66 year old man with knee pain

Case conference

3 June, 2008
Preop H and P

- 66 year old man
- R knee pain for years
- No prior history of coronary or other heart disease
- History of diagnosed sleep apnea; did not tolerate CPAP. No other history about that related
Medications

- Tamsulosin 0.4 mg once daily
- Lorazepam 0.5-1 mg at bedtime as needed
- ASA 81 mg daily off for 1 week
- Relafen 750 mg once daily, off for 1 week
- Toprol XL 100 mg once daily
- Lipitor 20 mg once daily

Allergy Celebrex
Examination

- Height 6’1”  Weight 290 lb  HR 66  BP 140/80
- Appearance: overweight in no distress
- Chest normal
- CV normal
- Abdomen normal
- No edema
Preop Lab testing

- Na 142  K 4.7  creat 0.9  ALT 17  glucose 109  Hgb A1c 5.5%  Hgb 14.6
- EKG  normal sinus rhythm.  L axis deviation otherwise normal
- Felt to be good operative candidate for total knee arthroplasty
Preop Anesthesia evaluation

- ASA II
- Recommend spinal anesthesia and continuous femoral nerve anesthesia and sedation
Anesthesia

- Femoral nerve catheter inserted
- 200 mcg morphine and 12.5 mg bupivacaine injected intrathecally
- No anesthesia problems except episode of coughing and irregular respiratory movements and apneic episodes of up to 25 seconds on handwritten note on op record
Postop anesthesia note at 1741

- Uneventful intraoperative course
- RR 12  HR 45 (on beta blocker) “patient without complaints”
- Transferred to floor at 2026
Evening of surgery

► Meds: Fentanyl 25 mcg at 1945
► Hydromorphone 1 mg at 2130
► Hydromorphone 1.5 mg at 2330
► Hydromorphone 0.3 mg at 0240
► No analgesics given at scheduled time of 0330
Note written at 0730 next morning

“Patient’s sats dropping into 70s and 80s when falling asleep on simple mask at 6 liters. Has history of sleep apnea and has CPAP at home that he doesn’t use. Call placed to RT at 0100. RT assessed and increased O2 to 10 liters. Patient improved but sats still dropping into 80s. Patient arouses easily and told to take deep breaths after periods of apnea”
Code Blue at 0530

- Patient with shallow respirations at 4 per minute. Ventilated and intubated

- Initial ABGs PO2 81 PCO2 96 pH 7.07 HCO3 27

- Cxr portable film “congestion” questionable L sided infiltrate.

- Intubated. Extubated postop Day 2 (30 hours) uneventful course afterward.
First Tier questions

- Unavoidable risk of surgery?
- Error?
- Anything to learn?
- Should there be institutional response?
What happens when adverse event or error occurs at Abb NW?

► Reporting: PVSR “Patient/visitor safety report”—in other institutions nurses: doctors reporting 5:1

► Reports can also come through patient representative, physicians calling me or department chair, VPMA etc.
Referral by quality specialists

- Med errors handled qualitatively and quantitatively
- Med adverse events
- Critical Event Review
- Peer Review referral
Critical event review

► “Root cause analysis”
► Interdisciplinary group of involved caregivers convened
► “Just culture” required to convey institution’s desire for learning and improvement.
► Skilled facilitator
► Key facts, timelines, and systems improvements primary focus
Critical Event Review

- 66 reviews in 2007 at Abbott Northwestern
- Physician no-shows a chronic problem, but improving.
- Emphasis on system issues rather than personal performance, though human error not off the table
- Flattening hierarchy a priority
- Totally confidential and nondiscernable
Critical Event review example

► Severe insulin adverse event event about 2003
► Led to urgent educational effort of >2000 nurses in less than one month on insulin action and pharmacodynamics
► Order set introduction which later led to Excellian order sets.
► Formation of Insulin error reduction team which morphed into Glycemic control improvement team and is still active
Choice of events for critical review

- Severe
- Potential for institutional learning
- Some are required to be reported which mandates critic event review “28 Never events” are required to be reported to Minnesota Department of Health
28 “Never Events”

- Surgical events: wrong body part, wrong patient, wrong procedure, foreign body retention, death in ASA I patient

- Care management events: death or disability due to medication error, transfusion incompatibility error, maternal death in low risk pregnancy, death or disability due to healthcare acquired hypoglycemia, death or disability due to failure to treat neonatal hyperbilirubinemia, Stage 3 or 4 pressure sore acquired in facility, death or disability due to spinal manipulative therapy, artificial insemination due to wrong donor or egg.
28 Never Events

► Product events: death or disability due to contaminated drugs or devices, using of a device other than intended, air embolism

► Environmental: electric shock, oxygen problems, burn, restraints or bedrails, fall while in healthcare facility

► Patient protection: infant discharged to wrong person, death or disability related to patient elopement, suicide

► Criminal events: care related to impersonation, abduction, sexual assault, physical assault.
Peer Review

- Physician performance issues delegated by the hospital to Organized medical staff
- Departmental function
- In department of Medicine, further delegated to Medicine quality management work group
- Primary function: monitoring care in department. Also can contribute system improvements.
Other QI Activities

► Morbidity and Mortality conferences
  § Excellent educational opportunity
  § Not confidential and not designed to handle serious performance issues

► Trigger tools  A response to the fact that voluntary reporting dramatically underreports and reports different cases. So use “triggers” such as Naloxone use, vitamin K use to identify problems present but not reported.

► FMEA “Failure mode and effects analysis” prospective analysis of potential for harm of new process or technology
Back to the case

- Critical event review convened. MD and nurse participation and particularly candid and educational discussion
- Multiple issues identified
- Event review occurred in context of 4 postop analgesic related respiratory arrests occurring this winter and spring including one with worse outcome
- Postoperative Pain control and respiratory monitoring task force formed. Educational presentation about respiratory depression given on H8000 and H7000 with plans to bring to rest of hospital
Issue 1—Communication about regional and intrathecal analgesia

- Standard policy is that if intrathecal or regional block anesthesia is used, only prn analgesics to be given.
- No systematic method of notifying surgeon writing postop orders of this. Nurses receive order to discontinue scheduled meds.
- Intrathecal bupivacaine and morphine not placed on MAR (though documented in progress note), a common situation upon transfer from PACU to floor. Sometimes things documented only on scanned op report.
Issue 2—Identification and intervention of high risk patients

► Anesthesiologist was worried at time of transfer—obese, sleep apnea, apneic episodes intraoperatively, difficult pain control.

► No interventions open to him other than admit to ICU and clearly the patient did not seem sick enough to warrant that.
Issue #3—Untreated Sleep Apnea

- ENT physician commenting on case “Untreated sleep apnea is a contraindication to elective surgery”
- Casual approach to both diagnosed and suspected sleep apnea prior to surgery—”maybe the wife will bring in the CPAP”
- RT discussing situation with patient hypoxic on 6 liter mask at 0200 reportedly discouraged or did not encourage using CPAP.
Issue #4—The scheduled pain order sets

► “Scheduled + prn” approach on most major surgical order sets.

► Dilaudid portion is written Q 4 hours Dose: 0.5-1.5 mg
   - Begin dose at 0.5 mg
   - If after 4 hours pain control is unsatisfactory, increase each scheduled dose by half of the total prn mgs given since the last scheduled dose.
   - For mild pain, decrease the scheduled dose by half
   - Discontinue scheduled iv hydromorphone when pain is mild
   - If RR is < 8 and difficult to arouse, decrease scheduled dose by 50% (sic)
   - Call physician if at maximum dose and pains is not controlled after 8 hours.

► AND this is just a portion of it—there is a prn section too
Issue # 4 the case

► Nurse began at 1.0mg not 0.5mg. Knew from experience that 0.5 mg wouldn’t touch him.

► She thought she was giving it in prn fashion though placed in Scheduled portion of MAR

► Did not give ordered 0.2mg prn doses

► Instead gave 1.5 mg 2 hours later, again documenting in scheduled portion of MAR, despite that scheduled order was Q 4hours
One anesthesiologist on 1 mg Dilaudid dose: "I wouldn’t give that much to a horse unless he was intubated."

Two of the season’s arrests occurred on 0.5 mg doses of hydromorphone.

Perhaps we need opioid tolerant and opioid naïve order sets to be separated.
Issue #6—misinterpretation of hypoxia and failure to rescue

- Two providers, nurse and RT responded to hypoxia in this setting by turning up FiO2.
- Failure of recognition that reason for continuous oximetry is monitoring a surrogate marker for PCO2 and that evaluation for hypoventilation or other causes is appropriate response to hypoxia in this setting.
- Failure of appreciation of “trajectory”
Response to the 4 cases

- Nursing education about postoperative respiratory monitoring
- Formation of a postop pain and respiratory depression task force: anesthesia, pain, surgeons, pharmacy, nursing, quality dept.
- A recommendation to remove pain orders from postop order sets and to have free standing opiate tolerant, opioid naïve and elderly debilitated order sets
Response to the 4 cases

► Consideration of abandoning the scheduled + prn approach in postop pain order sets
► Development of a risk score with help of statistician and retrospective review
► Development of an approach for monitoring and treatment of patients felt to be at higher risk: step down unit? ABGs? Earlier hospitalist involvement?
Summary

- Critical event reviews are multidisciplinary evaluations of adverse events with an intent of institutional learning. They are confidential and nondisclosable.

- Physician performance aspects of adverse events are handled separately in departmental peer review activities.

- A systematic approach to improvement of safety of postop analgesia is necessary.