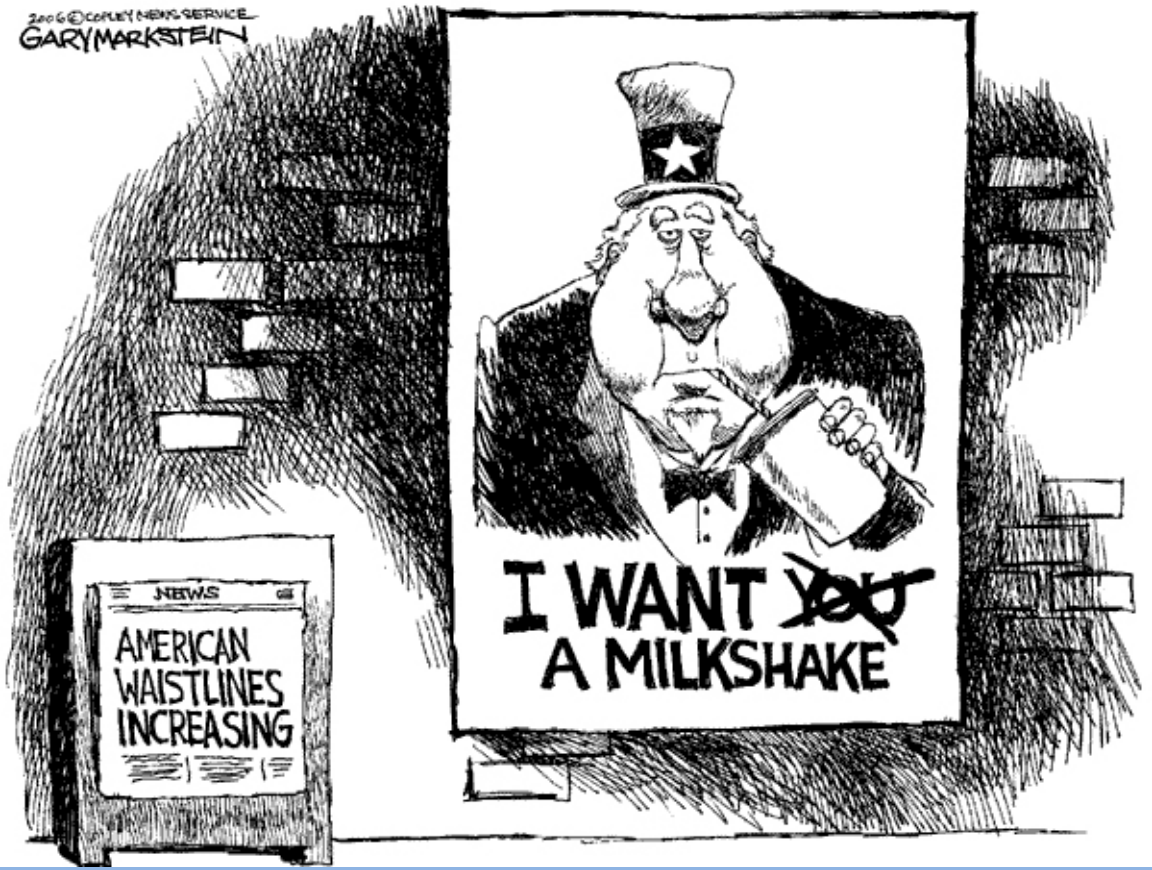
BEMS
Bariatric Emergency Management Strategy Treatment and Transport

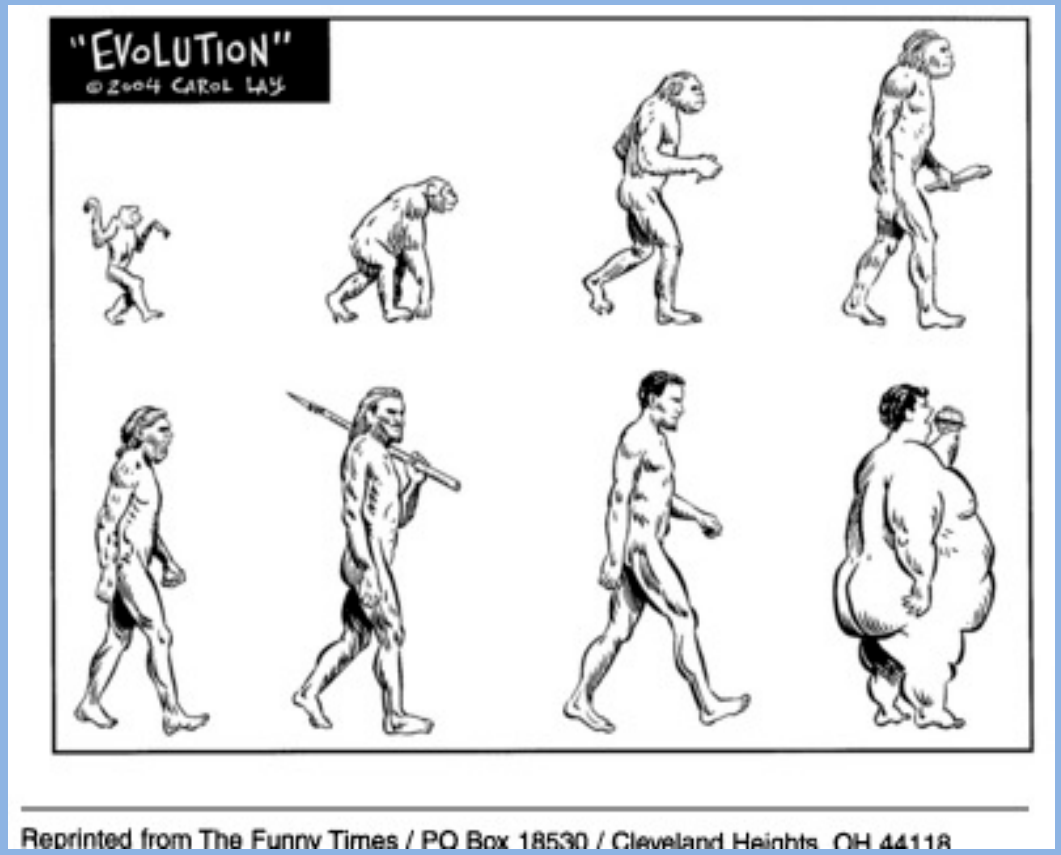
Kate Passow and Randy Breton

Physicians Transport Service



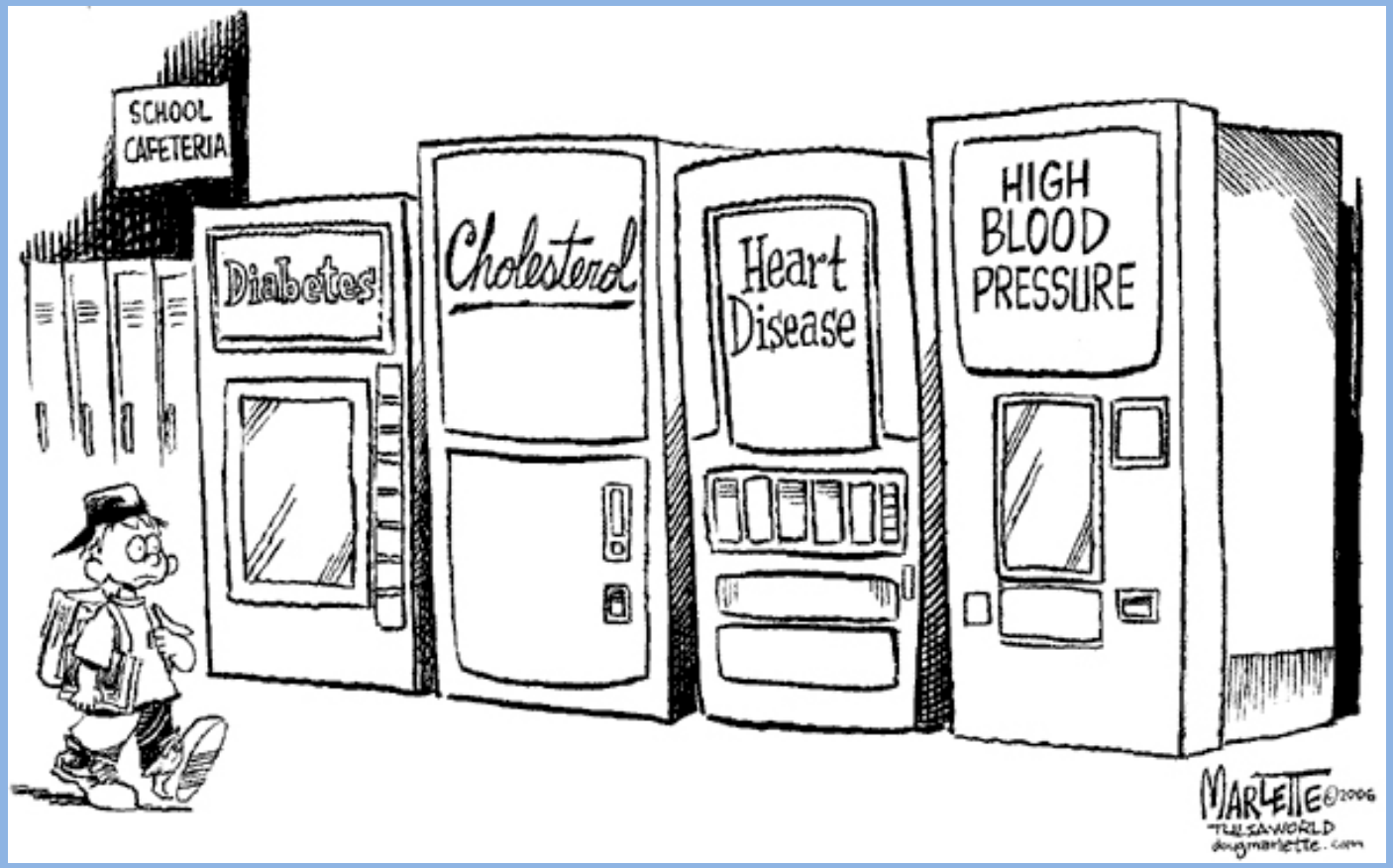
The Number of Bariatric Patients Increase Annually

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

Why were you called?

Uninjured - Gravity is an unforgiving God

"Just help me up"

Gravity is an unforgiving God

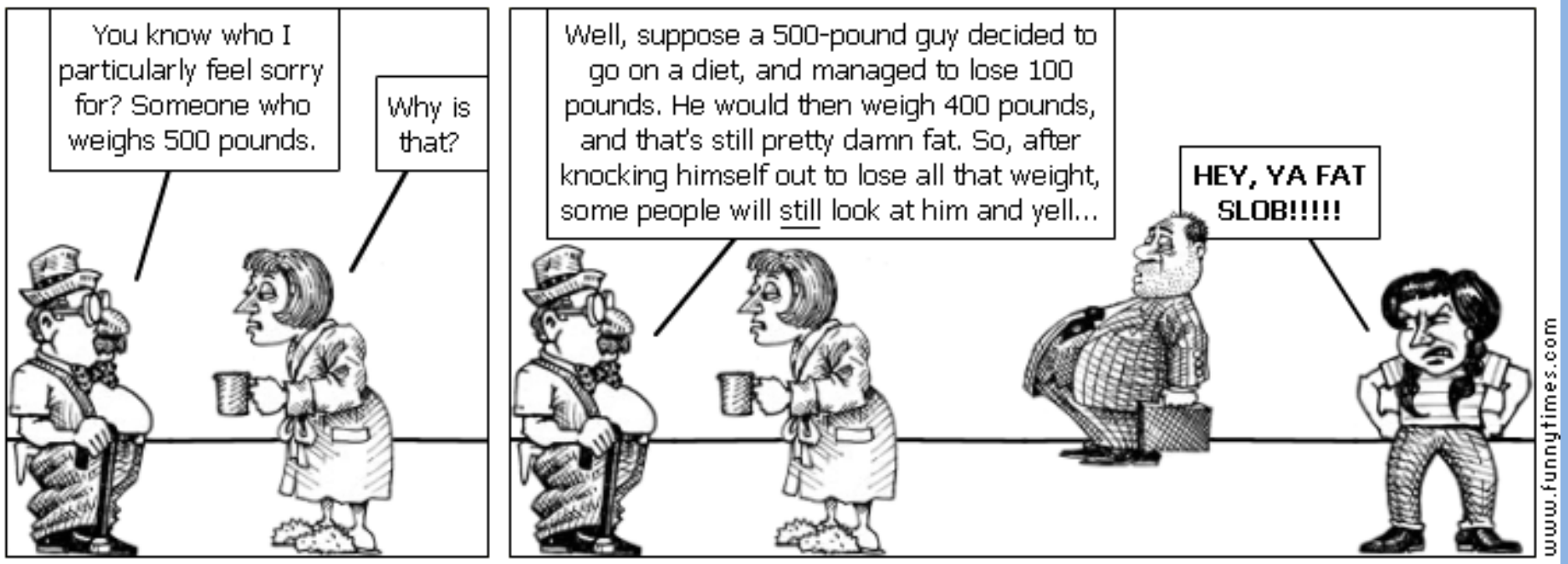
Injured

Falls Bed/furniture collapse

Medical Emergency

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

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

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

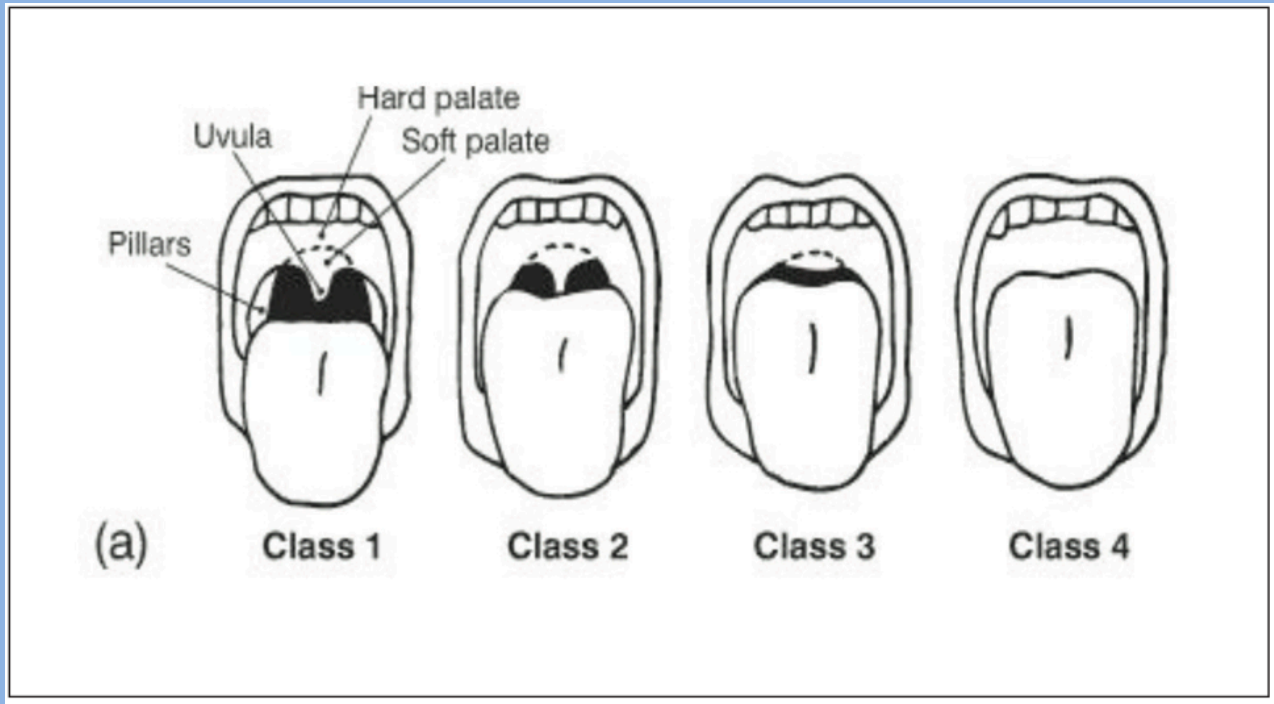


Figure 1. The Mallampati score:

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 GERD
- More than “4 quadrants”
- Increased issues with gall blader

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

The 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……..

Current Options

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?

Hospital Destination

- Is there a “bariatric center of excellence” near you?
- Early notification

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 Revision Date:	Page 1 of 4 Forms:
Approved By: Randolph T. Breton, Chief Executive Officer 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

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

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

BMI of 113

39 year old female
Weight ~630 lbs
5’ 3” tall – Chest- 75” Abdomen Girth 80”
Dispatched: unable to walk
Location:
Fourth floor of garden condominium

Last left structure 10 years ago - has a home business

S – lower legs leathery, red with open skin and weeping sores
A – NKDA
M –None
P – Morbid Obesity
L – Two boxes of waffles
E - Increase pain in legs

Assessment:
Sitting in bed SpO2 86% RA
Pulse 104 regular
Respiration 32 shallow
Forearm BP 184/120 (No other cuff to fit)
Unable to hear breath sounds below apex
Palms of hands cool, moist,
BGL High
Treatment:

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

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