

Slide 1

Patient Care Issues of Obesity

Jeannean Hall Rollins, MRC, BSRT (R) (CV)
Associate Professor
Medical Imaging & Radiation Sciences Department
Arkansas State University

Slide 2

Focus

- Definition of obesity
- Statistics in the United States
- Patient care issues in imaging procedures

Slide 3

Obesity - Definitions

- World Health Organization (WHO) definition is the most widely accepted
 - Based on Body Mass Index (BMI)
- Sample chart from CDC below

Height	Weight Range	BMI	Considered
5' 9"	124 lbs or less	Below 18.5	Underweight
	125 lbs to 168 lbs	18.5 to 24.9	Healthy weight
	169 lbs to 202 lbs	25.0 to 29.9	Overweight
	203 lbs or more	30 or higher	Obese

Slide 4

Obesity - Definitions

- Grade 1 overweight (commonly termed **overweight**) is a BMI of 25-29.9 kg/m²
- Grade 2 overweight (**obesity**) is a BMI of 30-39.9 kg/m²
- Grade 3 overweight (**severe or morbid obesity**) is a BMI greater than or equal to 40 kg/m²

Slide 5

Obesity - Definitions

- The surgical literature has more defined categories for severe obesity
 - BMI greater than 40 kg/m² is described as **severe obesity**
 - BMI of 40-50 kg/m² is termed **morbid obesity**
 - BMI greater than 50 kg/m² is termed **super obese**

Slide 6

Obesity in Children

- The definitions for obesity in children* are:
 - Greater than the BMI for the 85th percentile = **overweight**
 - Greater than the BMI for the 95th percentile = **obese**

*Age and sex-matched control subjects

Slide 7

Statistics in the U. S.

- Research over the past decade have consistently called obesity a "pandemic" in the United States and other developing countries.
- "In 2007–2008, based on measured weights and heights, approximately 72.5 million adults in the United States were obese" (CDC, unpublished data, 2010).
- A 2009 study by the CDC demonstrated that obesity had increased 1.1 percent from 2007 data.
 - This study estimated the overall prevalence at 26.7%

Slide 8

Statistics in the U. S.

- Rates are based upon "self-reported" heights and weights
 - Men and women often overestimate their height
 - Women often underestimate their weight

Slide 9



Slide 13

Who Cares?

- Why I care?
 - This is my family
 - I want to insure the best possible care for them by future imaging professionals
 - I want my students to know how to protect themselves, as well.

Slide 14


Obesity Impact on Imaging

- Positioning accuracy
- Technical factors
- Image quality
- Safety issues
 - Transfers
 - Equipment weight/size limits
- Patient communication
 - Empathy

Limited educational resources available

Slide 15

Safety Issues - Transfers



Photos credit: Frank, E., Long, B. and Smith, B. (and Merrill's Atlas of Diagnostic Radiology & Procedures 6th edition) Monty/Charles M. Lurie

Slide 16

Safety Issues - Transfers

- *Merrill's Atlas* now recommends 8 to 10 persons for transfers of larger patients
- "Slider" boards are generally too narrow to be of much use
- Planning of the transfer should occur *away* from the patient's sight and hearing range
- Communicate the process to the patient before execution of transfer

Slide 17

Equipment

- Ranges from as simple as appropriately sized gowns to as complex as larger hospital beds
- Wheelchairs now equipped to hold 700-1000 pounds
 - Wider and deeper seat - up to 34 inches wide and 20 inches deep




Photo credit: [iStockphoto.com](#)

Slide 18

Equipment - Traditional Standards

Imaging Technique	Weight Limit	Maximum Aperture Diameter (cm)
Fluoroscopy	350 lb (159 kg)	45
4- to 16-MDCT	450 lb (205 kg)	70
Cylindrical bore MRI, 1.5-3.0 T	350 lb (159 kg)	60
Vertical field MRI, 0.3-1.0 T	550 lb (250 kg)	55

Table from AJR 2007; 188:433

Slide 19

Equipment – New Standards

Imaging Technique	Weight Limit	Maximum Aperture Diameter (cm)
Fluoroscopy	700 lb (317.51 kg)	60
16-MDCT	680 lb (308.44 kg)	90
Cylindrical bore MRI, 1.5 T	550 lb (250 kg)	70
Vertical field MRI, 0.3-1.0 T	550 lb (250 kg)	55

Table from AJR 2007; 188:433

Slide 20

- ### Communications
- Cannot overemphasize the importance of empathy
 - Eliminate references to patient's size
 - Planning should be done in advance of patient's arrival in a private location

Slide 21



Slide 22

Positioning Accuracy

□ Collimated field size visually misleading




Photo credit: Frank, L., Long, B. and Smith, B. (2016). Merrill's Atlas of Radiographic Positioning & Procedures, 12th edition. Mosby, Elsevier, St. Louis.

Slide 23

Positioning Accuracy



Image credit: [radiologyassistant.com](#)

Slide 24

Positioning Accuracy

□ Merrill's Atlas, 12th edition, provides new positioning guidelines for improving accuracy and increase patient comfort

□ These guidelines eliminate the need for prodding and probing for traditional landmarks

Slide 25

Positioning Accuracy

- The jugular notch is palpated as the top reference
- Based upon the patient's height, the symphysis is located at the following distances from the jugular notch:
 - < 5 ft: 21 inches
 - 5 to 6 ft: 22 inches
 - > 6 ft: 24 inches




Photo credit: Frank, Long, and Smith, (eds) Merrill's Atlas of Radiographic Positioning and Procedures, 6th edition, Mosby/Elsevier, St. Louis.

Slide 26

Technical Factors

- Lots of bad press recently on radiation exposure
 - We have to be our own advocates in demonstrating we are teaching appropriate patient care for all patient populations
- Use of the new positioning guidelines should increase positioning accuracy, resulting in:
 - Reduced repeats
 - Allow for optimum use of AEC
- Provide higher grid ratios
- Use as many of the detectors as the patient covers

Slide 27

Image Quality




Photo credit: Frank, Long, and Smith, (eds) Merrill's Atlas of Radiographic Positioning and Procedures, 6th edition, Mosby/Elsevier, St. Louis.

Slide 28

Suggestions for Implementation

- Educators are obligated to provide detailed instruction on how to effectively work with every patient population
 - The dialogue and comfort level regarding the special needs of obese patients must increase
 - Based upon population statistics in children, this patient population is going to be with us for decades to come
- Consider the AIDS epidemic of the 1980s – education was the key to improving the quality of care

Slide 29

Future Needs

- Research
 - Improved technology for safer, easier transfers
 - Image receptors and/or display algorithms that can "cancel out" fog in the same manner that subtraction images are obtained
 - Psychosocial studies on the impact of obesity on the person, family, finances, etc.

Slide 30

Questions

?
