Patient Safety Tip of the Week

October 11, 2016

New Guideline on Preop Screening and Assessment for OSA

Our regular readers are well aware of the numerous controversies and limited evidence base regarding perioperative issues in patients with known obstructive sleep apnea (OSA) or those suspected as being at high risk for OSA (see the list of prior columns at the end of today's column).

The Society of Anesthesia and Sleep Medicine has just published "Guidelines on Preoperative Screening and Assessment of Adult Patients with Obstructive Sleep Apnea" (Chung 2016). This is a most thorough evaluation of the evidence base regarding multiple issues related to OSA in patients about to undergo surgery. One is struck by the lack of strong evidence for almost all the recommendations in the guideline, though we are not surprised since we've previously discussed most of the controversial issues. Yet this consensus guideline uses common sense and is very practical and appropriately balances concerns for patient safety with utilization of resources and concerns over timing of surgery.

Below is their executive summary of the recommendations:

- Patients with obstructive sleep apnea (OSA) undergoing procedures under anesthesia are at increased risk for perioperative complications compared with patients without the disease diagnosis. Identifying patients at high risk for OSA before surgery for targeted perioperative precautions and interventions may help to reduce perioperative patient complications.
- Screening tools help to risk stratify patients with suspected OSA with reasonable accuracy. Practice groups should consider making OSA screening part of standard preanesthetic evaluation.
- There is insufficient evidence in the current literature to support canceling or delaying surgery for a formal diagnosis (laboratory or home polysomnography) in patients with suspected OSA, unless there is evidence of an associated significant or uncontrolled systemic disease or additional problems with ventilation or gas exchange.
- The patient and the health care team should be aware that both diagnosed OSA (whether treated, partially treated, or untreated) and suspected OSA may be associated with increased postoperative morbidity.

- If available, consideration should be given to obtaining results of the sleep study and, where applicable, the patient's recommended positive airway pressure (PAP) setting before surgery.
- If resources allow, facilities should consider having PAP equipment for perioperative use or have patients bring their own PAP equipment with them to the surgical facility.
- Additional evaluation to allow preoperative cardiopulmonary optimization should be considered in patients with diagnosed, partially treated/untreated, and suspected OSA where there is indication of an associated significant or uncontrolled systemic disease or additional problems with ventilation or gas exchange such as: (i) hypoventilation syndromes, (ii) severe pulmonary hypertension, and (iii) resting hypoxemia in the absence of other cardiopulmonary disease.
- Where management of comorbid conditions has been optimized, patients with diagnosed, partially treated/untreated OSA, or suspected OSA may proceed to surgery provided strategies for mitigation of postoperative complications are implemented.
- The risks and benefits of the decision to proceed with or delay surgery include consultation and discussion with the surgeon and the patient.
- The use of PAP therapy in previously undiagnosed but suspected OSA patients should be considered case by case. Because of the lack of evidence from randomized controlled trials, we cannot recommend its routine use.
- Continued use of PAP therapy at previously prescribed settings is recommended during periods of sleep while hospitalized, both preoperatively and postoperatively. Adjustments may need to be made to the settings to account for perioperative changes such as facial swelling, upper airway edema, fluid shifts, pharmacotherapy, and respiratory function.

Though this guideline deals primarily with the preoperative issues and does not delve into the many intra- and post-operative issues in patients with known or suspected OSA, this is a valuable document with lots of great references. Note also that a podcast about the guideline is available via the Anesthesia &Analgesia website as well.

A new meta-analysis confirms the utility of the pre-op STOP-Bang questionnaire in predicting complications following surgery (Nagappa 2016). From studies in the literature they found 11 qualified studies with over 20,000 adult patients who underwent surgery. Compared to those with a pre-op STOP-Bang score of 0-2, those with a score of 3 or more had an almost 4 times higher risk of complications (OR = 3.83). But, while OSA may be responsible for many of those complications, don't forget that many of the STOP-Bang items by themselves (high BMI, hypertension, large neck circumference, age >50) may be associated with higher risks of surgical complications. Nevertheless, just knowing that such patients are at greater risk for complications should make staff more vigilant after surgery. They should be especially vigilant for signs of OSA and, as noted in the new Society of Anesthesia and Sleep Medicine guideline above, PAP therapy should be considered on a case-by-case basis even though the jury is still out on routine use of PAP in patients with undiagnosed but suspected OSA.

Our June 7, 2016 Patient Safety Tip of the Week "CPAP for Hospitalized Patients at High Risk for OSA" highlighted a study (Sharma 2016) which used the STOP tool to screen obese patients (BMI ≥ 30 kg/m2) admitted to select medical (non-surgical) services and sorted them into high- and low-risk for OSA groups. They found that rapid response system (RRS) activations were significantly more frequent in those patients in the high-risk group. But high-risk patients who were put on PAP (CPAP, BiPAP, or APAP) and were compliant with PAP were significantly less likely to have RRS activations than those high-risk patients not compliant with PAP or not receiving PAP. The study also implies (but does not actually include the data) that those patients compliant with PAP had lower mean LOS.

But perhaps the most important message is that patients identified at higher risk by the STOP-Bang questionnaire need closer postoperative monitoring. And, as we've emphasized in numerous columns, just using pulse oximetry and respiratory rate monitoring is not sufficient. **Capnography** has now become the gold standard for monitoring patients. A recent review (Geralemou 2016) highlights the evidence base that capnography predicts impending respiratory depression earlier than does either pulse oximetry or respiratory rate. That is especially true in patients who are receiving supplemental oxygen. And we've noted numerous times how in patients with OSA a nurse or respiratory therapist may respond to a pulse oximetry alarm only to find a patient now awake and breathing normally with a normal oxygen saturation. Then the patient goes back to sleep and develops airway obstruction.

Geralemou et al. note some of the concerns regarding this technology including consistent appropriate positioning of the end-tidal CO2 monitoring device in awake extubated patients, patient comfort, and less familiarity with this device compared to pulse oximetry by nursing staff.

But many hospitals have not yet adopted routine capnographic monitoring because of concerns over cost. Geralemou et al. point to a study which showed postoperative respiratory failure added approximately 9 hospital days to hospital length of stay, greater than $53,000 to hospital costs, and an almost 22% increase in mortality (Zhan 2003). The Canadian Agency for Drugs and Technologies in Health (CADTH) in 2016 did an analysis of end-tidal CO2 monitoring in the hospital setting (CADTH 2016). Though admitting that high level evidence of efficacy is limited, they performed an exploratory analysis which concluded that for patients in serious or critical condition and for patients with obstructive sleep apnea or receiving high doses of opioids in post-operative care, use of end-tidal CO2 monitoring is likely less costly and more effective than standard monitoring.

In addition, a business case has been made for the cost effectiveness of capnographic monitoring for procedural sedation for gastrointestinal endoscopy (Saunders 2016). Those authors found that the addition of capnography resulted in a 27.2% and 18.0% reduction in the proportion of patients experiencing an adverse event during deep and moderate procedural sedation/analgesia, respectively. The reduction in adverse events

resulted in cost savings that accounted for the additional upfront purchase cost. Capnography was estimated to reduce the cost per procedure by $85 (deep) or $35 (moderate).

All these articles reinforce 2 best practices we feel need universal adoption:

1. Use of the **STOP-Bang** questionnaire to screen for patients at risk of OSA preoperatively in all patients. (We also think it should be used to screen any hospitalized patient who might be given opioids or sedation).
2. Use of **capnography** in monitoring any patient in whom the possibility of respiratory compromise is considered.

Our prior columns on obstructive sleep apnea in the perioperative period:

June 10, 2008	"Monitoring the Postoperative COPD Patient"
August 18, 2009	"Obstructive Sleep Apnea in the Perioperative Period"
August 17, 2010	"Preoperative Consultation – Time to Change"
July 2010	"Obstructive Sleep Apnea in the General Inpatient Population"
July 13, 2010	"Postoperative Opioid-Induced Respiratory Depression"
November 2010	"More on Preoperative Screening for Obstructive Sleep Apnea"
February 22, 2011	"Rethinking Alarms"
November 22, 2011	"Perioperative Management of Sleep Apnea Disappointing"
March 2012	"Postoperative Complications with Obstructive Sleep Apnea"
May 22, 2012	"Update on Preoperative Screening for Sleep Apnea"
February 12, 2013	"CDPH: Lessons Learned from PCA Incident"
February 19, 2013	"Practical Postoperative Pain Management"
March 26, 2013	"Failure to Recognize Sleep Apnea Before Surgery"
June 2013	"Anesthesia Choice for TJR in Sleep Apnea Patients"
September 24, 2013	"Perioperative Use of CPAP in OSA"
May 13, 2014	"Perioperative Sleep Apnea: Human and Financial Impact"
March 3, 2015	"Factors Related to Postoperative Respiratory Depression"
August 18, 2015	"Missing Obstructive Sleep Apnea"
June 7, 2016	"CPAP for Hospitalized Patients at High Risk for OSA"

References:

Chung F, Memtsoudis SG, Ramachandran SK, et al. Society of Anesthesia and Sleep Medicine Guidelines on Preoperative Screening and Assessment of Adult Patients with Obstructive Sleep Apnea. Anesthesia & Analgesia 2016; 123(2): 452-473, August 2016 http://journals.lww.com/anesthesia-analgesia/Fulltext/2016/08000/Society_of_Anesthesia_and_Sleep_Medicine.22.aspx

Podcast: Article of the Month – August 2016 – Christine Park and Frances Chung
Creator: OpenAnesthesia
Interviewer: Christine Park
Interviewee: Frances Chung
Duration: 29:31
Anesthesia & Analgesia August 2016, Volume 123, Issue 2;
http://journals.lww.com/anesthesia-analgesia/pages/currenttoc.aspx

Nagappa M, Chung F. Perioperative Complications & Stopbang Scores. A Metaanalysis. 2016 annual meeting of the Canadian Anesthesiologists' Society (abstract 152726) as discussed in: Vlessides M. STOP-Bang Questionnaire Ably Identifies Risks for Perioperative Complications. Anesthesiology News 2016; October 3, 2016
http://www.anesthesiologynews.com/Clinical-Anesthesiology/Article/10-16/STOP-Bang-Questionnaire-Ably-Identifies-Risks-for-Perioperative-Complications/38049/ses=ogst?enl=true

Sharma S, Chowdhury A, Tang L, et al. Hospitalized Patients at High Risk for Obstructive Sleep Apnea Have More Rapid Response System Events and Intervention Is Associated with Reduced Events. PLOS One 2016; Published: May 11, 2016
http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0153790

Geralemou S, Probst S, Gan TJ. The Role of Capnography to Prevent Postoperative Respiratory Adverse Events. NPSF Newsletter 2016; 31(2): 42-43 October 2016
http://www.apsf.org/newsletters/pdf/Oct2016.pdf

Zhan C, Miller MR: Excess length of stay, charges, and mortality attributable to medical injuries during hospitalization. JAMA 2003; 290: 1868-1874
http://jamanetwork.com/journals/jama/fullarticle/197442

CADTH (Canadian Agency for Drugs and Technologies in Health). Capnography for Monitoring End-Tidal CO2 in Hospital and Pre-hospital Settings: A Health Technology Assessment. Ottawa: CADTH 2016 (CADTH health technology assessment; no.142); March 2016
https://www.cadth.ca/sites/default/files/pdf/HT0007_End-Tidal_CO2_Review.pdf

Saunders R, Erslon M, Vargo J.Modeling the Costs and Benefits of Capnorgraphy Monitoring during Procedural Sedation for Gastrointestinal Endoscopy. Endosc Int Open 2016; 04(03): E340-E351
https://www.thieme-connect.de/products/ejournals/abstract/10.1055/s-0042-100719

Healthcare Consulting
www.patientsafetysolutions.com

http://www.patientsafetysolutions.com/

Home

Tip of the Week Archive

What's New in the Patient Safety World Archive