

Management of the Obese Patient



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Introduction/Purpose Statement

According to the National Center for Health Statistics, more than 60 percent of adults in the United States are considered to be overweight or obese.^(1,1) A sizable number of these adults are morbidly obese or bariatric, leading to a number of medical and nursing challenges. Bariatrics is a field of medicine that studies obesity; its causes, prevention, and treatment.

The purpose of this home study packet is to define obesity using current guidelines, look at health problems that can occur (especially in relationship to the ICU environment), give some tips on how to manage the nursing care of these patients, and briefly review common bariatric surgery procedures.

Target Audience

This home study was designed for health care professionals with little to no familiarity with management of the obese patient.

Content Objectives

1. Define the terms overweight, obese, and morbidly obese.
2. Identify health conditions common to those who are overweight.
3. Describe nursing interventions specific to the obese patient.
4. Identify common bariatric surgical procedures.

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The Size of the Problem

The National Institutes of Health define being overweight as a body mass index (BMI) of 25 to 29.9 kg per m². (2,10) BMI describes the relationship between height and weight and is calculated using one of the two formulas below:

$$\text{BMI} = \frac{\text{Weight in kilograms}}{\text{Height in meters squared}}$$

$$\text{BMI} = \frac{\text{Weight in pounds} \times 703}{\text{Height in inches squared}}$$

With BMI, the higher the number, the more weight there is for that given height. Obesity is defined as a BMI of 30 or more and morbid obesity as a BMI more than 40. (3,1) The term bariatric most often refers to the study and care of patients who are morbidly obese, with a BMI more than 40. If you are wondering where you stack up in all this, a Body Mass Index Chart is provided in the appendix.

As you've heard in the media, obesity rose dramatically during the late 1990's for Americans of all ages. (17,1) The data show that 31 percent of adults 20 years of age and older (nearly 59 million people) have a BMI of 30 or more, compared with 23 percent in 1994. (17,1) The prevalence of overweight children and adolescents has also risen. Children who are at or above the 95th percentile of their BMI for age according to the CDC growth charts are considered overweight. (1,1) Ten percent of preschool children (2-5 years of age) are overweight (up from 7 percent in 1994), and 15% of children and teens (6-19 years of age) are overweight according to 1999-2000 data (nearly triple the rate from 1980) (17,2) This is concerning because overweight children often grow up to be obese adults and obese adults are at risk for significant health problems. (17,2) Researchers at the 2003 American Heart Association's Scientific Sessions reported that about 1 in 8 school children have 3 or more risk factors of the metabolic syndrome, a precursor of cardiovascular disease. (20,1)

Obesity does not strike everyone equally. In adults, more women are obese (33%) than men (28%), with the problem greatest among non-Hispanic black women (50%) compared to Mexican-American women (40%), and non-Hispanic white women (30%) (17,2) There was no significant difference in obesity rates among

men based on race/ethnicity. In children ages 6-11 years, more Mexican-American (24%) and non-Hispanic black (20%) children are overweight compared to non-Hispanic white children (12%). By adolescence, more non-Hispanic black and Mexican-American children (24%) are likely to be overweight than non-Hispanic white adolescents (13%). (17,2)

What all this means is that no matter what type of client you serve in the health care community, obesity is a significant problem.

Assessment of Risk

What's the big deal about obesity, you might ask. Being overweight or obese substantially increases the risk of morbidity from hypertension; dyslipidemia; type-2 diabetes; coronary heart disease; stroke; gallbladder disease; osteoarthritis; sleep apnea and respiratory problems; and endometrial, breast, prostate, and colon cancers. Higher body weights are also associated with an increase in all-cause mortality. (2,1)

When assessing risk in your clients, there is more to worry about than the degree of obesity. It is necessary to also look at overall health status and the waist circumference. Excess abdominal fat is an important, independent risk factor for disease. Central obesity (excessive fat tissue around the abdomen) ties into the whole concept of metabolic syndrome. Metabolic syndrome is a cluster of disorders that increase the likelihood of developing diabetes, heart disease, peripheral vascular disease, or a stroke.

Central Obesity (high waist circumference)

Waist circumference is a useful tool to use in patients who are categorized as normal or overweight, but adds little to the predictive power of the disease risk classification of BMI in individuals with BMIs \geq 35 kg/m². Men who have a waist circumference more than 40 inches and women more than 35 inches, are at greater risk for diabetes, dyslipidemia, hypertension, and cardiovascular disease. Individuals with a waist circumference above these values should be considered one risk category above that defined by their BMI (see figure 1).

Overall Health Status

Some types of diseases or conditions associated with obesity place patients at a high risk of mortality and require aggressive treatment. Established coronary

heart disease (or other atherosclerotic disease), type-2 diabetes, and sleep apnea all increase a patient's risk of death. Osteoarthritis, gallstones, stress incontinence, and gynecological abnormalities such as amenorrhea and menorrhagia also increase risk but are not life-threatening. Risk factors such as hypertension, cigarette smoking, high low-density lipoprotein cholesterol (LDLs) and low high-density lipoproteins (HDLs), impaired fasting glucose, and a family history of early cardiovascular disease, and age (male ≥ 45 years and female ≥ 55 years) also create a high absolute risk in the obese patient. The following table is offered as a way of classifying risk, according to the NIH. (2,10)

Figure 1: Classification of Overweight and Obesity by BMI, Waist Circumference, and Disease Risk*

	BMI	Obesity Class	Disease Risk* (relative to normal weight and waist circumference)	
			Normal waist circum.	High** waist circum.
Under-weight	<18.5		-	-
Normal	18.5-24.9		-	***
Over-weight	25-29.9		Increased	High
Obesity	30-34.9	I	High	Very high
	35-39.9	II	Very high	Very high
Extreme Obesity	≥ 40	III	Extremely high	Extremely high

*Disease risk for type-2 diabetes, hypertension, and cardiovascular disease
 **Waist circumference >40 inches in men and >35 inches in women
 ***Increased waist circumference can also be a marker for increased risk even in persons of normal weight (Source: NIH)

Metabolic Syndrome

Metabolic syndrome is a term used to describe a group of disorders of your body's metabolism that make you more likely to develop diabetes, heart disease, peripheral vascular disease, or a stroke. These disorders include:

- Central obesity (waist circumference more than 40 inches in men and more than 35 inches in women)
- Blood fat disorders (mainly high triglycerides and low HDL's)
 - ◊ Fasting triglycerides 150 mg/dL or more
 - ◊ Blood HDL cholesterol less than 40mg/dL in men and less than 50 mg/dL in women
- Elevated blood pressure (130/85 mmHg or higher)
- Improper use of insulin or blood sugar (insulin resistance or glucose intolerance)
 - ◊ Fasting glucose 110 mg/dL or more
- Prothrombotic state (high fibrinogen or plasminogen activator inhibitor [-1] in the blood)
- Proinflammatory state (elevated high-sensitivity C-reactive protein in the blood)

While each of these disorders is a risk factor in itself, the combination of the disorders greatly increases the chance of potentially life-threatening illnesses. While this cluster of disorders is not new (formally known as syndrome X, the deadly quartet, and insulin resistance syndrome), it is becoming increasingly common. It's estimated that 47 million U.S. adults have it. (18,1) The underlying causes are thought to be lack of physical activity, being overweight/obese, and genetic factors.

The Critically Ill / Injured Obese Patient

Robert is a 30 year-old male with a history of hypertension and depression. At a height of 70 inches and a weight of 400 lbs., Robert is well above a BMI of 40. Robert has been involved in a motor vehicle accident. The main problem the ambulance crew is having at the moment is just getting Robert from the scene to the hospital. The ambulance crew is not only having trouble extricating and moving Robert, but they cannot get a cervical collar on him to stabilize his neck. Robert is tachycardic, tachypneic, diaphoretic, and in pain.

Once Robert reaches the emergency room, the problems posed by his size will continue to challenge staff. Equipment won't fit, moving him will be a challenge, "road trips" for testing and unit transfers will be risky, and obesity will complicate his treatment in a myriad of ways. What can be done to give Robert the quality care he deserves? What

potential problems/complications should we be on the lookout for?

Airway Management

Airway management problems in obese patients can be extremely difficult. They tend to have large, immobile necks, are prone to obstruction, and are difficult to intubate. The first intubation attempt should be made by the most experienced person available, working under optimal conditions whenever possible. It is a good idea to have back-up help present. Each subsequent attempt to intubate will worsen swelling and cause airway trauma, making it harder to visualize the area and insert the endotracheal tube.

Be sure to have a properly fitted mask available and the ability to mask ventilate, if intubation should prove difficult or impossible (i.e., *before* sedation and paralysis deprives the patient of the ability to breathe on their own). Facial anatomy, increased soft tissue mass, and a large tongue may all make bagging by mask difficult. Alternative “rescue” airway devices such as a Laryngeal Mask Airway (LMA) and fiber-optic laryngoscope/bronchoscope should be close at hand in case they are needed.

Be conscious of the fact that percutaneous cricothyrotomy or surgical tracheostomy may be very difficult due to additional tissue in the neck area. It is hard to identify landmarks and there is an increased likelihood of false passage of the tracheostomy tube into other planes of tissue. Once intubated or trached, stabilization of the tube will be very tricky (especially tracheostomy tubes). Be extremely careful when turning or moving the patient to prevent accidental extubation.

Many patients who are obese also suffer from obstructive sleep apnea (either diagnosed or undiagnosed). Patients may need CPAP or BiPAP to keep their airways open. If the sleep apnea has not been treated or was not identified early on, the patient may have pulmonary hypertension and right-sided heart failure as a result.

Pulmonary Issues

The lungs and airways didn’t grow in size or function as the patient’s weight increased. In simple obesity, respiratory resistance is 3 times normal and compliance is half of normal. (4,104)

This doubles the work of breathing. The ventilatory drive changes to meet the demands of breathing by shifting to a higher respiratory rate and a smaller tidal volume. The bariatric patient is even more impaired, with a respiratory resistance 8 times normal and a work of breathing 4 times normal.(4,104) A “normal” respiratory drive may not be adequate to meet demand and can eventually lead to retention of CO₂. It may be “normal” for a bariatric patient to have resting hypoxia and hypercarbia. These patients are on the edge to begin with and have no reserves to draw on if there is an insult to the pulmonary system.

Respiratory expansion is restricted in the bariatric patient by the weight of the chest wall. An enlarged abdomen presses up on the diaphragm, restricting its movement and crowds the thoracic cavity. This causes a reduction in functional residual capacity, a reduced expiratory volume, and ventilation is diminished at the lung bases causing a ventilation-perfusion abnormality with arterial hypoxemia, especially when in the supine position. (7,1995) The mechanics of breathing are further impaired by fat deposits in the diaphragm and intercostal muscles (.6,86; 7,1995) All of these make the bariatric patient more susceptible to rapid desaturation and progression to respiratory failure. Monitor the patient closely for fatigue of respiratory muscles and becoming somnolent—it could be a sign of hypercapnia. Pulse oximetry may be used post-surgically for the first 24 hours or if the respiratory status of the patient is unstable.

A vigorous pulmonary toilet that encourages coughing, deep breathing, and incentive spirometry is essential to prevent atelectasis and pneumonia. Pneumonia is poorly tolerated by the obese patient and should be avoided whenever possible. Raise the head of the bed 30-45 degrees to help reduce the pressure of the abdominal contents on the diaphragm. A 45 degree upright and reverse Trendelenburg position are usually better tolerated than a 90 degree upright or supine position. (3,4)

While proper pain management is necessary for the patient to be able to cough and deep breathe, patients must be awake to be able to perform the necessary pulmonary toilet. The goal is to have the pain controlled with the patient awake enough to cough and deep breathe and/or participate in cares.

Cardiac and Fluid Issues

Obese patients have a higher incidence of pulmonary hypertension and right-sided heart failure. Watch for

inotropic failure via PA catheter and echo. Fluid volume will need to be managed very carefully.

Be watchful for third spacing of fluids. Signs of decreased circulating volume are persistent tachycardia over baseline, decreased urine output, decreased blood pressure, and an increased need for oxygen.

Deep Vein Thrombosis and Pulmonary Embolism

All obese patients require prophylaxis for DVT early on. Obese patients are at a higher risk for DVTs because of the lack of mobility, stasis, and polycythemia related to chronic respiratory insufficiency. Administer low dose molecular weight heparin subcutaneously and apply sequential compression devices whenever the patient is at rest. If the patient has been immobile prior to their hospitalization, they should have venous leg studies prior to using compression devices. (13,109) Foot devices may provide a better fit and patient tolerance if the patient's calves and thighs are too big for more traditional equipment. Staff should prepare for getting the patient up and moving as soon as possible.

Pharmacological Issues

There is very little published research in the area of dosing regimens for obese patients. The question is, do you keep going up on the dosage because dosing is usually done in milligrams per kilogram? Or would it be better to use Ideal Body Weight (IBW) versus Total Body Weight (TBW) to figure medication dosages. The issue gets even more muddled when the patient is third spacing fluids, which is a problem in critically ill obese patients.

What is known is that the obese patient has a higher percentage of adipose tissue and a lower percentage of water and lean body mass and that medications will be absorbed differently because of this. Some drugs are lipophilic and distribute mostly in the adipose tissue (carbamazepine, diazepam, propofol, and opiate analgesics). Dosages of these types of medications tend to be calculated using TBW. Other drugs tend to distribute mostly in lean muscle (acetaminophen and digoxin) and are usually dosed using IBW. (6,88) Some medications may be dosed using an Adjusted Body Weight (ABW) calculation. Medications that use an ABW calculation are those that appear to have an increased

distribution pattern because of the excess weight (presumed to be about 20-50% of the excess weight). This means that these types of drugs tend to spread out more in the body when there is excess weight. The recommended calculation to make the ABW is:

$$\text{Adjusted Body Weight} = (\text{TBW} - \text{IBW}) \times 0.4 + \text{IBW} \quad (5,19)$$

Here are some recommendations for a few selected medications frequently used in the ICU setting:

Opioids

Like any other patient, factors such as severity of the pain, ventilatory support, age, underlying illness, etc. will all impact analgesic requirements. While there is some evidence that obese patients may require smaller morphine-equivalent doses to relieve pain due to increased endogenous opioid concentrations, there is wide variability in requirements. (5,20) Dosing of opioids should be based on the pain assessment. The best approach is to give smaller IV doses frequently (every 10-15 minutes) until the pain is controlled at the right level. For continuous IV infusions of opioids, rate increases can be determined by frequent pain assessments. If an intermittent schedule is desired, there must be additional orders written for breakthrough pain.

Heparin

There is no consensus on whether to use unfractionated or low molecular weight heparin (LMWH) and little information about how to dose them in morbidly obese patients. Recommendations are that obese patients receive early prophylaxis for deep vein thrombosis (DVT) and pulmonary embolism, and that the regimen should err on the side of using the higher end of the range for initial dosing of heparin. Institutions may choose to cap dosing at a certain weight or use an adjusted weight that mimics plasma volume for the initial loading and maintenance infusion. Adjustments can be made after the initial dosing by following the appropriate labs (APTT or anti-Xa). (5,21)

Antibiotics

Recommendations for antibiotics are specific to the type of medication. In general, it is recommended that aminoglycosides (gentamycin, tobramycin, amikacin) be avoided to reduce the likelihood of ototoxicity and nephrotoxicity that can come with their use. If an aminoglycoside is indicated, there are 2 dosing options recommended, assuming that renal function is normal (5,24):

1. Use an adjusted body weight with a 12 hour dosing interval. This would provide a good concentration-killing effect while avoiding the high doses that would be necessary with once a day dosing.
2. Use an adjusted body weight together with once a day dosing but limit the total daily dose. This method takes advantage of the concentration-dependent killing effect, but may sacrifice a portion of the high peak concentration.

Either of these dosing regimens require therapeutic drug monitoring if therapy is given for more than 3-5 days.

For penicillins, cephalosporins, and quinolones, it is suggested that dosing be at the higher end of recommended treatment ranges—especially in morbidly obese patients that have severe infections. Cefazolin, particularly, should be given in higher doses for surgical prophylaxis. (5,24)

Sedatives

Recommendations vary as to whether total body weight (TBW) or ideal body weight (IBW) should be used as the basis for dosing. There is agreement that it is preferable and safer to use a series of “mini loading doses” or an infusion rather than a single IV dose, and to titrate to the desired effect.

Anesthetics

Patients that have received anesthesia are at risk for “resedation.” Because most anesthetics are lipophilic, patients may “resedate” when the anesthetic is released from the fat cells into the bloodstream. (13,107)

Oral and Transdermal Medications

Dosing and administration schedules of oral and transdermal medications may also need adjustment. (6,88) Bariatric patients often have a lower gastric pH, which may alter the absorption of medications. Cutaneous tissue is not perfused as well in the obese patient because adipose tissue is less vascularized. Absorption rates for medications are based on persons of average weight. Subcutaneously given drugs may also be absorbed inappropriately. Dosages may need to be increased because they are less well absorbed,

or the drug may need to be given more frequently.

General Guidelines

There are many other medications given in the ICU setting and few of them have been studied sufficiently in morbidly obese patients to make any firm recommendations. Because most studies exclude morbidly obese subjects, there is a lack of information available about patients that are more than 135 kg. Some institutions elect to cap dosing at a weight of 135 kg. for this reason.

Because the dosing calculation will vary depending on how the drug distributes in the adipose and lean tissues of the body, you should consult your pharmacist for dosing recommendations in bariatric patients.

Physical Assessment

When listening for breath sounds in the bariatric patient, be sure to displace skin folds over the area you are listening to, place the diaphragm of the stethoscope firmly on the spot, and have the patient inhale deeply. Auscultation is most effective in spots where the lung tissue is closest to the chest wall. Be sure to listen over dependent areas of the lung where fluid is more likely to collect.

Heart sounds can be heard more readily over the aortic and pulmonic areas to the left or right of the sternal border at the 2nd intercostal space, or listen with the patient in a left lateral side-lying position. Bowel sounds may take longer to detect.

Be sure to use the correct cuff sizes on the blood pressure cuff. The width of the cuff should be 40-50% of the arm’s circumference. The cuff should be long enough for the bladder to go around the arm almost completely (80% of the arm circumference).

Nutrition

When a bariatric patient enters the ICU, the temptation is to place them on an immediate, strict diet to try to take some pounds off. While weight reduction is a good goal, proper nutrition is essential for healing. Bariatric patients in the ICU should have a comprehensive assessment of their nutritional status as they are often protein deficient. (6,86)

While weight loss during a critical illness is usually not recommended, carefully controlled weight loss in the bariatric patient may be beneficial in certain instances. (3,3) In patients who are not critically ill, short periods of permissive underfeeding have been

associated with lower rates of infection and reduced insulin requirements. (3,3) A dietitian's expertise is necessary to prepare the nutritional formula and help manage the permissive underfeeding.

Solving Practical Problems

Nurses in the ER do not currently have a bed big enough to accommodate Robert. They improvise by strapping two gurneys together while they wait for a special bed to arrive. This will make it difficult to transport Robert because most doors and elevators do not allow for double-width. The wheels also need to be aligned so they track correctly. The first problem they encounter is getting a weight, as the scale cannot handle someone Robert's size. The alternative is to order an oversized bed with weighing capability or to take Robert to the loading dock to use the freight scale. The doctor would like a CT but Robert is too big to fit in the scanner. The nurse must use a thigh cuff on Robert's arm to get a blood pressure. A Doppler probe is brought to the bedside because the nurse and doctor both have had no success in placing an IV due to the excessive subcutaneous fat.

As you can see, all kinds of practical problems need to be solved with a larger patient. Every hospital should have quick access to larger beds, preferably with weighing capability to 400 lbs. or more. A proper bed is the first step in being able to safely and comfortably move and care for a patient. If the patient cannot fit into the CT scanner, it may be necessary to transport the patient to a specialized radiology suite. If the patient is not stable enough to transport, practitioners will be limited to bedside exam and portable diagnostic equipment to aid diagnosis.

Road Trips

"Road trips" with the bariatric patient are inherently dangerous and need to be carefully planned whenever possible. Avoid after-hours movement of the patient to ensure adequate staffing. Be sure to call ahead to the receiving department and clearly communicate the patient's weight so that an adequate bed/table is available. Use a HoverMatt® or other transfer device. Constant presence of a Respiratory

Therapist is recommended for intubated bariatric patients when they are outside of their department.

Moving the Patient

While early mobilization is clearly a goal, it must be done safely—both for the sake of staff and the patient. Be sure that there is adequate manpower to move the patient safely. Usually 5 are needed to turn an intubated patient. Use an air mattress (HoverMatt®) for transfers and a lift for lifting the patient up off the bed. See if a bed/chair conversion is available from your equipment representative (see capital equipment list in the appendix).

Just moving the patient around in bed can be a challenge. It's always best to have adequate help when turning, ambulating, or moving an obese patient. Besides the obvious hazards of a patient falling or the caregiver injuring themselves, there is a risk that the patient will inadvertently dislodge wires, IVs, and/or catheters when they have to lurch around in bed to turn.

Go slowly and carefully with mobilization because the obese patient will be more sensitive to orthostatic changes and may have sensory neuropathies. Obese patients often have chronic back pain from increased load pressure, foot pain from flattening feet, and transient paresthesias of the arms from circulation impairment in the axilla. Stress fractures may be present, as well as degenerative joint disease. All can make ambulation difficult and painful. The gait is typically wide-based for balance, with a rolling motion. Arms are often held out from the body due to girth or paresthesias and the back is often arched to counterbalance the abdomen. Address the issue of pain management and assess the need for assistive equipment such as a quad-cane or walker. Consider ordering occupational and physical therapy consults for assistance with daily activities and ambulation.

Make sure the patient can stand with their own strength before ambulating. It is unlikely that staff would be able to help the patient if they start to fall. If a patient fall occurs, give them care on the floor until enough help arrives to safely get them up. Bring a strong footstool or chair nearby as a resting spot for the patient. If the patient is not able to help lift themselves, blankets or a stretcher can be used to lift the patient. If necessary, call emergency services, fire or ambulance crew for help in moving the patient. They have experience lifting and moving patients of all sizes.

Blood Specimens

Since obtaining ABGs may be difficult, a cannula should be placed if repeated sampling is expected. The arterial line will also provide a means for monitoring blood pressure. If it is impossible to get an ABG, respiratory status can be assessed by using pulse oximetry alone or combined with capnography (a close fitting mask is used to determine expired CO₂ levels). Venous or capillary sampling for blood gases can also be done. Venous sampling uses a different range of normal for the O₂ and CO₂ because a peripheral venous sample mostly reflects the skin and muscle extraction of oxygen. A venous sample is not a good reflection of a patient's oxygenation but will at least give insight into their blood pH. A capillary sample is generally only run on neonates but can, in a pinch, be done on an adult. A special heparinized tube will be needed to collect and run the sample and it should be iced after collection, just like an ABG.

If the patient does not have an access for drawing specimens and they are a difficult draw, be sure to check with the laboratory to see if capillary specimens or pediatric tubes can be sent for analysis. Most laboratories are capable of running these types of specimens.

Intravenous Access, LPs, and Injections

Subcutaneous fat can make it difficult to locate veins for cannulation. Ultrasonography may be needed to help find the veins. Tourniquets may not work well or may cut into the flesh if tied too tightly. Try using a large blood pressure cuff instead to more comfortably distend the veins. Choose cannula size carefully. Use a smaller cannula (22 or 24 gauge) whenever possible to spare veins for future use.

An external jugular line may be difficult to impossible to insert due to a short, thick neck. A longer cannula may be needed, which may make the line "positional." Try to minimize Trendelenburg's position during line insertion because it causes the abdominal contents to press against the diaphragm, restricting breathing. Supplemental oxygen may be needed.

Femoral vein access will be complicated by difficulty in locating landmarks, lifting the abdomen away from the operative site, and moisture/yeast infections in groin area.

Longer needles will be needed for injections and lumbar punctures. It may be necessary to conduct lumbar puncture with the patient safely braced in a sitting position. Remember that the "opening pressure" measurement is not valid from a sitting position.

Medications given by IM injection often miss the muscle in bariatric patients because the needle is too short. A standard 1-1.5 inch needle is generally too short. Either use a longer needle or change the route of administration.

Toileting

Stress incontinence is a common problem for bariatric patients due to increased intra-abdominal pressure. Difficulty getting out of bed can magnify this problem. Wall-mounted toilets may not be able to support the weight of the patient and standard commodes are too small. Patient rooms for obese patients should have floor mounted toilets or an extended size commode should be ordered. Be aware that the patient may need assistance with cleansing the perineal and perianal area. These areas are very difficult for the patient to reach. Occupational therapy can offer devices to assist with bathing and cleansing.

Catheterizing, or even applying a condom catheter, can be difficult in the bariatric patient. Suprapubic adipose tissue may need to be retracted in male patients (either by an assistant or by using tape) in order to visualize the perineum. It may be necessary to use a portable light to be able to see the perineum and introitus in a female. The side-lying position with the upper leg flexed or lifted by an assistant can help with female catheterization. The drainage tubing may be relatively short and extension tubing may be needed to secure it properly. Tape adhesion can be a problem, too, due to warmth and moisture in the perineal area.

Skin Care

Skin care in the obese patient can be quite a challenge, but is extremely important. Obese patients have many skin folds and those folds hold onto moisture. Hygiene may be impaired because they cannot see or reach areas that need cleaning. Rashes are often found in the groin, perineum, axilla, breast area, and in large skin folds. These areas offer warm and moist conditions that encourage the growth of yeast and fungi. Carefully cleanse and dry all skin folds during bathing and toileting. Apply ointments as needed to areas where yeast and fungus is a

problem. For areas that are very difficult to dry, using a hairdryer on low may help. Powder applied to skin folds may help to reduce moisture and chafing. A fan may help to keep the patient cool and dry. The umbilicus may be deep and difficult to clean; gentle use of cotton swabs may help. The coccyx/ischial area is very vulnerable to skin breakdown and needs to be monitored carefully.

Cellulitis can be a problem in the obese patient due to poor circulation and/or in conjunction with diabetes. Patients may not be able to care for wounds themselves because they cannot adequately see and reach the affected area.

Daily inspection of the skin should include incisions, IV sites, pressure areas (gluteal, sacral, heel and the head), the abdomen, breasts, back folds, thighs, posterior neck, and perineal areas. Follow a rigid schedule of turning and re-positioning (including manual turning of the head) every two hours to prevent decubitus ulcer formation. Do not rely on a rotational mattress to do this for you. While specialty beds can be helpful, they do not provide enough movement to prevent ulcer formation. Assess that skin folds are clean and dry with each re-positioning. The back of the neck is often overlooked when an airway assistance device is in place—check this spot often as secretions can accumulate there. Be sure that lines and tubes do not get trapped in skin folds.

Vasopressors increase the likelihood of decubitus ulcer formation, so be especially watchful in these patients. Adipose tissue is poorly vascularized and may cause delayed healing of open wounds. Diabetes can compound the problem by increasing the incidence of infection and delayed healing. Watch for potential wound dehiscence due to high skin tension (increased adipose tissue and edema). An abdominal binder may help relieve tension on abdominal wounds and add support. Consult a wound or ostomy nurse for complex wound or skin care needs.

ICU Course

The ICU course for bariatric patients is often full of complications, setbacks, and challenges. It is also very difficult to predict how the patient will do.

Bariatric patients have a higher incidence of cardiac, pulmonary, and endocrine problems than non-obese patients. (7,1981) They are also more prone to have hypertension and sleep-related disorders, require more oxygen, a longer weaning time from mechanical ventilation, and a longer hospital stay. (7,1981-1982) Critically ill bariatric patients have a higher ICU mortality rate, and it is difficult to predict the outcome for these patients using conventional means. The APACHE II scoring system, which is used extensively to predict mortality in ICU patients, does not work well with bariatric patients. The predicted mortality of survivors is not statistically different from the nonsurvivors in bariatric patients. Neither the length of ICU stay nor duration of mechanical ventilation predicted in-hospital mortality to a significant degree. Multiple organ failure remains the best predictor of ICU mortality in the critically ill bariatric patient (7,1995)

Bariatric Surgery

There are literally thousands of treatments for obesity ranging from prayer to herbal medicine to diets to surgery. Many of us have tried these programs and, if the statistics can be believed, have struggled (usually unsuccessfully) to keep the weight off.

While the number of patients who are morbidly obese or bariatric, are low compared to the number of adults who are overweight or obese, it is estimated that 5 million people meet the criteria for clinically severe obesity. (8,86) Weight loss options for the bariatric patient are somewhat limited, with bariatric surgery being more effective in facilitating and maintaining weight loss.(8,86)

Bariatric surgery promotes weight loss by making the stomach smaller and delaying emptying of the stomach and/or by shortening or bypassing the small intestine, causing food to be poorly digested and absorbed. Patients selected for bariatric surgery usually have: (9,32)

- BMI of 40 or more (or BMI 35 or higher with comorbidities)
- Absence of a correctable cause for the obesity
- Absence of a major psychiatric disorder or history of substance abuse
- Are an adult with a long-standing history of obesity (5 or more years)
- Have been unsuccessful with weight loss using non-surgical means
- Able to follow the dietary and behavioral changes recommended post-surgically

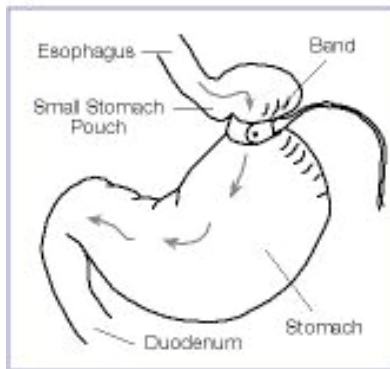
There are 4 main types of procedures that are performed:

- Laparoscopic Adjustable Gastric Banding (Lap-Band)
- Vertical Banded Gastroplasty (VBG)
- Roux-en-Gastric Bypass (RNYGBP)
- Biliopancreatic Diversion (BD)

Laparoscopic Adjustable Gastric Banding (Lap-Band)

The Lap-Band procedure restricts food intake by placing an inflatable silicone band around the upper part of the stomach, giving it an “hour glass”-shape.

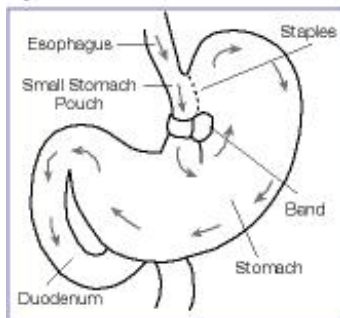
Figure 2



This produces a small upper stomach and a narrow passage to the lower stomach. This will cause an early and longer feeling of fullness, resulting in a smaller intake of food. The band can be inflated or deflated through an access port just under the skin. This will increase or decrease the diameter of the narrow passageway from the upper stomach to the lower stomach, which will directly impact the amount of food the person can consume. It is the least invasive bariatric surgery available and is completely reversible. However, it is a relatively new procedure and may not be covered by insurance.

Vertical Banded Gastroplasty (VBG)

Figure 3



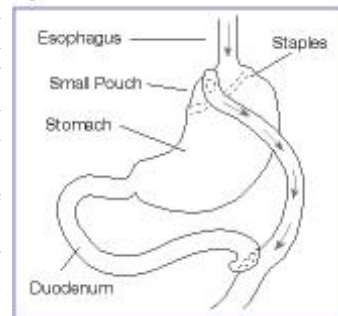
VBG restricts food intake by creating a small (30 ml capacity) pouch at the top of the original stomach. The smaller stomach

or pouch is made by using a circular stapling instrument. The circular stapling instrument simultaneously cuts a “window” in the stomach as it staples around the window to close it. The window is created to slip the band through. A vertical stapler is then used to staple vertically above where the window has been cut, forming a small pouch. The pouch initially holds about 30 ml or 1 oz. of food, but will slowly expand to hold 2-4 oz. over time. This procedure does not bypass or impair the stomach or small intestine so it does not result in vitamin or mineral deficiencies. The procedure also involves placing a band of either Marlex or Gore-Tex to make the passageway from the small upper stomach to the lower stomach narrow. This slows the rate of gastric emptying which helps the person feel full longer. A slightly different procedure places a silicone band to narrow the smaller stomach outlet into the lower stomach rather than the circular stapling with Marlex band (Siliastic Ring Vertical Gastroplasty).

Roux-en-Gastric Bypass (RNYGBP)

The RNYGB procedure, which can be done with a surgically opened abdomen or through laparoscopy, was developed in the 1960’s and is considered by many surgeons to be the “gold

Figure 4

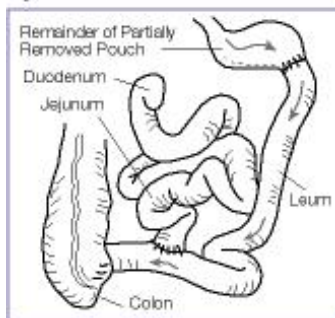


standard” to which all other procedures are compared. The surgery involves stapling of the stomach to restrict the intake of food. Most bariatric surgeons today will actually divide the stomach after stapling to reduce the risk of the staple line from breaking down or splitting.(10,94) Physically dividing the stomach causes a very strong seal to form along the staple line, much like a weld. The small intestine (jejunum) is then anastomosed to the smaller stomach. The anastomosis is deliberately made narrow to delay emptying of the small stomach pouch, which will prolong the feeling of fullness after eating. This anastomosis bypasses the distal stomach, duodenum, and proximal jejunum, causing a slight malabsorption of food. Because of this malabsorption, weight loss with RNYGBP is greater than with restrictive procedures but may cause nutritional deficiencies (especially iron, calcium, and vitamin B12). Taking a daily multiple vitamin to prevent nutritional deficiencies is part of the patient’s

postoperative self-care. Another problem that can occur with this procedure is dumping syndrome. Because the pylorus is bypassed, food can rapidly enter the small intestine from the small stomach pouch, pulling water into the intestine along with it. This propels food through the intestine more rapidly. The increase in peristalsis can cause diarrhea, nausea, abdominal cramping, rapid heart rate, sweating, and weakness or dizziness. Eating sugary foods is a secondary (and preventable) cause of dumping syndrome in patients with RNYGBP. Patients are discouraged from eating high calorie, sugary foods postsurgically.

Biliopancreatic Diversion (BPD)

Figure 5



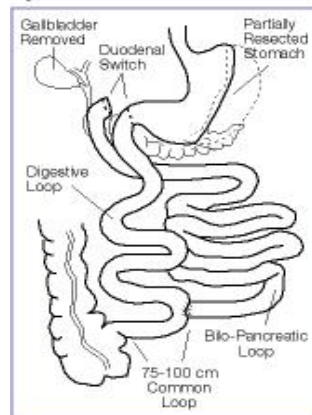
BPD is the most drastic of all obesity surgeries available and is rarely performed in the United States due to the serious long-term complications that can result and because a superior hybrid of this

procedure (Duodenal Switch or DS) exists. With BPD, 65-75% of the stomach is removed; intestines are rerouted and shortened so that 60% no longer carries food but only bile and pancreatic juices. This delays food mixing with digestive juices until the last 50-100 cm of small bowel—most fats and proteins don't have a chance to digest and pass through the colon undigested. This increases the possibility of losing more weight than with any other bariatric procedure.

Duodenal Switch

Duodenal switch (DS), a hybrid of the BPD procedure, involves disconnecting the small intestine between the pyloric sphincter and the common bile duct and reattaching it

Figure 6



close to the colon. The surgeon then cuts the small intestine to about 50-60% of its full length and attaches the lower end to the open end of the duodenum. This causes food to come in contact with digestive juices only a short way before it enters the colon. All sections of the intestines remain functioning; they are just rearranged and not removed. The stomach size is also reduced by removal of about 75% of the stomach along the greater curvature. An appendectomy and gall bladder removal are performed at the same time to prevent future surgeries. DS offers the advantage of greater weight loss through restriction and malabsorption like BPD, but preserves the pylorus and prevents dumping syndrome. By removing the greater curvature of the stomach where the majority of stomach acid is produced, the risk of developing a marginal ulcer is eliminated. The procedure is also functionally reversible by lengthening the bowel to absorb more calories.

Why Have Surgery?

After reading how invasive bariatric surgery is, one might wonder why a doctor would ever recommend it. When you look at the complications and self-care needed post-surgically (too many to cover here), one might wonder why anyone would agree to have it done, especially considering the high morbidity and mortality compared to other elective procedures. The answer lies in the obesity related conditions that can threaten the quality and quantity of life and the lack of other alternatives. Those that meet the criteria for surgery have tried other means to lose weight and the weight either did not come off or stay off. Bariatric surgery remains the most effective method for long-term weight loss. When the weight is lost, most obesity-related conditions abate or even completely resolve (most notably, Type 2 diabetes, obstructive sleep apnea, hypoventilation of obesity, gastroesophageal reflux, and peripheral edema). There is also usually an immediate reduction in the incidence of hypertension, but these benefits diminish over time. (11-booklet 7,7) The need for medications for diabetes, and cardiovascular disease may be reduced or even eliminated.

Psychosocial Issues

Providing compassionate emotional support for the bariatric patient and their families is essential. Keep in mind that the patient has experienced significant social disapproval prior to today. Obesity has long been associated with failure, laziness, lack of

willpower, low intellect, social ineptness, poor hygiene, and psychological dysfunction. These negative stereotypes cross all levels of age, education, and profession. (12,140) Persistent, strong, negative attitudes towards obesity occur even in physicians and nurses who *specialize* in the treatment of obesity. (12,140) These attitudes can be conveyed without conscious intention. It is not surprising that obese patients who receive medical care report embarrassment, humiliation, and insults. Some sources cite an increased incidence of depression and anti-depressant usage in the obese, other sources negate these differences. (12,140; 19) Most have tried to lose weight numerous times, without lasting success. Body language and facial expressions can easily transmit a nurse's discomfort in caring for the patient. Grunts and groans with patient transfers underscore to the patient the burden that they represent to their caregivers. Keep in mind that the intubated patient can still hear you. Bariatric patients often avoid regular medical care because the appointments involve being weighed and counseled about their weight and the lack of appropriately sized equipment. Many feel they are being judged harshly by those in charge of their care. Bariatric patients want to and should receive the same professional, respectful care as any other patient.

Conclusion

Obesity has become one of the most important public health issues worldwide, affecting both developed countries (Canada, United States, United Kingdom) and Third World areas such as Latin America, China, Asia, and Africa. (8,84) It affects both adult and pediatric populations and there are multiple reasons why the problem continues to grow (genetics, cultural influences, lifestyle, and environmental factors). Health care facilities and providers must become better equipped to manage obese patients. Hopefully this home study has helped to further your education in this area.

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References in the book have a two-number format. The first number indicates the source the information is taken from (as listed below). The second number indicates the page number where that information was taken from.

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Figures

- Figure 1: Taken from the National Institutes of Health website: www.nhlbi.nih.gov/guidelines/obesity/ob_ome.htm, page 10.
- Figures 2-6 Taken from the National Institutes of Health website: <http://win.niddk.nih.gov/publications/gastric.htm>, pages 3-6.

Appendix List

1. Body Mass Index Table NIH Website (reference 2), click on link.
2. Where to measure waist circumference, NIH (reference 2, pg 9).
3. Capital Equipment list, source: www.ormanager.com.

Appendix 1

Body Mass Index Table

for BMI greater than 35, go to Table 2 on next page

To use the table, find the appropriate height in the left-hand column labeled Height. Move across to a given weight (in pounds). The number at the top of the column is the BMI at that height and weight. Pounds have been rounded off.

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Height (inches)	Body Weight (pounds)																
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287

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Table 2: Body Mass Index for BMI over 35

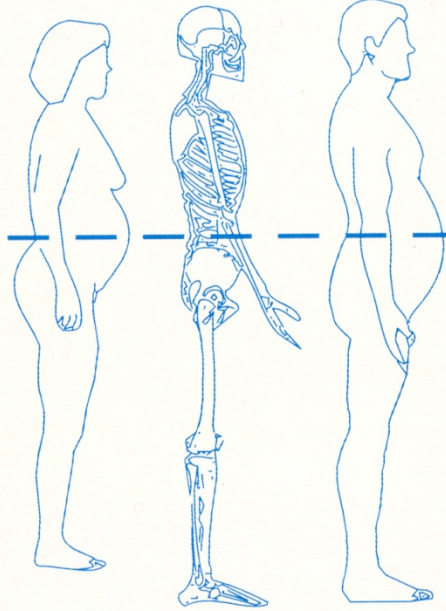
To use the table, find the appropriate height in the left-hand column labeled Height. Move across to a given weight. The number at the top of the column is the BMI at that height and weight. Pounds have been rounded off.

BMI	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Height (inches)	Body Weight (pounds)																		
58	172	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258
59	178	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267
60	184	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276
61	190	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285
62	196	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295
63	203	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304
64	209	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314
65	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324
66	223	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334
67	230	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344
68	236	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354
69	243	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365
70	250	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376
71	257	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386
72	265	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397
73	272	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408
74	280	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420
75	287	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431
76	295	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443

Appendix 2

Waist Circumference Measurement

To measure waist circumference, locate the upper hip bone and the top of the right iliac crest. Place a measuring tape in a horizontal plane around the abdomen at the level of the iliac crest. Before reading the tape measure, ensure that the tape is snug, but does not compress the skin, and is parallel to the floor. The measurement is made at the end of a normal expiration.



Measuring-Tape Position for Waist (Abdominal) Circumference in Adults

(Source: NIH, reference 2, page 9)

Appendix 3

Capital equipment related to obesity

Bariatric beds

Burke Bariatric

800/255-4147

www.burkebariatric.com

Tri-Flex II bariatric bed with 1,000-lb capacity has integrated scales and trapeze option.

Hill-Rom Company, Inc

800/445-3730

www.hill-rom.com

Magnum II bariatric patient care system holds patients up to 800 lb and functions as a bed, chair, and transport vehicle. Total Care bariatric bed system has a 500-lb weight limit.

Invacare

800/333-6900

www.invacare.com

Bariatric and heavy-duty products include beds, wheelchairs, lifts, slings, and trapezes.

KCI

210/255-6364

www.kci1.com

BariMaxx II bed system with pressure reduction environment for patients up to 1,000 lbs.

Bariatric bedside commodes

Gendron

800/537-2521

www.gendroninc.com

Bariatric shower and commode chairs, patient lifts, wheelchairs, beds, stretchers.

Bariatric patient transfer devices

Air Pal

800/633-4725

www.airpal.com

Inflatable patient transfer mattress creates less friction for moving patients.

Allen Medical Systems

800/433-5774

www.allenmedical.com

Products for bariatric patients up to 1,000 pounds (450+ kilograms) including long patient Transfer Boards.

HoverTech International

800/471-2776

www.hovermatt.com

Inflatable HoverMatt patient transfer mattress has no weight limit and can be used with x-ray and MRI.

Inventive Products Inc

800/336-6911

www.apc.net/ipi/slippinfo.htm

The Slipp is a two-layer vinyl patient transfer sheet that is not air powered.

KCI

800/275-4524

www.kci1.com

EZ Lift battery-powered electric patient lift/transfer system with 1,000 lb capacity.

Liko Inc

888/545-6671

www.liko.com

The UltraTwin FreeSpan patient lifting device for patients up to 880 lbs.

Bariatric scales

Scale-Tronix

800/873-2001

www.scale-tronix.com

Stand-on scale for patients up to 1,000 lb.

Bariatric stretchers

Steris Corporation

800/548-4873

www.steris.com

Hausted Horizon electric powered stretcher with extra wide litter top and pressure care mattress has 625-lb capacity

Stretchair

800/787-9537

www.stretchair.com

Combination wheelchair-stretchers for bariatric patients with capacities up to 1,000 lb.

Stryker

800/787-9537

www.strykermedical.com

Bariatric stretchers.

Bariatric surgical tables

Getinge USA

800/475-9040

www.getingeusa.com

Maquet Alphamaxx surgical table with 1000-lb patient weight capacity designed for patient ergonomics with full articulation in normal and reverse orientation.

Skytron

800/759-8766

www.skytron.us/

Hercules 6500HD bariatric/general purpose surgical table provides full body imaging capability for advanced procedures, including 1,000-lb lift, 850-lb articulation, and 180-degree top rotation. Optional table side extensions.

Steris Corporation

800/548-4873

www.steris.com

Bariatric table extensions for Amsco 3080/3085 SP surgical tables rated for patients up to 1000 lb.

Stryker

800/787-9537

www.strykermedical.com

Bariatric surgical tables.

Trumpf Medical Systems

843/534-0606

www.us.trumpf-med.com

Titan surgical table has a 1,000-lb capacity. It is fully articulated, modular, split leg, and mobile with complete longitudinal movement and extreme low-height adjustment.

Bariatric wheelchairs

Gendron

800/537-2521

www.gendroninc.com

The Regency XL 2000 wheelchairs hold patients from 600-lbs to 850-lbs and have seat configurations from 20 inches to 32 inches wide and from 18 inches to 22 inches deep. The chairs also are available in a bariatric recliner modes featuring power assist manual recline. Gendron also has bariatric beds, stretchers, shower and commode chairs, and patient lifts.

Wheelchairs of Kansas

800/537-6454

www.wheelchairsofkansas.com

Bariatric products such as wheelchairs, beds, lifts, and walkers.

Source: OR Manager, Inc. www.ormanager.com. 800/442-9918, used with permission.

Directions for Submitting Your Post Test for Contact Hours

To obtain a certificate of completion for this home study program, please complete the post-test and evaluation on the next few pages. The date on your certificate of completion will be the date that your home study is received. **Any materials received with a postmark after the expiration will be discarded.**

HealthEast, HCMC, & MVAMC Employees

If you are an employee of HealthEast, HCMC, or MVAMC, you may send the post-test and evaluation to TCHP for processing. Your post-test will be returned to you through your hospital. It cannot be mailed to your home.

Paid Participants

If you are not an employee of one of the TCHP hospitals, please send the post-test and evaluation to TCHP with a check for \$12.00. Please make check payable to **TCHP Education Consortium** and mail to:

**TCHP Education Consortium
Capitol Office Building
525 Park Street, Suite 120
St. Paul, MN 55103**

Your post-test will be returned to you with the certificate of completion.

Management of the Obese Patient Post- Test

Please print all information clearly and sign the verification statement:

Name _____
(please print legal name above)

Birth date (required)

Format: 01/03/1999

M	M	D	D	Y	Y	Y	Y

For HealthEast, HCMC, or MVAMC, employees only:

Hospital _____ Unit _____

Personal verification of successful completion of this educational activity (required):

I verify that I have read this home study and have completed the post-test and evaluation.

Signature

- 1) Morbid obesity is defined as:
 - a) BMI more than 40
 - b) Greater than 40 lbs. overweight
 - c) Waist circumference more than 40
 - d) Death caused by being overweight
- 2) The term bariatric refers to:
 - a) A field of medicine that studies obesity
 - b) A patient who has taken barium in x-ray
 - c) The study and care of patients who are morbidly obese.
 - d) Both A & C
- 3) Obesity increases the risk of morbidity from all of the following *except*:
 - a) Type-2 diabetes
 - b) Osteoarthritis

- c) Bunions
 - d) Coronary artery disease
- 4) Waist circumference is a useful tool to measure in people who are:
 - a) Normal weight
 - b) Overweight (BMI <35)
 - c) Morbidly obese
 - d) Both A & B
 - e) All of the above
- 5) The metabolic syndrome is a term used to describe a group of disorders including:
 - a) HDLs more than 40 mg/dL
 - b) Low blood sugar
 - c) High waist circumference
 - d) All of the above
- 6) Which statement about airway management in the obese patients is false?
 - a) Bagging by mask may be difficult
 - b) A tracheostomy will make it much easier to manage the patient's airway
 - c) Obstructive sleep apnea is a common problem
- 7) Which statement about medications in the obese patient is false?
 - a) Obese patients who have had anesthesia are at risk for re sedation
 - b) Opioids and sedatives should be titrated to the desired effect
 - c) Dosing is always done in mg/kg

Expiration date: The last day that post tests will be accepted for this edition is **December 31, 2017**—your envelope must be postmarked on or before that day.

Management of the Obese Patient Evaluation

Please complete the evaluation form below by placing an "X" in the box that best fits your evaluation of this educational activity. Completion of this form is required to successfully complete the activity and be awarded contact hours.

At the end of this home study program, I am able to:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Define the terms overweight, obese and morbidly obese.					
2. Identify health conditions common to those who are overweight.					
3. Describe nursing interventions specific to the obese patient.					
4. Identify common bariatric surgical procedures.					
5. The teaching / learning resources were effective. <i>If not, please comment:</i>					

The following were disclosed in writing prior to, or at the start of, this educational activity (please refer to the first 2 pages of the booklet).		
	Yes	No
6. Notice of requirements for successful completion, including purpose and objectives		
7. Conflict of interest		
8. Disclosure of relevant financial relationships and mechanism to identify and resolve conflicts of interest		
9. Sponsorship or commercial support		
10. Non-endorsement of products		
11. Off-label use		
12. Expiration Date for Awarding Contact Hours		
13. Did you, as a participant, notice any bias in this educational activity that was not previously disclosed? <i>If yes, please describe the nature of the bias:</i>		

14. How long did it take you to read this home study and complete the post test and evaluation:
 _____ hours and _____ minutes.

15. Did you feel that the number of contact hours offered for this educational activity was appropriate for the amount of time you spent on it?
 ___ Yes
 ___ No, more contact hours should have been offered
 ___ No, fewer contact hours should have been offered.

Expiration date: December 31, 2017
