



Shared Learning

from the Dental Patient Safety Foundation Reporting Tool

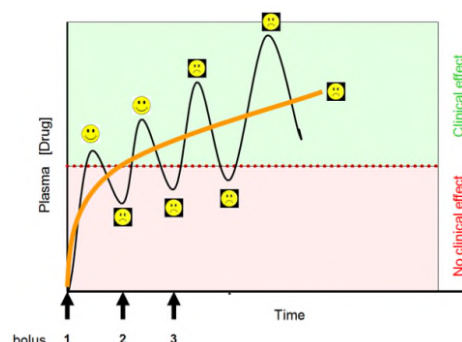
“What gets measured gets managed” is the DPSF philosophy to encourage reporting. All received information about patient safety events (unsafe conditions, near misses or adverse events) are contextually de-identified (confidentiality is fully protected under federal law), aggregated, analyzed and abstracted by selected experts from our DPSF committees. Reports are generated and disseminated as the only means to learn from our errors. The information in these peer-reviewed reports is provided for its educational value only, and does not purport to establish any legally binding standard of care. Feedback is encouraged.

Case 2018.2A: Deeper Than Intended Depth of Anesthesia – Lost Airway

Situation: An apprehensive 47 y/o patient (see box at right) presented for minimally invasive dental procedures. Practitioner and patient agreed to “procedural sedation” to facilitate satisfactory completion. Monitors included ECG, NIBP, SpO₂ - 2 lpm O₂/nasal cannula, 22g angiocath to left hand with 0.9NS. **2mg midazolam** and **50µg fentanyl** administered intravenously to effect. Local anesthesia was administered. 12 minutes into the case, patient became combative – prompting administration of an additional **2mg midazolam** and **25µg fentanyl**. Local anesthetic was augmented and treatment continued, but patient remained restless. Vital signs were 185/105mmHg, HR 115, SpO₂ reading lost due to patient movement. An additional **1mg midazolam** and **25µg fentanyl** were given, and **20mg ketamine** was added. One minute later patient become unresponsive and apneic and the SpO₂ dropped precipitously. Panic ensued as the practitioner and staff had never anticipated or experienced such an event before and thus were unprepared to respond. Feeble attempts to re-establish ventilation were unsuccessful. EMS was summoned but the patient could not be resuscitated. The official cause of death was hypoxic encephalopathy and pulmonary edema, secondary to asphyxia.

- 5'7", 240#, BMI = 38
- 165/98mmHg, HR = 99bpm
- Type II DM (A1c7.6) (metformin)
- HTN (lisinopril)
- Nighttime snoring / Mallampati 3
- 5 METS functioning
- ASA II or III

What we learned: Like most sentinel events, this case could be a consequence of the temporal convergence of a series of sub-optimal patient management decisions. Marginally controlled DM and HTN, together with obesity and a probable difficult airway would increase the risk of office-based sedation for this ASA III patient. Lack of an agreed upon and structured anesthetic plan, including depth of anesthesia limit setting, facilitated “anesthetic momentum” as level of sedation trumped level of safety. As visually depicted in the diagram, repeated bolus dosing can surreptitiously culminate in overdose, as drugs re-enter central circulation from saturated fat and muscle stores. Airway tone and ventilatory urge are negatively affected, especially in compromised patients. The sudden drop in SpO₂ exacerbated time urgency which provoked decline in both thought and performance. Capnography might have sounded an earlier warning. Both practitioner and staff appeared unprepared for this event. Ketamine is a general anesthetic agent and should only be used by dentists with general anesthesia training and permitting.



Recommendations and Action:

1. Practice a “culture of safety”
2. Conservative patient selection for office-based sedation
3. Plan for failed sedation – limit depth of anesthesia
4. Robust monitoring facilitate proactive vs. reactive therapies
5. Simulate airway emergencies frequently, involve staff
6. Trained anesthesia assistants are a valuable asset

The DPSF encourages frequent reporting of unsafe conditions, near misses and adverse events as the only means to close the gap between knowing how to prevent these occurrences and taking the necessary action to do so. Please visit our website.

Additional reading:

Rall M, Dieckmann P. Safety culture and crisis resource management in airway management: General principles to enhance patient safety in critical airway situations. Best Prac Res Clin Anaesth 2005; 19:539-557.