



## Association for Radiologic & Imaging Nursing

### POSITION STATEMENT

#### Bariatric Patient Safety in the Imaging Environment

#### Introduction/Problem Statement

The prevalence of obesity is increasing in the United States. According to the Centers for Disease Control and Prevention (CDC), in 2010, 72.5 million adults are obese. Obesity is a costly condition that can reduce the quality of life and increases the risk for many serious chronic diseases and premature death. The obese patient presents specific challenges within the imaging department because of the constraints of imaging technology design, weight limits, positioning limitations; potential respiratory depression related to sedative and analgesia medications combined with cardiac and respiratory system factors unique to the obese patient; and availability of instruments of appropriate length to target the identified lesion. Screening may reveal that anesthesia may be the most appropriate level of care to maximize safe and successful outcomes.

#### Rationale and Supporting Information

1. Levels of obesity are determined based on height and weight calculations to identify body mass index.
2. Weight categories based upon body mass index (BMI) are as follows:

< 18.5	Underweight
18.5-24.9	Normal
25-29.9	Overweight
> 30 -39.9	Obese
40 and above	Extreme obesity, also known as morbidly obese

3. Comorbidities, including diabetes, restrictive lung disease, chronic obstructive pulmonary disease (COPD), reactive airway disease, emphysema, hypoxemia, hypercapnia, gastroesophageal reflux disease (GERD), hypertension, sleep apnea, depression and anxiety

disorders, hypertrophic cardiomyopathy, and hypercholesterolemia, increase as the BMI increases and place the obese patient at higher risk of complications during and after procedures.

4. Changes in lung volumes and capacities may be relatively minor until BMI exceeds 40 kg/m<sup>2</sup>.
5. Morbidly obese patients have increased basal metabolic rate, causing an increase in carbon dioxide production and rate of total body oxygen consumption. These factors contribute to a more rapid oxyhemoglobin desaturation in the morbidly obese patient.
6. Obese patients, especially those with a BMI > 28 kg/m<sup>2</sup>, have a higher incidence of asthma.
7. Oxygen desaturation can decrease three times faster in the morbidly obese patient than in the normal weight person.
8. Chronic hypercapnia and increasing BMI are manifest in the Pickwickian syndrome, now referred to as “obesity-hypoventilation syndrome,” a state of chronic daytime alveolar hypoventilation characterized by a room air PaO<sub>2</sub><70 and PaCO<sub>2</sub>>45MMHg in obese patients BMI >30.
9. Thirty million Americans are estimated to have obstructive sleep apnea (OSA). Sixty to 90 percent of people with OSA have ≥BMI 30 kg/m<sup>2</sup>, which is seen as narrowing of the upper airway and loss of upper airway muscle tone.
10. Midazolam contributes to lung volume reduction that carries over into the post procedure phase. All central depressant medications lessen the action of the pharyngeal dilator muscles in the adult obese patient with OSA, thus leading to a reduction in pharyngeal lumen diameter. Opioids contribute to pharyngeal collapse and may also contribute to poor ventilator response to hypoxemia and hypercapnia.
11. Continuous positive airway pressure (CPAP) use at home indicates a need to continue this level of airway care during hospitalization.
12. Limitations of table weight and aperture diameter for fluoroscopy, computed tomography (CT), magnetic resonance imaging (MRI), and other techniques have constraint. Samples of limitations for each type of equipment include the following:

	Weight	Aperture	Diameter
CT	(and girth)	70 cm gantry	
MRI	≤350 pounds		>60 cm

MRI open	Up to 550 pounds (250 kg)	40-55 cm	
Fluoroscopy	350 pounds	45 cm	

13. Equipment needs for care of the bariatric patient include extra capacity wheelchairs and stretchers, ensure that doorways are large enough, straps for thigh and lower leg level to secure patient, pads for all pressure points, padding between the patient and any positioning device, larger gowns for modesty and comfort, and appropriately sized monitoring devices. Moving aids that minimize lifting such as the Hoyer lift or Hovermatt should be immediately available. Additional staff need to be available to ensure safe and smooth transfer from bed/gurney to table.

#### **ARIN's Position and/or Recommendation**

1. The care provider-nurse team share responsibility for the safe care of the bariatric patient undergoing diagnostic and interventional procedures in the imaging environment.
2. Clear, objective assessment criteria for patient limitations and co-morbidities must be identified and documented at the earliest opportunity to ensure optimal planning for safe and effective care in the imaging department. Such criteria would include presence of co-morbidities, ability of the patient to cooperate, girth and weight, and BMI.
3. Consultation with anesthesia providers should be made if co-morbidities and planned procedure dictate higher level of care for patient safety and best outcome.
4. All members of the imaging team require special education related to the needs of the bariatric patient and scheduling for particular procedures. Assessment of department equipment capabilities and imaging approaches to optimize techniques can lessen stress for patients who are already experiencing stress, both physical and psychological.
5. Pre-admit planning for the bariatric patient includes careful screening for co-morbidities, determining special equipment needs, and history of past procedural sedation. Pre-admit information should include height, weight, and BMI calculation, and girth measurement for CT or MRI to determine ability to fit.

## **Suggested Readings**

Association of periOperative Registered Nurses. (2004). AORN bariatric surgery guideline. *AORN Journal*, 79(5), 1026-1052.

Centers for Disease Control and Prevention. (2010). vital signs: State-specific obesity prevalence among adults – United States, 2009. *MMWR Morbidity and Mortality Weekly Report*, 59(30), 951-955. Retrieved August 4, 2010, from [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5930a4.htm?s\\_cid=mm5930a4\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5930a4.htm?s_cid=mm5930a4_w)

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