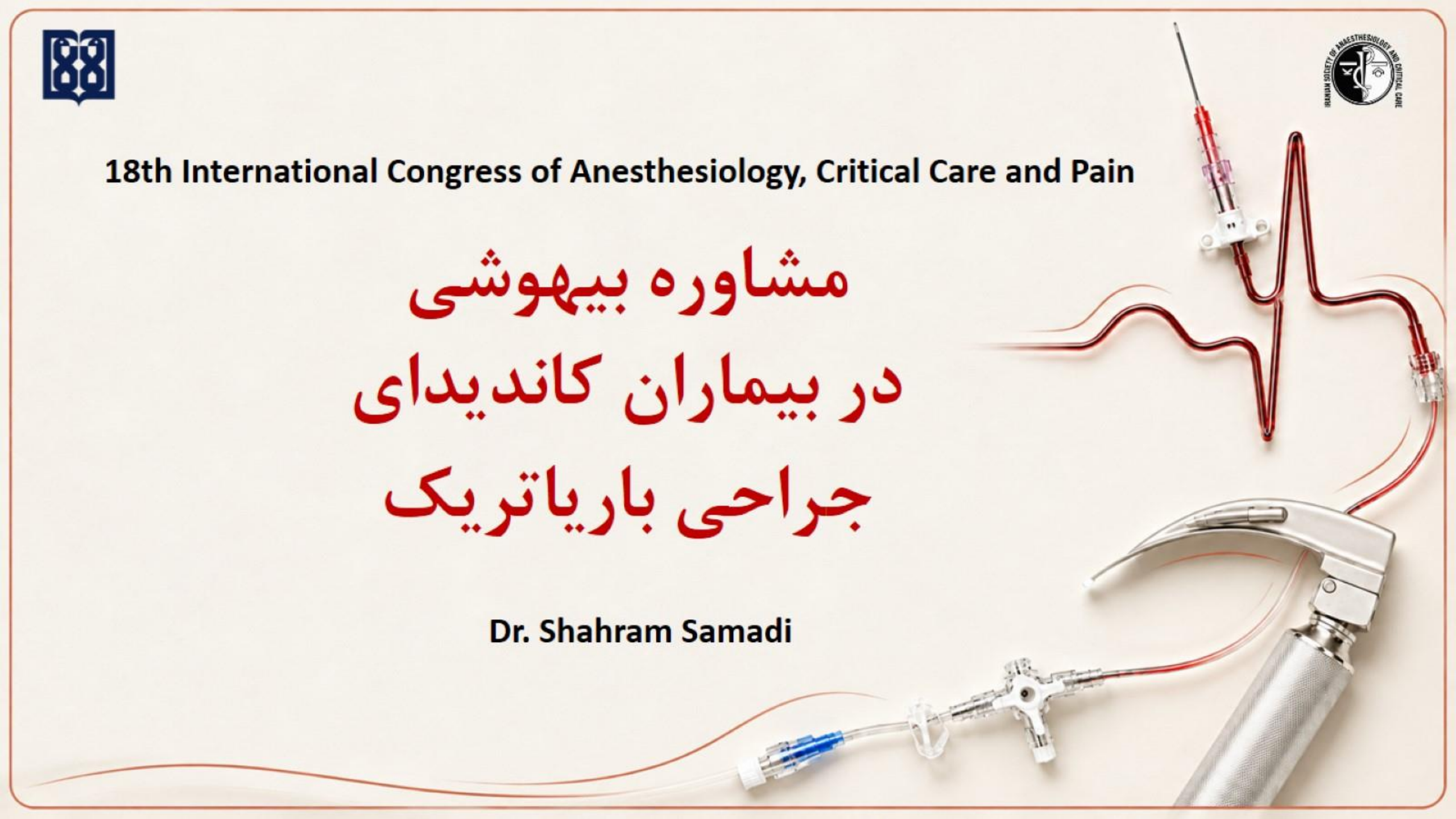
18th International Congress of Anesthesiology, Critical Care and Pain

مشاوره بیهوشی در بیماران کاندیدای جراحی باریاتریک

Dr. Shahram Samadi





دکتر شهرام صمدی

استاد بیهوشی دانشگاه علوم پزشکی تهران

فلوشیپ پزشکی خواب

فلوشیپ انفورماتیک بالینی

رییس کمیته پزشکی خواب انجمن بیهوشی


خدا کند انگورها برسند
جهان مست شود
تلوتلو بخورند خیابان ها
به شانه هم بزنند رئیس جمهورها و گداها
مرزها مست شوند
خدا کند انگورها برسند
برای لحظه ای، تفنگ ها یادشان برود دریدن را
کاردها یادشان برود بریدن را
قلم ها آتش را آتش بس بنویسند
خداکند کوه ها به هم برسند
دریا چنگ بزند به آسمان، ماهش را بدزدد
به میخانه شوند پلنگ ها با آهوها
خدا کند مستی به اشیا سرایت کند
پنجره ها دیوارها را بشکنند

Outline

1. Preoperative Assessment and Surgical Risk
2. OSA Screening and Diagnostic Testing
3. OHS and Perioperative PAP
4. Recommendations

Clinical Case: Preoperative OSA Evaluation



1. Patient Profile

52-year-old man scheduled for sleeve gastrectomy

2. Anthropometrics & Vitals



BMI 46 kg/m² | Neck Circumference (NC) = 44 cm | Treated hypertension

3. Clinical Symptoms



Loud snoring and witnessed apnea | No daytime fatigue reported

STOP-BANG Score?

Probability of OSA?

پرسشنامه STOP-BANG

غربالگری خطر آپنه انسدادی حین خواب

به هر پاسخ «بله» ۱ امتیاز و به هر پاسخ «خیر» ۰ امتیاز تعلق می‌گیرد.



سؤالات پرسشنامه	
S	خر و پف بلند؟
T	اغلب در روز احساس خستگی یا خواب‌آلودگی دارید؟
O	کسی متوجه قطع تنفس شما هنگام خواب شده است؟
P	فشارخون بالا دارید یا برای آن دارو مصرف می‌کنید؟
B	شاخص توده بدنی (BMI) بیش از ۳۵ است؟
A	سن شما بیش از ۵۰ سال است؟
N	دور گردن بیش از ۴۰ سانتی‌متر است؟
G	جنسیت شما مرد است؟

امتیازدهی و تفسیر نتیجه

جمع امتیاز: ۰ تا ۸

۵ تا ۸	۳ تا ۴	۰ تا ۲
خطر زیاد	خطر متوسط	خطر کم

Interpreting the STOP-BANG Score



A score ≥3 is a positive screening threshold.

Screening Threshold



At 3–4, ≥2 STOP items plus male sex, BMI >35 or large neck may indicate high risk.



The score **does not** establish OSA or its severity.

Screening ≠ Diagnosis

S: Loud Snoring

1. ✨ Louder than talking

2. ✨ Loud enough to be heard through closed doors



T:

Daytime Tiredness





Miller 10e, Ch. 54; Chung et al., Br J Anaesth 2012; SASM 2016

O:

Observed Apnea





Miller 10e, Ch. 54; Chung et al., Br J Anaesth 2012; SASM 2016

P:
Hypertension





Miller 10e, Ch. 54; Chung et al., Br J Anaesth 2012; SASM 2016

STOP-Bang Score: BANG Components



B BMI > 35 kg/m²



A Age > 50 years



N Neck circumference > 40 cm



G Gender: Male



Miller 10e, Ch. 54; Chung et al., Br J Anaesth 2012; SASM 2016

Undiagnosed OSA in Bariatric Candidates

Single-center study | 170 bariatric candidates | 2004



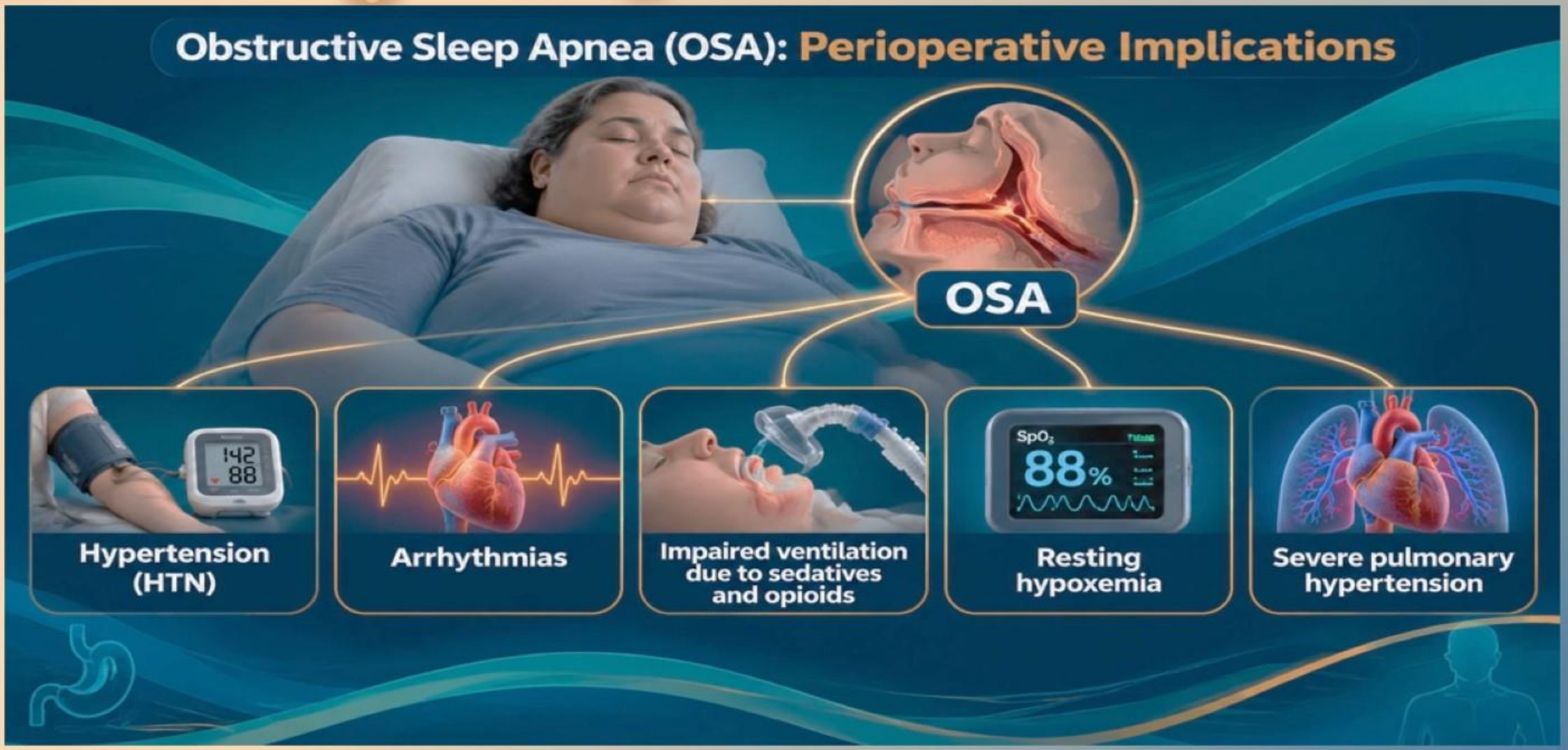
About 15%

had a prior OSA diagnosis

About 76.6%

had undiagnosed OSA

Percentages are reported as stated in the study.


Obstructive Sleep Apnea (OSA): Perioperative Implications
OSA
142
88
Hypertension (HTN)
Arrhythmias
Impaired ventilation due to sedatives and opioids
SpO2
88%
Resting hypoxemia
Severe pulmonary hypertension

Bariatric Surgery Indications



1

BMI

≥35

kg/m²

2

BMI

30–34.9

kg/m²

+ metabolic disease, or after inadequate durable benefit from nonsurgical treatment.

3

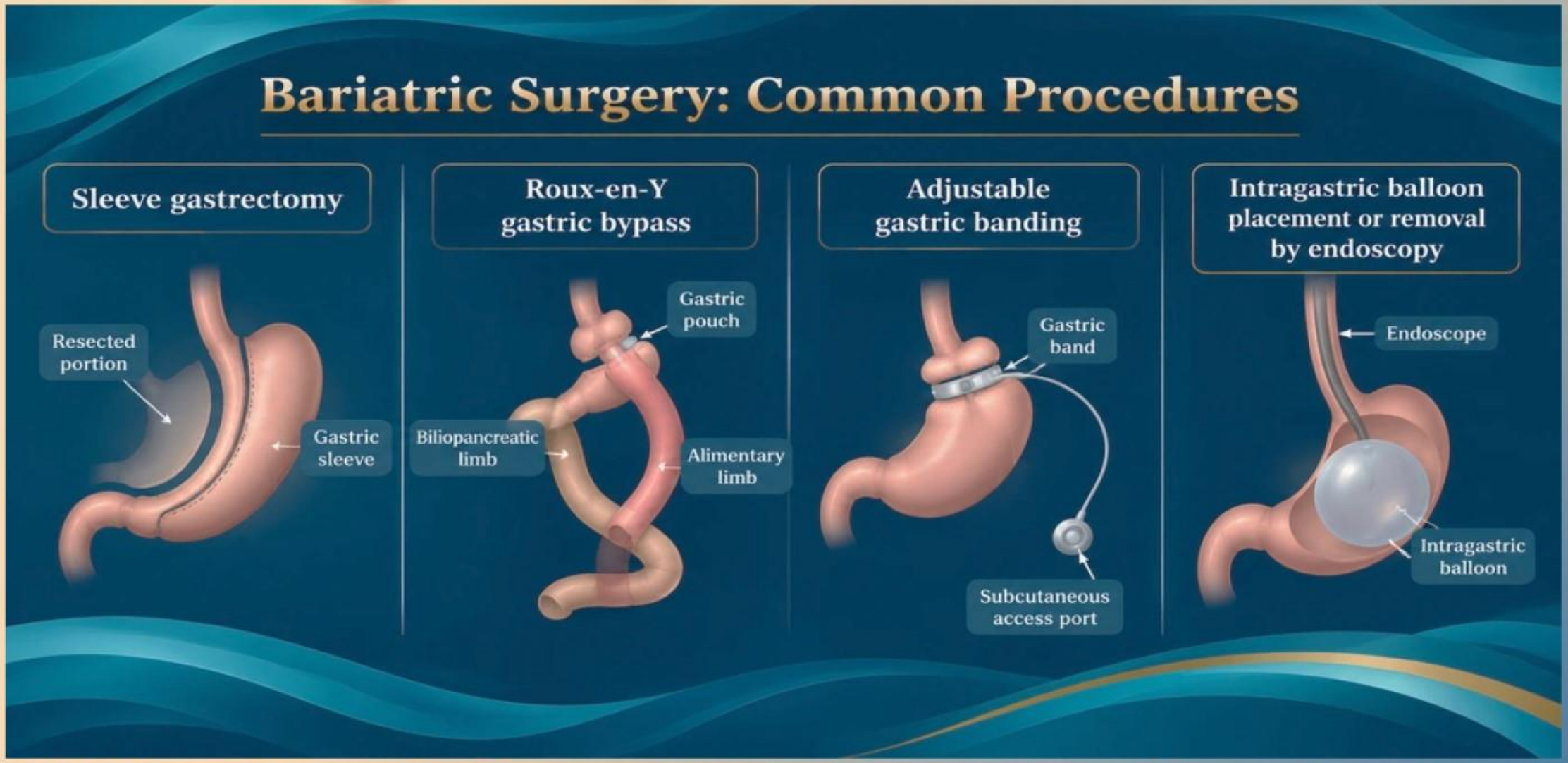
BMI

≥27.5

kg/m²

for Asian populations

! Local referral and insurance coverage may differ.


Bariatric Surgery: Common Procedures
Sleeve gastrectomy
Resected portion
Gastric sleeve
Roux-en-Y gastric bypass
Gastric pouch
Biliopancreatic limb
Alimentary limb
Adjustable gastric banding
Gastric band
Subcutaneous access port
Intragastric balloon placement or removal by endoscopy
Endoscope
Intragastric balloon

Preoperative Evaluation for Sleeve Gastrectomy



Prior anesthetic difficulties



Cardiopulmonary Reserve, Renal and liver function



Diabetes, Nutrition and aspiration risk



GLP-1 use, dose escalation and GI symptoms



Plan fasting and aspiration precautions with the team

Preoperative Considerations for OSA Patients



STOP-BANG



Prior sleep study oxygen desaturation and current PAP use



PSG or appropriate HSAT



Overnight oximetry alone does not diagnose or exclude OSA.

Bariatric Surgery Anesthesia

Preoperative PAP Screening and Preparation

for Obstructive Sleep Apnea (OSA)



1 STOP-BANG Screening & Home Sleep Apnea Test (HSAT / REI)

- S Snoring
- T Tiredness
- O Observed apnea
- P Pressure (HTN)
- B BMI > 35
- A Age > 50
- N Neck circumference > 40 cm
- G Gender (Male)

STOP-BANG ≥ 3 = Higher Risk for OSA



Consider HSAT / REI to confirm diagnosis

2 Checking Current PAP Usage / Bringing Personal Device



- Review adherence (e.g., usage ≥ 4 h/night)
- Ask the patient to bring their PAP device (mask, machine, settings)

3 Preoperative Titration and Airway Assessment



- Optimize PAP settings (if needed)
- Assess airway (Mallampati, neck circumference, etc.)
- Plan perioperative PAP use

Proper Screening. Adequate Preparation. Safer Surgery.

When Is In-Lab Sleep Testing (PSG) Indicated?



Awake or suspected sleep-related hypoventilation



Significant cardiorespiratory disease or respiratory muscle weakness



Chronic opioid use, prior stroke, or severe insomnia



After a negative, inconclusive, or technically inadequate HSAT



High BMI alone is not an indication.

When Can HSAT Be Used Instead of In-Lab PSG?

1

An uncomplicated adult with increased likelihood of moderate to severe OSA



2

A technically adequate test



HSAT
(Home Sleep Apnea Test)

3

Most HSAT reports use REI (Respiratory Event Index) based on TRT time (instead of TST).



TRT = total recording time | TST = total sleep time

HSAT
(Home Test)

PSG
(In-Lab Sleep Study)

AHI Severity Scale



Mild 5 to <15 events/hour



Moderate 15 to <30 events/hour



Severe ≥30 events/hour

AHI Severity Based on AASM Guidelines.

Proceed or Postpone? A Positive OSA Screen

A positive OSA screen alone **does not** mandate postponement.

Consider further evaluation when:



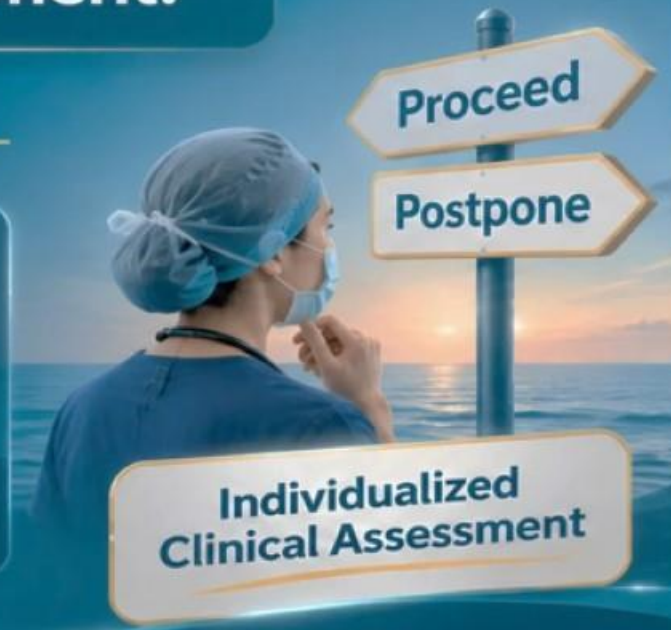
Unexplained resting hypoxemia



Severe pulmonary hypertension



Suspected hypoventilation



Individualized Clinical Assessment

Obesity Hypoventilation Syndrome (OHS)

Diagnostic features



Obesity (BMI ≥30 kg/m²) and sleep-disordered breathing



Awake arterial $PaCO_2$ ≥45 mmHg



After excluding other causes of hypoventilation

Perioperative considerations



Increased concern for respiratory failure



Sensitivity to sedatives and opioids

When to Suspect OHS

Unexplained awake hypoxemia, exertional dyspnea or morning headache



Peripheral edema, pulmonary HTN or right heart strain



Marked nocturnal desaturation or evidence of sleep hypoventilation.

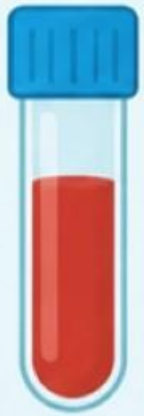


High AHI alone does not establish OHS.

OHS Diagnosis: Bicarbonate & ABG

Step 1

Serum Bicarbonate (HCO_3^-) Screening



Threshold:
27
mmol/L

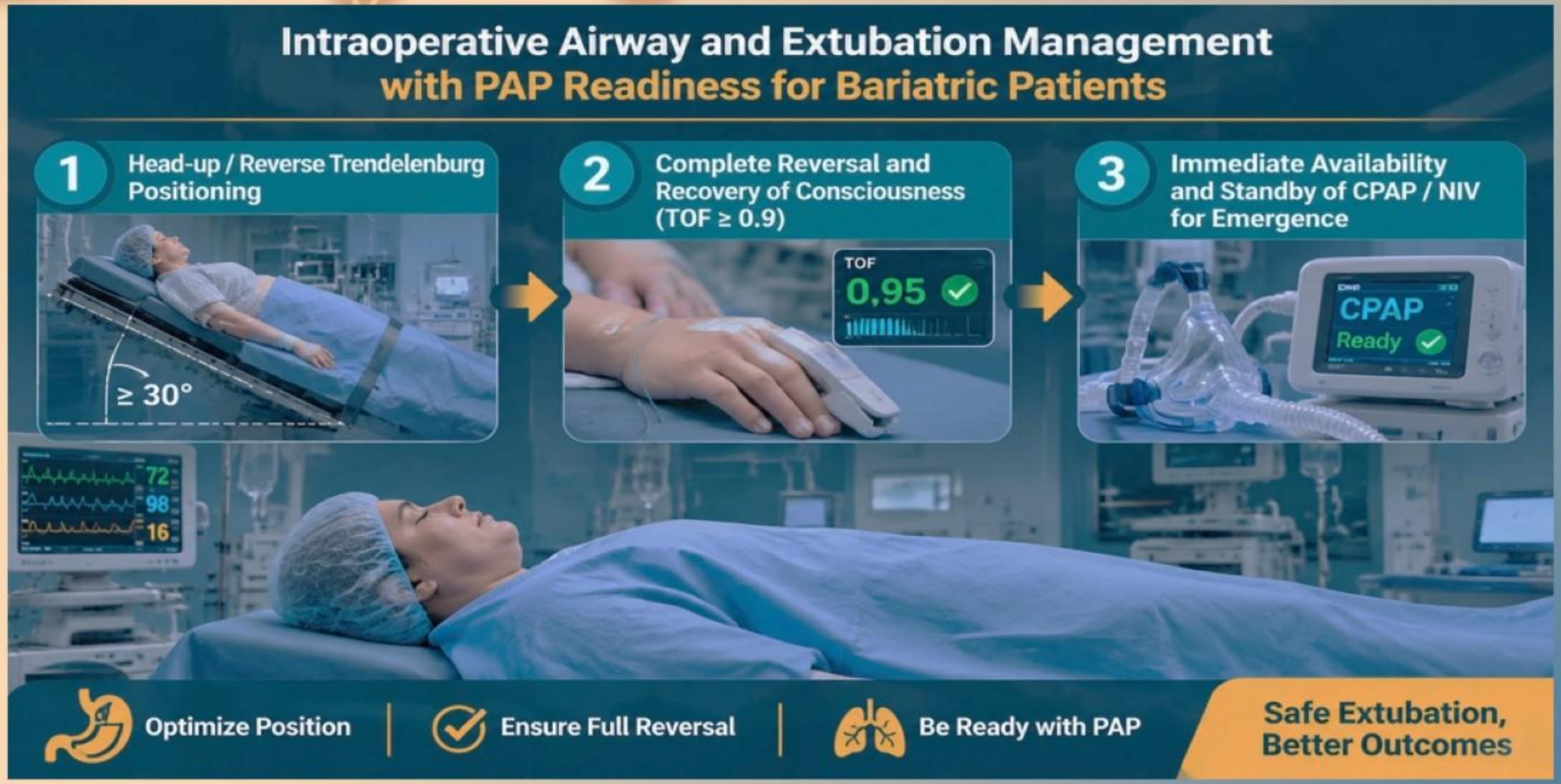
Step 2

Arterial Blood Gas (ABG) Confirmation



Awake $PaCO_2$
≥ 45
mmHg

Intraoperative Airway and Extubation Management with PAP Readiness for Bariatric Patients



Postoperative PAP Therapy Management
in PACU and Ward for Bariatric/OSA/OHS Patients



1 Immediate Resumption of Home CPAP/BiPAP



2 Monitoring Compliance, Leaks, and Gas Exchange

- Usage time & adherence
- Mask leaks
- SpO_2 and $PaCO_2$

3 Early NIV/PAP Support and Escalation Criteria in PACU

- Persistent hypoxemia
- Rising CO_2
- Increased work of breathing
- Airway instability

Maintain PAP to Prevent Respiratory Complications

Monitor Closely for Early Intervention

Support Safe Recovery in PACU and Ward

Preoperative Consultation & Device Management for OHS/OSA



Stable ambulatory OHS with severe OSA: CPAP can be first-line.



If severe OSA is absent or ventilation remains inadequate, consider NIV after specialist assessment.



Record device type, settings, adherence and residual symptoms.



Ask the patient to bring the device and mask.



Resume established CPAP in the immediate postoperative period.



Document oral appliance use separately and agree when to resume it.

BARIATRIC ANESTHESIA CONGRESS

Reassessment of OSA/OHS Patients



No routine repeat sleep study in an asymptomatic patient on **effective PAP.**



Consider retesting for substantial **weight gain** or **loss**, persistent symptoms, cardiovascular change or unexplained PAP data.



After weight loss, **reassess** before stopping PAP.

Intraoperative Airway & Analgesia Recommendations



Preoxygenation in a ramped, head-up position (≧30°).



First-line videolaryngoscopy per SOBA



Rescue and consider awake intubation when indicated



Opioid-sparing analgesia (avoid unnecessary sedation)

Bariatric Anesthesia Congress

ICU Admission Criteria after Bariatric Surgery



Age or BMI alone **does not** mandate ICU admission.



Treated, uncomplicated OSA **does not** routinely require ICU after laparoscopic bariatric surgery.

References

Miller’s Anesthesia, 10e (2025), Ch. 54; Stoelting, 9e, Chs. 1 & 18.

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AASM diagnostic testing 2017: 10.5664/jcsm.6506

ATS OHS 2019: 10.1164/rccm.201905-1071ST

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ASA neuromuscular blockade 2023: 10.1097/ALN.0000000000004379

SOBA airway management 2025: 10.1111/anae.16647

Additional sources are listed on relevant slides.

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for Your Attention

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