

# Perioperative Medicine Summit

Using Evidence to Improve Quality, Safety and Patient Outcomes



# Obesity Hypoventilation Syndrome OHV

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# Disclosure

- ✦ Research support
- ✦ Dept. of Anesthesia, University Health Network, University of Toronto
- ✦ University Health Network Foundation
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- ✦ ResMed Foundation

## Conflict of Interest

STOP-Bang Patent; Property of University Health Network  
Pfizer research grant

# Patients with Obesity Hypoventilation Syndrome can be diagnosed by:

- ✱ 1. Elevated daytime carbon dioxide
- ✱ 2. O<sub>2</sub> saturation less than 90%
- ✱ 3. Elevated HCO<sub>3</sub>
- ✱ 4. All of the above

# Case Presentation

- ✱ Male patient 55 years old
- ✱ BMI 50 kg/m<sup>2</sup>
- ✱ Hx of hypertension
- ✱ Laparoscopic colon resection
- ✱ Hx of heavy snoring
- ✱ Preop clinic : O<sub>2</sub> saturation 92%

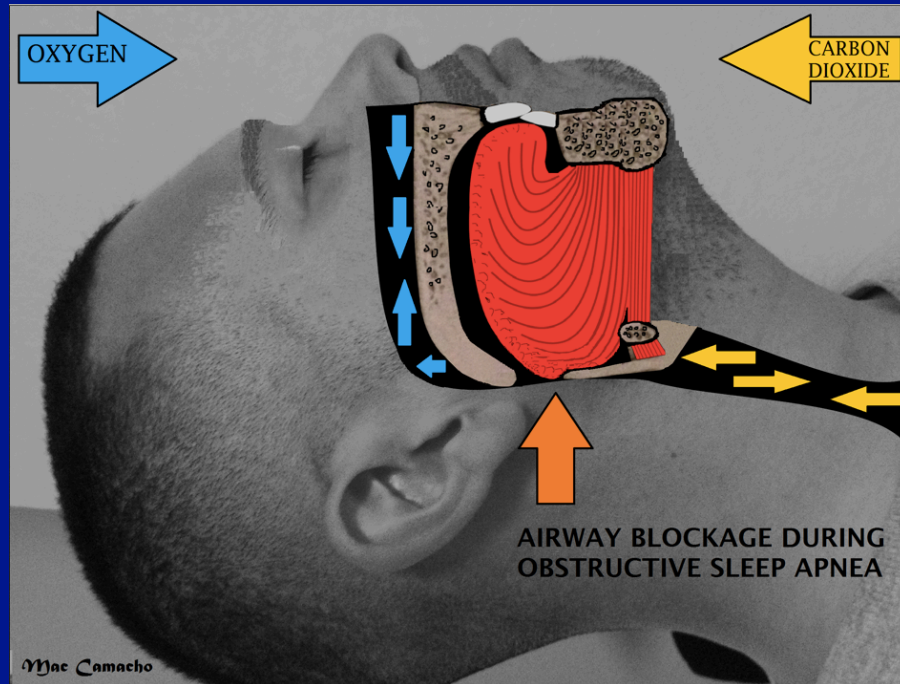
# Obesity Hypoventilation Syndrome: The big and breathless



# Pickwickian Syndrome



# 10-20% of obese OSA pt. have obesity hypoventilation syndrome



- ✦ Sustained nocturnal hypercapnia may lead to elevation in serum  $\text{HCO}_3$

Mokhlesi et al. Sleep Breath. 2007; 11: 117-24

# Do you look at HCO<sub>3</sub> level?

\* ↑ AHI 10 events/h → ↑ HCO<sub>3</sub> 0.17 mmol/L

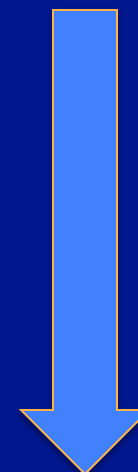




# Sensitivity and Specificity of Combining STOP-Bang and HCO<sub>3</sub>

## Severe OSA

	SN	SP
★ STOP-Bang $\geq 3$	97.3	27.7
★ STOP-Bang $\geq 3$ + HCO <sub>3</sub> $\geq 28$	48.6	79.4
STOP-Bang $\geq 3$ + HCO <sub>3</sub> $\geq 29$	29.7	87.7
STOP-Bang $\geq 3$ + HCO <sub>3</sub> $\geq 30$	16.2	95.5



SN: Sensitivity; SP: Specificity

Chung F et al Chest 2013

# Obesity Hypoventilation Syndrome

- ✦ 0.15-0.3% of general population

- ✦

- ✦

- ✦

- ✦



a

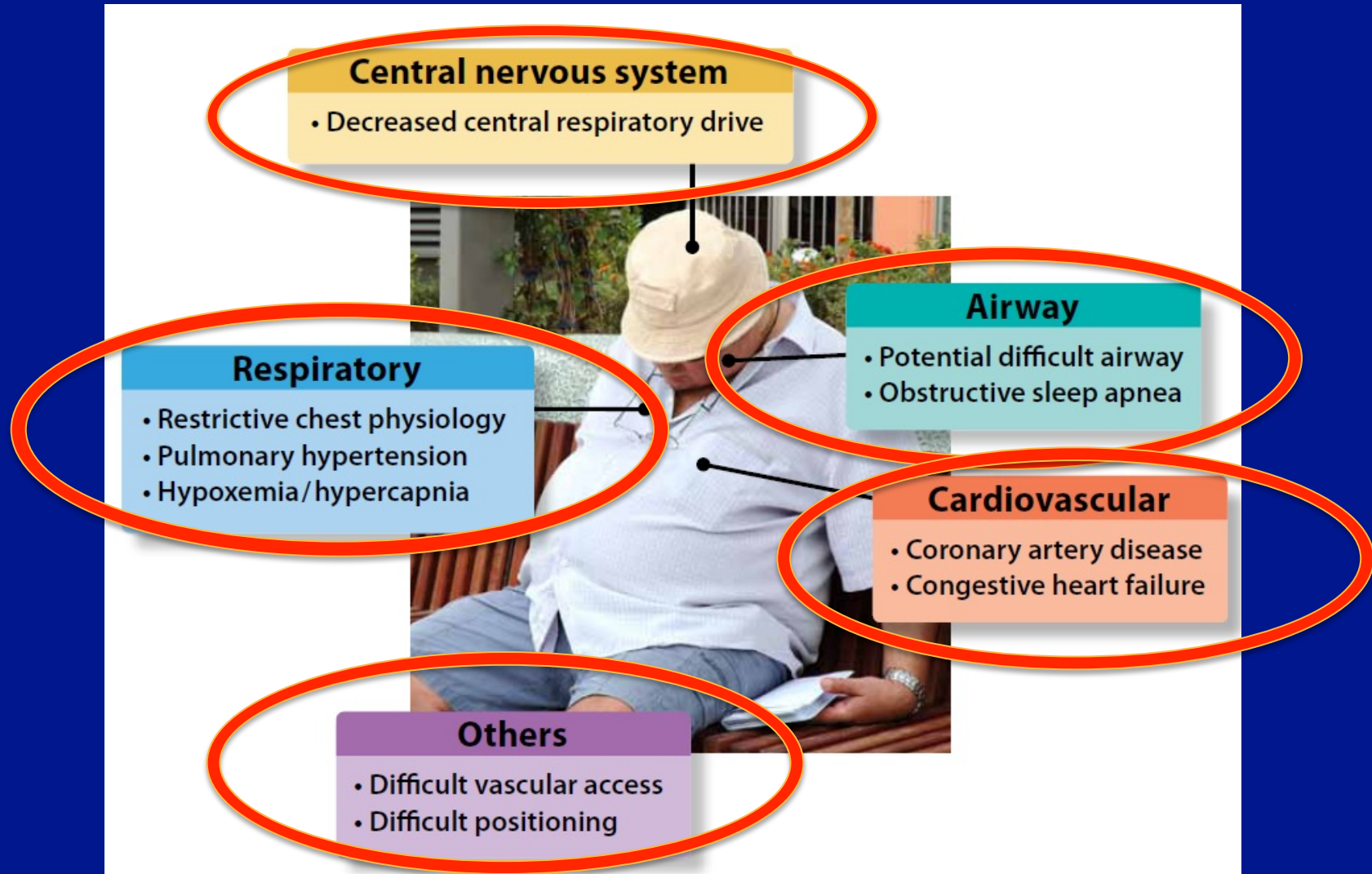
mmHg

mmHg

pulmonary hypertension

# Obesity hypoventilation syndrome

Chau E et al Anesthesiology 2012



# Morbidly obese pt.: Cardiomyopathy & pulmonary hypertension



# Postop Cx in pt. with unrecognized OHV undergoing elective noncardiac surgery

- ✱ In patients with OSA, reported incidence of OHV is 10-20%
- ✱ With BMI  $>50$  kg/m<sup>2</sup>, prevalence up to 50%

## Postop Cx in pt. with unrecognized OHV undergoing elective noncardiac surgery

- ★ Compared with OSA, pt. with OHS were more likely to develop:
- ★ Postop respiratory failure OR: 10.9
- ★ Postop heart failure OR: 5.4
- ★ Postop ICU transfer OR: 10.9

# Postop Cx in pt. with unrecognized OHV undergoing elective noncardiac surgery

- ✱ Compared with OSA, pts with OHS were more likely to develop:
- ✱ Postop ICU transfer OR:10.9
- ✱ Tracheostomy OR: 3.8
- ✱ Higher ICU and hospital length of stay

# Clinical diagnosis of OHV

- ✱ Severely obese
- ✱ Severe AHI
- ✱ Hypersomnolent
- ✱ Symptoms of OSA
- ✱ Dyspnea
- ✱ Cor pulmonale
- ✱ Low extremity oedema



# WHO are these OHV patients?

- ✦ Obese patients
- ✦ Severe COPD
- ✦ Restrictive lung disease
- ✦ (predicted FEV1 < 50%)

Oxygen

(corresponding to)

Serum bicarbonate

Confirmed

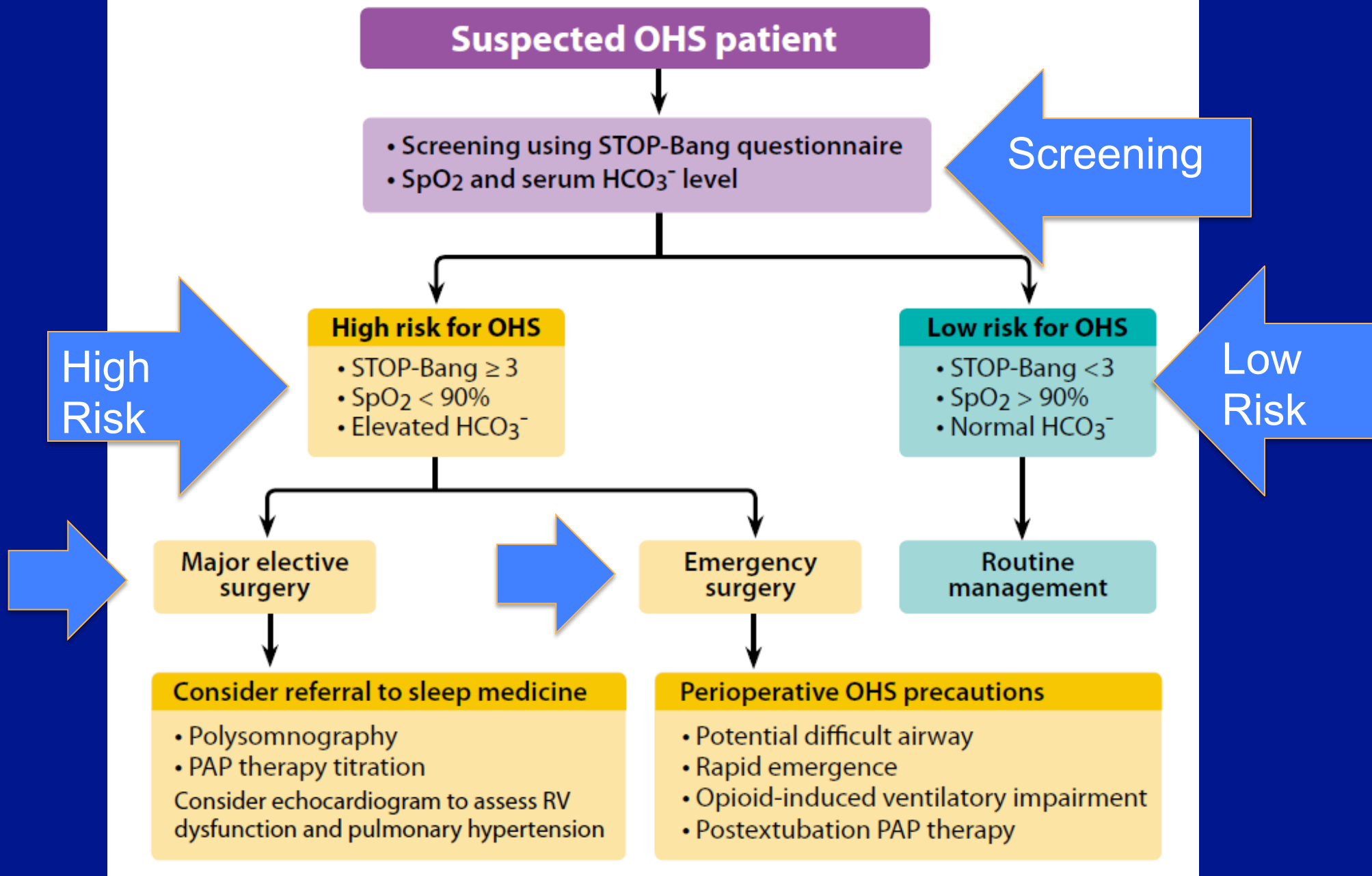


# Postop Cx in pt. with unrecognized OHV undergoing elective noncardiac surgery

- ✱ Wherever postop respiratory failure occurs in an obese patient with obstructive sleep apnea:
- ✱ The possibility of sleep related hypoventilation should be considered.

# What can be done before elective surgery?

- ✱ Serum bicarbonate
- ✱ Pulse oximetry
- ✱ ABG
- ✱ Polysomnography



# Survival analysis of OHV pts.

