**Sedation for gynecologic procedure with local anesthetic toxicity**

*Setting:*

Patient in the sedation suite undergoing a procedure with a paracervical block and nurse sedation

*Critical Patient Issue:*

Local anesthetic systemic toxicity (LAST) leading to hemodynamic collapse

*Background Information and timeline:*

This scenario is set during normal daytime operating hours in a procedural suite. The participant is called to take over a procedural sedation (conscious sedation) room because the surgeon is having difficulty keeping the patient from moving. The patient is undergoing a dilatation, curettage, & hysteroscopy secondary to post-menopausal bleeding. The procedure started 20 minutes prior to the participants’ arrival. The patient has already received a total of 5 mg intravenous midazolam and 150 mcg of intravenous fentanyl in addition to a para-cervical block with 40 ml of 0.5% bupivacaine. She has a past medical history significant for hypertension and chronic atrial fibrillation. The sedation nurse has called the participant to help, as the patient has been moving too much. Time 0 is when the participant enters the room. The surgeon requests that the participant provide “about 5 minutes of good sedation.” The initial vital signs show atrial fibrillation (chronic) with infrequent premature ventricular contraction (PVC) couplets (new), moderate hypertension compared with baseline, and an oxygen saturation of 90%. The patient is moving and verbalizing incomprehensibly. Over the course of the scenario, the PVCs become more frequent and progress to short runs of Ventricular Tachycardia (VT) as well as progressive hypotension and hypoxemia. The patient becomes unconscious, and the surgeon notes clear seizure activity (unless the participant rapidly induces a general anesthetic). Ultimately the patient has sustained pulseless VT.

Once the participants treat the local anesthetic toxicity with lipid emulsion, the patient converts back to atrial fibrillation with stable hemodynamics after the next correct cardioversion. The patient remains in pulseless VT if lipid emulsion is not given.   If the participant doesn’t ask for lipid emulsion (or doesn’t appear to consider LAST), as the patient becomes more unstable, the surgeon first asks “Could this be due to something I did” and later “This really seems like a reaction to my block”, and finally “If this is the block, isn’t there an antidote?”

**Laparoscopic surgery with retroperitoneal hemorrhage**

*Setting:*

Patient undergoing general anesthesia for pelvic laparoscopic surgery

*Critical Patient Issue:*

Occult retroperitoneal hemorrhage (HEMORRHAGE) secondary to an iatrogenic injury leading to hemodynamic instability and shock

*Background Information and timeline:*

The participant is called to relieve an anesthesiologist who just started a pelvic endoscopy/laparoscopy case because that individual is needed to start a subspecialty case. The surgical procedure is about to begin. The participant receives a full report and the confederate anesthesiologist leaves. The patient is a 33-year old female who has been having pelvic pain for nearly six months who presents for a diagnostic pelvic endoscopy. Her past medical history is unremarkable. The surgeon (a gynecologist) proceeds with trocar placement (time 0), at which time there is an (initially) unrecognized injury to the internal iliac vein causing retroperitoneal hemorrhage. The initial vital signs are stable and then progressively proceeds to mild, moderate and finally severe hypotension. The participant anesthesiologist is required to develop a differential diagnosis for hypotension, recognize hemorrhagic shock, and then to treat and stabilize the patient. A mid-scenario issue is the management of peritoneal insufflation. Later in the scenario, management issues include blood transfusion and the need for definitive surgical intervention.

At 10 minutes, the surgeon asks to review the CT scan because “I don’t remember her having a retroperitoneal mass.” Two minutes after reviewing the scan, the surgeon states, “The mass looks bigger and is blue. It could be a retroperitoneal hematoma.” If the participant asks the surgeon to open the abdomen, “I’m not comfortable opening the retroperitoneum.”

**Endoscopic retrograde cholangiopancreatography with post-operative malignant hyperthermia**

*Setting:*

Patient is in the Post Anesthesia Recovery Unit (PACU) after a gastroenterologic procedure

*Critical Patient Issue:*

Malignant hyperthermia (MH) presenting in the post anesthesia care unit

*Background Information and timeline:*

It’s 5:30 pm, and the participant is the “late” call anesthesiologist. There is one other anesthesiologist still working at this site (the First Responder). The PACU (post-anesthesia care unit) nurse has called the participant to evaluate the patient, who is tachycardic, diaphoretic, mildly hypertensive, tachypneic, and somewhat somnolent. Twenty minutes prior to the scenario’s start, the patient had a general endotracheal anesthetic (GETA) for an ERCP. A GETA was done because of her GERD and pre-procedure nausea and vomiting. The ERCP lasted about 45 minutes. Upon arrival at the patient’s bedside (time 0), the nurse explains the situation to the participant. All of the pre-, intra-, and post-operative documentation is available at the patient’s bedside.

As the scenario progresses, the malignant hyperthermia reaction evolves and the patient becomes progressively more tachycardic with premature ventricular contraction couplets, hypertensive, hyperthermic, and somnolent. At 2 minutes, the GI physician enters the PACU, asks the participant how the patient is doing and, upon being briefed, states “She had pus in her common duct and she’s probably bacteremic. Give her 750 mg of metronidazole.” The gastroenterologist leaves 2 minutes later to see another patient in the emergency department. At 8 minutes the mannequin has trismus and neck flexion enabled. About this time, the nurse states (usually when asked to start another IV) that the patient ‘feels stiff’. The severity of the metabolic abnormalities (hyperkalemia, acidosis, hyperthermia, etc.) depend on when and how aggressively the participants treat the MH with dantrolene. Administration of succinylcholine to perform a rapid sequence induction prior to dantrolene initiation precipitates pulseless ventricular tachycardia.

**Small bowel obstruction with unstable atrial fibrillation followed by a myocardial infarction**

*Setting:*

Patient undergoing general Anesthesia in the operating room

*Critical Patient Issue:*

Acute unstable tachyarrhythmia, hemodynamic instability followed by myocardial infarction

*Background Information and timeline:*

The participant is called to relieve another anesthesiologist who has become acutely ill while taking care of a patient undergoing open laparotomy for a small bowel obstruction. The patient is a 65-year-old man who has a small bowel obstruction and has failed medical management. His history is notable for stable exertional angina, hypertension and type 2 diabetes. He is a heavy drinker and smokes 1 ppd. The patient lives alone with limited access to healthcare and may have been poorly compliant with his prescribed medications. Time 0 is when the confederate anesthesiologist begins to leave the room after the handover. One minute later, the surgeon asks for more retraction and the patient goes into atrial fibrillation (AF) with a rapid ventricular rate. The resulting significant hypotension does not respond to medical therapy. Cardioversion is required before the patient will convert to sinus rhythm. If cardioversion has not been performed by 10 minutes, the surgeon asks, “Why don’t you cardiovert him?” Immediately upon conversion to sinus rhythm, ST elevations occur consistent with an anterior myocardial infarction. The participant is expected to recognize the STEMI, provide initial medical therapy (including treatment of low blood pressure), and contact a cardiologist. The participant must communicate with the cardiologist, negotiate between surgical and cardiology care plans, and activate the catheterization lab.