

Outpatient Anesthesia: Update and Issues

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Learning Objectives

- OPSU and PONV

Discuss the physiology and pharmacology of nausea, vomiting, and antiemetic drugs.

Discuss preventative measures.

- OPSU and OSA

Discuss the appropriate triage and perioperative treatment of OSA patients in the OPSU

- Unsuitable cases and patients in OPSU

Discuss factors determining appropriate cases in the OPSU setting

- OPSU and Pacemakers/AICDs

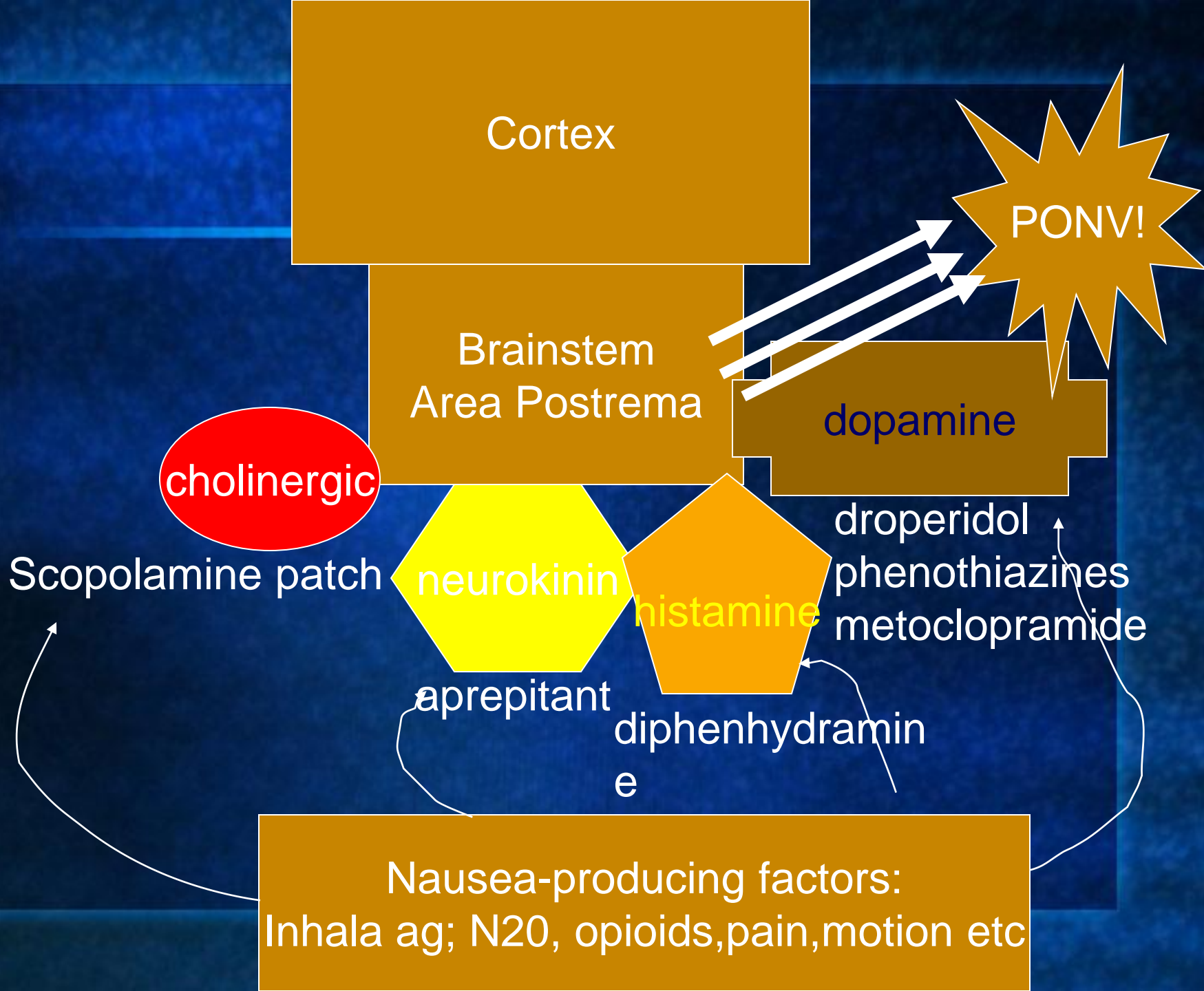
Discuss management of patients with implanted cardiac devices

- OPSU and Cardiac Stents

Describe latest recommendations for management

OPSU and PONV: that “little” big problem

- Without treatment, >30% of surgical patients will have PONV
- Delays discharge, requires escalation in nursing care
- Distressing to patients (a significant no. pts would rather have pain than nausea!) and families
- Occasionally requires admission = economic disaster!



PONV

- Mechanism: noxious stimuli to the vomiting center in the area postrema of the brainstem
- Perioperative nausea-producing stimuli
 - Opioids
 - Pain
 - Motion
 - Hypovolemia
 - Longer anesthesia
 - Preop anxiety

Factors predicting PONV

- Surgical: gyn laparoscopy; strabismus; longer surgery and anesthesia
- Medications: opioids, inhalation anesthetics
- Patient: child/younger, female, non-smoker, hx motion sickness, previous PONV

PONV Risk Assessment

- Elicit history, plan accordingly, risk categories:
 - Low: one episode in past, no other hx
 - Medium: >1 episode, some historical factors
 - High: multiple PONV episodes, motion sickness, female, non-smoker, young

Treatment and Prevention Plan

- Low: no tx; save your money!!
- Medium: multimodal approach with two drugs--dexamethasone, serotonin receptor antagonist (SRA), use preventative measures
- High: multimodal approach with three drugs--dex, SRA, phenothiazine, use preventative measures

Prevention of PONV

- Aggressive hydration: >20 mL/kg IV during short cases and postop
- Avoids hypovolemic baroreceptor-mediated BP swings with motion and ambulation
- Sympathetic activation of vomiting center with hypotension and motion during hypovolemia

Prevention

- Avoid GA when possible: Use MAC, regional
- Neuromuscular blockade reversal
↑PONV via cholinergic mechanisms
- PPV and intubation: air in stomach, irritation of vagal receptors upper airway, pharynx, most important risk=reversal (Neostigmine ↑Ach)

PONV and Analgesia

- Best to use non-opioids when possible: ketorolac, acetaminophen, PO NSAIDS
- Bupivacaine wound infiltration and regional/limb/field blocks
- **BUT**: If opioids must be used, give adequate amount; all too ironically----
pain causes nausea!!

Suggested PONV Regime: 60kg; laparos ovar cystectomy

- Induce propofol
- Sevo, no N₂O
- Low dose Roc/Vec intubation
- Give 20 mL/kg fluid
- Dexamethasone 4 mg start of case**Late Addition**
- Ondansetron 4 mg + Phenergan 12.5 mg at conclusion
- **Droperidol .625mg start of case ITS
BACK!!
- Do not reverse, let MR wear off
- Fentanyl 200 µg for pain control
- No NG tube unless requested by surg; does not prevent PONV

Dangers of Phenergan® (Promethazine)

- Extremely caustic to veins
- Extravasation can cause tissue slough
- Deadly if given arterially
- Severe vasospasm can result in amputation of extremity

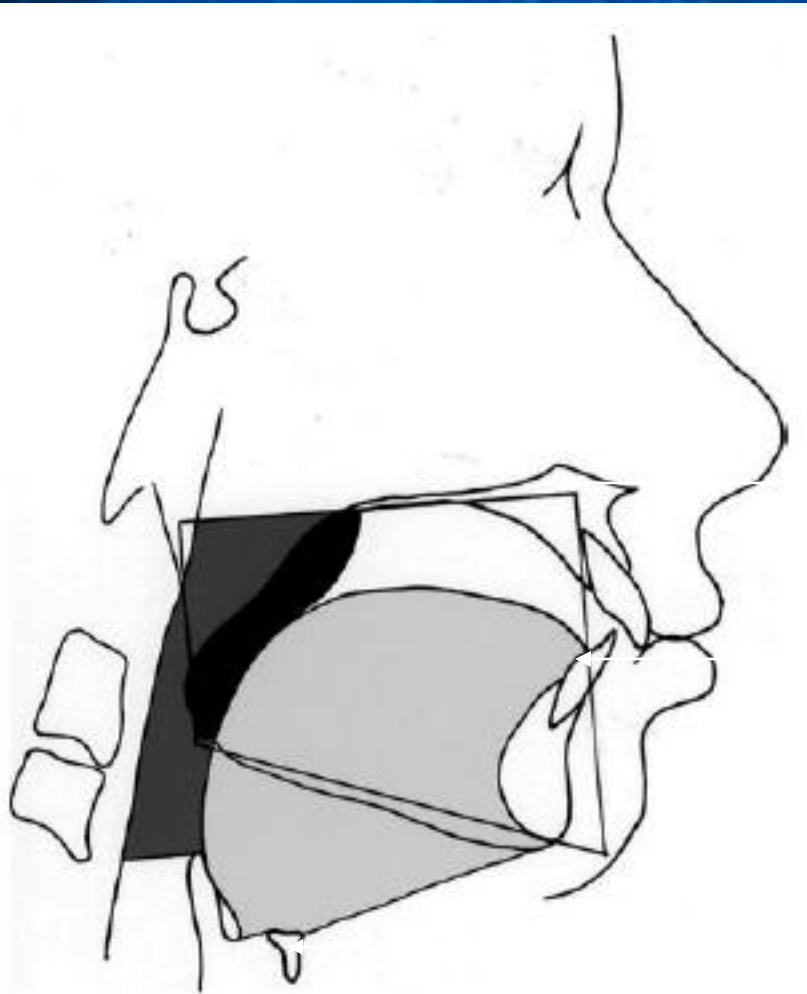
Rescue Therapy

- She's vomiting in recovery: now what?
- Fluid bolus 500 mL. Treat pain if present. Repeat phenergan, or try compazine 5 mg, or try propofol 20-40 mg. Make sure nurses do not move patient rapidly or abruptly. Admit prn.
- Notice: no droperidol; removed from UCLA formulary October 2007 2° black box warning implications: soon to return!**But now ITS BACK!!! YAY!!!!
- New med: Emend ® (aprepitant), neurokinin-A blocker.

Obstructive Sleep Apnea and OPSU

- Intermittent cessation of airflow at the nose and mouth during sleep
- Apneas of 10 sec duration 5x an hour
- 20-30sec apneas, maybe 2-3 min
- Three types of sleep apnea:
 - *Obstructive
 - Central
 - Mixed

The Upper Airway and Pharyngeal Dilator Muscles



Tensor palatino

Genioglossus

Hyoid muscles

Nasal entrance



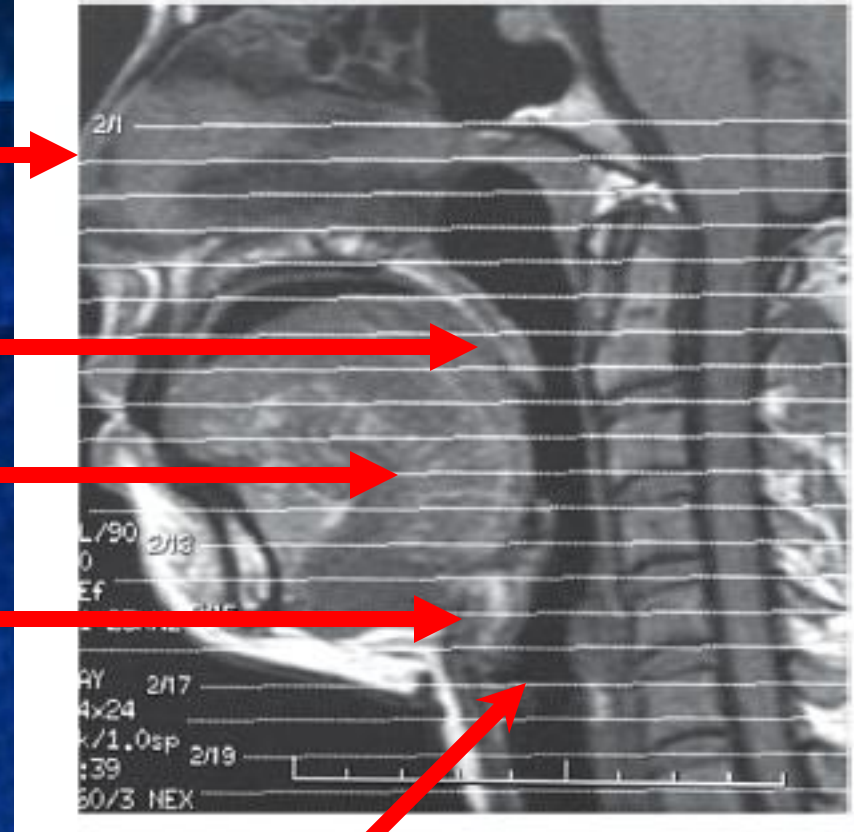
Tensor palatina



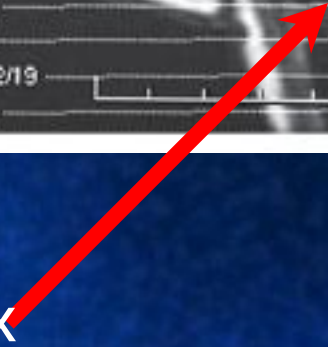
Genioglossus



Hyoid muscles



Hypopharynx



Anatomical abnormalities in OSA: nasopharyngeal airway narrow; tongue larger; soft palate length, area, size larger; hyoid bone more inferiorly positioned



Primary Events

Physiological Consequences

Clinical Outcomes

Diagnosis: typical features

- Male, age 30-60
- Snoring
- Daytime sleepiness
- Witnessed Apneas
- Moderate obesity
- Large neck circumference
- Mild to mod Htn

Sleep Study

Severity of Sleep Apnea	AHI* adult	AHI peds	LSAT
None	0-5	0	
Mild	6-20	1-5	>85
Moderate	21-40	6-10	80-85
Severe	>40	>10	<80

*Apnea-Hypopnea Index: no. apneas/hyp per hour; apnea \geq 10s

OSA Scoring System

- Derived from ASA guidelines, Anesthesiology, 2006; 104: 1081-93
- Severity of OSA
 - None = 0
 - Mild = 1
 - Mod = 2
 - Severe = 3
- If you have clinical sx suggestive of OSA, but no sleep study, assume “2”.

Invasiveness of Surgery

- Superficial surgery, nerve block, no sedation = 0
- Superficial surg with GA; peripheral surg, block, mild sedation = 1
- Periph surg with GA; or airway surg with mod sedation = 2
- Major surg with GA = 3
- Airway surg with GA = 3

Estimated need for postop opioids

- None = 0
- Low dose oral opioid = 1
- High dose oral, or parenteral opioid = 3

Now (sorry)-- higher math:

- Estimated severity of OSA (0 1 2 3)
- Estimated surgical invasiveness (0 1 2 3)
- Estimated opioid requirement (0, 1, or 3)
- Add: Estimated severity + Estimated surg
invasiveness **OR**
- Add: Estimated severity + Est opioid require
- Whichever is highest, is the patient's score--
you may subtract one point if pt is on CPAP
and will use perioperatively.

OSA Score and OPSU

- Risk = 4, pt is at increased periop risk
- Risk \geq 5, pt is at significantly increased periop risk, and is not a candidate for freestanding OPSU
- This scoring system, though not validated yet, gives clinicians useful organizing tool for evaluating this challenging patient population in OPSU setting.

Managing the patient periop

- Fiberoptic, difficult airway equipment immediately available. Assess for AFOI.
- Regional, blocks, light sedation preferred
- GA better than deep sedation due to loss of airway
- Use short-acting agents when possible
- Extubate fully awake

Post op Care

- Use non-opioid analgesia as possible, ketorolac, acetaminophen, oral NSAID
- Continuous pulse ox, until RA O₂sat >90% asleep
- Use patient's CPAP-have them bring in
- Sit pt up as possible
- Monitor at least 3 hrs in PACU

Discharge Criteria

- Room air O₂ sat baseline
- No hypoxemia or airway obstruction at rest
- If hypoxia or airway obstruction occur at rest on RA, monitor additional 7 hours, admit PRN
- Do not discharge patient if you feel he is still at risk for postoperative respiratory depression

Appropriate Patient Selection for OPSU

- Facility Type: free-standing, or attached to a hospital or a medical center
- Patient Medical History
- Planned Surgery and associated requirements: transfusion? Postop vent? Postop intensive care?

Nature of the OPSU Facility

- Attached to larger institution: what is the relationship? Can specialists be called upon to consult, electively? Emergently? Can pts be transferred directly? If so, can do bigger cases, for sicker patients.
- Free standing: limit surgery to manageable cases, no transfusion, no postop vent or ICU. Still need difficult airway, cardiac arrest, and MH treatments available.

Patient Medical History

- Free standing OPSU
- Medically stable
- Trouble:
 - Severe CV or Resp dz
 - Renal Failure
 - Liver Failure
 - Severe Congenital abnormalities
 - Severe Obesity; BMI > 40; note OSA hx

Patients with Complex Medical History and OPSU

- Get information from PCP/Cards about pt's condition, its severity and status. Any ischemia when stressed?
- Is pt in any distress: arrhythmia, dyspnea, altered LOC?
- What is planned procedure: peripheral surg with no or little sedation, pt is in no distress, may be OK. Big surgery/GA-trouble.
- Need clear institutional guidelines about what is acceptable, when to say NO.

Surgical Procedures and OPSU

- If pts can be admitted directly from OPSU, may be no problem; but less income.
- Free-standing: no blood transfusions, no prolonged ventilation, no intensive postop care.
- So: surgical procedures must be minimally invasive, fluid shifts minor, low complexity.
- Need institutional guidelines to delineate what is acceptable in your OPSU.

A Note of Caution

- Beware of surgical promises for painful procedures: in fact the patient MAY need GA!...and then what???
- With extremely fragile patients, ANY procedure may place them at risk: and if they have a respiratory or cardiac arrest--then what???
- Will you be able to defend yourself in a court of law for having proceeded?

OPSU and Pacemakers

- Need Cards note “avoid hypoxia and ...”No-please describe:
- Indication for the pacemaker. Pacemaker, type, mode, settings, what happens with magnet application-VOO?
- Is pt pacer dependent? No escape rhythm; asystole.
- Unipolar bovie: EMI can inhibit pacemaker—put pad far from pacer unit
- Use bipolar bovie with small EMI limited to tips
- Magnet and transcutaneous pacer immediately available
- Following procedure, must assure pacemaker is working properly before d/c pt home; if you put a magnet on it, have it interrogated to assure proper function

OPSU and the AICD

- Medical history, cause of AICD insertion and implications to care
- Combined unit with pacer? Need to get device information from pt, cards note, or do CXR, can see ID on radiograph
- Look up recommendations from manufacturer, or get cardiac lab to come, interrogate and manage device
- Problem: use monopolar bovie, AICD may fire 2° to EMI, may put pt in VF
- Use bipolar bovie or harmonic knife to avoid EMI interference
- Magnet use: in many models, this will turn OFF the AICD arrhythmia detection/shocking. Pt MUST BE MONITORED FOR VF AND HAVE DEFIB IMMEDIATELY AVAILABLE. In combined unit, the pacemaker will not be made asynchronous, can still be inhibited by EMI, dangerous in a pacemaker dependent patient

OPSU and Cardiac Stents

- AANA J 10/09: 52 yo for robot pros, dx pros ca. CAD, MI 3 yr PTA, DE stent prox LAD + circumf 2 yr PTA; d/c Plavix ASA 3 d PTA; took antihyperten. Fatal MI 3rd hour of surg.
- UCLA/SM: 48 yo, lumbar microdisc. Hx CAD, s/p LAD DE stent 3 yr PTA, d/c Plavix 1 year PTA; ASA 2 wk PTA. Neg stress test 1 yr PTA. Fatal MI in PACU.

Cardiac Stents and OPSU

- 2 processes: restenosis from cell growth into stent-BMS problem, prevented by tacrolimus/sirolimus drug in DES; thrombosis-prevented by anti-platelet Rx (Plavix, ASA) in DES patients
- Bare metal stents: no elective surg > 1 mo post implant
- DES: no elective surg >1 yr post implant
- Continue ASA. D/C clopidogrel as close to surg (5-7d) as possible, resume immediately
- Emergency surgery, bleeding risk, on Plavix—give DDAVP 0.3 mcg/kg IV; platelet transfusions to reverse Plavix effect w. new platelets
- Signs/sx of myocardial ischemia: assume stent thrombosis, rush to cath lab for angioplasty, resulting MI/ischemia high mortality risk: 30-50%
- No studies have been done that determine ideal time for d/c Plavix post stent implant. These patients are at increased risk for cardiac events.

Summary

- OPSU procedures account for 70% of surgery. OPSU setting has limits.
- PONV poses major challenge: pt discomfort, economic loss from ↑nursing care and time to d/c, unanticipated hospital admission. There are new meds and measures that can help.
- OSA patients are at risk for postop resp depression, obstruction and death-need a clinical pathway to safely care for them in OPSU setting. ASA scoring system can help.
- OPSUs should have guidelines to delineate what patient populations and surgeries are safely appropriate in a given facility.

Summary

- AICDs and Pacemakers can be managed in OPSU with proper consultation and preparation—be sure devices are working again prior to d/c home
- Cardiac stents can be managed in OPSU, but strict guidelines must be followed for antiplatelet tx and monitoring—need emergency referral/transfer plan in case of stent thrombosis
- Some might hesitate to care for these patients in a free-standing surgery center setting due to increased risk for cardiovascular morbidity and mortality

References

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- **Email me for references on PONV, OSA and patient selection in OPSU: cgriffis@mednet.ucla.edu**