Lung Protective Ventilation
a QI story

William Hightower, MD

Henry Ford West Bloomfield Hospital

I have no disclosures

Let's cut to the chase

- Everyone in this room [now] understands the benefits of a lung protective ventilation strategy, right?

- Lots of anesthesia providers trained long before this strategy evolved

- How do we bridge the gap between what we **should** be doing and what we **are** doing?

Solutions (that probably didn't work all that well)

- Education meetings
- Ideal body weight charts
- Calculators and apps
- Nagging, harassing, etc.

- It is hard to break established habits!

Designing a better cognitive aid

- Henry Ford Health System goes live with Epic in 2013 and 2014

- In the following years, Epic adds some fun new functionality

Ht: 1.854 m (6' 1")	BMI: 29.03 kg/m²
Wt: 99.8 kg (220 lb)	Ideal WT (kg): 79.9

- I start to think about using these tools

- I place a ticket with HFHS IT and wait…and wait…and wait…

- In 2016, HFHS gears up to join ASPIRE Cohort 3…and my ticket goes to the front of the line!

Lung protection strategy event

- A new event which is the Quick Event Sequence for all GA macros
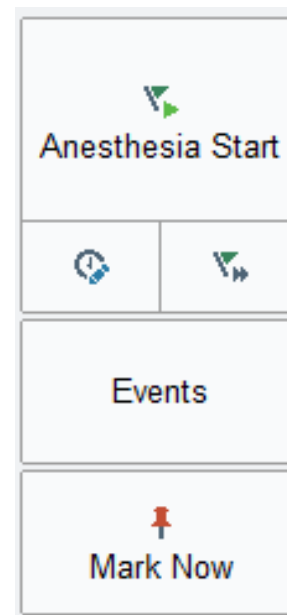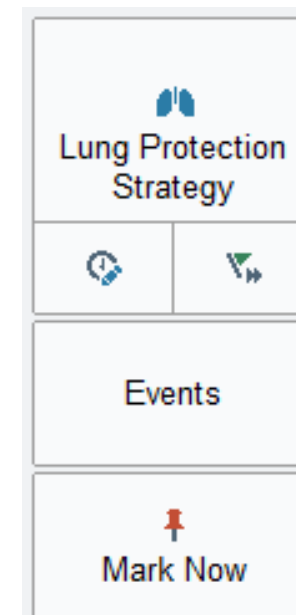
Lung protection strategy event

- This event fires a report (popup window) which calculates the suggested tidal volume based on patient IBW (6-8mL/kg)

- The report also suggests PEEP and recruitment maneuvers

- The event also triggers an hourly recruitment maneuver reminder

Lung Protective Strategy For Male Patients, Ideal Body Weight = 79.9 kg:

1. Lung protective tidal volume for this patient is 479 ml to 639 ml based on ideal body weight.

2. PEEP is recommended to prevent intraoperative atelectasis.

3. Periodic alveolar recruitment maneuvers are recommended to treat intraoperative atelectasis.

The build

Event Template Editor – AN HFHS LUNG PROTECTION EVENT [1128910001]

Record name: AN HFHS LUNG PROTEC
Display abbreviation:

Event name: Lung Protection Strategy
Template class: Anesthesia Event

One time: No
Event icon: ANES_DUAL_LUNG

Validation extensions:

Prompting extensions: AN HFHS LUNG PROTECTION STRATEGY REPORT PROMPT [11289122

Filing extensions: AN HFHS EVENT ADD ALVEOLAR RECRUITMENT MANEUVER REMIND

Free Text Settings
SmartList: [Add]

Lung protective tidal volume is 6-8mL/kg ideal body weight. PEEP is recommended to prevent intraoperative atelectasis. Periodic alveolar recruitment maneuvers are recommended to treat intraoperative atelectasis.

Event with extension that creates a report with a print group displays the SmartText

HFHS LUNG PROTECTION STRATEGY MALE LOWER LIMIT [366888]

AN HFHS LUNG PROTECTION STRATEGY MALE LOWER LIMIT

This rule is used to calculate tidal volume suggestion based on patients ideal body weight.

Evaluation logic: [And] [Or] $round(((s3-s7)*s5+s4)*s6,0)$

🔒 Rule Criteria is currently read-only.
Rule is read-only because it cannot be edited in this environment.

#	Property/Rule	Operator	Value (or Property)	Result Type	Result
1	Patient » Height: Inches	<	58	Quit	-----
2	Patient » Sex	<>	Male [2]	Quit	-----
3	Patient » Height: Inches	<>		Property/Rule Column Value	-----
4	Constant » Always One			Number	50
5	Constant » Always One			Number	2.3
6	Constant » Always One		1	Number	6
7	Constant » Always One		1	Number	60

We had to create the IBW calculation from scratch and calculate the tidal volume range off this value

## SmartText Editor - AN HFHS LUNG PROTECTION STRATEGY MALE [11289100001]

Name: AN HFHS LUNG PROTECTION STRATEGY MALE
Version: 10/3/2012
Log events?

General | Restrictions | Discrete Data Settings | Editors List | Used By | Synonyms | Languages & Overrides | Label Settings

|	Language	Rule	Override SmartText
1		AN HFHS LUNG PROTECTION STRATEGY CHECK PATIENT AGE SMARTTEXT OVERRIDE	AN HFHS LUNG PROTECTION STRATEGY SMARTTEXT LESS THAN 12 YEARS OLD
2		AN HFHS LUNG PROTECTION STRATEGY NO HEIGHT ENTERED	AN HFHS LUNG PROTECTION STRATEGY NO HEIGHT ENTERED
3		AN HFHS LUNG PROTECTION STRATEGY FOR PATIENTS LESS THAN CUTOFF HEIGHT	AN HFHS LUNG PROTECTION STRATEGY FOR PATIENTS LESS THAN CUTOFF HEIGHT
4		AN HFHS LUNG PROTECTION SMARTTEXT SEX DETERMINATION	AN HFHS LUNG PROTECTION STRATEGY FEMALE

Rules based on patient age, sex, height

Measure performance (HFWBH)

PULM 01 (<10mL/kg IBW)
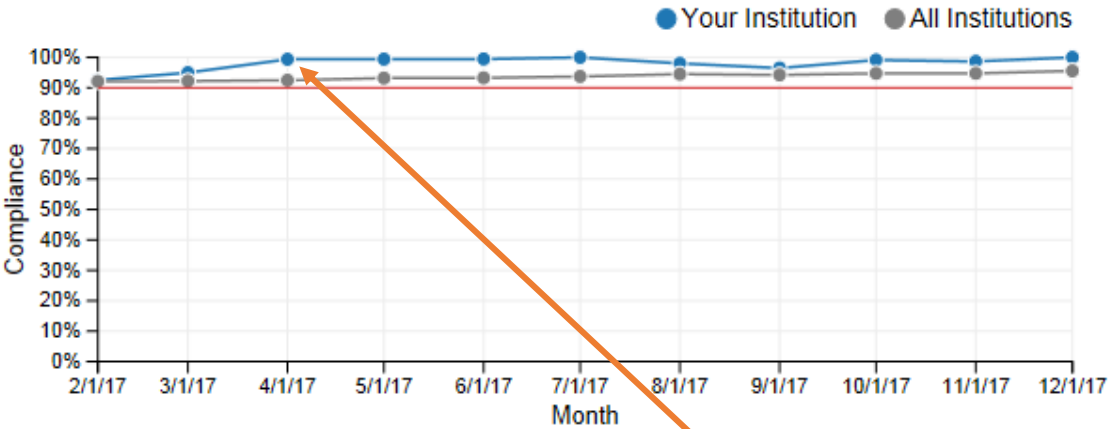
PULM 02 (<8mL/kg IBW)
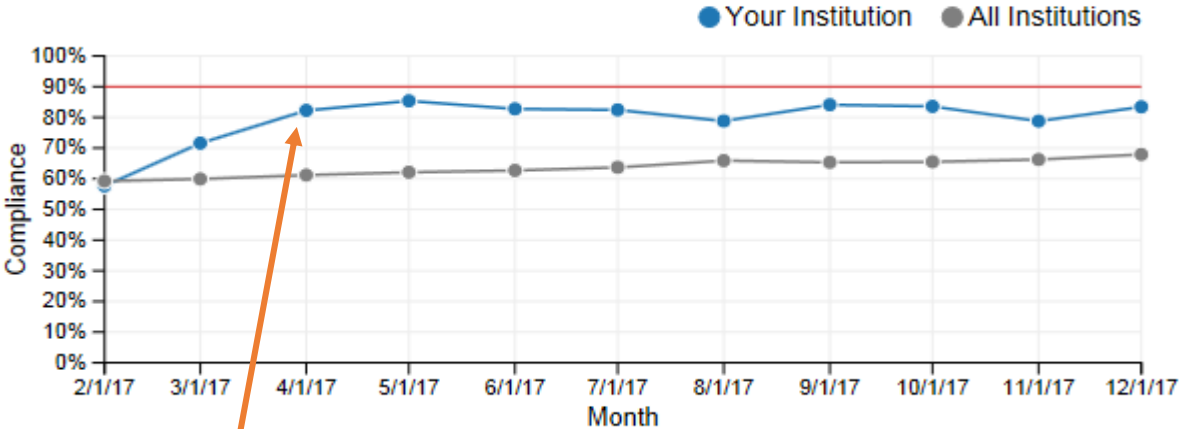
Lung protection event went live April 2017

What we learned

- Staff was very receptive to using the event (automatic and easy)
- Staff liked the idea of a tidal volume range
- Use QI (ASPIRE) to get stuff done
- Cheers to our Epic build team (Josh Barron) and TS (Evan Flink)
- MOCA 2.0 Part IV 25 credits for yours truly