

INTRODUCTION

- Obesity is a predictive factor in patients who experience postoperative respiratory failure
- Evidence supports the use of lung protective tidal volumes during intraoperative mechanical ventilation in obese patients using 6-8 ml/kg of predicted body weight

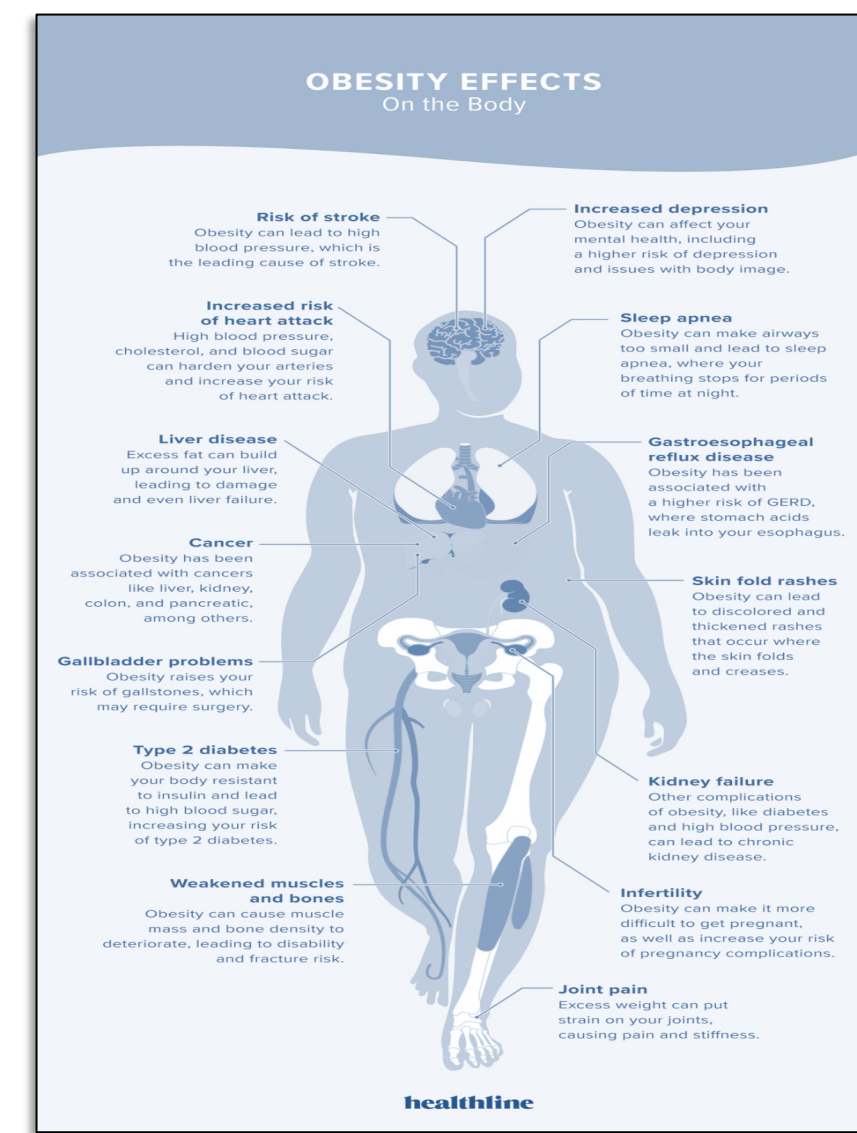


Figure 1: Obesity Effects On The Body. (Falk, 2008)

CLINICAL QUESTION:

Does the implementation of a reference card improve anesthesia provider use of lung protective tidal volumes for adult patients with obesity undergoing surgery with GETA with controlled ventilation

OBJECTIVE: Increase the percentage of patients receiving lung protective tidal volumes through the use of a tidal volume reference card

Background/Significance

- Obesity rates in the perioperative setting are greater than in the general population
- Lung protective ventilation decreases the risk of high inspiratory pressures and excessive tidal volumes which cause volutrauma and barotrauma
 - Obese patients are 5x more likely to be ventilated with excessive tidal volumes
- Point of care nudge interventions make low cost and effective impacts on clinically important variables

LUNG PROTECTIVE TIDAL VOLUMES FOR BMI ≥ 30								
MALE ^{*PBW = (50 + 0.91) × (cm - 152.4)}					FEMALE ^{*PBW = (45.5 + 0.91) × (cm - 152.4)}			
Ht (in.)	Ht (cm.)	PBW (kg)	6 ml/kg PBW	8 ml/kg PBW	Ht (in.)	Ht (cm.)	PBW (kg)	8 ml/kg PBW
58	147	45	272	363	55	140	34	272
59	150	48	286	382	56	142	36	290
60	152	50	300	400	57	145	39	309
61	155	52	314	418	58	147	41	327
62	157	55	328	437	59	150	43	346
63	160	57	342	455	60	152	46	364
64	163	59	355	474	61	155	48	382
65	165	62	369	492	62	157	50	401
66	168	64	383	511	63	160	52	419
67	170	66	397	529	64	163	55	438
68	173	68	411	548	65	165	57	456
69	175	71	425	566	66	168	59	475
70	178	73	439	585	67	170	62	493
71	180	75	453	603	68	173	64	512
72	183	78	466	622	69	175	66	530
73	185	80	480	640	70	178	69	549
74	188	82	494	659	71	180	71	567
75	191	85	508	677	72	183	73	586
76	193	87	522	696	73	185	76	604
77	196	89	536	714	74	188	78	623
78	198	92	550	733	75	191	80	641
79	201	94	563	751	76	193	82	660
80	203	96	577	770	77	196	85	678
81	206	99	591	788	78	198	87	697

RESULTS

Time Period	Count	LPV at Surgery Start	
		Yes	No
Pre-Intervention	Observed	6	34
	Expected	11.5	28.5
Post-Intervention	Observed Count	17	23
	Expected Count	11.5	28.5



Power analysis to determine adequate sample size = 80 cases

- 40 eligible cases pre-intervention
- 40 eligible cases post-intervention

PRE-INTERVENTION
TV 6-8 ml/kg PBW at incision: 15%

POST-INTERVENTION
TV 6-8 ml/kg PBW at incision: 42.5%

Chi-square Test of Association

Statistically significant association between intervention and lung protective tidal volumes ($p = .007$)

Independent-Samples t-Test

Statistically significant decrease in average TV/PBW from pre-intervention to post-intervention ($p = .001$)

Pre-intervention avg: 9.5 ml/kg PBW
Post-intervention avg: 8.4 ml/kg PBW

DISCUSSION

Aims and Objectives were achieved

- Developed tidal volume reference card
- Increased intraoperative use of lung protective tidal volumes in adults with obesity
- High incidence of over-ventilation
- Females more likely to be over-ventilated
 - Significant decrease in mean TV/PBW in females, $M = 1.2$, 95% CI [0.4, 2.0], $p = .002$
- Decreased average TV/PBW from pre-intervention to post-intervention phase

Limitations/Confounding variables:

- Did not track individual provider performance
- Pre- and post-intervention incidence of postoperative respiratory complications in the obese not measured in this study
- Only one aspect of lung protective ventilation strategy was employed for this study

Facilitators:

- First Rutgers NAP DNP project implemented at site
- Supportive anesthesia staff and culture

METHODS

DESIGN

Quasi-experimental, Quantitative, Quality Improvement Project with Retrospective Chart Review

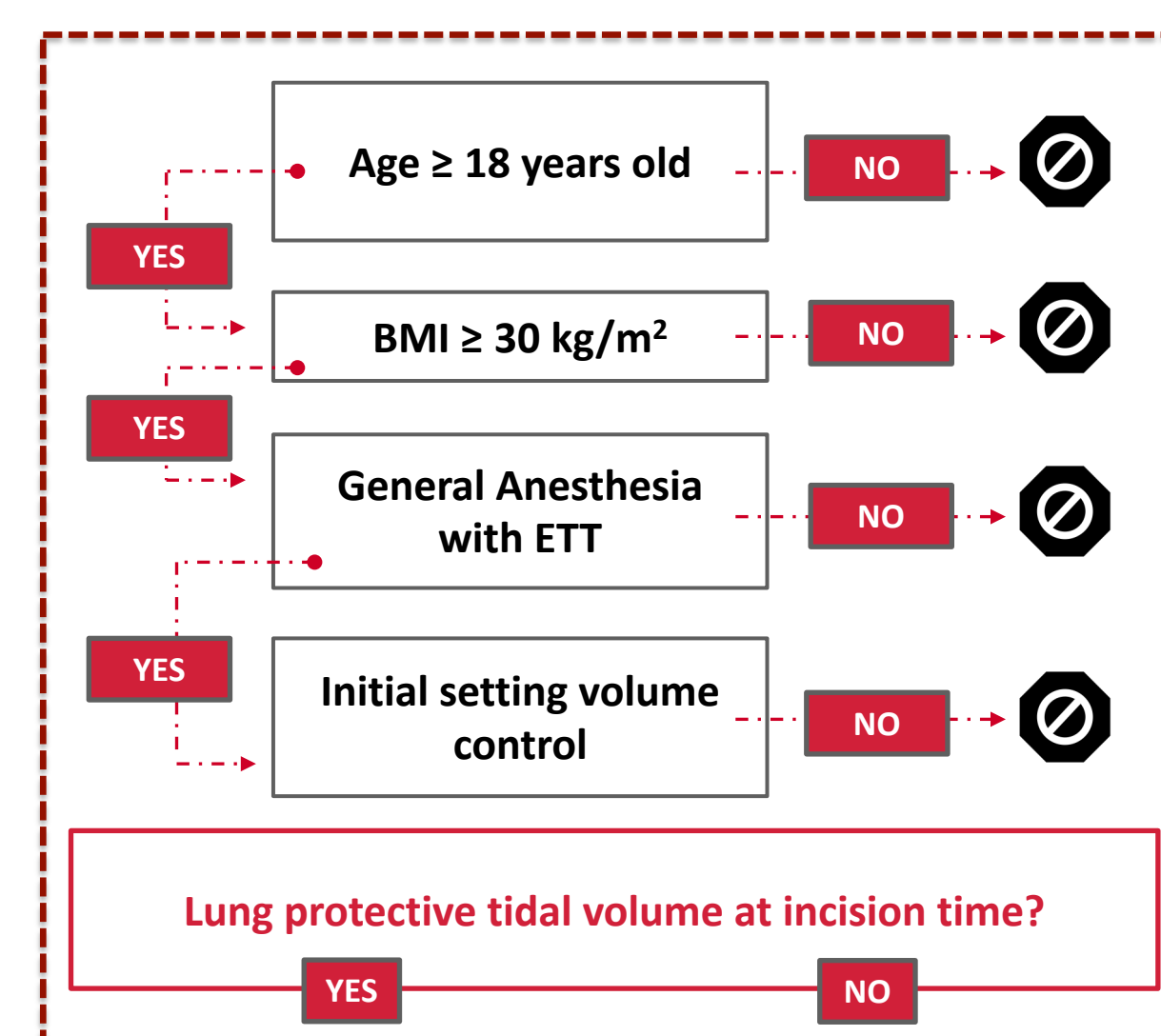
- Reference card containing variables that determine predicted body weight (gender, height) with recommended lung protective tidal volumes (6-8 ml/kg PBW)
- Educational presentation of reference card with instructions for use during staff meeting and PowerPoint presentation emailed to all anesthesia providers
- Following presentation, reference card placed on visible area of anesthesia workstation

Sample size: 40 pre-intervention eligible cases, 40 post intervention eligible cases

Chart Review Algorithm

Measures: pre-intervention and post-intervention data collected using chart review algorithm

Analysis: compare utilization of lung protective tidal volumes pre- and post-intervention



DATA

IMPLICATIONS



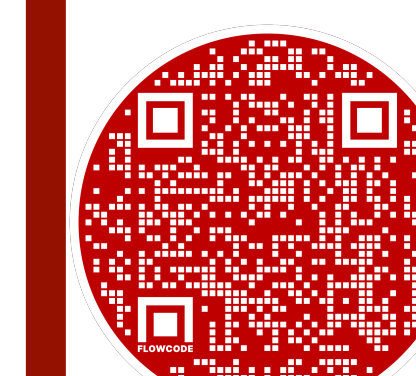
Validates the use of a point of care reminder card to improve clinical outcomes

Incorporate other aspects of LPV on reference card

Need for increased education and application of LPV

Provide groundwork for introduction of LPV at institutional level

CONTACT INFORMATION



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Please scan for references