
1. Obesity Assessment			
Height			
Weight			
Body Mass Index			
Waist Circumference			
2. Co-morbidity assessment (where indicated) and risk factor			
Blood pressure			
Fasting plasma analysis <ul style="list-style-type: none"> • Glucose • Cholesterol • Insulin 			
Liver function tests			
Endocrinology tests			
Reproductive morbidities			
3. Risk factor assessment			
Is there a history of overweight in the family			
Is there history of overweight in the individual			

Family, work and social environments			
4. Assess why and how energy imbalance has occurred			
Organized meals times			
Always hungry			
More than three snacks between meals			
Eating in front of TV			
Is food used as a comfort or reward?			
smoking			
Psychological issues			
Stress			
5. Determine the level of intervention required with treatment strategy and goals.			
- Was advised to			
Reduce dietary energy intake			
Increase planned and lifestyle activity			
Decrease sedentary behavior			
Refer to specialist			
6. Follow up to maintain weight loss			
The changes in the diet are sustainable			
Regularly monitor the weight			

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