# BEMS
# Bariatric Emergency Management Strategy Treatment and Transport

Kate Passow and Randy Breton

Physicians Transport Service

# BMI of 117

## Yes, Virginia, this patient does exist:

**"I'm not to fat, I am vertically challenged!"**

56 year old male
Weight unknown (726 at hospital)
5' 6" tall - Chest 80" - Abdomen Girth 90" - Thighs 60"
Width when supine 56" *(Do you have a tape measure?)*
**Location:**
Top floor of a suburban townhouse
*(What is the width of a standard hallway? Stairs?)*

Last left structure 9 years ago - Last left bedroom 5 years ago

**S -** Headache, dyspnea, thirst
**A –** Exercise, Dieting (per patient)
**M –** HCTZ, Glucophage (occasionally), ASA, Beta blocker
**P –** Morbid Obesity, HTN, Type 2 Diabetic (Non-compliant), Sepsis
**L -** Last oral intake (breakfast) 2 hours ago
24 eggs, 2 lbs. bacon, 2 pounds sausage, loaf of toast (whole wheat!), ½ gallon milk, box of frosted flakes, coffee, ½ gallon orange juice
**E -** Unable to get to doctor visit, progressive reduced mobility

**Assessment:**
Sitting in bed SpO2 92%
Forearm BP 176/110 (No other cuff to fit)
Unable to hear breath sounds
? JVD
? Peripheral Edema
BGL 508

**Actual event:**
Total extrication time: 6 hours

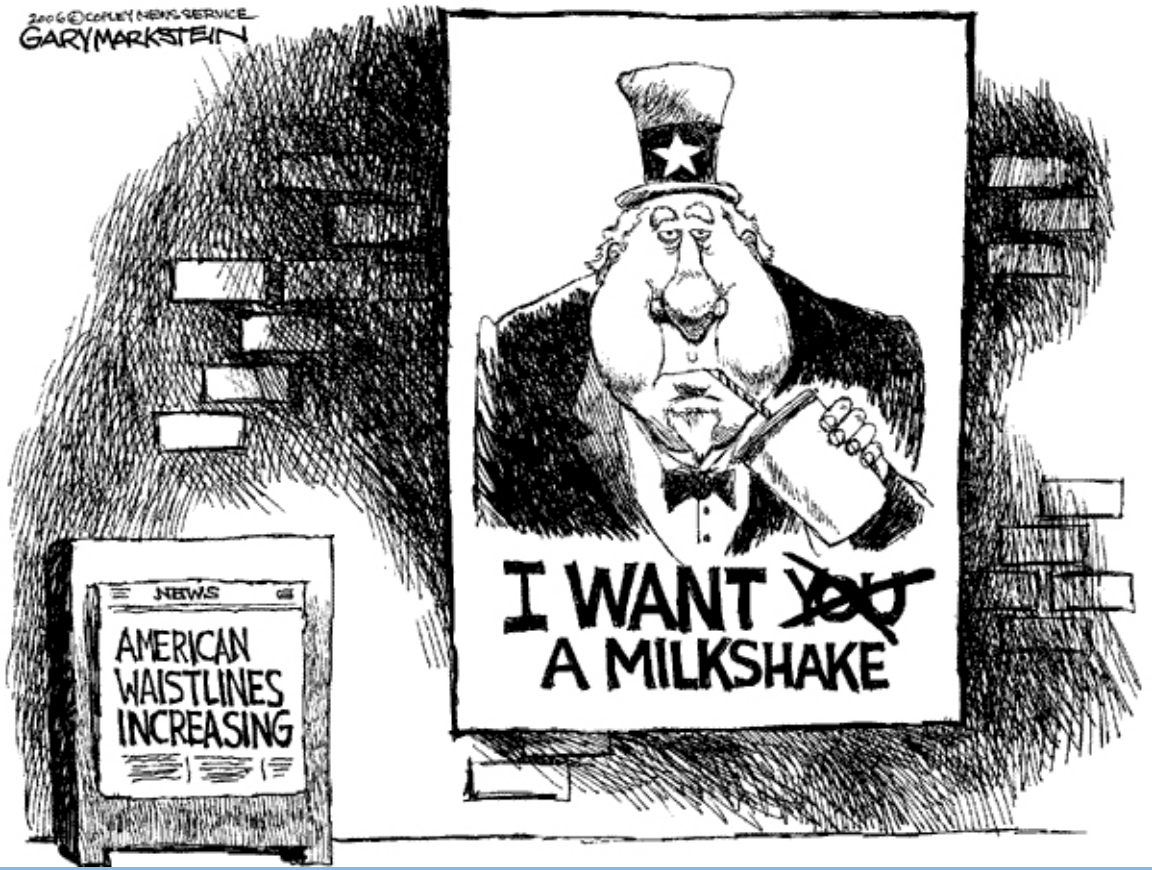
# What do you want the headline to read?

**Too fat to rescue? More heavy patients denied air ambulances**
by Joel Aleccia

**Need An Ambulance? If You're Overweight, It's Going To Cost An Extra $543**
By consumeristcarey July 4, 2009

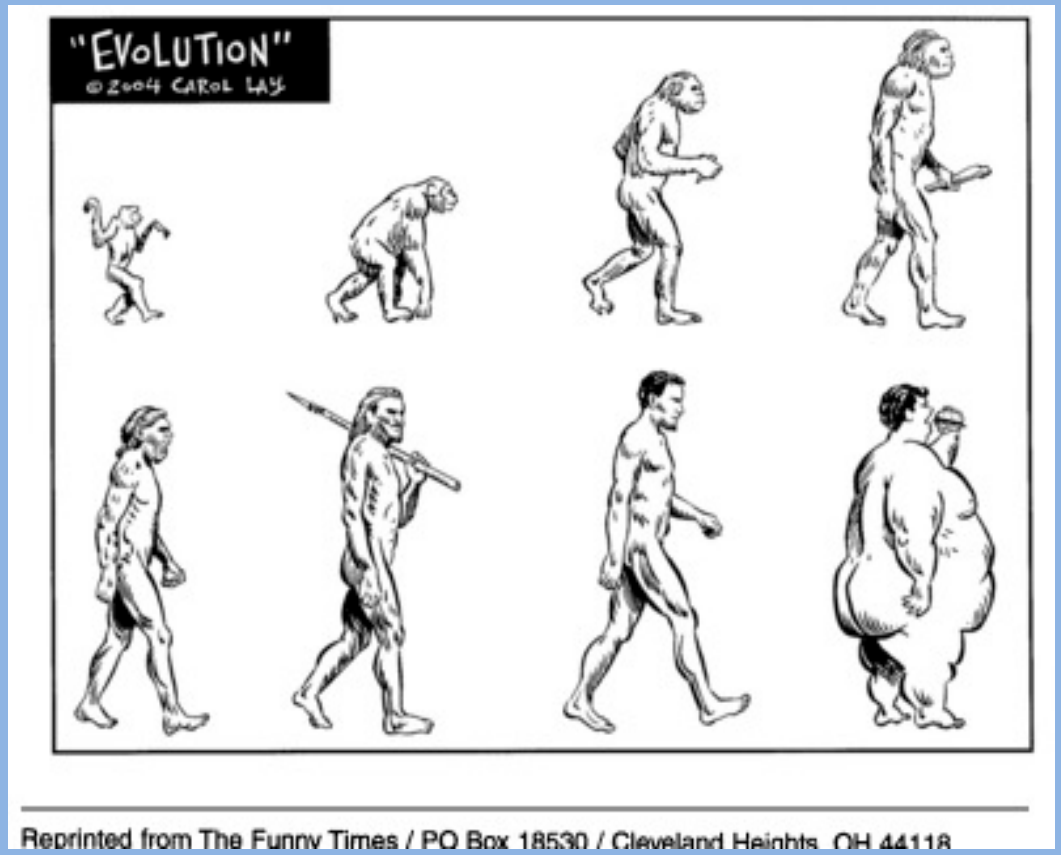
**Firefighters called to help ambulance crews lift overweight patient out of his home**

**Obese woman died on the floor after ambulance with lifting equipment took 3 hours to arrive**
16:50, 30 Jun 2015 By Luke Traynor , Mari Jones



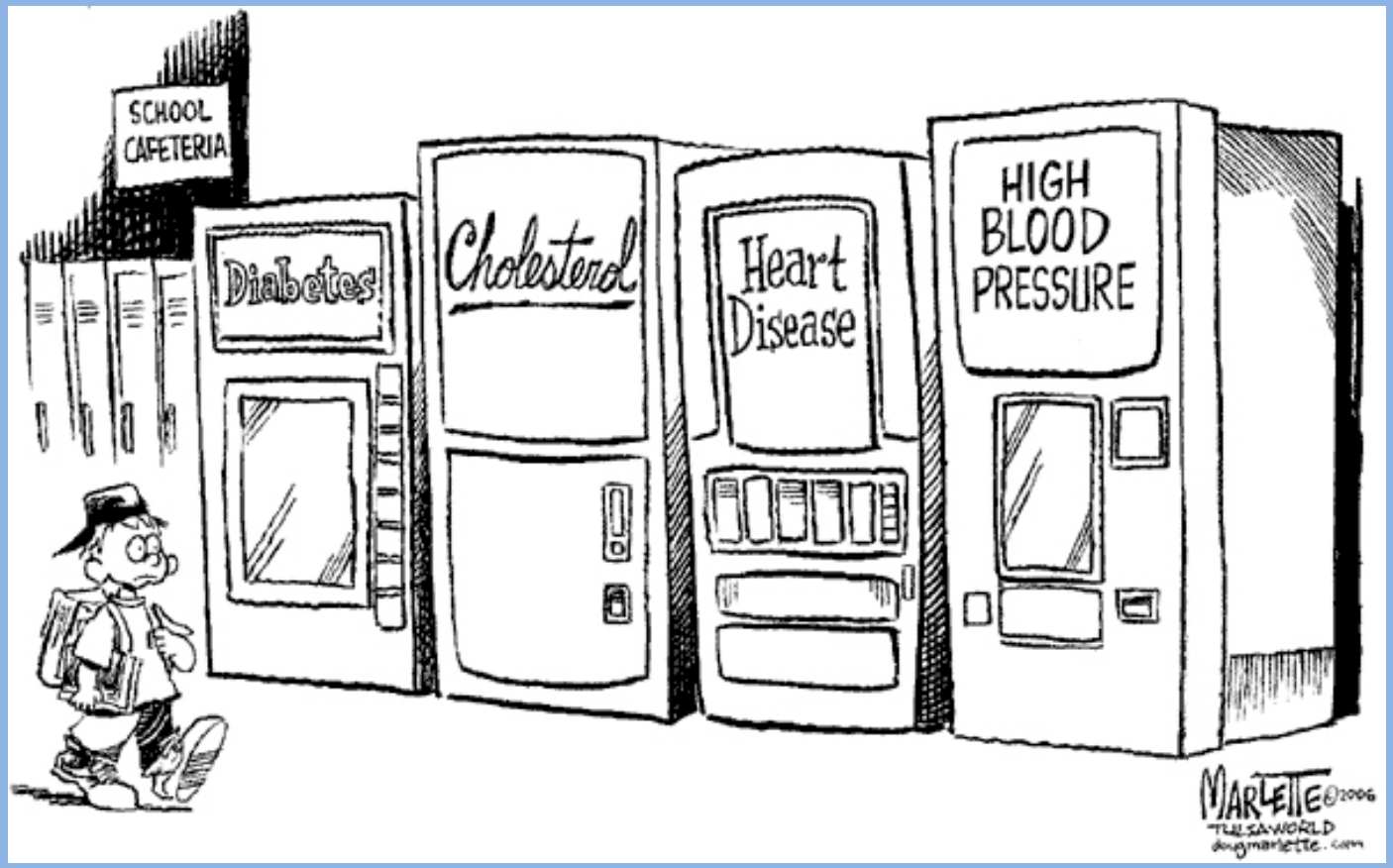

**The Number of Bariatric Patients Increase Annually**

# YOU NEED TO HAVE A PLAN!




**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**
**Centers for Disease Control and**
**Prevention National Center for Health Statistics**

| **Average Male Weight** | | **Average Female Weight** | |
|---|---|---|---|
| 1960 | 166.3 pounds | 1960 | 140.2 pound |
| 2002 | 191.6 pounds | 2002 | 162.9 pounds |




# The path from Obesity to Chronic Health Problems

*BEMS - Bariatric Emergency Management Strategies*

# What is BMI? Body Mass Index

- One way to determine your desirable body weight is to use the following formula:

- Women: 100 pounds of body weight for the first five feet of height plus five pounds for each additional inch.
- Men: 106 pounds of body weight for the first five feet of height plus six pounds for each additional inch.

- But if you have a small body frame, you should subtract 10 percent from that number. For a large frame, 10 percent should be added.

# Body Mass Index Chart 1

| 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 |

# Body Mass Index Chart 2

| 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 |

# Why were you called?

**Uninjured**

"Just help me up"

Unable to get up to meet daily needs

**Injured**

Falls

Bed/furniture collapse

**Medical Emergency**

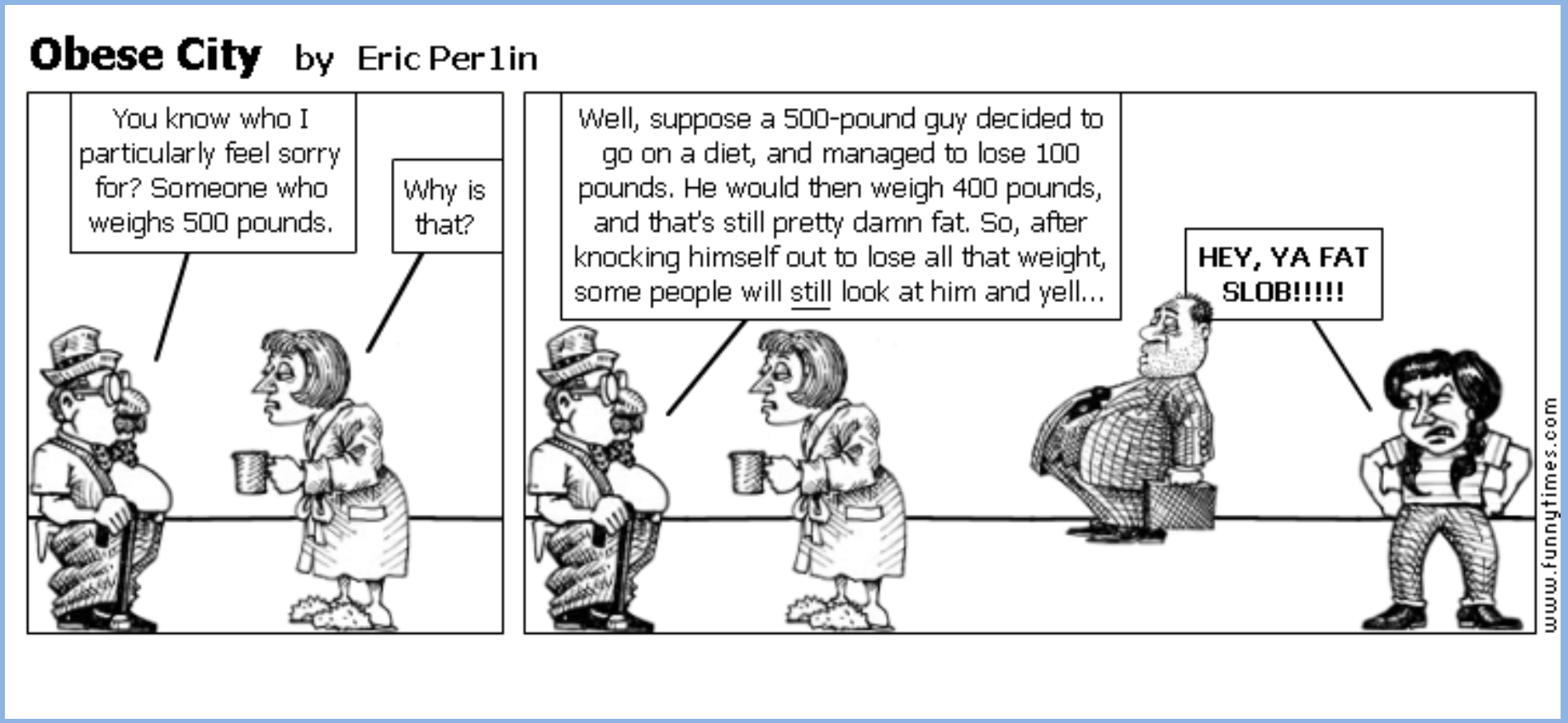
Cardiac

Respiratory

Endocrine

# Why weren't you called?

- ***Why do Bariatric Patients wait to call 911?***
  - Last Resort
  - Embarrassment
  - Nosy People
  - Fear
  - Repulsion by Others
  - Paranoia
- Dislike comments from Healthcare Providers


Obese City by Eric Perlin
You know who I particularly feel sorry for? Someone who weighs 500 pounds.
Why is that?
Well, suppose a 500-pound guy decided to go on a diet, and managed to lose 100 pounds. He would then weigh 400 pounds, and that's still pretty damn fat. So, after knocking himself out to lose all that weight, some people will still look at him and yell...
HEY, YA FAT SLOB!!!!!
www.funnytimes.com

# Bariatric Unique Patient Care Considerations

Physiology

- Anatomy Differences
  - Weight centered most often:

| | |
|---|---|
| Abdomen | Difficult to assess |
| Chest | Causes Dyspnea Supine |
| Thighs/Buttocks | Dense, very heavy to move |
| Back | Causes head to hang back |
| Neck | Airway Issues, c-collar issue |
| Arms/Legs | Easily injured in movement |

- Joints unable to bear weight or move on own
  - Knees
  - Ankles
  - Hips
  - Back/Neck
- Airway
  - M Score of 4
  - “Hump” may distort normal ET angles
  - Chronic Hypoxia
  - Chronic Dyspnea
- Gender specific needs/concerns
  - Incontinence
  - Hygiene

# Head/Face/Airway

- Face and chin additional adipose
- Difficult to get a mask seal
- Large thick tongues
- High Mallampati score

# Mallampati Score

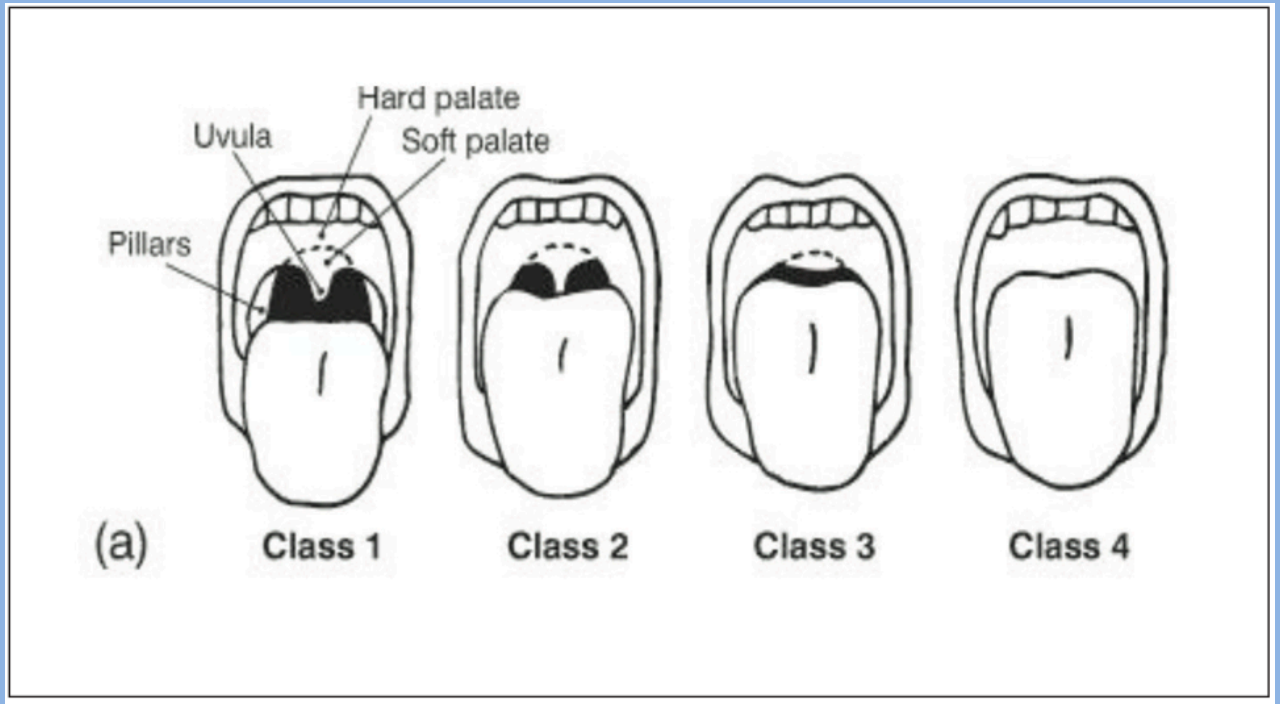



**Figure 1. The Mallampati score:**

**Class 1. Complete visualization of the soft palate**
**Class 2. Complete visualization of the uvula**
**Class 3. Visualization of only the base of the uvula**
**Class 4. Soft palate is not visible at all**

# Neck/Back

- Additional Adipose
- Kyphosis
- Increase neck circumference
- Short necks
- Truly “no neck” for collars

# Chest

- Decreased chest compliance
- Inefficient respiratory muscle
- Avoid laying supine
- Obesity Hypoventilation Syndrome- (Pickwickian Syndrome)

# Abdomen

- Increased abdominal cavity content from adipose tissue
- Increased intra-abdominal pressure
- Increased incidence of hiatal hernia
- Increased reflux
- More than “4 quadrants”
- Increased issues with gall bladder

# Thighs/Buttocks

- Dense and very heavy to move
- Hygiene concerns

# Extremities

- Joint issues
- Extra adipose tissue
- Trauma concerns

# Skin challenges

- Pressure Ulcers
- Irritant Dermatitis
- Skin Infections
  - Cellulitis
  - Necrotizing fasciitis
- Intertrigo
- Acanthosis nigricans

# Lymphedema

- Seen in up to 75% of morbidity obese population
- Can impede perfusion of blood and medications such as antibiotics to the tissue
- Will often need long term management
- Compression, exercise, skin care, and lymphatic drainage

# Assessment Challenges

- Lung sounds
- Pulse rate
- Pulse ox
- Blood pressure

# Transport Challenges

- Have you considered how you would move the following patients safely:
- **4’8” 250# paraplegic from second floor**
- 5’6” 400# unconscious person from a basement apartment
- **5’10” 600# patient down 4 interior and 12 exterior steps**
- 6’2” 860# patient from bathroom floor on third floor of a townhouse

- Are we talking 2-3 Engines? Lots of people
- Heavy Rescue? Breaching equipment, expertise.
- Tower Ladder? Manpower, tools.
- Urban Rescue? Shoring, manpower, expertise.

- Okay, they just stopped breathing……..

# BMI of 117

## Yes, Virginia, this patient does exist:

**"I'm not to fat, I am vertically challenged!"**

56 year old male
Weight unknown (726 at hospital)
5' 6" tall - Chest 80" - Abdomen Girth 90" - Thighs 60"
Width when supine 56" *(Do you have a tape measure?)*
**Location:**
Top floor of a suburban townhouse
*(What is the width of a standard hallway? Stairs?)*

Last left structure 9 years ago - Last left bedroom 5 years ago

**S -** Headache, dyspnea, thirst
**A –** Exercise, Dieting (per patient)
**M –** HCTZ, Glucophage (occasionally), ASA, Beta blocker
**P –** Morbid Obesity, HTN, Type 2 Diabetic (Non-compliant), Sepsis
**L -** Last oral intake (breakfast) 2 hours ago
24 eggs, 2 lbs. bacon, 2 pounds sausage, loaf of toast (whole wheat!), ½ gallon milk, box of frosted flakes, coffee, ½ gallon orange juice
**E -** Unable to get to doctor visit, progressive reduced mobility

**Assessment:**
Sitting in bed SpO2 92%
Forearm BP 176/110 (No other cuff to fit)
Unable to hear breath sounds
? JVD
? Peripheral Edema
BGL 508

**Actual event:**
Total extrication time: 6 hours

# Preplanning for the Bariatric Patient

- Which tools are needed?
- Where in your jurisdiction?
- What personnel will you need?
- Who else do you need to help you?
- When should the plans be made?

# What tools might you have right now?

| Tool | Concern |
| --- | --- |
| Reeves | Breaking, strap length |
| Stretcher | Max Load 700# |
| Tarp | Tearing, hand holds |
| Ropes | Injury to patient |

# What tools *could* you have?

| Tool | Advantages |
| --- | --- |
| HoverMatt | Up to 56” wide, capable of up to 1200# |
| HoverJack | Designed for no lift transfer in structure and downstairs |
| Bariatric Cot | Max Load 850# in up position |
| | 1600# in down position |
| | Eight positions for movement |
| Bariatric Tarp | 1600# rated, ample handholds |

# Public/Private Partnership

| OPERATING PROCEDURE | 640.06 |
|---|---|
| Bariatric Patient Care, Movement and Transportation | |
| Effective Date: March 25, 2011<br>Revision Date: | Page 1 of 4<br>Forms: |
| Approved By:<br>Randolph T. Breton, Chief Executive Officer<br>Luis F. Eljaiek, Jr., MD, FACEP, FAAEM, Operational Medical Director | |
| | |

PHYSICIANS TRANSPORT SERVICE

# BEMS - Bariatric Emergency Management Strategies

- 911 Agency
  - Desire to protect citizens
    - Usually not pre-identified
    - Patients feel embarrassed
    - Patients feel endangered
  - Desire to protect staff
    - High potential for injury
    - Unique and challenging
    - Infrequently managed
  - Desire to contain cost
    - Equipment expensive
- Interfacility Agency
  - Desire to protect patient
    - Frequently same patients
    - Patients feel embarrassed
    - Patients feel endangered
  - Desire to protect staff
    - High potential for injury
    - Frequently managed –
      - 100+ patients/month
  - Desire to contain cost
    - Multiple Crews required

# Hospital Destination

- Is there a “bariatric center of excellence” near you?
- What notifications do you need to make?
- When should notification be made?

# BMI of 106

52year old male
Weight ~800 lbs
6' 1" tall – Chest- 93" Abdomen Girth 100"
**Dispatched:** unable to walk, trouble breathing

**Location:**
Fourth floor of garden condominium

Last left structure 6 years ago - has a home business

**S –** dyspnea, 1-2 word sentences, pursing of lips
**A –** NKDA
**M –**ASA
**P –** Morbid Obesity, HTN, Type 2 Diabetic (Non-compliant), Sepsis
**L –** box of Cheerios
**E -** Increased trouble breathing

**Assessment:**
Sitting in bed SpO2 83% RA
Pulse 144 irregular
Respiration 50 shallow
Forearm BP 200/140(No other cuff to fit)
Unable to hear breath sounds below apex
Placed on ETCO2 nasal canula at 4 LPM – CO2 72
BGL 543
**Treatment:**
CPAP, beta-blocker

# Take Home Points

- Do you know how many bariatric patients are in your service area?
- Do you work with the hospitals to know when bariatric patients are being discharged home?
- Do you have a plan ready for a “surprise” patient?
- Do you have what it takes to keep you, your crews, and your patients safe?

# References


- Beitz, J. (2014) Providing quality skin and wound care for the bariatric patient: An overview of clinical challenge. *Ostomy Woun Management* 60(1): 12-21 http://www.o-wm.com/article/providing-quality-skin-and-wound-care-bariatric-patient-overview-clinical-challenges
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# Contact Info


- Kate Passow
- kpassow@ptsems.com