

Critical /Progressive Care of the Patient with Obesity

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Critical Care Symposium-Putting New Evidence into Practice

Background

- Rochester, New York
- Rochester General Hospital (528) bed tertiary care hospital
 - 20 years of progressive/critical care experience.
 - Clinical Nurse Specialist
 - Patients with pulmonary disorders
 - Development of a clinical practice guideline for nursing care of the patient with obesity
- St. John Fisher College- Wegman's School of Nursing
 - Six Years Full-Time Faculty

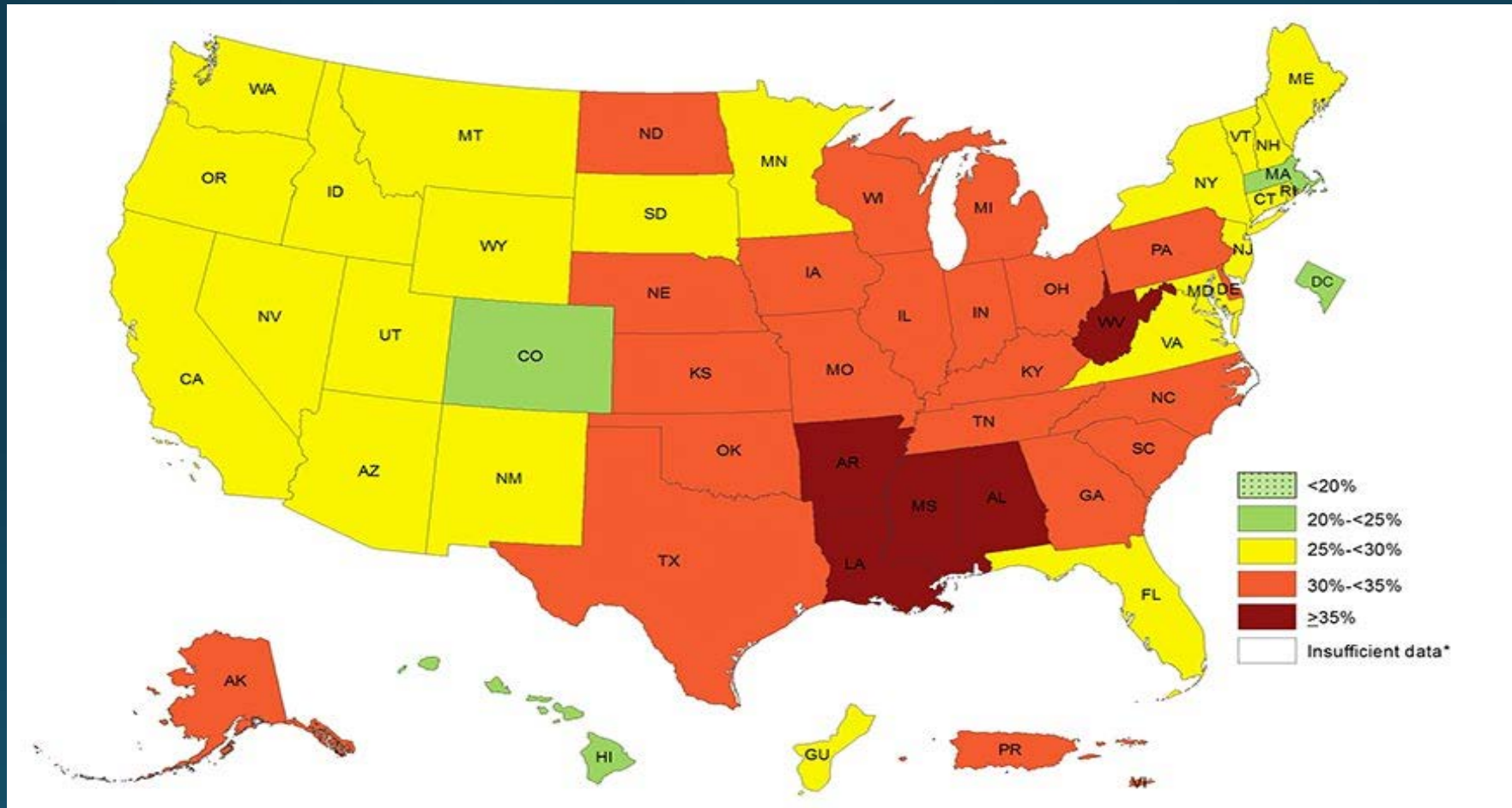


- Examine the magnitude of the obesity epidemic in the United States and U.S. hospitals
- Discuss the unique care needs of patients with obesity in progressive/critical care.
- Identify evidence based practice interventions to improve care.



Magnitude of Obesity

Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2016



(Centers for Disease Control and Prevention, 2017)

Magnitude of Obesity

1/3

- 36.5% of U.S. Adults
- \$147 billion annually/health care costs
- Health care expenditures of obesity exceed those of healthy weight individuals by \$3,559

Magnitude of Obesity in Acute Care

- 2004-2008: 4 million morbidly obese patients hospitalized in the United States
- In intensive/progressive care units 1 of 3 patients is obese

Magnitude of Obesity

- Patients with obesity have distinctive comorbidities that complicate their care
- Higher rates of resource utilization, ICU admissions, Respiratory failure



Obesity Paradox



- General population: chronic diseases increase risk of long term mortality when compared with normal weight patients
- Obesity Paradox: Lower mortality in the critically ill with increasing body mass index, conversely underweight individuals demonstrate the greatest risk of mortality
- Inconsistent Research surrounding subject

Needs of Patients with Obesity

- Obese patients admitted to the ICU have the potential for unstable clinical conditions
- Benefit from being monitored in progressive care units before transfer to a general medical care unit
- Multiple effects of obesity on all organ systems and possible obesity related complications require increased monitoring



Needs of Patients with Obesity

- Require Interprofessional Team to Manage Care
 - Physician
 - Specialty Consults
 - Respiratory Therapy
 - Wound Ostomy
 - APRN (Nurse Practitioner/Clinical Nurse Specialist)
 - Clinical Pharmacist
 - Clinical Nutrition
 - Social Work/Care Management
 - Physical Therapy
 - Occupational Therapy
 - Bedside Nursing
 - Unlicensed Assistive Personnel
 - Hospital System



Systems Approach with Evidence Based Inter

Pulmonary

Cardiac

Skin

Nutrition

Mobility

Diagnostics

Psychological Considerations/Stigma

Pulmonary

- Obesity may be a risk factor for difficult intubations.
 - Studies indicate that obesity is a risk factor, however a weak predictor
- **Recommendation:** Recommended method for bag mask ventilation and oxygenation prior to ventilation is position patient in a 25° semi-fowlers position or reverse Trendelenburg position
- **Recommendation:** Utilize the Difficult Airway Algorithm developed by The American Society of Anesthesiologists
 - Ensure backup emergency intubation is available on critical /progressive care units.

Pulmonary

- Mechanical Ventilation Settings:

Recommendation: Initial tidal volumes set to approximately 8mL/kg of PBW in most morbidly obese patients or 6mL/kg of PBW in morbidly obese patients with ARDS . Utilize standard formula for PBW or IBW

Recommendation: Plateau Pressures should be maintained at less than 30 cm H₂O

Recommendation: Addition of conservative levels of Positive End Expiratory Pressure (PEEP) may help with lung function, however higher PEEP levels should be avoided due to possible hemodynamic compromise

Pulmonary

- Early tracheostomy and reduction/termination of sedation may improve blood gas parameters and reduce ventilation pressures.
 - **Recommendation:** Consider early tracheostomy and weaning from sedation in obese patients
- Extubation and Weaning of obese patients may pose challenges due to co-morbid conditions
 - **Recommendation:** Early tracheostomy may improve overall weaning if patient is awake and alert and free from stress and discomfort of an endotracheal tube.
 - **Recommendation:** Utilize NIPPV to decrease the incidence of re-intubation
- Early tracheostomy may also reduce LOS in the ICU as the patient may transition to a progressive care unit.

Pulmonary

Pulmonary conditions associated with obesity:

- Obesity Hypoventilation Syndrome

- Obstructive Sleep Apnea

- Respiratory Failure

- Increase RR, Oxygen Consumption, Work of Breathing

Recommendations:

Non-Invasive Positive Pressure Ventilation during sleeping hours, include oxygen as needed , continuous oximetry during acute phase. Assessment includes ABG analysis and Pulmonary function testing.

Cardiac

- Significant changes in circulatory system including:
 - Increased Blood Volume and Viscosity
 - Increased risk for early atherosclerosis
 - Increased risk for MI, Stroke, Heart Failure, Hypertension, Ventricular Hypertrophy and Dysrhythmia

Recommendations:

Ensure appropriate monitoring equipment is available (Including accurate size blood pressure cuffs)

During activity and mobilization, heart rate and blood pressure should be closely monitored- due to the large increase in cardiac workload

Cardiac

Increased risk for VTE- Every 10 unit increment in a patient's BMI there is a 37% increase in risk.

May be more difficult to accurately complete diagnostic studies

Recommendations:

If mechanical prophylaxis is ordered ensure appropriate fit of sequential compression devices or compression stockings.

Early mobilization

Increased difficulty obtaining peripheral and central access.

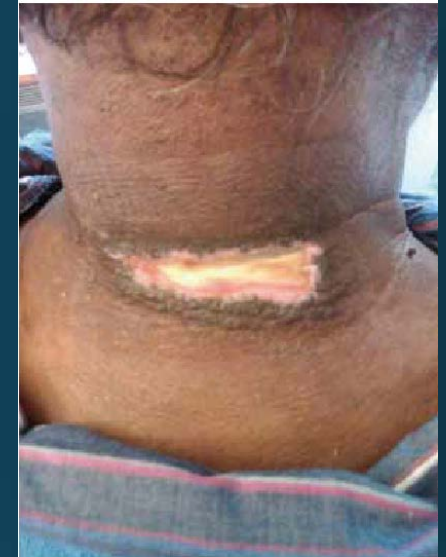
Recommendations: Ultrasound guidance, avoid femoral placement of central catheters if possible, Utilize Central Venous Catheter Bundles.

Skin

- Obese patients may be predisposed to pressure ulcers and deep tissue injury for a variety of reasons
 - Decreased blood and oxygen supply due to increased adipose tissue
 - Increase in perspiration and moisture
 - Immobility of obese patients places them at greater risk
 - Shear and Friction Forces with manual repositioning

Skin

- Unusual pressure injury may develop
 - Skin Folds
 - Under Breasts
 - Pannus
 - Gluteal Folds
 - Posterior Neck
 - Lumbar and Mid back



Skin

- **Recommendations:**

- Assess for pressure , including areas where skin-skin contact may cause friction
- Local care of pressure ulcers and utilize pressure relieving mattresses
- Vigilant hygiene for skin folds (Keep skin folds dry- utilize moisture wicking fabric, antifungal powders)
- Provide and promote early mobility in patients using assistive devices
- Provide adequate size commode to promote continence
- Manually reposition patients who are unable at least Q2 hours
- Monitor for malnutrition!!

Nutrition

- Obesity is associated with protein breakdown, increased energy expenditure, insulin resistance and rapid deterioration in muscle mass
- BMI not a good indicator of nutritional status
- Obese patients often have high calorie malnutrition, intake of calories is excessive but deficient in essential nutrients
- Malnutrition in obese patient is associated with poor outcomes and increased morbidity and mortality

Nutrition

- **Recommendations:**
 - Full assessment of nutritional risk should be performed on all patients admitted to the ICU using a valid/reliable assessment tool.
 - Traditional serum markers for nutrition assessment often not used in the ICU
 - If oral nutrition is not an option enteral nutrition is the first line of nutrition that should be considered. (24-48 hours)

Nutrition

- Recommendation:
 - High-protein, hypocaloric feeding is recommended
 - In patients where IC (Indirect calorimetry) is not used , dosing is as follows
 - BMI 30-50kg/m² : 11-14kcal/kg actual body weight
 - BMI >50kg/m² : 22-25kcal/kg actual body weight
 - Protein recommendations based on ideal body weight
 - 2.0g/kg/day for BMI of 30-40kg/m²
 - 2.5g/kg/day for BMI of >40kg/m²

Diagnostics

- Radiology and Imaging may be difficult to perform in the patient with obesity
- Distorted Images may limit diagnostic value
- Scanners for CT/MRI have chest/abdominal girth restrictions and weight limits
- **Recommendations:** Nurses should become familiar with limits of diagnostic equipment
- Safe transfer collaboration with radiology/imaging department is important



Mobility /Safe Patient Handling

- Benefits of progressive mobility well established in all patient populations
- Managing mobility in this patient population poses unique challenges related to staff availability, appropriate equipment, and patient issues such as dyspnea and exercise intolerance



Mobility/Safe Patient Handling

- What are the barriers:
 - Staff /Patient Fear of Injury
 - 50% of injuries among nurses are classified as skeletal muscle disorders.
 - Lack of Policies supporting safe patient handling
 - Lack of Staff
 - Lack of Appropriate Equipment

Mobility/Safe Patient Handling

- **Recommendations:**

- Height/weight, waist circumference measured for all patients
- Utilization of safe patient handling algorithms
- Staff knowledge of location and appropriate use of all equipment
- Staff Education: Hands on training with the equipment, who to notify if it malfunctions, where to obtain the equipment, weight limits of equipment
- Collaboration with physical /occupational therapy , APRN, bedside staff for mobility plan.
- OSHA: Max weight for manual lifting

Case Study

- 56 year old women with a BMI of 48.04kg/m²
- Admitted with community acquired pneumonia
- PMH: MI, CAD, Hyperlipidemia, HTN, Depression, Ischemic Stroke with residual left sided weakness
- Limited mobility at home: Wheelchair to bed and commode only



Case Study

- Since hospitalization refused ambulation
- Day three of hospitalization: Temp 39.2 C, worsening pneumonia and worsening respiratory acidosis
- Received NIPPV, however continued to deteriorate and required intubation and prolonged mechanical ventilation



Case Study

- ICU stay was complicated by CAUTI, and inability to wean
- Tracheostomy placed on hospital day 10
- During her ICU stay mobilization was attempted but difficult because of her anxiety and deconditioned status
- Pressure ulcer development on right buttock.



Case Study

- Transferred to the Progressive Pulmonary Care unit for possible weaning.
- Plan of Care:
 - Clinical Nurse Specialist involvement
 - Respiratory Therapy
 - Nutrition Consult
 - Psych Consult
 - Intensive PT/OT
 - Complex discharge teaching
 - SW/Care Management Involvement



Questions?

Thank you!

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