Case Study

Inappropriate Anesthesia Administration Results in Severe Consequences

Clinical Sequence

A 40-year-old male patient with a history of obesity, hypertension, diabetes, and diabetic retinopathy had been under the care of internal medicine, endocrinology, and nephrology for renal dysfunction, neuropathy, and other comorbidities.

The patient received inpatient treatment for left big toe osteomyelitis and was later readmitted with left foot wounds and an infection, and also received a vascular consultation. The patient was diagnosed with gangrene in the same toe and was scheduled to receive a partial amputation. A podiatrist completed a debridement. However, the amputation was delayed due to poor renal function.

The patient was readmitted for the amputation several weeks later and, following an evaluation by cardiology, was cleared for surgery. The CRNA completed the anesthesia evaluation and planned for monitored anesthesia care (MAC). The supervising anesthesiologist, who oversaw four CRNAs, assessed the patient, noting comorbidities, including obstructive sleep apnea (OSA). Based on the American Society

of Anesthesiologists (ASA) physical status classification system, the anesthesiologist classified the patient's status at ASA IV, which is defined as "a patient with severe systemic disease that is a constant threat to life."

The CRNA began the induction of anesthesia. The anesthesiologist was not present at this time; however, the patient's vital signs were stable. The patient was receiving oxygen through a mask while the CRNA administered Fentanyl 100mcg and Propofol 50mg. Simultaneously, the podiatrist injected 15cc of 1% Lidocaine into the patient's left foot. The patient became unresponsive immediately.

The anesthesiologist was called to the operating room (OR) seven minutes after induction. The patient initially received ventilation via a bag/mask and was then intubated. Five minutes later, the patient was in pulseless electrical activity (PEA). The code team arrived. After 15 minutes, the patient was in ventricular fibrillation, and the code team defibrillated the patient. He returned to a normal rhythm and was then transferred to the intensive care unit (ICU) on a ventilator. It was later noted that documentation on the code sheet was inconsistent with care provided and illegible due to handwritten notes.

MRI findings identified an anoxic brain injury, and the patient was diagnosed with irreversible anoxic encephalopathy and later passed away.

Case Study

Missed Lung Nodule Results in Fatal Diagnosis

Clinical sequence

A 40-year-old presented to a clinic after a motor vehicle accident. A chest X-ray showed fractured ribs and clear lungs. Two months later, the patient returned due to ongoing left upper chest pain and was examined by a nurse practitioner (NP) who noted that the patient was experiencing ongoing rib pain and ordered a chest CT.

The radiologist identified an 8 mm nodule in the patient's right lower lung and recommended a repeat CT in 3 months, a biopsy, and a possible PET scan. The NP was notified and reexamined the patient a couple of days later. During this exam, the NP focused on a possible thoracic spine compression fracture and did not document or acknowledge the presence of the lung nodule. The NP ordered an MRI of the thoracic spine. The radiologist, again, mentioned the lung nodule in their report.

Seven months later, the patient returned with new hip pain which the NP diagnosed and treated. Two weeks after that, the patient presented with new onset abdominal pain, and an abdominal CT was completed.

The abdominal CT showed that the lung nodule had doubled in size and there was concern for malignancy. The radiologist recommended a chest CT with IV contrast. The patient was not notified of the findings and the NP did not follow up on the test or read the report.

Six months later, the patient returned with chest and back pain and dyspnea. A chest X-ray showed that the lung nodule had now quadrupled in size. The radiologist notified the patient and the NP of the findings via telephone.

Ultimately, the patient had melanoma metastasize to the lung, brain, spine, and abdominal organs. The patient died shortly after their diagnosis.

Case Study

Oversights in Post-op Diabetes Care Cause Critical Complications

Clinical sequence

A 56-year-old male with a history of Type I diabetes mellitus (DM), managed with an insulin pump, and peripheral vascular disease was admitted for a femoral-popliteal bypass graft. After the procedure, the patient was transferred to the Post-Operative Care Unit (PACU). Despite having Type I diabetes and being on an insulin pump, endocrinology was not consulted. Without orders from the vascular surgeon, the nurse instructed the patient's wife to turn off the pump because the patient was sedated and unable to self-bolus. The patient was to be covered with sliding scale insulin (SSI). About an hour later, the patient's blood sugar was 197. The vascular surgeon was called and they asked the nurse practitioner (NP) to order insulin but, due to busyness, the insulin was never ordered or given. Documentation of these discussions did not exist.

The patient's blood sugar was 284 when transferred to the floor, and the vascular surgeon was not called. It is unclear whether the admitting team knew the insulin pump was off. Transfer orders included SSI and finger sticks with meals and at bedtime, so he was given one unit of insulin (type unknown). No further testing was done until the following morning when his blood sugar was 434. A rapid response team was called, an insulin drip was started, and the patient was transferred to the ICU for DKA. Serial cardiac enzymes indicated the patient had suffered an MI.

Case Study

Informed Consent Is More than Just a Signature

Clinical Sequence

A 57-year-old female elected to have a facelift and upper and lower blepharoplasty (a surgical procedure that corrects or improves the appearance of the eyelids). Prior to the facelift and upper blepharoplasty, the patient reviewed the information sheet as well as the consent form, which listed scarring and need for revision as possible risks of the procedure. The physician documented that the patient "understands risks and recovery time of a facelift." The procedure was completed without incident.

Two weeks after the initial facelift and upper blepharoplasty was completed, the physician completed the lower blepharoplasty. Again, the patient signed a consent form that listed scarring and the need for revision as possible risks. The physician did not, however, document that the risks were discussed verbally with the patient. The patient alleged these risks were not reviewed or discussed verbally. Per the physician, because of the condition of the patient's skin, incisions were made lower than is typical. This resulted in prominent scarring below the patient's eyes and a need for a revision.

Case Study

A Failure to Document Patient's Refusal

Clinical Sequence

A 60-year-old, obese male, with a history of smoking, hypothyroidism, and borderline hypertension presented to his primary care provider (PCP) for an evaluation of abdominal discomfort. A ventral hernia was identified, but no other findings were noted. The PCP recommended a digital rectal examination (DRE) and a colonoscopy, however, the patient refused both. This discussion, including the patient's refusal, was not documented in the patient record.

Over the next seven years, the patient saw his PCP irregularly for problem-oriented exams and exhibited a pattern of non-adherence to care. Colonoscopy and DREs were recommended several times, which the patient refused. Those recommendations and refusals were not documented.

Eight years after his PCP's initial recommendation for a DRE and colonoscopy, the patient presented to the hospital with complaints of generalized weakness for several weeks, decreased appetite, and dark stools. A CT scan revealed an enlarged liver with numerous lesions consistent with metastasis. A colonoscopy showed a mass in the cecum; biopsy showed moderately differentiated adenocarcinoma. At

this time, the patient was not a surgical candidate and was transferred to the medical oncology service for chemotherapy, with a life expectancy of one year.

Case Study

Inadequate Screening of Patient with Substance Use Disorder Has Fatal Ending

Clinical Sequence

A 58-year-old male patient with a medical history of high blood pressure, diabetes, and alcohol use disorder was being treated by a nurse practitioner (NP) for smoking cessation. The patient was prescribed Chantix for smoking and reported he had not smoked for over a year. The patient reported to the NP that he was drinking at least six to eight beers per night, which was increasing his blood sugar levels. At this point, the NP did not refer the patient to any substance use support services.

A few months later, the NP saw the patient for depression and anxiety, which was precipitated by fear he may lose his business. The patient had resumed smoking and reported increased, extreme anxiety. He stated he had not slept in over a week and had been taking his friend’s Alprazolam (anti-anxiety medication). The NP prescribed the patient Lorazepam

for anxiety, and he was instructed not to take this medication with alcohol.

The patient returned the following month stating he was still not sleeping. The NP documented “No depression, no life stressors” in his chart. Eighteen months later, the patient reported he was highly anxious, still drinking alcohol at night, depressed over his failing business, and had lost 15 pounds. At the time, the patient was taking Chantix along with two anti-anxiety medications (Clonazepam and Lorazepam) and an anti-depressant (Citalopram), all of which were prescribed by the NP.

The patient called the NP requesting additional medication for anxiety. The NP counseled the patient to try to relax and “let the medication work.” The NP did not refer him to mental health services or assess him for suicidal ideation.

The next day, the patient was found to have died by suicide.

Case Study

Inadequate Documentation Complicates Review of Chest Tube Placement

Clinical Sequence

Following thoracic surgery, a post-operative X-ray revealed a right pleural effusion requiring drainage. The physician reviewed the risks, benefits, and alternatives of chest tube placement with the patient, and informed consent was signed. A chest tube was placed without image guidance with one liter of drainage. No complications occurred at the time of placement. A post-procedure stated that the catheter was placed using the Seldinger technique but did not detail other techniques that were used. Shortly after the procedure, the patient became hypotensive with new bloody drainage from the chest tube. They were taken emergently to the operating room where a liver laceration was identified and repaired.

Case Study

Unwitnessed Fall Highlights Gaps in Documentation

Clinical Sequence

An elderly patient was evaluated in the ED after falling at a skilled nursing facility. A head CT was negative, and a small forehead laceration was repaired. While waiting for transfer back to the skilled nursing facility, the patient had an unwitnessed fall in the ED. The patient was assisted back to bed and evaluated by a nurse and physician. The patient denied pain or injury. Their mobility after the fall was not assessed, and no imaging was performed.

When the patient was transferred back to the skilled nursing facility, it was noted that they were not able to stand or walk. The patient returned to the ED, where imaging identified a hip fracture requiring surgical fixation. The emergency medicine physician documented the patient's unwitnessed fall in the ED for the first time in the medical record during the second ED visit. The nurse caring for the patient when they had the unwitnessed fall documented a “late entry” describing the event after the patient returned to the ED and was diagnosed with a hip fracture.

Case Study

Lack of Follow-up Leads to Renal Cell Cancer Diagnosis Delay and Death

Clinical Sequence

A 55-year-old female with an unknown medical history presented to an outpatient clinic for a routine visit. She was evaluated by Physician Assistant “A” (PA-A), who documented both “no complaints” and “upper abdominal pain” in the diagnosis section of the note. PA-A ordered labs, an electrocardiogram (EKG), a cervical screening, and an abdominal ultrasound (U/S).

The labs showed anemia, and the EKG and cervical screening were normal. The U/S revealed a 7 cm right kidney mass, and

a computed tomography (CT) scan was ordered. The patient was notified about the importance and urgency of scheduling the CT scan. However, the patient refused due to the cost of the scan. The conversation regarding the patient's refusal was not documented in the medical record, and no further follow-up occurred.

Ten months later, the patient returned to the clinic with complaints of dysuria and excessive thirst. Physician Assistant "B" (PA-B) evaluated the patient and stated he discussed the prior U/S results and the need for a CT scan, but the conversation was not documented. Labs were completed, which confirmed non-insulin-dependent diabetes mellitus, and the patient was started on oral antidiabetics.

One year later, the patient presented to the Emergency Department with complaints of abdominal pain, blurred vision, and dysuria. On examination, the patient had a palpable right kidney mass. A CT scan and biopsy were performed, which confirmed Stage 4 renal cell cancer.

Due to extensive carcinomatosis, the patient had a poor prognosis with no treatment options. She was admitted to the intensive care unit and recommended for hospice. The patient expired one month later.

Case Study

Medication Mix-up Contributes to Patients' Death

Clinical Sequence

A nurse in an understaffed MICU was caring for two patients. The first patient was hemodynamically tenuous and required vasopressors (Norepinephrine) for blood pressure management. The second patient was being treated with antibiotics (Bactrim) for pneumonia. This patient was progressing well and was scheduled for transfer to a step-down unit once a bed became available.

The nurse called the pharmacy and requested that both the Norepinephrine and Bactrim be sent to the unit. Both medications were delivered to the MICU via the hospital tube station from the pharmacy. Around 6:30 p.m., the nurse administered the Norepinephrine instead of the Bactrim for the patient with pneumonia. The medication rate was also incorrect and set at the Bactrim rate, which was triple the maximum dose for vasopressors. The nurse did not complete the required safety checks before starting the medication.

Around the shift change, the oncoming nurse noted the patient's blood pressure was 220's systolic. The nurses did not recognize the error and discussed possible causes of an

elevated blood pressure, including abdominal pain or anxiety related to the upcoming transfer. The overnight nurse rechecked the patient's blood pressure and noted it remained elevated. The patient was also experiencing a fast heart rate and increased, labored breathing.

The nurse called the resident, who noted a cardiac rhythm on the monitor concerning pulseless electrical activity (PEA) and then called a code blue. The charge nurse, who was assisting with the code, then recognized the wrong name on the medication and realized that Norepinephrine was infusing instead of Bactrim. The infusion was stopped, but the code was unsuccessful, and the patient expired at 8:45 p.m.

An investigation concluded that the medication error precipitated the code and the patient's death. The nurse had been employed at the hospital for five years and had no prior performance issues.

Case Study

Failure to Order Medical Imaging Leads to Permanent Vision Loss

Clinical Sequence

A healthy, young professional presented to an ophthalmologist one day after a piece of metal hit them in the eye. They were

diagnosed with a scleral laceration and referred to a second ophthalmologist. The patient was seen two days after the injury and the second ophthalmologist noted visible vitreous at the site and repaired the scleral laceration. On the fourth day, the first ophthalmologist saw the patient again and documented their vision as 20/40 with some blurring.

Two and four weeks later, the first ophthalmologist saw the patient and noted vision in the injured eye improved to 20/20. However, it was noted that the iris in the injured eye was not constricting appropriately, and they were referred back to the second ophthalmologist.

The patient visited the second ophthalmologist three weeks later, complaining of light flashes in the periphery of the injured eye and blurred vision. The physician documented a vitreous detachment; no intervention was required at that time.

Two months later, the first ophthalmologist saw the patient again and diagnosed them with a cataract in the injured eye. The second ophthalmologist was also consulted due to decreased visual acuity with increased debris in the vitreous. The patient’s vision was documented as 20/70. An ultrasound was performed, and no foreign bodies were noted in the eye.

Approximately one week later, the second ophthalmologist performed surgery, followed by a vitrectomy two weeks later. During the procedure, the physician found and removed a metallic foreign body within the anterior vitreous at the root of the iris.

The patient had follow-up visits with each ophthalmologist, and vision in the injured eye continued deteriorating. The patient was diagnosed with retinal detachment and proliferative vitreoretinopathy, which required additional surgery.

Case Study

Failure to Resume Anticoagulation after Procedure Causes Stroke

Clinical Events

A 70-year-old male presented to the emergency department with a gangrenous toe and was found to have an obstructed superficial femoral artery. The patient's history included atrial fibrillation, stroke, hypertension, chronic kidney disease, coronary artery disease, diabetes mellitus type II, chronic obstructive pulmonary disease, and chronic heart failure. They were also being treated with Eliquis for atrial fibrillation.

The patient was admitted to the hospital, where a vascular surgeon was consulted and an angiogram was scheduled for the next day. The hospitalist caring for the patient (Hospitalist A) documented the plan for the angiogram and anticoagulation treatment was withheld in preparation for the angiogram. The patient was successfully stented on day two of admission. Hospitalist A's note stated the patient "was on Eliquis. As per vascular surgery, after procedure the patient may start Eliquis or low dose Lovenox, if needed and okay with surgery. Restart Eliquis whenever okay per surgery."

On day three of admission, the patient was seen by the vascular surgeon and there was no mention of anticoagulation in the note. The hospital medicine nurse practitioner (NP) documented that Eliquis was on hold since the patient's admission for possible right foot amputation. The NP also sent a page to Hospitalist B stating that the patient is not on DVT prophylaxis. Hospitalist B saw the patient and documented he was having a vascular work-up to assess blood flow as he may require amputations. Hospitalist B saw the patient again the next day (four days since admission), and the assessment and plan seemed identical to the previous day.

At 8am the following day, Hospitalist B noted the patient was walking, talking, and following commands. At 11:58am, a Rapid Response was called for unresponsiveness. The patient

suffered a massive cerebral vascular accident (CVA) resulting in aphagia and inability to walk.

Case Study

Delayed Breast Cancer Diagnosis after Insufficient Follow-Up

Clinical Sequence

A 38-year-old presented to her primary care provider (PCP) with concern for a palpable breast lump. The PCP noted the presence of the lump but documented that it was “likely a cyst, no imaging needed.” No follow-up imaging was ordered.

One year later, the patient had a screening mammogram. The mammogram showed a 1.5cm mass, and an ultrasound-guided biopsy was performed. She was diagnosed with Stage 2 breast cancer. She required chemotherapy before undergoing a mastectomy and subsequent radiation. The patient required a 5-year course of Tamoxifen after surgery and had to delay pregnancy for that length of time.

Case Study

Overriding Drug Alerts Results in Patient Death

Clinical Events

A 61-year-old female with a complicated medical history was admitted for an evaluation of a large right ventricular thrombus with Automatic Implantable Cardioverter Defibrillator (AICD) lead involvement. Her history included non-ischemic cardiomyopathy with ventricular tachycardia, an AICD placement, atrial fibrillation, and recurrent pulmonary emboli. The patient was also taking the antiarrhythmic Dofetilide (500mcg/day), which is associated with QT interval prolongation, a heart rhythm disorder that can lead to an arrhythmia.

The plan was to surgically remove the thrombus, AICD device and leads. Prior to the procedure, the patient exhibited wide complex tachycardia/ventricular tachycardia and reported chest pain and nausea. Due to the risks of a large intra-cardiac thrombus, the cariology resident decided to treat her with Amiodarone. The resident discussed the plan with their attending and Amiodarone was ordered and administered. Amiodarone is contraindicated for patients on Dofetilide because it may cause QT interval prolongation. The cardiology resident overrode the electronic medical record alert. The attending did not recall being informed the patient was on Dofetilide when they decided to order Amiodarone.

The patient also complained of nausea and was treated with Zofran and Compazine. The resident also overrode alerts regarding administering Zofran and Compazine. Like

Amniodarone, they are contraindicated because of their impact on the QT interval. The patient suffered a cardiac arrest due to an arrhythmia associated with prolonged QT interval. The patient was resuscitated and transferred to the ICU. Over the next two hours, the patient had multiple ventricular tachycardia arrests without a sustainable pulse. The patient was cannulated for Extracorporeal Membrane Oxygenation (ECMO). Ultimately, the patient had poor neurological function and it was decided to take the patient off life support. The patient died two days later. Upon interrogation of the AICD, it was believed the lethal dysrhythmias were correlated with the administration of the Amiodarone, Zofran, and Compazine.

Case Study

Fatal Injuries after Inadequate Wound Treatment and Documentation

Clinical Events

A 75-year-old female with a medical history of peripheral vascular disease, hypertension, diabetes, and deep vein thrombosis was admitted to the hospital with an acute exacerbation of her chronic heart failure. Upon admission, the initial documentation stated the patient had a pressure ulcer on her coccyx that was later changed to “wound incontinence breakdown to the right buttocks and intergluteal cleft.” It was

also documented that the patient had a blister on her right foot.

The patient was incontinent and bedbound; she was then discharged from the hospital to a SNF with stage 2 wounds to her left buttocks and sacrum, as well as an open wound on her left buttock. The wound care nurse at the SNF assessed the patient and made recommendations for wound care. The documentation regarding adherence to recommended interventions was unclear. Six months later, the wound was documented as a “large nonhealing stage 3 wound with drainage.”

Seven months after admission to the SNF, the patient was transferred to the emergency department (ED) for respiratory distress and placed on BiPAP. At this time, there was discussion with the family about changing the patient’s status to “comfort measures only (CMO),” but the family declined, opting for “do not resuscitate/do not intubate (DNR/DNI)” as part of the care plan. A surgeon assessed the patient and noted wounds to the left flank, left heel, and a stage 4 pressure ulcer on the sacrum.

When discharged, the patient’s family selected a different SNF due to concerns of neglect and worsening wounds at the previous SNF. Three days later, the patient returned to the ED for worsening unstageable wounds with drainage and was

diagnosed with sepsis from osteomyelitis of her coccyx. At this time, the family agreed to change her status to CMO and she died in hospice care within two weeks.

Case Study

Misinterpretation of CT Scan Delays Stroke Diagnosis

Clinical Events

A 54-year-old female was brought to the emergency department (ED) in the late afternoon after being found unresponsive at work. The ED provider noted that the patient presented as lethargic, stuporous, and aphasic. A stat CT scan was performed, which the radiologist read as negative for a stroke. In the evening, the family asked for a neurology consult as they thought the patient had had a stroke. They were told the CT scan was negative for a stroke and that a neurologist would see the patient in the morning because no one was available after hours.

Later that night, the ED provider documented that the patient was presenting with a left-sided droop, weakness, and neglect. The patient then had a Computed Tomography Angiography (CTA) scan, which a radiologist read but did not record the results. The radiologist reportedly informed the tech the CTA scan was sub-optimal and not diagnostic, but

they did not mention any findings or follow up on the results with any providers.

The patient was admitted to the floor the next morning. The patient's care was transitioned to a hospitalist who noted that the patient's condition remained unchanged and ordered a neurology consult. The neurologist ordered an MRI which was read as a large stroke. Later that evening, the patient became unresponsive and their right pupil was fixed and dilated. They were placed on a ventilator, transferred to a higher level of care, and passed away the following day.

The original CT scan was later re-read with marked abnormality in the right hemisphere with loss of gray-white matter in the parietal area consistent with an acute middle cerebral artery infarct. When the CTA scan was reevaluated, it showed loss of blood flow consistent with a right middle artery infarct and developing edema.

Case Study

Toddler Requires Surgery after Delay in Foreign Body Diagnosis

Clinical Sequence

A parent brought their toddler to an urgent care facility for a swollen nose and nasal trauma after reportedly running into a

screen door. The child had no significant medical history, and X-rays were performed at the visit. The following day, the radiologist noted a foreign body resembling a battery in the child's right naris with no evidence of fracture. The urgent care facility called the parents and advised them to have their child evaluated by their pediatric provider. A handwritten note on the X-ray documented that the parent was informed of the foreign body, but the parent denies receiving this information.

A nurse practitioner (NP) at the pediatric office saw the patient; however, the NP did not have access to the urgent care notes and did not attempt to obtain the visit records. The parent told the NP about the patient's recent injury and stated the X-rays from the urgent care visit were normal. Relying on the parent's report, the NP's exam noted swelling and bruising around the right eye and the bridge of the nose. The NP ordered follow-up facial, orbital, and skull X-rays and to return for a follow-up visit in three days. The parent reported the wait in radiology was too long, so the X-rays were never completed. The child and parent never presented for the scheduled follow-up visit.

Two weeks later, the parent brought their toddler back to the pediatrician reporting intermittent nose bleeds. The pediatrician documented a normal exam, except for dried blood in the right naris. The pediatrician diagnosed the child with nosebleeds due to dry weather and nose-picking. The

parent was instructed to use nasal saline and Vaseline and to follow up in one week. The parent denied being given these instructions.

Nine weeks later, the parent returned to the pediatrician's office because the child had been experiencing malodor and nasal discharge for one week. A different pediatric provider documented purulent green discharge from both nostrils and referred the family to an ear, nose, and throat (ENT) physician. The parent claimed they were not aware of this referral.

The following day, the child was brought to the emergency department (ED) with significant nosebleeds. A nurse practitioner in the ED referred the family to an ENT.

Six days later, the child's insurance approved the ENT referral, and an ENT evaluated the child 11 days after that. The ENT confirmed there was a foreign body in the naris and performed surgery five days after the evaluation to remove it. The ENT found multiple pieces of a button battery in both nares. The battery had decomposed and leaked acid, which had damaged the nasal septum and part of the bone, which caused a large anterior nasal septal perforation. As a result, the child may require additional surgery for cosmetic issues related to the perforation.

Case Study

Life-altering Misunderstanding During Shift Change

Clinical Sequence

An 80-year-old male with a history of atrial fibrillation (on Coumadin) presented to the Emergency Department (ED) after falling and hitting his head. Upon exam, the patient had no neurologic deficits or obvious signs of trauma. A head CT revealed a small subdural hematoma. The patient's INR was 2.8 (anticoagulated patients are considered therapeutic between 2.0 and 3.0). The emergency medicine physician ordered fresh frozen plasma (FFP) and vitamin K to be given to reverse anticoagulation. The FFP order was put in the electronic system and went to the lab at 6:31 a.m. The blood bank prepared the FFP and it was ready to be dispensed at 7:41 a.m. While the day shift nurse had received the overnight nurse's report at the 7:00 shift change, the day nurse was not aware of the FFP order and did not know to look for the indication of its readiness in the patient's record.

The patient was admitted to the neurology unit and was transferred from the ED at 9:30 a.m. Over the next several hours, the patient's condition deteriorated and he began to have mental status changes. A repeat CT showed evolution of the subdural hematoma and the patient was taken urgently to

the operating room for a right craniotomy. The patient received the FFP at 12:30 p.m.

After a nine-day admission, the patient was discharged to a rehabilitation facility. He had several readmissions to the ED and several subsequent stays in rehab. After making a partial recovery, the patient was discharged home. While there, he experienced an additional fall and required 24-hour care. Prior to this event the patient was living independently with his wife. He was retired but had continued to do some consulting work.

Case Study

Improper Management and Lack of Communication Causes Significant Post-Surgery Complications

Clinical events

A 60-year-old female presented to a general surgeon for laparoscopic cholecystectomy. The surgeon identified the gallbladder, removed adhesions, found the cystic duct/artery, and placed clips to create a ductotomy. The surgeon read the cholangiogram as normal. The intra- and extra-hepatic bile ducts, and duodenum, were checked. The operating surgeon noted no filling defect. The gall bladder and proximal cystic duct were dissected free. Surgery was completed without any

noted intraoperative complications. The patient was transferred to the PACU for recovery and discharged later that day.

Case Study

Vegetative State After Restraints Entanglement

Clinical Sequence

A 30-year-old male was brought to the Emergency Department with head injuries following a pedestrian-motor vehicle collision that may have been a suicide attempt. The patient tested positive for alcohol and methamphetamines and required a tracheostomy and gastrostomy. He was subsequently managed as a traumatic brain injury patient.

The patient was transferred to the intensive care unit (ICU) and then to the trauma inpatient unit after some improvement. He was agitated, pulled at lines, and was a high risk for falls. Wrist restraints and a Posey belt were ordered for safety.

Two weeks after his admission, the patient was found unresponsive, seated on the floor, entangled in the restraints and Posey belt. A Code Blue was called and the patient was intubated with his pulse restored. He was transferred back to the ICU.

The patient sustained an acute anoxic injury resulting in severe brain damage and remains in a permanent vegetative state requiring full time care.

Case Study

Failure to Diagnose Myocordial Infarction

Clinical Sequence

A 77-year-old male presented to the Emergency Department (ED) with a complaint of abdominal pain. An abdominal CT confirmed a diagnosis of gall bladder disease. Three months prior, the patient's EKG demonstrated aortic stenosis meeting criteria for aortic valve replacement. The patient was admitted to the ICU, with a plan for a cholecystectomy scheduled as an "add on" for the following day.

On the EKG performed in the ED there appeared an automated computer-generated interpretation of "abnormal, possible inferior MI." The emergency medicine physician had documented "EKG not indicated" and no additional cardiac studies were ordered at that time.

The general surgeon's admission orders included an additional EKG.

The following morning, the pre-op RN phoned the ICU, unable to locate the EKG in the patient's chart, requested an EKG be done prior to surgery. A respiratory therapist performed an EKG, in the presence of the patient's daughter (who was a nurse). The automated computer-generated interpretation for this EKG was, again, abnormal: "consider subendocardial injury." At this point there four EKG results were available in various locations of the patient's record.

Prior to induction of anesthesia, there was no physician review of any of the EKGs. The CRNA believed it was safe to proceed with anesthesia and did so. In the medical record documentation, the box on the pre-anesthesia work-up form, relative to EKG review, was left unchecked. The anesthesiologist became aware of the unchecked EKG box (incomplete pre-anesthesia checklist) after induction of anesthesia but did not stop the surgery. The cholecystectomy proceeded uneventfully. The patient was extubated, had normal vital signs and a normal sinus rhythm, and was sent to the PACU. Shortly after his arrival, the patient suffered cardiac arrest and died.

Case Study

Test Result Snafu Delays Cervical Cancer Diagnosis

Clinical Sequence

A 32-year-old female with a history of genital herpes had a physical exam and Papanicolaou test (Pap) with her internal medicine (IM) provider. One month later, a message was sent to the patient stating that her Pap results were abnormal and a referral to Gynecology would be made. For unclear reasons, the Gynecology referral made by her IM provider through the electronic health system did not go through and the patient never saw a concurrent message sent to her through the online portal. This message did not have an associated email alert to the patient.

Over the next two years, the patient had several encounters with the same office, including treatment for asthma, refill of birth control pills, and evaluation for an axillary lump. During that time, no mention of the abnormal Pap test or Gynecology referral was documented. Two years after her abnormal Pap test, the patient returned for a routine physical and interest in attempting pregnancy. A Pap test done at this time was also abnormal. This time, the patient saw the message sent via the online portal and scheduled a Gynecology appointment.

Colposcopy and biopsy revealed squamous carcinoma. A loop electrosurgical excision procedure was done with negative margins, but question of lymph involvement. The patient underwent further testing, referral to Oncology, removal of several lymph nodes, and was ultimately diagnosed with 1A-1 cervical cancer. Following surgical treatment, the patient’s

prognosis includes close follow up, egg donation, and the need to use a surrogate for any future pregnancy.

Case Study

MPL Defense Verdict Bolstered by Appropriate Consent Process

Clinical Sequence

A 38-year-old, otherwise healthy, patient underwent open reduction and internal fixation with screw fixation with intraosseous wiring cerclage for treatment of an oblique spiral fracture of the fifth right finger. Prior to the surgery, the hand surgeon discussed with the patient the benefits and risks of the surgery (including that they may not regain full range of motion of their finger) and described alternatives to surgical treatment. A written informed consent was obtained and signed by both the surgeon and patient prior to the procedure.

Post-operatively, the patient's fracture healed but they developed a contracture and required additional surgeries. (The patient's dense scar tissue contributed to the development of the contracture.) Despite aggressive occupational therapy, the patient continued to have problems, which resulted in functional limitations of their fractured finger.

Case Study

Multiple Amputations Follow Prolonged ED Stay

Clinical Sequence

A 34-year-old male presented to the ED on a Sunday at 2:30 a.m. with complaints of abdominal pain, vomiting, diarrhea, and fever for several days. His temperature was 100.4°, heart rate 98, and blood pressure 111/70. His labs included a white blood cell count of 20.4 and a urinalysis positive for blood. He was ordered for IV metronidazole, ciprofloxacin, and ceftriaxone. The Emergency Medicine (EM) resident ordered an abdominal CT scan but did not specify that it was urgent. The results of the scan (performed at 10:00 a.m.) were delayed by an hour due to Radiology not being immediately available on Sundays. Those results revealed a right hydroureteronephrosis due to ureteropelvic junction stone and pyelonephritis.

A Urology resident was consulted, examined the patient, but did not appreciate the severity of the situation or the need for nephrostomy drainage for this infection. An intravenous hydration was ordered to flush out the stone. The Urology resident spoke by phone with the Urology attending, who approved the plan. Over the course of the rest of the day and into the evening neither the EM attending, nor the Urology resident spoke with the Urology attending. Interventional

Radiology (IR) was never notified. The EM attending planned to admit the patient to the ICU, but no beds were available.

At 3:00 p.m., the patient's blood pressure started gradually decreasing and he developed a temperature of 103°. The resident was unable to successfully achieve central venous catheter access. Vasopressors were initiated through peripheral access and the patient was finally transferred to the ICU on Sunday night at 10:00 p.m., 17 hours after arriving at the ED.

Within the next few hours, the patient suffered respiratory failure, septic shock, disseminated intravascular coagulation (DIC), acute renal failure, and metabolic acidosis. Monday morning, IR was contacted for a nephrostomy tube placement to drain the infection, but determined that the procedure was too risky due to the increased bleeding time. Later that day, Urology placed a right ureteral stent without noted complication. Due to a positive blood culture, Infectious Disease was consulted to adjust the patient's antibiotics. Over several days, the patient suffered cyanotic fingers bilaterally, absent distal popliteal and ankle pulses, and an intracranial hemorrhage. Ultimately, he required bilateral below-the-knee and hand amputations, and he experienced severe post-operative pain (maintained on high doses narcotics).

Case Study

Complications from a Simple Procedure

Clinical Sequence

A 43-year-old, otherwise healthy, patient received their annual flu vaccine at their primary care physician's office. The flu vaccine was administered by a licensed practical nurse (LPN) via right deltoid muscle injection.

The patient had some initial tenderness at the injection site that progressed to not being able to lift their arm a few hours after the injection. The patient contacted the practice with complaints of right shoulder pain (using a pain scale of 1–10) their pain was an 8), which was not relieved with ibuprofen. They were instructed to call back if the pain did not improve.

Four weeks later, the patient was referred to orthopedics as the pain did not improve and they could not resume normal activities. The patient was diagnosed with shoulder bursitis. The patient was treated with steroid injections and physical therapy and made a full recovery.

Case Study

Insufficient Documentation Leads to Unclear Cause of Harm for Patient Receiving Anesthesia

Clinical Sequence

A 41-year-old male underwent a colonoscopy with endoscopy at an ambulatory care center for evaluation of recent history of abdominal and rectal pain, and blood in his stool. A pre-procedure evaluation was completed by the anesthesiologist and a certified registered nurse anesthetist (CRNA). The only anesthesia-related risk noted was obesity.

The CRNA administered monitored anesthesia care (MAC) for the procedure. The patient may have received 200mg of propofol, possibly twice, however, the CRNA's documentation is unclear. The duration of the procedure was 30 minutes.

As soon as the patient was moved to the post anesthesia recovery unit, he was placed on oxygen via mask and pulse oximetry monitoring. At that point, the CRNA noted that the patient was not breathing but had weak radial pulses. A code was called and additional staff arrived to assist with cardiopulmonary resuscitation. The CRNA began ventilating the patient via Ambu bag then attempted to intubate the patient, but was delayed by about one minute due to a missing piece

on the laryngoscope. The patient became pulseless; CPR was started.

Rescue medications, including epinephrine and atropine, were administered. The cardiac monitor revealed pulseless electrical activity, so CPR was continued and the patient regained a pulse. EMS arrived and transported the patient to the hospital where he was found to have severe anoxic ischemic encephalopathy. The patient did not improve or regain meaningful neurologic function, and remains in a persistent vegetative state.

Case Study

Defense Verdict After Patient Challenged Surgical Outcome

Clinical Sequence

April 3: A 42-year-old female with a history of chronic pelvic pain (CPP) presented to her gynecologist with complaints of pelvic pain and uterine fibroids seen on an ultrasound. Upon examination, the gynecologist noted a tender uterus and a small submucosal fibroid. A plan was made for a hysteroscopy with fibroid removal and a diagnostic laparoscopy to rule out endometriosis.

May 4: A hysteroscopy, dilation and curettage, laparoscopy, and lysis of adhesions was completed. A small posterior fibroid

was removed; no endometriosis or submucosal fibroid was visualized. The gynecologist stated that they notified the patient of the findings, however, the patient denies this.

August 10: The patient returned to the gynecologist with complaints of increased urination and bilateral pelvic/hip pain. The patient's bladder was noted to be tender on examination. Urine cultures, antibiotics, and an ultrasound were ordered.

September–October: The ultrasound results showed a posterior fibroid pressing the endometrial cavity and a submucosal fibroid projecting posteriorly. An MRI showed a fibroid with submucosal extension, and small submucosal fibroid. A cystoscopy was completed showing bladder indents likely from the fibroid.

October 30: The gynecologist performed a cautery of the endometrium/uterosacral tissue, a right ovarian cystectomy, and a lap myomectomy. In addition, the posterior fibroid and another (1–2 cm) fibroid were removed.

November 14: The patient continued to complain of CPP, although healing was noted.

November–November: Over the next year, patient presented to the Gynecology office multiple times with complaints of bleeding, nausea/vomiting, abdominal pain, and painful menses. Exams and labs were within normal limits. Painful menses was resolved with NSAIDs and birth control pills. An ultrasound showed new small submucosal, intramural fibroid. Adenomyosis was also noted. A total abdominal hysterectomy (TAH) was advised; the patient declined. The plan was to

continue on NSAIDs and birth control pills for symptom management.

December–December: The following year, the patient sought care from three other gynecologists for complaints of pelvic pain, fibroids, and urinary signs and symptoms. Again, a TAH was recommended and declined by the patient. Antihormonal medications were prescribed, and a one-time Lupron injection was administered.

Case Study

Shaky Adherence of Patient Identification During Blood Transfusion

Clinical Sequence

A 59-year-old female presented to the Emergency Department (ED) with complaints of general weakness and inability to function.

The patient had a history of smoking, substance use disorder, hypertension, hyperlipoproteinemia, gastric reflux and uterine fibroids. On arrival to the ED, her vital signs were within normal limits and her EKG was normal with no ST elevation. The patients' labs indicated metabolic acidosis with elevated lactate, liver function tests and a decreased hematocrit. The patient was agitated and refused to tell the nurse her name.

The ED attending was made aware of the patient's status and the plan was to rule out infection and correct the electrolyte imbalance, dehydration, and anemia. Intravenous fluids and antibiotics were initiated. Blood work was sent to cross match the patients' blood type, however, a repeat blood draw was required as the initial specimen was lost.

Prior to the blood transfusion, the patients' vital signs were stable. Twenty minutes after initiation of the transfusion, the patient became hypertensive, tachycardic, with a dropping temperature. The transfusion was stopped after the patient had received about 25cc of A+ blood. At this time, the nurse realized that the name on the blood product verification form was a different ED patient with the same last name.

Later that day, the patient was transfused with the correct blood type. She subsequently became hypertensive and hypothermic, indicating an acute hemolytic reaction. The patient was intubated and transferred to the ICU. Eventually, she was discharged to a rehab facility. A few months later, at home, the patient died of hypertension and anemia.

Case Study

Intraoperative Arrest During Knee Surgery

Clinical Sequence

A 53-year-old male with a history significant for obesity, hypertension, and a prior right-knee surgery arrived at the hospital for a partial left knee replacement. The patient's vital signs at the preoperative evaluation were: blood pressure 143/80; pulse 80, respiratory rate 18, oxygen saturation 97%. The anesthesiologist assessed the patient at ASA II. The anesthesiology plan included an epidural/regional block and intraoperative sedation.

The anesthesiologist administered Versed 2mg and fentanyl 100mcg. The epidural and regional blocks were completed without issue. The patient was transferred to the operating room (OR) and care was transferred to a certified registered nurse anesthetist (CRNA).

The patient was positioned and the monitoring equipment and nasal canula were placed. At this time, his vital signs were BP 99/57; pulse 60; oxygen saturation 94%.

Twenty minutes following incision, the CRNA gave the patient propofol 30mg IV bolus. Following the bolus, the bp and O2 sats continued to decrease. In response, the CRNA increased nasal cannula oxygen, then applied an oxygen mask, repositioned his jaw, and inserted nasal trumpets into one nostril and the patient's mouth. The O2 sats did not respond to the CRNA's interventions and the patient suffered a respiratory and cardiac arrest.

Intubation was attempted but the endotracheal tube (ETT) placement was not confirmed. The ETT was removed, and a laryngeal mask airway was placed. A cardiologist arrived at the OR for evaluation and assistance with the resuscitative efforts. The patient was defibrillated three times and an external pacemaker was placed. A second attempt at intubation was successful and central lines were placed.

Subsequently, the patient's labs indicated profound acidosis. Resuscitation was discontinued and the patient was pronounced dead.

Case Study

Inadequate Differential Hinders Chance to Prevent Paralysis

Clinical Sequence

A 24-year-old with a history of methadone use, heroin abuse, and chronic back pain presented to the ED with chief complaint of back pain. The Emergency Medicine physician documented a normal neurological exam, with a differential diagnosis of lumbar strain, radiculopathy, fracture, abdominal aortic aneurysm, kidney stones, or acute pyelonephritis/urinary tract infection. The patient was discharged home with a diagnoses of acute lower back pain and acute narcotic withdrawal.

Five days later, the patient returned to the ED unable to walk or communicate. The patient's mother reported the patient to be lethargic and delusional over past 24 hours; she suspected a drug overdose. On examination, the patient was agitated, combative, and moving all four extremities. They were given Haldol. Lab work revealed urine positive for opiates and tricyclics, and an elevated white blood count. The patient was diagnosed with acute polydrug ingestion with altered sensorium and possible tricyclic overdose. They were admitted to the hospital.

The patient's mother told the admitting hospitalist that, two weeks prior, the patient experienced 3–4 days of stool incontinence (but no urine incontinence). Due to the patient's altered mental status, a neurological exam was not conducted. They were diagnosed with acute encephalopathy with known drug abuse, and admitted to Telemetry.

The patient initially remained disoriented and unable to follow commands. Not long after admission, they became agitated and were moving all extremities. The hospitalist ordered morphine. Later in the evening, the patient's temperature was 101.2 degrees; the staff did not notify the hospitalist.

Five hours later, the patient was noted to be groaning in pain. Staff notified the on-call physician who ordered an X-ray but did not examine the patient (the X-ray was negative). Two

hours later, the nurse's note stated bilateral lower extremities flaccid and "patient complaining of severe lower and upper back pain." During discovery, Nursing stated the on-call physician was contacted, but there was no documentation of the call, and the physician denied a call was made. Approximately six hours after the noted change in symptoms, a second hospitalist rounded and assessed the patient to have no lower extremity movement. An MRI revealed a spinal epidural abscess (SEA), C5 to T2 with soft tissue abscess at T1-T2. The patient is now a paraplegic.

Case Study

Discharged Patient with Pending Test Results

Clinical Sequence

Day 1: A 68-year-old male was admitted to the hospital after falling on ice and feeling short of breath. The patient was found to have a right-sided pneumothorax. A chest tube was placed in his right lung. The patient was monitored and showed good clinical improvement. He was assessed by physical therapy for mobility and home safety.
Day 3: Two days after his admission, the patient was ready to be discharged to his home without any follow-up services recommended. The patient's discharge paperwork indicated that he had a pending result from a pleural fluid culture that

had been collected on Day 2. The result of the fluid culture, which demonstrated gram positive cocci, was called from the lab to the care unit on the morning of discharge, but contact with a member of the care team was unsuccessful. The attending physician was paged, but did not respond. The culture result was not escalated to the patient's nurse or another member of the care team. The patient was discharged later that day, unaware of the positive culture.

Day 5: Two days after discharge, the patient was taken by ambulance to another hospital in septic shock. He required additional chest tubes and intravenous (IV) antibiotics to manage the infection. After 10 days in the hospital, the patient was discharged home with a PICC line and required several more weeks of IV antibiotics. He was able to fully recover.

Case Study

A Mismanaged Virtual Visit

Clinical Sequence

Day 1: A 13-year-old female with a history of chronic dermatitis presented to urgent care with right index finger pain, redness, swelling, and rash for three days. She denied trauma to the area. She was diagnosed with cellulitis, prescribed Bactrim and a NSAID, and sent home.

Day 2: The patient presented to the Emergency Department (ED) with no improvement. ED Physician "A" added Benadryl

and prednisone for a suspected “underlying vector bite” and discharged the patient.

Day 4: The patient was examined by a nurse practitioner (NP) at her primary care office. The NP instructed the patient to continue the Bactrim and NSAID and scheduled a one-week virtual telehealth follow-up visit.

Day 5: The patient returned to the ED. Her X-ray did not show osteomyelitis or a foreign body. ED Physician “B” supervised a resident who incised and drained a “simple” finger abscess. The patient was discharged with a prescription for Keflex and instructions to continue Bactrim. She was told to return to the ED if her symptoms worsen, and to be examined by her pediatrician in two days.

Day 11: The patient’s mother waited four days to fill the Keflex prescription; the patient was not evaluated in the pediatrician’s office prior to her scheduled telehealth visit. During this virtual visit, the NP instructed the patient to continue with the medication but did not ask the patient to unwrap her bandage for examination. The NP documented that the visit was cut short due to technical difficulties.

Day 24: The patient returned to the pediatrician’s office after antibiotics were completed. Upon examination of the patient’s finger—which continued to have purulent drainage—the pediatrician diagnosed the patient with osteomyelitis and referred her to a hand surgeon.

The surgeon diagnosed osteonecrosis; X-rays showed distal fractures and subluxation of the distal joint. As the infection

had now spread through the entire finger, the surgeon advised for amputation.

The surgery was completed without complication and the patient was able to return to playing sports. She required counseling for emotional trauma.

Case Study

Tripped Up by Copying and Pasting in the EHR

Clinical Sequence

An 85-year-old with a history of diabetic peripheral neuropathy with gait instability had been instructed many times to use an assistive device when ambulating. The patient consistently declined this advice and other treatments intended to reduce their risk of falling.

The patient presented to their primary care physician with a toe blister and was referred to podiatry on the same day. The Podiatrist debrided the wound, and placed the patient in a walking boot to relieve pressure on the their toe. The patient was not provided with instructions on the walking boot nor was their mobility with the boot assessed. When leaving the office, the patient fell and sustained a hip fracture.

Review of the medical record identified that portions of the podiatrist's note were identical to notes from five years earlier stating that the patient walked "regularly." This narrative, which was copied and pasted by the podiatrist, may have led to incorrect or leading information about the patient's mobility.

Case Study

Lack of follow up for incidental finding results in poor outcome for patient

Clinical Sequence

A 58-year-old male was referred by his primary care provider (PCP) for an abdominal CT scan to rule out an abdominal aneurysm. The patient was a long-term smoker with a history of high blood pressure, chronic obstructive pulmonary disorder, and coronary artery bypass surgery. The CT scan result was negative for aneurysm but did show "nodular densities" in the right lung base, and an "indeterminate" right renal lesion.

The radiologist who read the report recommended a follow-up CT scan for the lung densities and a renal ultrasound to investigate the lesion. The patients PCP received and initialed the CT scan report; however, no follow-up test was ordered, and no discussion of those incidental findings occurred

between the patient and the provider. (At this time, patients did not systematically receive all test results directly.)

Two years later, the patient was seen by a new PCP for complaint of a cough with yellow mucus production that he reported was “different” than his regular smoker’s cough. The PCP noted the recommendation from two years prior for a follow-up CT scan, which the patient then had completed. The scan revealed an 8 cm mass in the right lower lobe of the patient’s lung. An additional PET scan showed advanced disease with lymph node involvement.

Shortly thereafter, the patient was admitted to the hospital with shortness of breath, coughing, fatigue, and dyspnea on exertion. He was transferred to the ICU and required a thoracentesis and chest tube placement. A right adrenal biopsy revealed poorly differentiated non-small cell carcinoma and a PET scan revealed wide metastasis.

The patient underwent extensive chemotherapy but died less than 18 months later.

Case Study

Fire in the OR

Clinical Sequence

A 74-year-old male with a history of right-sided neck pain and temporal headaches was admitted to the hospital for a temporal artery biopsy to rule out temporal arteritis. In the OR, the circulating nurse put the electrocautery device on a standard setting. The anesthesiologist placed a face mask on the patient, covering his nose and mouth, to deliver oxygen (a strap could not be used as the area needed to be accessed for the biopsy).

The vascular surgeon applied a local anesthetic and then, assisted by an intern, draped the patient's face and prepped him with a chlorhexidine gluconate solution. Due to the drapes, the anesthesiologist was unable to fully visualize the vascular surgeon or the patient's face.

The patient's skin was incised with a scalpel, then the dissection of subcutaneous tissue with electrocautery started. The surgeon observed a yellow spark from the tissue, along with the smell of smoke, and the patient began thrashing around. The scrub nurse pulled back the drapes and observed flames in the mask. The mask was removed, the oxygen was turned off, and the fire was put out by dousing it with saline. A fire alarm was pulled per protocol.

An ENT consult was obtained. The patient had singed nose hair and a burned lip. His wounds were cleansed, and he was given pain medication. The patient was intubated and

transferred to another hospital's burn unit for further treatment of neck and facial edema.

Subsequently, the patient was discharged home with services for wound care.

Case Study

Policy Changed After L&D Medication Mix-up

Clinical Sequence

Close to the time of a change of shift, a 30-year-old female primigravida presented to the Labor and Delivery (L&D) unit and was assigned to a registered nurse (RN). This RN had less than two years of nursing experience and had been working on L&D for approximately six months. Prior to the completion of this shift, the RN was preparing the delivery room for the oncoming staff while also getting medication to treat the patient for her complaint of nausea. The RN obtained three vials of medication: Zofran for nausea, and lidocaine and Pitocin for use after delivery. The RN planned to start a peripheral intravenous (IV) catheter and administer the Zofran.

While preparing to administer the Zofran, the RN was distracted by a call about another patient who had just arrived on L&D in active labor. After starting the IV on the first patient, the RN, intending to administer the Zofran, mistakenly

administered 10mg of Pitocin as an IV push (Pitocin is typically titrated). Of note, both the Pitocin and Zofran vials had green caps.

The RN immediately recognized the error. The patient reported pain, and her abdomen became firm. The RN was not able to find fetal heart tones. The patient was quickly administered terbutaline to counteract the effects of the Pitocin and required an emergent cesarean delivery.

A healthy infant was delivered within 18 minutes of the administration of the Pitocin. The error was disclosed to the patient by the obstetrician. The patient has an incision scar and, for any future births, may incur risks associated with a prior cesarean delivery.

Case Study

Incomplete Record Review Delays Endocarditis Diagnoses

Clinical Sequence

A 43-year-old female saw her new primary care physician (PCP) one time. Shortly after that visit, she was seen by a covering physician for an urgent care appointment with complaints of intermittent fever and fatigue for one week. Her exam was unremarkable; no heart murmur was detected.

Blood work, including Lyme serology, urinalysis, and urine culture were ordered. She was instructed to call or return if her symptoms worsened.

Two days later, the patient emailed her PCP with a complaint of continued fever, fatigue, and a new rash. She was scheduled for an appointment with her PCP for the following day. Her PCP did not see the patient's history of congenital bicuspid aortic valve, which was in her medical record. Lab work was repeated, and the patient was treated for a presumed urinary tract infection.

Initially, the patient improved, but eight days after her visit, she called the office—and emailed her PCP—with complaints of increased fever (to 102.5), joint pain, and a rash that had spread to her chest. The patient, who requested additional blood work and a treatment plan, was not seen in person, but her lab work was repeated. She was also referred to infectious disease for evaluation of her persistent fever and fatigue.

One week later, on exam by the infectious disease physician, a heart murmur was noted. A subsequent ECHO led to diagnosis of aortic valve endocarditis. The patient was admitted for IV antibiotics and required a valve replacement. She did not experience any long-term sequelae.

Case Study

Fragmented Care Delayed a Diagnosis of Meningitis

Clinical Sequence

A 28-year-old man presented to Urgent Care with complains of right ear pain and right-sided facial paralysis.

At this visit, impacted ear wax was noted and removed, and a CT scan was performed. The Radiology report read, “no acute intracranial abnormality and minimal non-specific, non-aggressive fluid R otomastoid cells.” A diagnosis of Bell’s palsy was made with a plan was for oral steroids and follow up with ENT.

Three days later, the patient presented to the ENT, now with complaints of dizziness, hearing loss, facial nerve weakness, ear discharge, and pain. The ENT concurred with the Bell’s palsy diagnosis and increased the patient’s steroids.

Two days later, at his home, the patient was found confused and banging his head on the floor. He was transferred to an emergency department (ED). The Emergency Medicine physician ordered a head CT to rule out injury/trauma. The CT report stated, “no acute abnormality.”

Twelve hours later, the patient became unresponsive A head CT scan was repeated and the Radiology report identified fluid in the right ear and opacification of mastoid air cells. He was admitted with a diagnosis of bacterial meningitis, with respiratory insufficiency, dysphagia, aphasia, and cognitive decline.

The patient remained in acute care for 10 months and was discharged to a rehabilitation facility. He has permanent brain damage, hemiplegia, and requires 24-hour care.

Case Study

Missteps Before and After Patient Fall

Clinical Sequence

A patient on coumadin for peripheral vascular disease was admitted to the hospital by his cardiologist for symptoms consistent with thrombosis/arterial insufficiency of the foot. The patient was diagnosed with an acute arterial embolism, requiring surgery. The patient required a pre-op cardiac evaluation for bradycardia and remained on anticoagulation therapy. At the time of surgery, the patient was assessed at low risk for falling. Following surgery, he was transferred to telemetry unit.

Five days post-operatively, at approximately 6:00 p.m., the patient's family reported that he fell in the bathroom and hit his head. A nurse found the patient sitting on the bathroom floor. The patient denied any injury but had an abrasion on his right arm. The patient's son and nurse assisted him back to bed and the nurse dressed the wound. Following his fall, the nurse elevated the patient's fall risk. On the same day, physical therapy had documented the patient had difficulty walking due to leg pain and swelling.

The nurse filed an incident report; the fall was not documented in the patient's chart. Because the injury was minor, the physician was not notified, and no treatment was indicated.

At the change of shift, the overnight nurse was not informed of the patient's fall. The night nurse documented the patient was responsive throughout the night. At 5:51 a.m., the nurse found the patient aphasic and called the rapid response team. A stat head CT revealed a large right intraparenchymal hematoma. The patient underwent a hemicraniectomy and hematoma evacuation. He was transferred post-operatively—on a ventilator—to the intensive care unit. The neurosurgeons note stated, per family, the patient lost his balance and fell back into the shower hitting his head.

Two days later, the patient deteriorated. A repeat CT showed ongoing bleeding and new infarcts. The patient's anticoagulants were stopped. The patient's neurological status failed to improve, and a tracheostomy and PEG was placed.

The patient died 15 days later.

Case Study

Atypical Chest Pain Mismanaged in the ED

Clinical Sequence

A healthy 50-year-old woman presented to the ED with atypical chest pain. The patient reported some family history of cardiac disease (uncle with coronary artery disease). While being seen by a physician assistant (PA), the patient reported pain as non-exertional, intermittent for the past few days, radiating to her right arm, with no shortness of breath. The patient's vital signs, EKG, and labs (including troponin and potassium) were all within normal limits.

While in the ED, the patient's pain increased. A repeat EKG showed "peaked T-waves consistent with hyperkalemia, hyperactive ischemia, or possibly a variant of normal." The PA interpreted the test as normal; the attending Emergency Medicine physician was unaware that a second EKG had been

done. The PA and attending met with the patient and discussed their findings. The clinicians told the patient that they felt her pain was gastrointestinal, and that a cardiac cause was ruled out. The patient was directed to schedule a stress test as an outpatient.

The next morning, the patient became unresponsive at home and could not be resuscitated. Autopsy revealed that she suffered a heart attack in the setting of atherosclerotic heart disease.

Case Study

EHR Error Exacerbates Adverse Event during IHT

Clinical Sequence

A 60-year-old female with a history of vascular risk factors, presented to her local Emergency Department (ED) with a complaint of bilateral, lower extremity pain and draining ulcers. She was diagnosed with cellulitis. The patient had arrived with a home oxygen tank and connected tubing, but since her blood oxygen level was low, she was given supplemental oxygen in the ED. The nurse erroneously selected “room air” on the patient’s EHR (instead of documenting the supplemental oxygen volume and mode (cannula or face mask).

As the patient was to be admitted, an intra-hospital transport (IHT) request was submitted and a hospital transporter arrived to take the patient to a floor. The IHT form had no note regarding the patient's need for oxygen; she was transported with her home equipment. During the transfer of the patient into a room bed, the patient suffered a pulseless electrical activity (PEA) arrest.

Meanwhile, a nurse attempting to connect the patient's home tube to the wall in her room discovered that it was too short, creating a delay. At that point, the nurse realized that the patient's home oxygen tank was empty.

The patient was stabilized, then transferred to the ICU. Her blood pressure was 76/37; she was intubated and placed on a ventilator. In the ICU, the patient suffered two additional PEA arrests. Vasopressors and tissue plasminogen activator therapy was started. The patient had a full neurological recovery, however, she could not be weaned from the ventilator and, per her advance directive, declined a tracheotomy.

The patient was terminally extubated and died.

Case Study

Unacknowledged PSA Test Result Delays Prostate Cancer Diagnosis

Clinical Sequence

A 57-year-old male with a history of bladder cancer was seen by his primary care provider (PCP) for an annual physical. He denied urinary symptoms and his prostate exam was normal. The patient was referred for a screening colonoscopy and lab work, which included PSA screening (two years prior, his PSA was 2.5). The new PSA result, which was 4.7, was not reviewed by the PCP or communicated to the patient.

Seven months later, the patient was seen his PCP with a complaint of dizziness. His (cholesterol) medications were reviewed and modified. There was no discussion of recent PSA test result.

Two years later, the patient was seen by his PCP for a complaint of new urinary symptoms and was referred to Urology. A prostate nodule was detected on exam, and his PSA was 9.78. Biopsy led to diagnosis of high-grade adenocarcinoma without evidence of metastasis. The patient underwent treatment with chemotherapy and radiation.

Case Study

Misread and Missed Opportunities

Clinical Sequence

A 55-year-old male with a significant pack/year history of smoking presented to primary care with complaints of an intractable, non-productive cough and wheezing for the prior six weeks. The PCP examined the patient, and a plan was made that included chest X-ray and smoking cessation. An X-ray was completed that day, and the radiology report stated,“lung fields clear, no acute pulmonary disease.”

Two months later, the patient returned to his PCP with complaints of persistent cough, now with nasal congestion, sore throat, and frontal sinus pressure for the prior 10 days. The patient had continued smoking. At this visit, the PCP diagnosed reactive airway disease, prescribed an inhaler, and again advised the patient to quit smoking.

Over the next three years, while he continued to follow up with the PCP, the patient’s cough persisted and he continued to smoke. No additional radiology studies were ordered. He was eventually diagnosed with chronic obstructive pulmonary disease.

When the patient developed leg pain severe enough to warrant evaluation by a rheumatologist, radiologic studies were ordered. A chest CT revealed a right upper lobe mass suspicious for malignancy invadingthe mediastinum. The Radiology report included a notation that the mass had increased in size from the X-ray five years earlier.Subsequent MRI of the brain revealed a lesion, and the patient received a diagnosis of stage IV lung cancer.

Case Study

Brain Damage Follows Inattention to Newborn's Jaundice

Clinical Sequence

Immediately post-delivery (cesarean), the mother (G3P3) and newborn girl were noted to have an ABO incompatibility with a negative Coombs (antibodies) test. The mother's second child was jaundiced after birth and had required phototherapy.

Within two hours of birth, bloodwork was drawn and the baby's bilirubin level was 5.5mg/dL. Per hospital policy, a bilirubin level >5 in first 12 hours of life was considered high risk. That policy recommends retesting before discharge, with consideration of phototherapy.

The next day (day of life 1), the baby was breast feeding well, but the nurse noted the baby had slight jaundice (her testimony that she alerted the mother and child's family medicine physician was denied by that MD). No further bilirubin testing was ordered. The following day, another nurse documented slight jaundice.

Prior to discharge, the mother asked her physician if the baby required phototherapy. She was told the bilirubin test was within normal limits and that the baby "looked fine."

On her baby's fifth day of life, the mother called her physician's office stating the baby was inconsolable and still jaundiced. Without consulting the physician, an appointment was made for four days later. The following night, when the parents observed the baby arching, screaming, and becoming lethargic, they again called the physician's office. The answering service told the parents to call the next morning.

The physician saw the baby that morning and suspected a urinary tract infection. Because the baby's urine was dark yellow, the physician ordered a bilirubin check. The results were 33 mg/dL (critically high). The baby was sent to the Emergency Department where she was admitted for phototherapy and then transferred to a children's hospital for tertiary care. An MRI showed significant kernicterus (brain damage associated with severe jaundice). At no time during

the baby's admission to the children's hospital did the baby's physician follow up with the family or hospital to check on her condition.
The kernicterus resulted in severe development delays; the baby will require lifelong care.

Case Study

Rare Stroke Risk not Discussed Prior to Anticoagulation Suspension

Clinical Sequence

A 71-year-old woman was referred to the ambulatory pain clinic for management of ongoing back and leg pain associated with lumbar radiculitis. Her medical history was significant for hypertension, hypercholesteremia, asthma, and coronary artery disease. She had been taking anticoagulation medications (clopidogrel and aspirin) since undergoing coronary artery bypass graft (CABG) surgery five years prior to this visit.

Medical work-up revealed a lumbar disc herniation with extrusion causing nerve root compression. An epidural steroid injection was recommended by the Pain Medicine physician. The patient was scheduled for the injection and advised to stop taking her anticoagulants for the seven days prior to the procedure, which she did. There was no documentation of

discussion regarding the risks of discontinuing her blood thinners.

On the morning of the scheduled procedure, the patient presented to the Emergency Department with right-sided weakness, slurred speech, and facial droop, and scored 3/3 on the Cincinnati Prehospital Stroke Scale. She was found to have 60% stenosis, complete occlusion of her left internal carotid artery, and a non-hemorrhagic infarct of her left middle cerebral artery.

The patient was admitted to the hospital for a week and discharged to a rehabilitation facility.

Case Study

Unit Ill-prepared for Labor and Delivery Complications

Clinical Sequence

1:00 p.m. A 30-year-old gravida 2, para 1 patient with a history of premature labor and cesarean delivery presented to the hospital in labor at 39.2 weeks (full term) for delivery. Her pre-natal course during this pregnancy had been unremarkable; the patient was counseled and consented for a trial of labor after cesarean. The patient was connected to an external fetal monitor and her labor progressed satisfactorily.

11:00 p.m. Recurrent late decelerations were noted in the fetal tracing, and then returned to baseline for a short period.
1:30 a.m. The patient had significant vomiting and a new series of decelerations were noted. Under such circumstances, hospital policy called for cessation of Pitocin, initiation of oxygen, resuscitation with intravenous fluids, and requesting the obstetrician's presence at the bedside. In this case, the obstetrician (OB) was in the operating room (OR) with another case; a second OR team was unavailable, the covering (family practice) physician did not have OR privileges, and the nurse caring for this patient did not begin the protocol.
2:30 a.m. After completion of the prior case, the OB presented and immediately intervened. Delivery of the infant via vacuum assist was complicated by shoulder dystocia. The infant was born with poor Apgars and was cyanotic with low muscle tone. Resuscitation efforts were initiated. The mother suffered a partial uterine rupture that had to be surgically repaired.
4:30 a.m. The neonatal intensive care unit team from another hospital arrived to transfer the infant to their hospital.
The infant had a severe neurological injury and, at the family's request, supportive care was withdrawn. The infant expired.

Case Study

Post Catheterization Death after Anticoagulation not Restarted

Clinical Sequence

A 65-year-old female with history of hypertension, atrial fibrillation on warfarin, and an embolic stroke 10 years prior, presented to the Emergency Department with symptoms of congestive heart failure: 1-2 weeks of increasing shortness of breath, dyspnea on exertion, and pulmonary edema. Her work up revealed a normal ejection fraction, however, she had severe mitral stenosis as well as moderate aortic stenosis.

The patient was admitted to the hospital for a percutaneous mitral valvuloplasty procedure in the cardiac catheterization lab. Her prothrombin time (PT), partial thromboplastin time (PTT), and international normalized ratio (INR) were monitored closely. Warfarin was discontinued, and she was started on a heparin infusion to maintain a therapeutic PTT.

In preparation for the procedure, the patient's heparin was stopped. Following a successful percutaneous mitral valvuloplasty, the patient was transferred to a cardiac step-down unit. Her care plan called for the heparin to be restarted after removal of the bilateral vascular sheaths. The interventional cardiologist asked the resident on the cardiac step-down unit to restart the heparin four hours after the vascular sheaths were removed. The post-procedure orders included follow-up instructions that did not reference restarting anticoagulation therapy.

On review of the patient's labs and orders, the resident noted that the PTT and activated coagulation time (ACT) were therapeutic. The fact that the heparin was not ordered was not realized until 15 hours later, when the morning PTT resulted at a subtherapeutic level, at which time it was immediately restarted. About five hours later, the patient was found unresponsive and was diagnosed with an acute stroke. She underwent an emergent intra-arterial thrombectomy for revascularization of an acute middle cerebral artery occlusion.

Subsequently, the patient had major neurological deficits and was made comfort measures only. Two weeks later, she died.

Case Study

Is the Procedure Being Performed What the Patient Consented To?

Closed Malpractice Case

A 25-year-old female with history of an acoustic neuroma resection on the right side and neurofibromatosis type II (a genetic tumor suppressor syndrome) was referred for a Gamma Knife radiosurgery. As a result of a previous right acoustic neuroma resection, the patient was deaf in her right ear. The goal was to treat uncontrolled pain due to right trigeminal schwannoma (tumors).

Prior to the procedure, the patient's case was discussed before the Neurosurgical Conference, which determined that the trigeminal tumor on her left side was more extensive. Subsequently, the surgeon performed the procedure on the left side. No complications were noted during the procedure. However, when she woke up from her surgery, the patient had partial hearing loss in her left ear.

The consent form in the patient's record stated the condition to be treated as "trigeminal nerve schwannoma," which was the original procedure she was referred for. It did not specify right or left side. The consent form was not signed; the patient and her family claimed that changing the procedure to the left side was never discussed.

Immediately post-op, the patient developed partial hearing loss on the left side that was most likely caused by radiation toxicity and/or edema of the nerve post-treatment. Six months later, the patient underwent an unsuccessful cochlear implant that resulted in complete deafness in her left ear.

Case Study

Gaps in Clinical Workup Lead to Young Patient's Missed Colorectal Cancer

Clinical Sequence

A 31 -year-old woman with no significant medical history complained of rectal bleeding to her primary care physician, a cardiologist. At this visit, she also described hard stools with hematochezia and possibly hemorrhoids. The cardiologist performed a digital rectal exam which identified external hemorrhoids and was negative for occult blood. The cardiologist recommended the patient increase her dietary fiber intake and noted a colonoscopy would likely be ordered, although this did not happen.

Eleven months later, when the patient returned to the cardiologist, she complained again of rectal bleeding. Lab work, including a complete blood count, was normal. At this visit, the patient was scheduled for the colonoscopy, which was performed the following week. It revealed a single, mild internal hemorrhoid and a normal colon to the cecum. Per the gastroenterologist's notes, the colon was well-prepped for the exam and the "cecal area was seen from a short distance" using a pediatric scope. A single image was obtained during this procedure.

Several months following the procedure, the patient returned to her cardiologist with complaints of hard stool and blood on the toilet paper. The cardiologist documented the assumption that this was associated with the hemorrhoid seen via colonoscopy.

Four months later, the patient was seen by another provider in the cardiologist's office for complaints of hematochezia. She was advised to return if her symptoms persisted, and a gastroenterology referral would then be initiated.

The patient returned to her cardiologist several times over the following months for complaints of extreme fatigue. Her weight was noted to be stable; no further tests were ordered or completed. Neither discussion of her previous complaints of rectal bleeding nor any differential diagnoses were documented.

A year later (32 months after her initial complaint), the patient presented to the Emergency Department with severe abdominal pain, nausea, and vomiting. She was severely anemic and received three units of packed red blood cells. A CT scan revealed distention and free fluid in her colon, and two hepatic lesions.

Surgical intervention included a right-sided colectomy, resecting the mass in the patient's hepatic flexure, and removal of the lesions from the right lobe of her liver. Pathology diagnosed moderately differentiated mucinous adenocarcinoma, positive lymph nodes, and (Stage IV) liver metastases. A subsequent PET scan identified three additional hepatic lesions.

Despite ongoing treatment, the patient died nine months later.

Case Study

Deactivated Bed Alarm

linical Sequence

A 70-year-old male with a history of coronary artery disease, hypertension, atrial fibrillation, chronic obstructive pulmonary disease, and Parkinson’s disease was admitted to the medical unit with progressive shortness of breath and a report of recent falls at home.

On initial assessment, the patient was hypotensive and delirious. He was considered at high risk for falls and a bed alarm intervention was implemented. Zyprexa was administered (for delirium) with no effect.

Overnight, the patient’s nurse checked on him in response to his bed alarm at least 10 times. During the early morning shift change, the patient was found on the floor; his bed alarm was not activated (who turned the alarm off could not be determined).

A cervical collar was placed, and an X-ray revealed multiple rib fractures and a sprained wrist. After the fall, a 1:1 patient

observer was implemented. Ten days later, the patient was discharged to rehab.

Case Study

Breast Cancer Treatment Delayed 15 Months by Mishandled Radiology Report

Clinical Sequence

A 53-year-old woman presented to the internal medicine (IM) clinic for follow up after being evaluated in the Emergency Department for complaints of shortness of breath and atypical chest pain. Her medical history was significant for smoking, substance use disorder, and a prior breast lumpectomy (benign). At this time, she had a chief complaint of fatigue for several months.

The patient was evaluated by an IM resident. Blood work, a stress test, colonoscopy, and a mammogram were ordered under the resident's name, with no attending physician noted. When the blood work results returned, the IM resident called the patient to advise follow up on abnormal chemistries, but that follow up, the stress test, and the colonoscopy were never completed.

The patient was scheduled for a mammogram, and this imaging revealed fine calcifications in the patient's left breast

and a suspicious, irregular mass in her right breast. The radiologist advised breast biopsy, and this was done in Interventional Radiology (IVR) within two days. The initial biopsy report noted pathology results to be pending.

In the hospital where the biopsy was performed, the anatomic pathology reporting system was manual, and not linked to the EHR. Even so, IVR was appropriately notified, and the results of the pathology report were integrated into the final IVR report two weeks later, confirming malignancy in the patient's right breast.

The radiologist sent the final report to the IM resident via electronic mail, and a hard copy via interoffice mail. The email was seen by the IM resident, but not acted upon, as the resident forgot to follow up with the patient. The attending IM physician remained unaware of this patient. At the completion of residency program 15 months later, the IM resident found the hard copy of the breast biopsy and pathology report while cleaning out his mailbox and notified the patient's attending IM physician.

The patient had surgery within a month, the breast mass having tripled in size. Surgical pathology from mastectomy diagnosed invasive ductal carcinoma and sentinel node involvement. By the time this case closed, the patient had undergone four cycles of chemotherapy, and endocrine

therapy was being planned. Her chance of five-year survival was 93 percent.

Case Study

Narrow Focus Fogs Opportunity for Timely PE Diagnosis

Clinical Sequence

A 55-year-old woman with a history significant for obesity, hypertension, asthma, and anxiety presented to Urgent Care complaining of shortness of breath, hemoptysis, and persistent cough for three days. She reported pain (6-7/10) in her posterior right shoulder and right calf. Nursing assessment revealed P: 120 and O2 sat: 94% on room air. These were documented in handwritten notes, to be entered later into the patient's electronic health record (EHR). The Urgent Care provider, a family medicine physician, did not review the nursing notes, and during the exam, the patient only complained of cough and hemoptysis, leaving the tachycardia and low O2 saturation—and the patient's complaint of pain—unaddressed. A chest X-ray (CXR) was ordered, and the wet read revealed cardiomegaly and the possibility of slight infiltrates. The patient was given a prescription for Levaquin for potential pneumonia.

The final radiology report noted marked cardiomegaly on the CXR, as well as mild central pulmonary vascular prominence and no infiltrates. The radiologist recommended a chest CT scan if hemoptysis persisted. The patient was not informed of this result.

Three days later, the patient returned to the Urgent Care clinic and was examined by her own primary care provider. (PCP). She remained short of breath with no improvement; she denied calf pain at this time. Her cough prevented her from lying flat at this visit, and examination revealed P:130, O2 sat: 96% on room air, lungs clear. The patient was sent for a stat cardiology consult. The cardiologist saw the patient without access to the PCP's notes, which had not yet been recorded in the EHR. At this visit, she reported resolved hemoptysis and feeling better on antibiotics. The patient declined a stat echocardiogram, instead, scheduling it for the following week. A pulmonary consult was ordered.

Two days later, the patient called her PCP complaining of "coughing up more dark red blood" and requesting a refill on her inhaler, which was ordered. Within 24 hours of this phone call, the patient died of a massive PE. Autopsy revealed the patient had been showering emboli for weeks.

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Case Study

The Challenges of Discharge Instructions

Clinical Sequence

A 62-year-old male with a history of diabetes, neuropathy, and peripheral vascular disease presents to the ED after suffering for three days with a contused foot after a heavy box fell on it. On exam, the foot is badly bruised, red, and swollen. The patient has full ROM and there are no skin tears. Foot X-rays are negative and the patient is diagnosed with a contusion. Treatment includes immobilization with a splint and limited weight bearing.

A posterior splint to stop the patient from bending and flexing the injured foot is placed by a patient care assistant. No patient evaluation after the splint is placed is documented. The physician (verbally) gives the patient discharge instructions that include removing the splint when showering, or if it is too tight. The patient is also instructed to return immediately if he notes any color changes, increased pain, sensory changes, or skin breakdown. Follow up is recommended with Orthopedics in one week. Written instructions are not provided.

Two days later, the patient returns to the ED with color changes and complaints of pain in the injured foot. The patient reports that he has not removed the splint since it was placed in the ED. The patient has a necrotic infection and, despite medical treatment, the patient requires partial amputation of his injured foot.

Case Study

A Discordant Provider-Patient Relationship

Clinical Sequence

At her son's first pediatrician visit after relocating, the mother of an 18-month-old male infant she adopted from China, reports that he has been well. He is seen by the pediatric practice over the course of two years for routine well visits and intermittent illness by several clinicians in the practice.

At one acute illness visit, the mother believes the child has strep throat and requests antibiotics. The rapid strep test results in a negative finding. When the pediatrician states his thoughts of the illness as being viral and that antibiotics will not be effective, the mother voices her dissatisfaction. After the pediatrician offers to send a throat culture to a lab for additional strep testing, the mother refuses and leaves the practice dissatisfied.

One day later, she returns with her son. A throat culture is obtained and sent to the lab. The test result is negative.

Six days later, the patient returns and is seen by another pediatrician. He is diagnosed with bronchitis, and treated with antibiotics.

At a later appointment, the child is improved and the first pediatrician addresses concerns regarding the relationship of pediatric practice and family, including options for ongoing

care, or to transfer to another practice. The mother chooses to transfer care to a new pediatric practice.

Case Study

A Forgotten Stent

Clinical Sequence

A 52-year-old male in relatively good health is admitted to the hospital for surgical removal of a large hemangioma on his liver by an oncology surgeon. Four days after an uneventful left hepatectomy, the patient is discharged home with a surgical drain in place.

One week post-op, the patient is seen in the emergency department (ED) with complaints of abdominal pain and increased drainage from his tube. From the ED, the patient is discharge home and told to follow up with his surgeon.
Three days later at the patient's follow-up appointment, his surgeon notes that the drainage is not alarming and removes the drain.
Two weeks later, imaging studies reveal a right upper quadrant fluid collection and the patient undergoes a drain placement in interventional radiology (IR).
Two months later, the patient has an MRI that reveals a stricture in the anterior segmental branches in the right hepatic lobe. He undergoes an endoscopic retrograde choliangio pancreatography (ERCP) to determine if there is a

bile leak. Although no leak is found, the gastroenterologist places a biliary stent from the common bile duct into the small intestine to facilitate drainage. The plan is for the patient to return in 6–8 weeks for removal of the stent. No follow-up appointment is made.

Two weeks later, the patient is seen by his oncology surgeon who expresses concern that drainage from the tube placed by IR is poor. They discuss a plan for the patient to have another surgical procedure to improve drainage from the fluid collection in his abdomen.

Four months after his initial surgery (hepatectomy), the patient undergoes a second surgery. During this surgery, a bile leak is identified and repaired, and a new drain is placed. Postoperatively, the patient continues to have drainage from his drain and loses 30 pounds.

One month later, the oncology surgeon decides to perform a hepaticojejunostomy. Drains from this surgery are removed two months later. The patient is seen in the surgeon's office one month later and reports he is doing well. He is advised to have laboratory blood work, but no mention is made of the indwelling stent placed during the ERCP five months prior.

Eight months later, the patient is admitted to the ED with fever and chills. A CT scan reveals the indwelling biliary stent placed during the ERCP 13 months prior is still in place in his common bile duct and is infected. The patient requires another surgery to remove the infected stent.

Case Study

Passive Response to Mother's Status During Labor

Clinical Sequence

A morbidly obese 26-year-old in the 41st week of her first pregnancy was admitted to Labor & Delivery 3cm dilated and complaining of a sore throat. Her prenatal history included a positive Group B Strep test. The initial external fetal heart rate (FHR) tracing was Category 1; the nurse noted that FHR recording was complicated by the mother's size.

12 hours later, the patient's temperature was 100.5°; she was given Ampicillin and her nurse midwife consulted with the on call obstetrician (by phone) regarding a potential viral syndrome. The patient was not seen by the obstetrician.

- **6 hours later**, the patient had progressed to 4cm; her temperature remained at 100.5° and she was given anti-flu medication (oseltamivir). Oxytocin was also administered.
- **5 hours later,** the patient had progressed to 6cm dilation.
- **8 hours later**, no cervical change.
- **4 hours later**, the patient had progressed to 8cm and her membrane was artificially ruptured.
- **6 hours later** (41 hours since her admission), the mother was fully dilated. Meconium stained fluid was noted; the FHR tracing was Category 2 with decelerations.
- **1.5 hours later**, chorioamnionitis was diagnosed and treated with antibiotics.

- **1 hour later**, a female infant (3700g) was delivered vaginally; her Apgars were 1/3/5, and she died shortly after birth. Her cultures were negative; autopsy confirmed hypoxic ischemic encephalopathy.

Case Study

Poor Triage of Stroke Patient Closes Opportunity for Timely Administration of Thrombolytics

Clinical Sequence

1. **At 2:45 p.m.**, an 83-year-old woman with a history of multiple stroke risk factors was brought to the Emergency Department (ED) by her daughter who noticed her mother “sounded strange” during a phone conversation.
2. **At 3:36 p.m.**, she was seen by the triage nurse, who noted confusion, garbled speech, and a mild right facial droop. Neither the patient nor her daughter could pinpoint when the symptoms had begun. Her history included hypertension, heart disease, hypercholesterolemia, and possible TIAs. Based on her assumption that the neurologic symptoms had started more than three hours prior, the triage nurse assigned the patient a triage score of 3, and directed her to the waiting room until a physician was available to examine her. Her daughter was told that her mother had likely had a stroke and would be given medication in the hospital. She was instructed to notify someone if her mother’s symptoms progressed while they were waiting.
3. **At 4:45 p.m.**, the patient’s daughter notified ED personnel that her mother had new onset of right-

sided paralysis. She was told there were “many major cases” in the ED.
4. **At 5:15 p.m.**, the patient was taken to a room.
5. **At 6:00 p.m.**, the patient was evaluated by the ED physician who documented near-total right paralysis and possible initial symptom onset at 2:00 p.m. A CT scan showed no acute hemorrhage. After a neurology consult and consideration of the event time course and the patient’s age, the ED physician decided not administer thrombolytics. The patient received Plavix and was admitted to the floor. An MRI showed acute posterior temporal lobe and basal ganglia infarctions.
6. **On her third day of hospitalization**, the patient—whose symptoms and gait had been improving—fell while getting out of bed and was noted to have increased right-sided weakness. She was started on a heparin. During her stay she was diagnosed with new versus paroxysmal atrial fibrillation.
7. **Eight days after her stroke**, the patient was transferred to a short-term rehabilitation center. Her facial droop resolved within one month; she has minimal right-sided incoordination and balance problems. Embarrassment over her mild expressive aphasia makes her reluctant to participate in certain activities. Since her stroke, she has had falls resulting in a right hip fracture that required surgery and a right proximal humerus fracture.

Case Study

Diagnosis of Aortic Dissection Delayed by Mismanagement of Imaging Orders

Clinical Sequence

1. **At 1:00 p.m.**, a 60-year-old male with a history of hypertension and family history of aortic dissection called his primary care provider coverage one hour after abrupt onset of epigastric abdominal pain. He was referred to an emergency department (ED) more distant from his home than his local hospital.
2. **At 4:30 p.m.**, the patient arrived at the ED (he drove) and was evaluated by the triage nurse. His blood pressure was 133/35 and his epigastric pain was 10/10; he was assigned an (ESI) score of 3.
3. **At 5:15 p.m.**, as the patient was placed in a room, he noted his pain now radiated into his chest and throat.
4. **At 5:32 p.m.**, an electrocardiogram (EKG) showed new ST depressions.
5. **At 5:50 p.m.**, an ED resident evaluated the patient and noted a diastolic murmur. The resident's documentation stated concern for aortic dissection with a plan to obtain a CT angiogram (CTA). Per the radiologist request, a chest X-ray was to be ordered prior to the CTA. Documentation by the ED attending was not present.
6. **At 6:50 p.m.**, both the CTA and chest X-ray were ordered. The X-ray demonstrated an enlarged cardiac silhouette; the CTA was delayed at the request of the radiologist in order to obtain a creatinine (to rule out the risk of renal failure during the CTA).
7. **At 7:15 p.m.**, the patient suffered bradycardia and subsequent PEA/asystolic arrest. ACLS was initiated, the patient was intubated, and he regained spontaneous circulation. A bedside EKG demonstrated a pericardial effusion. A cardiothoracic surgery consultation was requested and an emergency CT scan confirmed aortic dissection with hemopericardium.
8. **At 8:05 p.m.**, the patient was transferred to the operating room, where he suffered another cardiac arrest prior to sternotomy. During the subsequent

aortic root graft and mechanical aortic valve replacement, the patient had five episodes of cardiac arrest. He subsequently developed renal failure, hypoxic ischemic brain injury, and paralysis of both legs.

9. **Post-discharge**, the patient continued to experience significant neurological disability and, less than two years after the aortic dissection, he died.

Case Study

10. Inconsistent Performance and Documentation of MD Orders

Clinical Sequence

1. A 56-year-old male was admitted for surgical repair of multiple facial fractures suffered when a basketball backboard fell on his head. Following surgery, the patient was transferred to ICU with his jaw wired shut. He was placed on a Dilaudid PCA for pain control.
2. **Post-op Day One, 5:00 p.m.**: The patient was extubated and transferred to the floor. He remained on a PCA with his jaw wired shut and his nose packed bilaterally. He received oxygen (as needed) without continuous monitoring. The routine on the floor was vitals every four hours unless ordered otherwise; the order for this patient was for vitals “per ICU routine” (hourly). The receiving nurse documented a full set of vitals hourly between 5:00 p.m. and 7:00 p.m.
3. **8:00 p.m.**: A second nurse assumed the patient’s care and assumed the order for vitals “per ICU routine” was a mistake, although she never confirmed this with anyone. Nothing relative to the frequency of vitals was documented in the patient’s record.

4. **11:00 p.m.**: The patient reported insomnia and the nurse administered 0.5 mg Ativan.
5. **Post-op Day Two, 12:00 a.m.**: The nurse documented a full set of vitals which were normal and overall consistent with those documented on the prior shift.
6. **2:00 a.m.**: The nurse documented the patient's heart rate and blood pressure, but no other vitals. She made frequent visual checks on the patient, but nothing was documented.
7. **4:00 a.m.**: The nurse administered several medications and recorded the patient's pain level, but did not record any vital signs. She later testified that she a) wanted to let the patient sleep, and b) believed she had an hour leeway relative to when vitals had to be taken and she planned to do that when she came back in about an hour to administer additional medications.
8. **5:20 a.m.**: The nurse found the patient unresponsive, with no pulse. A code was called, but the resuscitative efforts were unsuccessful and the patient died.

Case Study

Too High a Threshold for Intervention Led to Inpatient Prolonged Stay and Treatment

Clinical Sequence

1. A 36-year-old obese, inebriated, male was brought to an academic medical center (AMC) emergency department (ED) with stab wounds to his upper left abdomen and right arm. He was evaluated by the Emergency Medicine attending and a trauma surgeon, but the findings of the wound exploration were not documented. A focused assessment with sonography for trauma (FAST) exam was documented, as negative. The wound was closed and the patient was discharged home.

2. Five hours later, the patient presented to a community hospital ED with severe abdominal pain. A CT scan showed an intra-abdominal hematoma contiguous with a loop of small bowel. He was admitted to the surgical service for observation, IV fluids, and antibiotics. On the evening of admission, he became tachycardic with increased abdominal pain. A repeat CT scan showed free air and increased free fluid, and the patient was transferred to the ICU. His symptoms were documented to improve with NGT and foley placement.
3. Over the next eight days, the patient had additional CT scans showing increased abdominal free fluid and increased small bowel dilation. The treating surgeons documented that exploration was not indicated because the amount of free air was not increasing. He was transfused two units of packed red blood cells for a hematocrit drop from 42 to 30. When he was subsequently found to have worsening leukocytosis, tachycardia, and renal failure, he was transferred back to the ICU, then—at the request of his family—to a (different) teaching hospital. There, he underwent emergent exploratory laparotomy, demonstrating 10 liters of abdominal free fluid, and a through-and-through injury to the jejunum. After three operations for washout, feeding tube placement, and skin grafting, he was discharged to rehab and later required additional skin grafting and hernia repair.
4. He had recurrent hospital admissions for bacteremia, and required extensive occupational and physical therapy.

Case Study

Failure to Double-check Blood-product Dosing Imperils Tonsillectomy Patient

Clinical Sequence

Fifteen days after undergoing a planned tonsillectomy, an 8-year-old-girl with a pre-existing Factor VII deficiency (clotting disorder) presented in the Emergency Department, late at night, with complaints of bleeding and coughing up blood. At 4:30 a.m., the attending anesthesiologist and a (fatigued) fourth-year anesthesia resident reviewed the patient's history and discussed the need to administer Factor VII (a clotting agent prior to the necessary cauterization procedure). A hematologist gave a verbal order for 500 mcg (0.5 mg) of Factor VII (NovoSeven), to be dispensed from the hospital's blood bank to the pre-op area.

In the pre-op area, the anesthesia attending and resident discussed the necessary dosage: 0.5 mg. When the Factor VII arrived, no order was attached. The label stated NovoSeven 5 mg (5000 mcg). At the time of this event—due to different electronic systems—the hospital did not have a standard process in place for the review of the electronic health record (EHR) to confirm the hematologist's order (the EHR required a refresh for the order to be visible). The anesthesia attending

and resident referred to the hematologist's notes related to the girl's tonsillectomy. The anesthesia attending and resident agreed that the correct dose was 500 mcg/0.5 mg. The resident administered the entire amount via IV (no double-check was required).

The patient was brought to an operating room for cauterization. As she was placed under anesthesia, and during the pre-op checklist, the dosing error was realized by the anesthesia resident who alerted the surgical team. The hematologist was consulted and the patient underwent cauterization. An apology and disclosure was made to the family and the patient's PACU stay was extended due to the concern of clot formation. She required close observation until the Factor VII had metabolized (approximately 6–8 hours). The patient experienced no complications.

Case Study

A Slip in Protocol Leads to a Patient Fall and a Tragic Outcome

Clinical Sequence

A 55-year-old female with multiple co-morbidities (hypertension, Type 2 diabetes and on dialysis for end-stage renal disease) was admitted to the hospital with a diagnosis of

osteomyelitis of the spine. She was treated with a course of antibiotics. Two months later, she returned to the hospital with worsening lower back pain. The patient's daughter reported that her mother had been experiencing periods of instability and dizziness at home (the mother denied this). The nursing staff noted the patient as a high risk for falls.

A standing lumbar spine film to rule out spinal instability was ordered by a covering orthopedic resident. The nurse prepared a transfer checklist and placed it inside the chart (the hospital's policy is to place this note on the front of the chart). A transporter wheeled the patient to Radiology, where she was received by a technologist with no verbal hand off given about the patient. The technician asked the patient if she was okay to stand, and she said she was. He helped her get into the right position for the film and stepped away to capture the image.

In the time he stepped away, the patient became unstable and fell. The technologist rushed to the patient who was now bleeding from the face and head and was disoriented. A code was called and the patient was stabilized. A head CT scan revealed right parietal intra parenchymal hemorrhage. She sustained facial fractures and exhibited left-sided hemiparesis.

The patient was admitted to the ICU. She was unable to swallow or recover mobility and required a percutaneous gastrostomy tube for feeding. Following transfer to a rehabilitation facility, the patient developed a Stage IV decubitus ulcer of her sacrum. After two years in a nursing home, the patient died.

Case Study

Device Vendors Distract Surgical Team

Clinical Sequence

A 53-year-old man with long-standing history of rectal prolapse presented for elective sigmoid resection with rectopexy.

The patient underwent a pre-operative surgical office consultation weeks prior to surgery and was apprised of the surgical risks, including bleeding, infection, injury to organs, anastomotic leak, need for temporary (or permanent) ostomy, pain or injury to nerves affecting urinary or sexual function. There was no documented discussion of potential use of an experimental device or the associated risks of such mechanical devices to be utilized during the surgery.

A day before the surgery, the patient was admitted for bowel prep. The morning of the surgery, the surgeon again reviewed

how the procedure would be performed and described the associated risks. Meanwhile, two representatives of a stapling device vendor requested access to the OR to oversee the trial of a new stapler. The hospital's policy for vendor access to the OR required approval by the Materials Department for use of trial devices, after which the representatives could be provided ID badges for access to the OR suite. In this case, the attending surgeon informed the vendors that they must obtain an ID badge to gain access to the OR without clearly articulating the steps for approval of trial devices.

When the vendors returned to the OR with ID badges, the surgeon granted them access to the OR.

As the surgeon applied the trial stapler in performing the anastomosis, it closed around the distal sigmoid colon and rectum, but would not re-open. After 45 minutes of trouble-shooting with the vendor representatives—including replacing batteries—the surgical team elected to re-open the sigmoid colon and resect the rectum to remove the stapler. During this process, part of the rectum was torn and multiple staples were lost in the operative space. These complications required that the patient undergo a diverted loop colostomy, requiring surgical reversal.

The surgeon disclosed this event to the patient, who underwent an uncomplicated recovery and surgical reversal seven months later.

Case Study

Incomplete Patient Understanding of Risks Complicates Surgery

Clinical Sequence

A 56-year-old female met with the anesthesia resident 10 days before she was scheduled for an elective vaginal hysterectomy due to uterine prolapse. The resident examined the patient and they discussed her (five-year) history of polychondritis—a rare and chronic rheumatic disease which can affect a patient's cartilage, trachea, and mucus membranes. The patient indicated that she never had a problem with breathing. Since the resident had not heard of polychondritis, she checked with the attending anesthesiologist, did some research regarding the condition, and found nothing contraindicating general anesthesia. The patient was cleared for surgery. She was felt to be ASA II (her illness should not affect receiving anesthesia).

On the day of the surgery, the attending anesthesiologist evaluated the patient and asked if she had any problems with her respiratory status; she denied any problems. The plan was

to use general anesthesia with a possible stress dose of steroids. The patient was induced by an anesthesia resident for general anesthesia, but the endotracheal tube could not be passed beyond the glottis. The attending then attempted the intubation and switched to a laryngeal mask airway. The ventilation with this was only adequate.

A decision was made to cancel the case, awaken the patient, and obtain an ENT consult as an outpatient regarding the apparent sub-glottic stenosis. However, as the patient was awakening, she developed progressive shortness of breath and stridor. An emergency tracheotomy (performed by an otolaryngologist) was unsuccessful due to narrowing of the trachea. The patient then developed flash pulmonary edema. A thoracic surgeon performed a successful sternotomy, but significant anoxia had occurred over approximately 10 minutes.

After surgery, the patient suffered continuous seizures. An EEG confirmed severe anoxic brain injury. After two months in a vegetative state, the patient died. An autopsy revealed evidence of polychondritis in the upper airway and nasal passages. An investigation revealed a history of spiral CT scans of the trachea (at an outside facility) which, initially, demonstrated scarring of the patient’s trachea, then showed that the scarring was resolving. This information had not been communicated to either the gynecologist or to the anesthesia

team. The patient's family was similarly unaware that her polychondritis had been symptomatic.

Case Study

Opioid Treatment for Sleep Disorder did not Consider Patient's Overall Medication Risks

Clinical Sequence

A 38-year-old woman continued to receive psychiatric care for depression subsequent to two suicide attempts years earlier; she was taking Ativan and Celexa. Her psychiatrist referred the patient to an internal medicine sleep specialist for restless leg syndrome (RLS) and other sleep related issues. The specialist noted her history of depression, however no self-harm assessment was noted.

A sleep study noted sleep apnea. The internist recommended BiPAP, and prescribed Mirapax for her RLS. The internist and patient communicated weekly via email to assess the effectiveness of her treatment. Two months after her initial visit, the patient was again seen by the internist. Since the Mirapax was not helping the patient's RLS, the internist prescribed low dose Oxycontin, ordering 60 (5 mg) tablets. Six weeks later, the internist prescribed another 200 (5 mg)

Oxycontin tablets. There was no documentation other than the prescriptions noted in the patients record.

Three weeks later, the patient was found dead in her apartment. Autopsy indicated suicide by Oxycontin overdose.

Case Study

Are We Properly Tracking Test Results and Referrals?

An 8-year-old with a history of forearm fractures and osteopenia was referred to an endocrinologist, who made an interim diagnosis of idiopathic juvenile osteoporosis (IJO). The girl was referred to a gastroenterologist to rule out celiac disease.

An upper endoscopy, performed by a different physician, indicated all structures appeared normal. Five days later, the pathology report was positive for celiac disease. Over the next three years, the child was treated by her gastroenterologist, endocrinologist, and orthopedic surgeon for IJO. When she developed abdominal pain and constipation, her PCP (different from three years prior) conducted a celiac test, which was positive. When asked by the endocrinologist if a patient could become celiac positive three years after a negative test, the gastroenterologist saw the previous (positive) results in the

patient’s chart. (Neither the endocrinologist nor the referring gastroenterologist had ever reviewed them.)

When notified, the girl’s parents said they had been told the initial test results were negative, but couldn’t recall by whom. A gluten-free diet gradually improved the girl’s condition.

Case Study

Patient’s Migraine History Biases Diagnosis in ED

Clinical Sequence

A 41-year-old woman with a history of frequent visits to the Emergency Department (ED) arrived there by ambulance with a complaint of headache, nausea, and vomiting. The EMS crew documented that the patient had a headache.

The triage nurse documented that the reason for the visit was a headache, and that the patient was sleepy and “refusing to talk.” While being examined by the Emergency Medicine attending, the patient vomited a small amount of bile. A neurology exam was noted to be within normal limits, however, the record does not include a description of the patient’s headache or other details of her exam.

Within three hours of her arrival, the patient was diagnosed with a migraine. No further testing was ordered. The patient was given Compazine for her nausea, and pain medication.

During discharge, the nurse documented that the patient refused to sit up. She was brought to the waiting room in a wheelchair and discharged to a waiting family member.Later the same day, the patient had an acute event and was taken to another hospital. Imaging identified a subarachnoid hemorrhage from a ruptured aneurysm. The patient had a complicated hospital course and suffered severe permanent cognitive deficits.

Case Study

Are We Prepared to Triage this Patient Call?

On a Saturday (8:00 p.m.), a father called his son's pediatrician's office and told the nurse practitioner (NP) that his 9-year-old had not felt well for three days: nausea, vomiting, decreased oral intake, weakness, and lethargy (sleeping 24 hours straight).

Suspecting the flu, the NP asked if the boy was alert (yes), had passed any urine (yes), or had a fever or rash (no). When the NP asked if he felt if his son would be "okay" that night or should be seen right away, the father replied, that he didn't

think his son needed to be seen right away, but was concerned that he hadn't eaten. The NP advised pushing ginger ale and making sure he was urinating.

When checked on at 4:00 a.m., the boy was sleeping and his breathing was more rapid. At 8:30 a.m., however, the father found his son was not breathing, called 911, and started CPR…but the boy could not be revived. Autopsy revealed diabetic ketoacidosis (the child had undiagnosed diabetes mellitus). His blood sugar was 1,165 (nl 50-80) and his HgA1C was 15.3% (nl 4-5.9%).

Case Study

Communication Issue Leads to Retained Foreign Body

Clinical Sequence

After completing successful brain surgery on a 54-year-old patient, the attending asked the resident to remove the intrathecal catheter. As the resident started to remove the catheter, a piece broke off and attempts to remove the piece were not successful. The resident notified the attending, who decided to leave the catheter in place, with the intention of removing it at a later date. In the operative note, the resident noted that a portion of the catheter broke off and was

retained in the lumbar spine. The patient was not informed of the retained catheter before his discharge.

When the patient returned to his surgeon for follow-up care, he complained of postoperative back pain.

Several months later, the patient complained to his primary care physician of continuing back pain so bothersome he could not drive or work. A CT Scan showed a retained tip of the spinal drain catheter from the surgery. This finding was conveyed to the surgeon, who informed the patient and his family and apologized, explaining that he had simply forgotten about the retained catheter. Following a minor procedure to remove the catheter, the patient's pain resolved.

Case Study

Does My Patient Understand Why I Ordered this Test?

Closed Malpractice Case

A 17-year-old male with no prior medical history asked his primary care practitioner (PCP) to complete a high school physical exam form. The form, which was documented in the medical record, noted a complete and normal physical exam.

Eight months later, the patient asked his PCP to complete a college physical exam form. This form notes all systems are normal, except a question of a slight systolic murmur. An echocardiogram was scheduled. The PCP's office was notified that the patient did not keep the appointment; there was no outreach to the patient in follow up to the missed appointment or new clinical finding. Neither the patient encounter nor the missed echocardiogram appointment was documented in the patient's medical record.

Over the next two years, the patient was seen by his PCP, with no documented discussion or follow up regarding the murmur or the recommended echocardiogram. At age 20, while playing football, the patient died. Autopsy revealed hypertrophic cardiac myopathy

Case Study

Did the Specialist Change the Treatment Plan?

Closed Malpractice Case

A 62-year-old female with a history of atrial fibrillation had her Coumadin managed by both Cardiology and her primary care physician (PCP). In March, she was evaluated by her cardiologist with complaint of bleeding. An EKG showed normal sinus rhythm (NSR). Since the patient had been in NSR

for several years, a decision was made to stop her Coumadin and start aspirin.

Seven months later, while being evaluated by her PCP, an EKG revealed atrial fibrillation. When asked if she was on Coumadin, the patient responded “yes.” No discussion of her atrial fibrillation or management of her Coumadin during the office visit was noted in her record. Three months later, the patient was admitted to the hospital with complaints of lightheadedness and dizziness. She subsequently suffered a stroke and sustained permanent injuries.

Case Study

Is My Patient’s History Up to Date?

Closed Malpractice Case

A 57-year-old male with a history of two MIs, sleep apnea, and hypertension was seen for complaints of jaw pain (8/10 severity) and chest *tightness*. Vital signs at visit reported as normal; exam revealed good range of motion in jaw. Provider felt jaw pain may be related to CPAP mask patient used for sleep apnea and diagnosed temporoman dibular joint (TMJ) disorder. This patient had two previous EKGs showing myocardial damage, however, the provider did not retrieve them at the time of the visit and no cardiac workup was performed. Five days later, the patient presented to the ED

with nausea and vomiting. Upon evaluation, he was diagnosed with an MI, then progressed into cardiogenic shock. Further testing revealed a lateral wall myocardial rupture, requiring surgery. The patient's condition worsened, he suffered kidney and liver failure, and subsequently expired from advanced system failure.

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Case Study

Is My Specimen Handling Process Reliable?

Closed Malpractice Case

A 27-year-old female was seen in office for complaints of frequency and burning on urination. A urine culture and sensitivity (C&S) was ordered. The patient was prescribed Bactrim and instructed to follow up with any ongoing issues. The urine specimen was never sent to the lab. Two weeks later, the patient called the office with complaints of excruciating back pain, and was referred to the emergency department. In the ED, urinalysis confirmed 3+ bacteria. Urine C&S was sent, the patient's Bactrim prescription was renewed, and she was discharged.

Two days later, the patient was admitted to the hospital through the ED with fever, nausea, and vomiting. The urine C&S obtained in the ED confirmed E-coli (not sensitive to Bactrim), and a new antibiotic was ordered. After a four-day inpatient admission, the patient was discharged home with a peripherally inserted central catheter line for prolonged antibiotic treatment.

A disclosure and apology to the patient revealed that her urine C&S had never been sent from the initial office visit.

Case Study

Am I Sure My Patient Got The Test I Ordered?

Closed Malpractice Case

A 62-year-old-male with a 40-year 1-2ppd smoking history was seen in his primary care office for complaints of chest pain after hearing a rib crack. A chest X-ray was ordered; the radiologist's report noted a 3 x 1.5cm mass (left lung) and recommended a CT for further evaluation. The PCP's office system included placing the medical record in a "pile" for outstanding test results. The patient's medical record was filed prior to the office receiving/ reviewing the X-ray report (the CT scan was never ordered).

One year later, the patient returned with complaint of cough, chest pain, and congestion for the past month. A repeat chest X-ray identified enlargement of the mass seen in the previous image. Upon further evaluation, the patient was diagnosed with stage IV adenocarcinoma with metastasis to the brain. He died within one year.

Case Study

Who is Responsible for Follow Up?

Closed Malpractice Case

A 74-year-old male was advised, during a hospital stay, to see a pulmonologist for a specific opacity in his right upper lobe suspicious for carcinoma seen on a CT scan.

The patient was seen shortly thereafter by his PCP, who made a referral to a pulmonologist. The PCP saw the patient for regular visits for the next four years, but was not aware of the pulmonologist's recommendation for additional follow up regarding the lung concern. At age 78, the patient was diagnosed with stage IV lung cancer and died three months later.

Case Study

Should I use a Decision Support Tool?

Closed Malpractice Case

During an appointment for a self-detected breast lump, a 34-year-old's physical exam was noted as normal. The gynecologist ordered a mammogram, but did not indicate the patient's breast complaint on the order. Four months later, a *screening* mammogram was done and reported as "normal," with a note of "very dense stromal pattern," which reduces sensitivity for cancer detection. The radiologist did not recommend an ultrasound; the gynecologist received the report with no recommendation for further testing.

Nine months later, the patient returned to her gynecologist complaining of the same breast lump. The physician palpated the lump on exam and ordered a *diagnostic* mammogram and a surgical consult. Subsequent work up revealed breast cancer. The patient underwent a radical mastectomy and axillary node dissection, and was found to have metastases to the spine. The patient's positive family history of breast cancer was not recorded until after her diagnosis.

Case Study

Poor Pre-op Assessment Exacerbates Post-op Complication

Clinical Sequence

Prior to a total knee arthroplasty, a 62-year-old obese male with a history of osteoarthritis, hypertension, hypercholesterolemia, and sleep apnea saw his primary care physician (PCP) to be cleared for surgery.

During his exam, the patient denied any respiratory problems and was cleared for surgery. The history and physical performed by the PCP did not mention a history of sleep apnea. When seen preoperatively by the anesthesiologist, the patient again stated that he had no respiratory problems and did not mention his sleep apnea nor his use of CPAP at home.

The knee replacement was concluded without complications and the patient was admitted overnight for observation. During this time, his 02 saturations were in the low 90s, so he was kept on oxygen via nasal cannula to maintain his 02 saturations at 98-99%. The decrease in his 02 saturations was attributed to pain medication and his obesity; no further follow up was done. His 02 saturation level off of oxygen, prior to discharge, was not documented.

The patient was discharged home the next day on oxycodone. He died at home the next day.

Case Study

Failure to Supervise and Confirm Orders Leads to Preventable Death

A 77-year-old male was admitted after a fall at home and a positive CT for subdural hematoma. He was a smoker with a history of COPD, renal insufficiency, and difficulty swallowing. A spinal CT showed cervical disc displacement and some cord compression. Following a positive speech/swallowing evaluation for aspiration risk, the resident documented an NPO plan, however, the NPO was not entered into the system. The attending was not aware of the order, and the patient care

technician was never informed. When the meal tray arrived, the tech attempted to feed the patient, who aspirated.

A new chest X-ray showed no change from the previous study. The NPO was entered into the system after the incident. The next day, the attending physician saw the patient's deteriorated respiratory status, and transferred him to the ICU. There, the patient developed pneumonia, requiring prolonged intubation and IV antibiotics.

Two weeks later, the patient went to the OR for a tracheostomy and placement of a feeding tube. During the latter procedure, the patient suffered a laceration to the liver. He developed decubitus ulcers with skin breakdown and oozing from multiple sites. Within three weeks, the patient became septic and died.

The patient's family sued the attending, two residents, and two nurses involved in the care. They alleged that the defendants failed to properly supervise the patient and confirm that all proper orders were implemented. They further alleged that these oversights led to the patient's aspiration, development of aspiration pneumonia, rapid deterioration, and preventable death. The case was settled in the mid-range.

Case Study

Infant Discharged Before Clinically Stable

A two-month-old boy, born at 36 weeks gestation, presented at the ED in acute respiratory distress. He was admitted to the PICU for treatment of respiratory syncitial virus (RSV) bronchiolitis. He developed respiratory failure and was intubated on day three of admission. The patient was eventually extubated and discharged after two weeks.

Three months later, the patient presented to his primary care physician with difficulty breathing. He was transferred and admitted for treatment of bronchiolitis and rotavirus. The patient was treated with Atrovent, Albuterol and Epinephrine, as well as IV and oral steroids.

After five days, a morning note in the medical record indicated the patient was not ready for discharge. However, that night he was discharged home after evaluation by the resident, who conferred with the attending by phone. Approximately five hours later, the child's mother found him unresponsive in his crib. EMS personnel found the child in full cardiac arrest. He was intubated and transported to a local hospital where he was pronounced dead in the ED.

The patient's family sued the attending pediatrician, resident, and nurse. The plaintiff alleged that the defendants negligently

discharged the patient before he was clinically stable, and failed to provide appropriate discharge instructions to the family. After an eight-day trial, the jury returned a verdict in favor of the defendants.

Case Study

Wrong Rod Inserted During Surgery

In October 2006, an 89-year-old female patient fell and sustained a fracture to her right hip and right femur. She was admitted to the hospital for surgical repair by the insured orthopedic surgeon. The procedure included placement of a rod in the affected leg. During the procedure, the insured sized the patient's rod by x-ray measurement next to the effected leg prior to placement.

Three boxes labeled "Left" and "Right" were brought into the OR. An RN opened the boxes, matched the product with the consent and placed the product into the surgical field. During surgery, the rod fit nicely with no resistance. There were no complications post-op, and the patient was discharged to a rehab facility ten days after surgery.

While in rehab, the patient developed pneumonia and was transferred to an acute facility for treatment. She was taken to x-ray, and while positioning her right leg on the table, it fractured. She underwent surgical repair by a non-insured

orthopedic surgeon in November. During the procedure, it was noted that a left leg rod had been used in her initial surgery instead of a right leg rod. After the second procedure, the patient developed a CVA, a DVT, a UTI, c-diff and a pleural effusion. In January, she required surgery to drain a right thigh hematoma that grew MRSA. In March 2007, a third surgery was necessary to replace the right hip joint due to erosion of the socket. She was admitted again in July with a UTI, subsequently suffered an MI and seizure disorder. The patient expired August 2007.

The insured orthopedic surgeon states he was presented with three rods and the one he chose was the perfect length. He did not notice it was a left leg rod rather than right due to the patient's anatomy. The RN did not notice the discrepancy either.

As co-executors of the patient's estate, her son and daughter filed a claim against the insured physician and RN alleging improper performance of surgery. The case was settled in the low-range.

Case Study

Multiple missteps in the referral process preceded patient's death from cardiac failure

An 51-year-old female with a history of attention deficit disorder and hyperlipidemia had been treated by her primary care physician for 14 years. Her high cholesterol was treated with medications and she was otherwise asymptomatic. Due to a family history of cardiac disease, the patient requested a cardiology referral for evaluation.

Her PCP ordered the referral and a stress test. The office reports sending the referral information to the patient, however, the patient did not receive it.

After the patient called the practice multiple times, a referral was scheduled (three months after initial request). On the day she was to have her cardiology appointment, the patient died.

Her death was attributed to significant coronary artery disease, with hyperlipidemia noted.

Case Study

A misread X-ray of patient with pneumonia led to respiratory failure and death

A 55-year-old male was diagnosed by his primary care clinician with sinusitis and prescribed an antibiotic. Six days later, he was evaluated in an urgent care clinic for shortness of breath, labored breathing, extreme fatigue, and chest pain with cough. The patient had a temperature, a fast heart rate, and low oxygen saturation.

After he was treated with an aerosolized nebulizer, his oxygen saturation improved. Based on her negative interpretation of a chest X-ray, the urgent care clinician diagnosed a viral URI and instructed the patient to see his family doctor the next day.

Two days later, the X-ray was read by a radiologist with impression of pneumonia. The clinic called the patient and instructed him to go to his local Emergency Department for evaluation and treatment. Before he could get to the ED, the patient died of respiratory failure associated with pneumonia.

Case Study

Lack of appreciation for significant elements of the patient's history and physical led to a missed PE

Diagnostic Assessment: Case Example

A 33-year-old obese patient with remote history of asthma, and on oral contraceptives, presented to her primary care

clinician with a three-day complaint of right thigh pain, swelling, and red streaking on her skin. On exam, her right inguinal lymph nodes were enlarged and antibiotics were prescribed.

Three days later, she returned with complaint of new onset shortness of breath, chest pain, and rapid heart rate. The patient had diminished breath sounds. Her physician thought she was having an asthma flare and advised her to continue antibiotics and asthma medications.

Later the same day, emergency personnel were called to the patient's home after she fell. She was brought to a local Emergency Department where she quickly decompensated and died. Autopsy revealed a large pulmonary thromboembolism.

Case Study

Multiple Missed Steps Delay Breast Cancer Diagnosis

Clinical Sequence

During a **September 2003** appointment with her gynecologist for a self-detected breast lump (left side), the 36-year-old patient's physical exam was normal. The gynecologist ordered a mammogram, but did not indicate breast complaint on the order.

The mammogram, in **January 2004**, was read as “normal,” but the report noted “very dense stromal pattern” which reduces the sensitivity of the study for detection of cancer. The radiologist did not recommend an ultrasound. The gynecologist received the report read as “normal” with no recommendation for further testing.

Nine months later (**October 2004**), the patient presented to her gynecologist, again complaining of a (left) breast lump. The physician felt the lump on exam and ordered a mammogram and a surgical consult. Subsequent work up with ultrasound, digital mammogram, and biopsy revealed breast cancer. The patient underwent a radical mastectomy and axillary node dissection, and subsequently was found to have metastases to the spine.

This patient had a positive family history of breast cancer, which was not documented until after her diagnosis.

Case Study

A Lifetime of Risk

Clinical Sequence

A 30-year-old female began care under a new primary care physician (PCP). At her first visit, the nurse practitioner (NP) noted that the patient had a splenectomy at age 10 (secondary to mononucleosis) followed by pneumococcal vaccine. A

history of hay fever was also noted, and the NP gave the patient prescriptions for Claritin and Flonase.

Two months later, the patient had a full exam by her PCP, who also noted her history of mononucleosis and splenectomy. Other than a tetanus booster, no other immunizations were noted or discussed at this visit. During the next 13 months, the patient was seen for a work-required physical examination and some minor health issues. During that period, the patient received no vaccines, nor was discussion of vaccination documented in her record.

Eight months later (at Christmastime) the patient attempted to call her PCP for a high fever of 105°, flu-like symptoms, and a 30-minute nose bleed. Her call was transferred to local trauma center nurse who surmised she had the flu, recommended ibuprofen, and informed the patient that the center would re-open the following day at noon.

The next morning, with worsened symptoms, the patient was taken to a local Emergency Department. With a blood culture positive for streptococcus pneumonia, she was diagnosed with pneumococcal sepsis, started on antibiotics, and transferred to a tertiary hospital. She required a lengthy hospitalization due to compartment syndrome in both legs, which led to partial amputations of both feet. She now has permanent disability (wheelchair bound), requires treatment for recurrent osteomyelitis and suffers from anxiety and depressive disorder.

Case Study

Patient Unaware of PSA Testing, Then Cancer

Clinical Sequence

A 52-year-old male presented to his PCP with a knee effusion. The physician documented the patient's refusal for a work up for malignancy and his agreement to blood testing only. A panel of laboratory tests included a PSA.

The lab results revealed very abnormal liver function tests (LFTs) and an elevated PSA of 6.8 (normal ≤ 4.0). The physician noted the PSA level was a little high and indicated the need for follow up. He documented a positive history for smoking and alcohol use, along with non-compliance (the patient did not complete a recommended chest X-ray after the initial visit). A note was sent to the patient, advising him of the elevated LFTs and the need for further evaluation, and requesting he call the office. The PSA result was not mentioned. The patient failed to return for a follow-up visit.

Nine months later, the patient returned for a physical exam with the nurse practitioner (NP) who documented a decrease in smoking and alcohol use, and noted no swelling or abdominal pain. The patient's blood pressure (BP), however, was elevated and the patient returned to the practice for another BP check a week later. He was seen by the PCP and given medication for hypertension.

Eleven months after that, the patient presented to the ED with a hand laceration (and alcohol on his breath). One month later, while being seen by his PCP for another hand laceration, the patient was noted to be thin and chronically ill-appearing. Noteworthy on his panel of lab tests was PSA elevated further to 12.9. A urology work-up revealed prostate cancer and a right renal mass. The PCP, unaware of these findings, received a scathing letter from the patient's daughter. The patient, who underwent a radical nephrectomy, prostatectomy, lymphadenectomy, and radiation therapy, is now followed by another PCP.

Case Study

Test Delay Blamed for Woman's Colon Cancer Death

Clinical Sequence

A 46-year-old female was seen by her PCP for a complaint of constipation and bleeding with bowel movements over the past five weeks. The patient had a history of hemorrhoids, and the PCP ordered a referral to GI for a sigmoidoscopy. Due to scheduling constraints, the sigmoidoscopy could not be performed for two months. The sigmoidoscopy revealed formed stool and a small polyp in the rectum. Biopsy results showed colonic mucosa and mild fibromuscular hyperplasia, with no evidence of adenoma.

Over the next 11 months, the patient was seen at the PCP's practice for episodic care, before an urgent visit with her PCP for weight gain and constipation. She was told to increase fiber in her diet and to consider a colonoscopy at some point. Four months later she returned again with recurrent constipation, and was prescribed lactulose. The following month she was referred for a colonoscopy, but before that appointment, she presented to the ED with acute lower left quadrant abdominal pain and emesis after taking the phosphosoda colon prep.

As part of the ED workup, a CT scan showed a complex multiloculated cystic mass in her pelvis, associated with peritoneal carcinomatosis and ascities. The results were worrisome for ovarian cancer and possible partial colonic obstruction, secondary to peritoneal disease adjacent to the sigmoid colon. Three days later, the patient underwent extensive surgery; pathology revealed metastatic adenocarcinoma of the sigmoid colon. She died three months later.

Case Study

Response to Air Embolism Good, But Prevention Lacking

Clinical Sequence

A 55-year-old male patient presented to the Emergency Department (ED) with worsening headaches and gait instability. A head CT revealed a large basilar tip artery aneurysm. During a stent-assisted coiling procedure, the patient's heart rate and blood pressure decreased. When the patient started to experience bradycardia, the neurosurgeon looked at the line and saw that it was empty. Air was discovered in one of the flush line bags connected to the angiography catheter. The flush apparatus was immediately disconnected, and the arterial catheter was aspirated with a syringe. MRI demonstrated bubbles in the aneurysm. The patient was started on 100 percent oxygen, and the surgeon consulted a second neurosurgeon regarding the complication. The procedure was stopped for approximately 15 minutes and the bubble decreased in size. The next angiogram showed that the bubble had reabsorbed. After the patient was stabilized, the decision was made to proceed with stenting and coiling, which was completed without incident. Following the procedure, the family was notified of the intra-procedure air embolism.

During the evening after the procedure, the patient developed a generalized seizure and was treated with Ativan, Dilantin,

Decadron, and Propofol. He was comatose for approximately two days. Subsequent neurologic deficits included deterioration in mental status, need for assistance in walking, and difficulty with activities of daily living. The patient was discharged to a rehabilitation facility for six months. He died of lung cancer two years later.

Case Study

Young Man Dies from Flu After ED Discharge

Clinical Sequence

An 18-year-old male college student, previously in good health, developed diarrhea, vomiting, and body aches lasting three days prior to being seen at the student health clinic. Initially, he was seen by an NP and diagnosed with a viral syndrome and discharged with instructions for supportive care. The next day, he was seen again at the university clinic; the physician noted clear lungs, but prescribed azithromycin and an albuterol inhaler, in addition to fluids and anti-pyretics for bronchitis or early community-acquired pneumonia.

The patient’s symptoms of nausea, vomiting, body aches, and diaphoresis continued to worsen, and he decided to go home to be cared for by his parents and his own PCP. Because his

symptoms continued to progress, he presented to the local urgent care center instead of waiting for his scheduled PCP appointment. There, he was found to have an HR of 157, RR of 28 per minute, and mottled skin. During this visit, he was seen by the urgent care physician, who ordered a single liter of IV fluids and anti-nausea medications. The patient was diagnosed with “vomiting/dehydration” and discharged to home with instructions to rest, take fluids, continue medications, and to return “if worse.” There is no documentation of vital signs after his initial presentation nor clinical re-evaluation after treatment. The entire encounter lasted just under an hour.

The next morning his parents took him to the ED as he became increasingly uncomfortable with labored breathing and severe diaphoresis. There he was found to be acutely ill, with grossly abnormal lab values (Hct 56, WBC 22.6, Na 126, and Bicarb 16). He was treated aggressively with antibiotics and IV fluids for presumed meningitis and sepsis, and was admitted to the Pediatric ICU. There, he continued to deteriorate despite all intensive care measures, including blood pressure support and mechanical ventilation. Less than 48 hours after being seen in the urgent care center, he suffered a cardiac arrest and died of septic shock and multi-organ dysfunction secondary to influenza A.

Case Study

Blindness From Undiluted Injection

Clinical Sequence

A patient with baseline vision of 20/20 presented to her ophthalmologist with a two-week history of progressive visual changes affecting her left eye. The physician diagnosed toxoplasmosis (parasitic infection) of the left eye, and prescribed oral antibiotics and antiparasitics. At first, the patient noted some improvement in vision but suffered persistent gastrointestinal side effects from the antibiotics.

At a follow-up visit several weeks later, the physician observed that the patient's vision had begun to deteriorate. The patient told the ophthalmologist that she stopped taking her medications due to the intolerable side effects. The physician discussed an alternative treatment option involving an injection of the antibiotic directly into the eye. They discussed the risks and benefits of intraocular injections, and the patient consented to the procedure.

In preparation for the injection, a technician retrieved undiluted clindamycin from the pharmacy, and confirmed with a fellow that it was the correct medication. The technician then drew up the medication and gave it to the ophthalmologist, who injected it into the patient's eye. The patient experienced abrupt vision loss. The ophthalmologist initially believed the vision loss was related to increased pressure during the infusion, and he ordered an angiogram, followed by intraocular washings with saline.

When the patient's vision did not return, the ophthalmologist transferred her to a specialty hospital, where she underwent a pars plana vitrectomy (removal of all fluid from eyeball). During the PPV the ophthalmologist observed ischemia of the retina. The patient's vision loss persisted, and she was referred to a retinal specialist. She has undergone seven surgical procedures, but despite interventions she still has no meaningful vision in her left eye.

Through further investigation, the ophthalmologist and his fellow concluded that the patient likely received an undiluted dose of the antibiotic. There was some confusion amongst the fellow, the technician and the ophthalmologist about who was

responsible for dilution. The ophthalmologist generally relied on the office staff and fellow to draw up and dilute the medication. When he injected the medication he thought it had already been diluted; however, based on the injury suffered, he is no longer sure. The ophthalmologist disclosed the error to the patient, and accepted full responsibility. The office has implemented a new policy requiring that all medication dilution be witnessed and signed off on, by either a fellow or an NP.

Case Study

Loss of High PSA Result Blamed for Fatal Cancer

Clinical Sequence

A 52-year-old male patient presented to his PCP's office for his annual physical exam. The patient had been treating with this PCP for more than 20 years, and had a medical history that included type II diabetes, high cholesterol, and back pain. One month before the physical, the patient had been seen for his back pain and had undergone an MRI of the L-spine, lumbar x-rays, and steroid injections with some relief. At this time, the PCP documented a thorough physical exam, including a normal prostate. Additionally, the PCP ordered routine blood work.

The final lab report documented a Hgb A1c 6.3 (normal); cholesterol of 191 (borderline high) and a PSA of 15.78 (nml 0–4). The PCP had not documented the tests he ordered, and did not notice the PSA findings. He proceeded to send two form letters to the patient: the first one addressed only the patient's cholesterol with advice to consume a low fat diet and increase his exercise; the second letter addressed the rest of the lab results. Unfortunately this letter commented on the patient’s good blood sugar control, but failed to address the PSA. Additionally, this letter was not signed by the PCP, but appears to have been mailed to the patient, possibly by an assistant.

The patient was seen three times over the next 12 months for follow up on his diabetes and cholesterol. During this time, the patient was put on Lipitor to lower his cholesterol. No PSA tests were ordered or addressed during this time period. Several months later, however, the patient presented to the Emergency Department with right flank pain, radiating to his lower abdomen and back, and was admitted to the hospital. Rectal and prostate exams were abnormal, PSA was 557.4, and an abdominal and pelvic CT showed retroperitoneal adenopathy with diffuse bony lesions suggesting metastases. The patient went on to have a biopsy with a Gleason score of 9 and perineural invasion. He was diagnosed with stage 4 prostate cancer and is being treated with hormonal therapy; however prognosis is poor.

Case Study

Mistaken Assumptions After Surgical Complication

Clinical Sequence

A 60-year-old male was diagnosed with kidney cancer while he was being treated for prostate cancer. After consultation with a urologist, he agreed to a nephrectomy. Two weeks before the operation, the surgeon explained the procedure to the patient in detail, along with a discussion of the risks of injury to major arteries and excessive bleeding that would require a conversion to an open procedure.

After the patient experienced some pre-operative difficulty tolerating insufflation of the abdomen with CO2, the surgery began. A vascular stapling device was applied to the left renal artery and the stapler was fired. When the surgeon released the stapler, he encountered a massive hemorrhage from the staple site. The surgeon attempted to use the stapling device to clamp the area; however the stapling mechanism would not activate.

The surgeon communicated the events and the urgency of the situation to the anesthesia team and rapidly opened the abdomen to get control of the bleeding at the renal artery

stump. The anesthesia team was able to resuscitate the patient while pressure was holding over the bleeding site. Blood was typed and cross-matched and ready for administration within 10 to 15 minutes. Meanwhile, the surgeon asked for emergency assistance from senior members of the urology team and from vascular surgery. A portion of the aorta was torn (2–3 centimeters in length) and had to be repaired with a graft.

Because of the extensive blood loss (12 liters), the patient became hypotensive (BP 40/20), resulting in rhabdomyolysis and blindness in his right eye.

Case Study

Boy Dies After Call to NP for Flu Symptoms

Clinical Sequence

An otherwise healthy nine-year-old boy developed flu-like symptoms (nausea/vomiting, decreased oral intake, lethargy, and weakness). After three days, the boy's father called the pediatrician's office at 8:00 on a Saturday night. The on-call nurse practitioner returned the call (which was recorded). The father relayed the symptoms and said that Gatorade was making the boy nauseous, but he was still drinking some ginger ale. The father expressed concern about how tired his son was—he'd slept for 24 hours straight (from 8:00 p.m. the

previous night). The boy woke up only to be carried downstairs to watch some TV for a little while. He felt a little better than the day before, but he also had some rectal bleeding and some bleeding from his mouth.

The NP acknowledged the boy's symptoms and said that most of it sounded like a viral illness, but that the rectal bleeding could be something different. She asked the father several questions in order to get a better understanding of the boy's condition, including:

- Was he alert? (father's response: yes but very tired)
- Had he passed any urine? (response: yes)
- Did he have a fever or rash? (response: no)

The NP then asked the father whether he thought the child was "OK" tonight or felt he should be seen right away. The father replied that he didn't think he needed to be seen right now. The NP agreed and made plans for him to be seen in the office the next morning (Sunday) after 8:00. She told him to call back if anything developed during the night. The father asked, "I don't need to worry about him not taking any food? He is taking some ginger ale." The NP responded by telling him to push the ginger ale and make sure he's urinating periodically. The NP documented the call in the medical record, including that the father was offered an ED visit

(although that was not specifically said, per the audio recording).

At about 4:00 a.m., the father checked in on his son and noted that he was sleeping but that his breathing rate had increased. At about 8:30 a.m., when the father again checked on his son, he was not breathing. He called 911 and started CPR. The ambulance and EMTs arrived within minutes and found the child apneic, pulseless, with fixed and dilated pupils, and his corneas cloudy. At 9:30 a.m., the child was pronounced dead.

An autopsy found the cause of death to be diabetic ketoacidosis (the child had undiagnosed diabetes mellitus). His blood sugar was 1,165 (nl 50–80); potassium was 7.1 (nl 3.5–5.3); and his HgA1C was 15.3% (nl 4–5.9%).

Case Study

Should Midwife Have Sought an OB Consult?

Clinical Sequence

A 23-year-old woman at 40 weeks gestation, G2P0Ab1, was seen in the office by a certified nurse midwife. She had a history of headaches, pregnancy-induced hypertension (PIH), oligohydramnios, and a low lying placenta confirmed by

ultrasound. Her BP was 150/90, and she stated she had persistent headaches not relieved by Tylenol or Fioricet. She was sent to the hospital and admitted for induction of labor. A cervical ripening agent, misoprostel, was placed to help ripen an unfavorable cervix.

At approximately 4:00 the next morning, oxytocin intravenous infusion was started, and she was given pain reliever. Fetal heart rate (FHR) was noted to be reassuring. The midwife and the obstetrician together evaluated the patient at 8:00 a.m., confirming the cervix (cx) to be 1cm dilated / 50% effaced / -2 station. Oxytocin was continued.

At 2:00 p.m., she had spontaneous rupture of membranes notable for thick meconium. Cervical exam at that time was 1.5 cm dilated and 80% effaced. Moderate contractions were occurring every three minutes, lasting 60 seconds, and the baseline FHR was in the 130s. The patient and her spouse were informed of the meconium, and induction of labor continued, oxytocin infusing at 18 mu/min.

The patient was reassessed every 2-3 hours by the midwife, who consistently documented a reassuring FHR. However, a note in the chart at 9:30 p.m. referred to prolonged fetal heart decelerations that responded positively to scalp stimulation. This entry was crossed out as having been done in “error;” however, the change lacked a date and time.

At 11:30 p.m., there was good progress in labor with her cervix at 9cm / 80% / -1, caput noted on the fetal head. Contractions were every two minutes, and baseline FHR was in the 140s with accelerations. During the patient’s labor, the obstetrician periodically monitored her BP and reviewed the FHR tracing, but this activity was not documented in the medical record.

At 12:30 a.m., the FHR tracing was noted to be un-interpretable at times. The patient was fully dilated at 12:50 a.m. At 1:05 a.m., the baseline FHR decreased and was notable for decreased variability and marked decelerations.

At 1:20 a.m., a female infant was delivered vaginally, and she was suctioned immediately for meconium. The baby was limp, and had poor respiratory effort. Meconium was found below the vocal cords. Apgars were 1/5/7. She was taken immediately

to the NICU and placed on CPAP. A septic work-up was notable for an elevated WBC = 21.6, negative chest X-ray, and negative blood culture and spinal fluid evaluation. However, she received prophylactic antibiotics.

She began to experience seizures at about four hours of life and was treated with phenobarbital and Ativan. A pediatric neurologist was consulted. An MRI and EEG identified abnormalities consistent with hypoxic ischemic encephalopathy. Pathology of the placenta showed meconium staining, but no abnormalities of the fetal membranes or the umbilical cord were identified.

The infant was hospitalized for eight days and then discharged to home on a regimen of phenobarbital. She was later diagnosed with cerebral palsy. She is now legally blind, has spastic quadriparesis, severe developmental delays, and seizures. She also requires a feeding tube for nutritional support.

Case Study

Unresolved Symptoms and Delayed Colon Cancer Diagnosis

Clinical Sequence

A 36-year-old female patient was seen in the ED with complaints of abdominal pain and rectal bleeding. She presented with no blood, but had positive bowel sounds and was diagnosed with a small internal hemorrhoid. She was discharged and told to follow up with a surgeon, who recommended a barium enema and colonoscopy.

Six weeks later, the barium enema was done, and the results were normal except for an area of compression on the wall of the rectum. No colonoscopy was done at this time. A week later, the patient followed up with the surgeon, reported feeling better and, on exam, had no bleeding or evidence of masses.

The patient was seen two weeks after that, and an ultrasound to follow up on the area of compression showed two ovarian follicles, one referred to as “large.” At this visit the patient reported that her hemorrhoids have improved but there has still been some bleeding. The surgeon referred the patient to a gynecologist for follow up of the cysts. The patient was seen

within a few weeks by a gynecologist, and she had an exam and Pap smear, but there was no documentation of a plan for pelvic surgery.

The patient record resumes a year-and-a-half later with no documentation that any follow up occurred for the rectal bleeding or ovarian cysts from before. At this time, the patient was seen in the ED for lower quadrant abdominal pain, “which is always sore,” and constipation. She had a bowel movement; her symptoms improved; she was discharged, with instructions to return if her symptoms recurred.

Three weeks later, the patient presented to the family health center with a complaint of abdominal pain. Ultrasound demonstrated an enlarged uterus and a complex mass of the pelvis, in the same area as the study from the previous year. A week later, the patient was seen by a gastroenterologist for constipation and bright red blood per rectum. Her exam revealed a protuberance that was seen and palpated. The gastroenterologist referred the patient back to the gynecologist for follow up.

Within weeks, nearly two years after her initial ED visit for abdominal pain and rectal bleeding, the patient underwent

exploratory laparoscopy for a pelvic tumor at another facility. She was found to have a primary colonic adenocarcinoma with metastases to the ovaries, omentum, and liver. She underwent a sigmoid resection, omentectomy, and appendectomy. The patient died two years later.

Case Study

Shared Decision making Missing in Ablation Procedure

Clinical Sequence

A 38-year-old female, married with three children, wanted to conceive another child. She sought medical advice and treatment in order to safely stop the beta-blockers she was taking. For the prior 20 years, she had had recurrent supraventricular tachycardia (SVT) with periodic symptoms that included shortness of breath, diaphoresis and mild lightheadedness. The frequency and duration of these symptoms had been increasing, resulting in several visits to the ED over the previous couple of years. For treatment of her SVT she had been taking a number of medications with varying degrees of success and/or ability to tolerate their side effects. Her family history included both parents with myocardial infarctions (the mother probably had SVT as well); and a brother who sustained a cardiac arrest at age 55 (diagnosed

with hypertrophic cardiomyopathy).

Her primary care physician referred the patient to a highly-regarded cardiologist who was board-certified in internal medicine, cardiology, and electrophysiology, with extensive experience performing radiofrequency catheter ablations. After an echocardiogram revealed both a normal ejection fraction and LV function, the cardiologist recommended that the patient undergo an electrophysiology study (EPS), followed by a radio-frequency ablation procedure. That day, the cardiologist reviewed with the patient both the risks and benefits of the EPS and the ablation. He provided written literature regarding both. The patient signed a consent form for both the study and procedure, which included the following language regarding potential risks: "...other complications...damage to heart's normal conduction system requiring a permanent pacemaker." The surgery was scheduled for several weeks later.

Several days prior to surgery, the cardiologist found he had a conflict with his schedule and arranged for one of his associates, a physician unknown to the patient and not board-certified, to step in (the medical record has no indication that this was explained to the patient). The associate cardiologist performed the EPS, which provoked the expected typical AV

node re-entrant tachycardia (AVNRT). The patient was noted to have sinus tachycardia (HR 120), which was felt to be inappropriate sinus tachycardia (IST); the patient had a history of such episodes with palpitations independent of SVT. The IST condition requires ongoing treatment with beta blockers, even with an ablation procedure. Prior to initiating the radio-frequency ablation, the cardiologist contacted the original cardiologist and explained the findings—both the AVNRT, as well as discovery of the IST. He was instructed to proceed with the ablation. During that procedure a junctional rhythm developed and within one second of seeing the heart block (HB), the cardiologist terminated the radio-frequency energy.

The patient was observed overnight in the ICU; however, a complete heart block persisted and the patient required the implantation of a permanent pacemaker. Two weeks post procedure, she was again placed on beta-blockers for the IST.

Case Study

Lost Chance to Repair Surgical Injury

Clinical Sequence

At age 4, a child who had been born with a large hemangioma of the left side of the face was scheduled for surgery. The

hemangioma had grown rapidly during infancy, leading to congestive heart failure (treated with digitalis and diuretics).

The plastic and reconstructive surgeon discussed doing a first-stage skin resection and reassured the patient's parents that the surgery would go well. The informed consent signed by the surgeon and the patient's mother made no mention of the risk of a facial nerve injury, a recognized risk of these procedures.

The hemangioma (8x8 cm, 3cm in depth) was excised with difficulty. In the operative report, the surgeon specifically mentioned attempting to avoid damage to the facial nerve by dissecting across the deep portion of the hemangioma but superficial to the parotid masseteric fascia. The surgery was five hours long with extensive bleeding (1500cc), which obscured the operative field. The patient required two pediatric units of blood intraoperatively.

After surgery, the patient was taken to the ICU, where she remained intubated because of fluid shifts, significant facial edema, and the potential for airway difficulty. She required further transfusions of packed cells and platelets. In the days following the surgery, she remained on mechanical ventilation, and was agitated and edematous. The parents asked many questions but did not find the surgeon adequately accessible.

After an extended postoperative stay, the patient returned home (out of state). The surgeon advised the parents that she expected their daughter's postoperative symptoms of facial weakness and swelling on the left side to resolve with time.

Six months after surgery, the parents were increasingly concerned about the lack of motion of the upper portion of the child's face. At that time, the child was evaluated for possible repair/reconstruction. The surgeon noted "trace of marginal mandibular function with no facial nerve function in the remainder of the face, representing an injury to the main or peripheral branch of the facial nerve." An EMG showed minimal remaining facial nerve function on the left.

During the subsequent repair, the left facial nerve was identified in the scar from the prior surgery and was noted to be involved in the hemangioma. Nearly a year after the first operation, no significant muscular function had returned to the left side of the child's face.

Case Study

10-fold Dose Error Transferred with Patient, Death Results

Clinical Sequence

An 86-year-old woman with a history of coronary artery disease post coronary bypass surgery, mitral valve disease with replacement, congestive heart failure, and chronic renal insufficiency was treated at a tertiary facility emergency room for congestive heart failure.

Providers believed that the patient would benefit from rehabilitation before returning home, so she was transferred to a rehab facility for medical monitoring and therapy to improve her function. The transfer medication list included *Digoxin 0.625 mg daily*. However, she was actually taking *0.0625mg*. Her home medication list had stated 0.*0625* for the Digoxin, but did not include the unit, and was not checked during medication reconciliation.
At the rehab facility, the computer entry system did not allow for mg, and the admitting resident correctly converted the incorrect digoxin dose from mg to mcg. The order at the rehab facility was for Digoxin 625 mcg, when it should have been 62. The pharmacist reviewed the patient's orders, entered the digoxin dose into the computer system, and received a warning indicating the amount exceeded the maximum daily dose. The pharmacist overrode the computerized system alert, and failed to contact the ordering physician to verify the dosage per hospital policy for when a discrepancy occurs.

The registered nurse transcribed 625 mcg daily to the medication administration record and documented that

medications were administered. Thus, the patient was given 10 times the intended dose of digoxin for four days. She complained of nausea, and was treated with compazine and zofran. Her heart rate had dropped into the 30's, and her blood work revealed an elevated potassium level (7). Further testing showed a digoxin level of 27.5 (normal therapeutic range: 0.8 to 2 ng/ml). She was transferred to a tertiary facility for treatment, where she returned to baseline.

After the incident occurred, the rehab admitting nurse denied that the patient received Digoxin, stating she had neglected to circle it on the form to reflect that it was not given. The nurse amended the medical record to indicate she did not provide the digoxin, and then she dated the note as though she had written all of it that day.

Six weeks later, the patient died from renal failure and cardiomyopathy.

Case Study

Medication Error Proves Fatal

An 86-year-old woman presented to the emergency department with complaints of right flank pain that radiated to her stomach. Her history included coronary artery disease, bypass surgery, mitral valve disease with replacement, and chronic renal insufficiency. The patient was diagnosed with

congestive heart failure and treated with IV Lasix. She was transferred to a rehabilitation facility.

- The patient's extensive home medication list included digoxin.
- Dosage was cited as "0.0625" without a specified unit (it should have been mg).
- At the rehabilitation facility, the digoxin dosage was converted to mcg and hand recorded because the electronic medical record would not allow mg.
- The dose was later transcribed to the medication administration record as 625mcg rather than the correct 62.5mcg.
- The pharmacy then overrode an automated dosage alert.
- The patient's 10-fold overdose of digoxin was undetected for four days.
- Once the error was discovered, the patient was transferred to a tertiary facility for treatment of digoxin toxicity.
- Following treatment, the patient was discharged to a different rehabilitation center.
- Approximately six weeks later, she died of renal failure.

The patient's family filed suit against four physicians, five nurses, and two pharmacists affiliated with the admitting hospital and the (initial) rehab facility. The plaintiffs alleged that the excessive digoxin dose resulted in the patient's wrongful death. With no dispute over the medication error and

experts consensus that the overdose prompted the renal failure, the case was settled in the high range.

Case Study

Cardiac Follow-up Recommendation Neglected

Clinical Sequence

A 55-year-old male was brought to the ED of a local community hospital after an episode of rigidity, syncope, and incontinence. The patient's medical history was significant for a distant history of alcohol and cocaine use, Hepatitis C, and traumatic brain injury (TBI) after falling off a ladder eight years prior. He was an athletic non-smoker with no history of elevated cholesterol. His recorded family history was significant in that his father died at age 42 of a sudden cardiac arrest.

In the ED, his vital signs, a chest X-ray, and brain CT were normal. Serial EKGs and biomarkers were done (EKG 1: sinus bradycardia with 1o AV block and troponin level of 0.1; EKG 2: junctional rhythm with retrograde P wave conduction; EKG 3: sinus rhythm with primary AV block and LVH; his troponin level peaked at 0.26.)

During this time the patient had another episode of stiffness and unresponsiveness, was treated with Ativan and Dilantin, and was admitted.

The next day, the patient was transferred to a tertiary facility at the family's request. The transfer summary indicated the diagnosis of new onset seizures and that a new intracranial process should be ruled-out. It also recommended an outpatient stress test and fasting lipid profile because of an elevated troponin level, suggesting underlying coronary artery disease

After two days, the patient was discharged from the tertiary hospital with instructions to continue the Dilantin and aspirin; there was no record of a cardiac work-up or instructions to seek one.

One year later, the patient was readmitted to the tertiary hospital for a fever. He underwent a battery of tests, including an EKG, revealing non-specific T wave abnormalities, suggestive of ischemia. The second-year resident reviewed the results with his senior resident and they agreed that a cardiac consult was not indicated.

Four days later, the patient was discharged. His fever was thought to be due to an allergic reaction to his Dilantin, which was changed to Keppra.

Within 10 months, the patient noted that his stuttering was getting worse, so he was electively admitted to the hospital for long- term video monitoring of his seizure activity. Upon admission at 4 p.m., an EKG showed 1o AV conduction delay and new T wave inversion. Serial isoenzymes were ordered. At about 3:00 a.m., the nurse noted that the patient's SAO2 dropped to 74 percent and that he was unresponsive. During intubation, the patient lost his pulse and a code was called. After a prolonged effort, the patient was resuscitated and transferred to the ICU.

Case Study

Poor Nurse Monitoring of Self-administered Insulin Led to Coma

Clinical Sequence

A 37-year-old wife and mother was admitted to the diabetic unit of the hospital with complaints of a severe headache, nausea and elevated BP (173/103). Her past medical history included Type I diabetes mellitus (since age 14), hypertension, renal insufficiency, and several other co-morbidities. Physician

orders included IV fluids, insulin, finger stick blood sugar (BS) checks with an insulin sliding scale, Labetalol, etc. The following day her endocrinologist ordered ‘when patient eating, discontinue sliding scale, let patient choose her own insulin dosage.’

Over the next day or so the patient’s BP and BS varied and her medications were again adjusted. Orders were written by her nephrologist for the IV fluids to be discontinued, and BS to be checked every four hours (“wake patient at night – start now”). The plan was for the patient to be discharged home the next day if stable.

The following day she did not go home as planned due to a rising creatinine level (Cr = 3.6, up from 2.7; nl range 0.5 – 1.1 mg/dl), along with the need for continued medication adjustments, and her history of asymptomatic hypoglycemia and hypertension. Her physician noted that the “patient is very aggressive with her insulin dosage, BS = 59 this am and 197 at 11pm – have asked the patient to be careful about lowering her BS below 120. Patient is willing to stay to stabilize her BP and renal function.”

During her continued stay her renal function continued to decline (Cr = 4.1), developing edema in her lower extremities (4+) and lower back, with crackles noted in her lungs and a weight gain of approximately 20 pounds since admission. Orders for daily weights and strict I&O were written. Her BS also continued to fluctuate, frequently below the desired 120 (e.g, RN note: “4-11pm: BS = 42 at 4:45pm – patient ate dinner and BS rose to 103; the patient checked her own BS and administered insulin but not always consistent with orders for every 4 hours”).

One week after admission, the patient was taken to the OR for creation of an AV fistula in preparation for upcoming hemodialysis. That night, when the patient checked her BS it was 128 at 10:00 p.m.). She gave herself 2 units of Humalog and 8 units of Lantus. At 4:15 a.m., the nurse wrote “will continue to monitor closely.” Despite this, the nurse did not document any BS check between 10:00 p.m. and 6:00 a.m. At 5:40 a.m., the patient was found unresponsive; her BS was 30 (ref 70-110). She had decerebrate posturing, was intubated, and transferred to the MICU.

Post event, the nurse admitted that she didn’t wake the patient up in the middle of the night to make sure she checked her BS (but was aware of orders to check BS every 4

hours). Progress notes in the MICU state that the patient's hypoglycemia was most likely due to her overly aggressive treatment of her BS before she went to sleep, which was compounded by her poor clearance of insulin secondary to renal insufficiency. After multiple tests (e.g., head CT, brain MRI; EEG; CXR), the impression was that the patient likely suffered an ischemic brain injury (with cortical and subcortical involvement) from hypoglycemia of unknown duration.

Approximately one week later she was able to open her eyes and move her extremities spontaneously, and was transferred back to the diabetic unit. Within two months, with improved symptoms, the patient was discharged to rehab.

Later that year, the patient underwent both a kidney and pancreas transplant. Over the next several years her neurologic function improved but she was still considered disabled, especially with regards to her emotional/social health. She spends most of her time watching TV and shows no interest in interacting with her husband or children; she also does little socializing with friends.

Case Study

Cancer, Death After Mistakenly Told Biopsy Normal

Clinical Sequence

A 53-year-old post menopausal female on hormone replacement therapy (> 10 years) presented to her PCP and NP several times for vaginal bleeding and pain during intercourse. The patient was treated for vaginitis, and she was referred to her gynecologist for further evaluation. She presented to her primary gynecologist three times over a six-week period with complaints of vaginal spotting. A pap smear was normal. A pelvic ultrasound showed widening of the endometrial stripe. The patient had a 16 mm stripe (normal range < 4 mm, with > 8 mm suggesting hyperplasia). Due to the abnormal bleeding and abnormal ultrasound findings, the gynecologist recommended an endometrial biopsy.

The patient deliberated a few days before deciding to have the biopsy. A covering gynecologist did the procedure because the primary gynecologist went on vacation and the patient wanted it done before she herself left for a trip. After the biopsy was completed, the gynecologist advised the patient to follow-up with her primary gynecologist when she returned.

The pathology report noted blood, mucous and scant endocervical epithelium, with immature squamous metaplasia

and glycogenated squamous epithelium (normal cervical findings). However, the report also indicated there was no endometrium present (purpose of test was endometrial biopsy), indicating the tissue was insufficient for diagnosis.

Upon receiving the results, the gynecologist who performed the biopsy forwarded them to the patient's primary gynecologist without personally reviewing the contents. When the patient called urgently for her results prior to her trip, a nurse practitioner at the health center located the report; upon seeing "normal cervical findings," she interpreted it to mean the biopsy results were normal. The NP advised the patient of the "normal" result and documented it in the patient's chart. She also included the result and the patient communication in an e-mail summary for the primary gynecologist when he returned.

Upon his return, the gynecologist saw the message from the NP and did not personally review the pathology report itself, assuming the covering gynecologist who did the biopsy reviewed the formal report. As a result, the biopsy was not repeated, and both the provider and the patient pursued the symptoms no further than the differential diagnosis of uterine lesions.

A year later, the patient was at a well visit with the primary gynecologist, and she mentioned continued vaginal spotting,

which she “got used to.” Another pelvic ultrasound showed an endometrial stripe of 23 mm with bilateral ovarian masses. A repeat endometrial biopsy showed stage III adenocarcinoma of the uterus with metastatic ovarian cancer. The patient underwent a hysterectomy, bilateral oophorectomy, omentectomy followed by chemotherapy and radiation therapy. She eventually developed pulmonary metastases and died from the disease.

Case Study

Colon Cancer Diagnosis Delayed

Clinical Sequence

A 68-year-old man, with a past history of cardiac disease, diabetes, hypertension, an MI six years prior, and prostate cancer two years prior (with radical prostatectomy, radiation and chemotherapy) saw his PCP of 20 years for a routine check-up. His physician noted that the patient “was fairly up-to-date, screening wise, but should have a colonoscopy sometime.” He had never had one, and the PCP intended to discuss this with him when he saw him for a more complete exam. Six months later, the patient returned to the PCP for a full physical, however, a discussion of a screening colonoscopy did not occur and no occult blood testing was done.

A year later, the patient presented to the emergency department complaining of epigastric pain for the prior three days. He was discharged, but returned the next morning with the same complaint. An abdominal and gall bladder ultrasound revealed a large gallstone. A GI cocktail was given and the patient's symptoms resolved and he was discharged home.

Four days later the patient followed up with his PCP, again complaining of epigastric pain and reporting a 25-pound weight loss. No change in bowel habits or blood in his stool were noted. The PCP diagnosed the patient with peptic ulcer disease and prescribed Nexium. A month later, an upper GI was negative for an ulcer or mass.

After another six months, the patient called his PCP with complaints of crampy abdominal pain and bloody stools. The PCP referred the patient to the emergency department to rule out a GI bleed. In the emergency department, the patient reported lower abdominal symptoms for the past three weeks with the first incidence of bright red blood nine days prior. A colonoscopy was done and found to be positive for colon cancer. Subsequent testing revealed metastasis to the liver. The patient died three years later from his disease.

Case Study

Test Results from ED Not Relayed to Patient in Time

Clinical Sequence

A 40-year-old female was referred by her new PCP to the local Emergency Department with complaints of fever, severe headache for six days, myalgias, and joint pain. In the ED, she also reported that she had had recent episodes of fainting in the shower and nausea. Her initial evaluation revealed a temperature of 103, blood pressure of 135/77, heart rate of 128, and respiratory rate of 20. A CT scan of her head was normal; a lumbar puncture was negative; and she was not pregnant. The patient had two blood cultures drawn, and was treated with a single dose of IV antibiotics.

Because her providers believed her that her symptoms were improving, she was discharged with instructions to follow-up with her PCP within a week.

Two days later, a Thursday, her blood cultures came back positive for Group B streptococcus. The results were received by the ED physician on duty, who had not been her treating physician during her visit. Per hospital policy, a dedicated LPN in the ED followed up on abnormal test results. The LPN tried

to reach the patient that afternoon, and left a message to call the hospital.

The following morning (Friday), the ED tried again, and was also unsuccessful at reaching the patient. (The phone number the patient gave during triage was for her husband's workplace). The staff nurse told the ED physician that she was still unable to reach the patient. No other attempts were made over the weekend, as the doctor felt the patient should be fine with the one dose of IV antibiotics she received during her first ED visit. Additionally, the patient's chart included no documentation of the identity of the PCP, who had initially called the ED to let them know that she was coming in.

On Monday, the patient returned to the ED with chills and a fever of 103. Her white blood cell count was 12.1, and a chest x-ray was negative, as was an initial echocardiogram at the bedside. Her positive blood culture results were obtained, and the patient was admitted for IV antibiotics. The patient was diagnosed with bacterial endocarditis, which was confirmed by a transesophageal echocardiogram with vegetation noted on the aortic valve. The patient experienced some complications of supraventricular tachycardia during her stay. She was discharged 15 days later, and remained on IV antibiotics for

five weeks.

A month and a half later, the patient was admitted with a left thalamic stroke, which resolved with no residual side effects. The patient is currently healthy, but will most likely require an aortic valve replacement in the future.

Case Study

Unexpected Surgical Complication, Lack of Empathy Triggers a Lawsuit

Clinical Sequence

A 52-year-old insurance executive with a physically active lifestyle and a 20-year history of hypertension that was difficult to control was referred to a surgeon, after a CT scan revealed a right adrenal mass (~4 cm). The surgeon recommended a laparoscopic adrenalectomy to remove the mass. The patient recalled that he was advised that laparoscopic surgery was less invasive and the recovery "would be quicker." The consent form that he signed indicated that he was also told that on rare occasions it might not be possible to do this procedure laparoscopically, and a slightly larger incision would be required, necessitating a longer hospital stay.

During surgery significant bleeding developed. It looked like the bleeding was coming from the vena cava. The operation was converted to an open procedure, and the surgeon called for assistance from another attending surgeon. According to the operative report, the adrenal mass was fairly large (>4 cm) and was located “in the very superior position underneath the liver and medially underneath the vena cava – very difficult location.” The bleeding was controlled, and the dissection of the right adrenal mass was accomplished without further complication. The patient received three units of blood. The surgeon did not see the injury occur, but thought it was due to a small avulsion injury or the blocking off of a small tributary.

In the recovery room, the patient’s wife recalled the surgeon telling her that “we hit the vena cava, and there was a lot of bleeding.” She remembered that the surgeon’s scrubs were covered in blood. After their conversation, she went home and looked up ‘vena cava’ on the Internet.

The patient woke up the next day in the intensive care unit on a respirator. He asked his nurse what happened, since this was not what he expected. She told him that there was an emergency in the operating room and that he would have to speak with his surgeon.

After recovery in the intensive care unit and on the surgical floor, the patient went home eight days after surgery. The record reflects one postoperative visit by the attending surgeon, with the notation for the patient to “call if any problems.” The patient and his wife felt that the surgeon was not forthcoming with an explanation of what happened and seemed indifferent to the impact on his patient.

Case Study

Fatal Bleed in Hospital As Patient Waits for Surgical Consult

Clinical Sequence

A 62-year-old male was seen in the ED on October 7th with complaints of abdominal pain for approximately two weeks. The patient had a past medical history of colon cancer, a myocardial infarction, an abdominal aortic aneurysm, as well as hypertension and hyperlipidemia. He reported cramping and diarrhea. The patient’s stool showed trace amounts of occult blood; WBC = 24.7, and Hct = 43.2. Chest x-ray was normal, but an abdominal CT scan revealed a 3.5 cm small bowel mesenteric mass. The scan was interpreted as worrisome for metastatic disease and the differential diagnosis included recurrent colon cancer, carcinoid tumor or lymphoma. The patient was discharged and told to schedule a biopsy of the

mass.

The patient followed up with both his PCP and his oncologist. On November 12th, he underwent a CT-guided needle biopsy showed some inflammation, but no malignancy was identified. The patient also underwent a PET scan and an MRI, which was also negative for malignancy.

On the evening of December 26th, the patient returned to the ED and was seen by the same physician from his October visit. His chief complaint was abdominal and low back pain for the past two months, which had increased in intensity in the last two days, and was worse when he bent over. He was found to have a boggy prostate, fever (1033) and chills, 4+ guaiac positive stools, an elevated PSA, WBC = 19.3, and Hct of 30. The patient was given Tylenol and morphine, and cultures were obtained. The differential diagnosis in the ED included fever with probable prostatitis, abdominal mass and chronic abdominal pain. The patient's PCP recommended that he be seen by the covering physician, who, after examining the patient, decided to admit him and start him on IV antibiotics pending the cultures. Potential diagnoses now included discitis, osteomyelitis, bacteremia, and endocarditis.

At about noon on December 27th, the patient was evaluated by the covering physician, who ordered an MRI and a lumbosacral spine x-ray as well as infectious disease and surgical consults. The infectious disease physician considered a possible spinal abscess, prostatitis, intra-abdominal process and endocarditis. He also ordered an echocardiogram and started him on a 3rd IV antibiotic. Three hours later, the patient refused the MRI due to pain. At this time it was noted that there was confusion over who was covering for the surgeon, and so the internal medicine physician reordered the consult; however the surgical consult was never done.

At midnight the patient was found unresponsive in his room. A code was called, but the patient was pronounced dead at 12:30 a.m. December 28th. An autopsy revealed that the patient died from a ruptured aortic enteric fistula associated with inflammation over the abdominal prostatic graft.

Case Study

Pre-op Findings Could Have Prevented Extra Surgeries

Clinical Sequence

On 9/17, a 21-year-old female presented to her local ED with complaints of upper abdominal pain. Ultrasound revealed multiple stones in the gallbladder without evidence of wall

thickening. It was also noted that the common bile duct appeared normal. A cholecystectomy was scheduled for 9/21.

A day after the ED visit, the patient returned with severe pain. An abdominal x-ray confirmed the presence of stones in her gallbladder, as seen the previous day on ultrasound, but it also revealed an additional stone outside the gallbladder in the common bile duct. The new findings were discussed with the surgical resident the next day.

Surgery was performed on 9/21 as planned, and was uneventful. The operative report contained no mention of a stone outside the gallbladder.

On 9/30, the patient had returned to school and she presented to a different facility to be evaluated for jaundice. An abdominal CT revealed biliary dilation and a large calcified stone in the distal common bile duct. The patient required two endoscopic retrograde cholangiopancreatography (ERCP) procedures under anesthesia to address the stone. She recovered without further problems. The original surgeon met with the patient and her family to disclose and apologize for the miscommunication that occurred prior to the first surgery. Because of the disclosure and sympathy exhibited by the

surgeon, the family only requested compensation for expenses.

Case Study

Undetected Med Toxicity in Child Seen by Multiple MDs

Clinical Sequence

A four-year-old boy with a complex neurological diagnosis including pervasive developmental disorder, ADD and sleep disorder, was under the direct care of a pediatrician since birth.

He was referred to a behavioral specialist for severe behavioral complaints, and the specialist started him on 500 mg of clonidine at bed time. He recommended that the child be closely monitored for side effects, including blood pressure and pulse. A consult letter containing this information was sent to the pediatrician who later stated he never received it.

Five months later, the child was referred to a sleep specialist, who started him on 1500 mg of chloral hydrate, one dose before bedtime. The child was seen by the sleep specialist twice and the specialist documented 11 telephone communications. According to the sleep specialist, medication risks were reviewed with the family.

When the sleep specialist saw the child four months later, he learned that sleep medications had been switched several times by the family, alternating between Benadryl, chloral hydrate, and hydroxyzine. The family had initially switched medications due to a concern that the choral hydrate was causing a rash. The specialist encouraged the family to carefully chart any visible changes or side effects, and he requested that the medications only be changed after clinical consultation. The sleep specialist documented this conversation in the medical record.

Over the next several months, behavior and sleep issues again worsened. The pediatrician suggested the parents administer a second dose of chloral hydrate during the night when the child woke up. The family then routinely administered two doses during the night.

Six months after the second appointment with the sleep specialist, the patient underwent surgery for a benign neoplasm (tumor) of the right temporal lobe. During the anesthesia work up, the parents were told the child was on a “whopping dose” of the chloral hydrate. Anesthesia did not communicate this concern to the pediatrician. The child was placed on steroids after surgery, and initially showed improvement in behavioral and sleep issues.

Upon the patient's discharge from the hospital, the neurologist re-started both the clonidine and chloral hydrate. Pharmacy called the pediatrician to question the high dose of the chloral hydrate. Since he didn't have much experience with the medication, the pediatrician reviewed a pediatric dosage text, but did not consult the sleep specialist who initiated the drug.

Several months later, the child collapsed at home immediately following a second dose of chloral hydrate, and died of a cardiac arrest. Although an acute overdose was not identified, evidence of elevated concentrations of clonidine and chloral hydrate was found in the body.

Case Study

Rare Blood Disease Fatal after Slow Labs Review, Narrow Focus

Clinical Sequence

A 40-year-old female, with a past medical history significant for obesity and smoking, was seen by her PCP for symptoms of fatigue and a skin rash. Laboratory tests indicated that her blood count and platelets were normal but that her blood sugar was elevated at 843 (nl=65-110). The physician diagnosed Type II Diabetes Mellitus (DM) and placed the patient on an oral antiglycemic medication.

Over the next five months, the patient was seen by the same physician multiple times for various complaints (continued fatigue, thirst, rectal bleeding and abdominal pain). An abdominal ultrasound revealed an enlarged liver consistent with fatty infiltrates; her liver enzymes were also slightly elevated. During a GI consult, a rectal exam was deferred, secondary to menses; stool cards were given but never returned. Her sedimentation rate was found to be elevated. EKG was slightly abnormal (non-specific T wave changes), but a followed-up echocardiogram/stress test was normal.

Four months after the stress test, she saw her PCP for the sudden onset of a rash. She was given Medrol and Atarax, and returned within three weeks for lab testing. The results were available within two days but not reviewed by her PCP for an additional week. Results included a platelet count of 59 (nl = 150-450) - a drop from 302 (the previous year); continued abnormal LFTs, and an elevated HgA1C (10.8). The physician noted "labs awful" in her chart.

At an appointment four days later, the patient admitted to not following her diet or checking her blood sugars. With continued complaints of skin problems, she was diagnosed with recurrent sebaceous cysts, and given antibiotics. Her PCP also prescribed Glucophage and encouraged her to check her blood sugars and see the dietician. She was also instructed to

discontinue any aspirin and Motrin, secondary to her decreased platelet count, and to return in two weeks.

Within two days, she again developed abdominal pain, followed by feelings of confusion and slurred speech, and was taken to her local ED. Her lab results revealed a low hematocrit (16.3), platelets = 8; with ABGs, LFTs, electrolytes and sugars abnormal. A head CT showed no sign of an acute bleed. Within three hours of arrival at the ED, she suffered a grand mal seizure, was intubated, and given two units of blood. Her heart rate and temperature were elevated, and she was transferred to a tertiary hospital. Lab work revealed increased multiple schistocytes, diagnostic of thrombotic thrombocytopenic purpura (TTP - a rare, life-threatening disease characterized by a widespread aggregation of platelets throughout the body, neurological dysfunction and renal insufficiency, resulting in blood clots in small blood vessels throughout the body1). Less than one hour after her transfer she experienced a cardiac arrest and died.

Case Study

Delay in Postop Hematoma Diagnosis Causes Paralysis

Clinical Sequence

A 62-year-old diabetic patient underwent a graft revision. An epidural spinal catheter was used for anesthesia and maintained one day post-operatively for pain control. After removal of the epidural, the patient was kept on Heparin to prevent re-closure of the graft.

Four days post-op, the patient complained of back pain and tenderness in his left groin near his catheterization site. The covering surgical attending and chief surgical resident noted positive graft pulses; no hematoma was detected. The differential diagnoses included restenosis, retroperitoneal bleeding, or abdominal aortic aneurysm or dissection. An abdomen and pelvis CT scan noted a full bladder and a small left inguinal hernia. After placement of a Foley catheter, the patient's severe back pain continued.

At 4:00 p.m., the surgical resident was notified when the patient started to vomit and complain of low back pain (10/10) radiating to his left groin. At 8:00 p.m., the nurse noted the patient was unable to move either leg and notified the resident. The record contains no notes by the resident at this point.

At 11:30 p.m., the patient's blood pressure increased to 220/110. The surgical resident contacted the intensivist (first-year cardiology fellow), who was able to control the blood pressure with medication. Based on the patient's description

of pain, a head CT scan was ordered to rule out an intracranial bleed or stroke; results were negative.

At 1:00 a.m., due to the patient's marked neurological deficits in both legs, the resident contacted the covering neurologist. Accounts differ regarding what happened next. According to the neurologist, he instructed the resident to obtain a stat spinal CT scan, call him with the results, and transfer the patient immediately to surgery if the scan revealed an epidural hematoma. However, the resident's documentation indicates the neurologist advised him that the patient's symptoms could be a result of a number of causes "including psychosomatic illness, Guillain-Barre, or cord compression syndromes …" According to the resident, their plan rejected a CT scan of the spine in favor of the more optimal MRI, which was available in the morning when the neurologist planned to see the patient. The resident contacted the covering surgical attending, who voiced no opposition to the plan.

At 10:30 a.m. (close to 10 hours later), the MRI was performed, revealing an epidural hematoma, up to T9. The patient was immediately transferred for surgery, but by then suffered significant cord damage, resulting in paralysis below the waist.

Case Study

Sent Home Twice Before Birth of Compromised Baby

Clinical Sequence

A 21-year-old female, G1 P0, had been being followed at a community hospital for an unremarkable prenatal course. At 39 weeks gestation, she spontaneously ruptured membranes at 7:45 a.m. and presented to the emergency department about an hour later. She was transferred to Labor and Delivery for evaluation and was seen by the nurse midwife on-call. The patient was deemed to not be in labor, and fetal well-being was thought to be assured. She was sent home at 9:45 a.m., having been advised to return when her contractions were closer together.

At about 11:30 a.m., the patient returned to Labor and Delivery with her husband, where she was re-evaluated by the same obstetrical provider. The patient’s cervix was 1 cm dilated, 90% effaced, and the fetal head at -1 station. The fetal heart was monitored via electronic fetal heart monitor (EFM) for 13 minutes; the nurse midwife deemed the fetal heart rate pattern as unremarkable, gave the patient Benadryl, and sent her home, instructing her to return if her contractions did not increase by 7:00 p.m.

The patient returned by wheelchair to L&D at 6:45 p.m., grunting and bearing down. Her cervix was 9 cm dilated, 100% effaced and fetal head at +1 station. EFM revealed a fetal heart tracing with marked variability in the baseline heart rate, fluctuating between 120-180, and notable for repeated decelerations to 90 bpm. The patient labored for about two more hours before delivery occurred, during which time there were persistent, recurrent deep variable decelerations to 80-90bpm. The nurse midwife delivered a baby boy at 9:01 p.m. with Apgars of 1 at one minute and 3 at five minutes.

The baby initially appeared floppy and had an umbilical artery cord blood gas pH of 6.74. Resuscitation by the on call pediatrician was successful after 20 minutes and the baby had his first spontaneous movement at 30 minutes of life. The baby was then transferred to a tertiary care facility where he experienced seizure activity. A brain MRI confirmed findings consistent with hypoxic-ischemic encephalopathy., The baby developed additional symptoms of profound, permanent neurological deficits, including blindness and a severe seizure disorder.

Case Study

Narrow Diagnostic Focus and Removal of Infant's Healthy Kidney

Clinical Sequence

On Tuesday afternoon, a five-month-old girl was referred to the emergency department for evaluation of intermittent fevers (103.8) and lethargy. On physical examination, she had a rectal temperature of 99.8, pulse 129, respiratory rate 40, and weight of 6.9 kilograms. Her chest was clear and the abdominal exam was unremarkable. The white blood count was 18.5. The differential was 35% polys, 16% bands, 47% lymphocytes and 1% monocytes. Urinalysis was cloudy with a specific gravity of 1.009, 3 to 5 red blood cells, more than 100 white blood cells, and moderate bacteria.

The infant was admitted for fever workup with laboratory studies suggestive of a urinary tract infection and possible pyelonephritis. The urine culture grew out E coli and the infant was started on intravenous Ampicillin and Gentamycin. A renal ultrasound to rule out hydronephrosis was ordered. During the night, the child spiked a temperature of 102 and was given Tylenol with good effect.

At 9:00 a.m. Wednesday, the renal ultrasound revealed a 2x2 cm mass in the upper pole of her right kidney. According to the radiologist, the location and appearance of the lesion—as well as the age of the patient—made it suspicious for a Wilms' tumor. A progress note written by a pediatric resident listed the primary diagnosis as "UTI/pyelonephritis and renal mass."

The attending pediatrician reviewed the abdominal CT scan with the radiologist and confirmed the finding of a right renal intraparenchymal mass, and no clear adenopathy (a chest CT scan was negative). The differential diagnoses remained Wilms' tumor, possible mesoblastic nephroma. The plan was to continue antibiotics and obtain a surgery consult for a right nephrectomy.

Later in the day, the pediatric surgeon evaluated the infant and his differential diagnoses included a small Wilms' tumor and a mesoblastic nephroma. The parents were told that their daughter had a Wilm's tumor, and they consented to an surgery. This was scheduled the next day for either a heminephrectomy or a complete nephrectomy.

At 8:00 p.m., repeat urinalysis was clear with specific gravity of 1.014, no red blood cells, 0-2 white blood cells, and few bacteria. The white blood cell count was 11.2 and the infant was afebrile.

Thursday morning, the patient was taken to the operating room for a possible nephrectomy. According to the operative report, "the right kidney was palpated and had only a subtle enlargement near the upper pole anteriorly just above the mid-portion. After the kidney was mobilized, once again it was palpated and there was no definitive mass that could be felt." The kidney was removed and sent off for frozen section. The

patient's pain was well controlled and her temperature was at normal levels during the postoperative period.

According to the final pathology report, the right kidney had acute and chronic pyelonephritis (acute lobar nephronia, severe with perinephrenic fat extension). This kidney lesion is commonly associated with reflux infection of E. coli which was cultured in the urine of this patient. There was no evidence of malignancy.

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Case Study

Decreased Fetal Activity and Inaction Prior to Stillbirth

Clinical Sequence

A 40-year-old obstetrical patient, G5 P3 (smoker), with a past medical history of bilateral tubal ligation, and pregnant via IVF, was admitted for premature rupture of membranes at 32 weeks. She was treated with antibiotics and IV steroids for fetal lung maturity. The biophysical profile was 6/8 (-2 for fluid volume) on admission. Fetal monitoring tapes show intermittent variable decelerations of the fetal heart rate (FHR) as low as 90-100 as well as a decrease in the baseline fetal heart rate from 140-150, down to 110-120. The patient complained of decreased fetal movement. A non-stress test (NST) was reactive and reassuring.

The next day, the mother again complained of decreased fetal movement. The nurse and resident told her not to worry, and advised her to eat her dinner to raise her blood glucose level and then do kick counts; FHR was 150 per Doppler. No monitor strip was done, nor was a NST performed. After dinner, the patient reported no fetal activity and staff notified the obstetrician, who confirmed no FHR. Labor was induced, and a stillborn infant was delivered with a nuchal cord x1. A small clot on the placental surface was noted, with possible

abruption. Autopsy was consistent with placental bacterial infection as the possible cause of fetal demise, although there were no clinical signs of infection. The other strong possibility for the cause of death was the nuchal cord.

Case Study

Multiple MDs ID Chronic Origin for Headaches Before Brain Aneurysm Death

Clinical Sequence

A 58-year-old female with a history of headaches, depression, anxiety and anorexia nervosa, sought out an internist after hearing him give a talk on migraine headaches. She had suffered from headaches since age 21, with a postmenopausal remission. Now, however, her headaches were a daily occurrence. During her initial visit with the internist, the patient described a series of recent losses in her life, including a break-up with a long-time boyfriend. The headaches were affecting her mood and her ability to sleep. She was taking Doxepin for insomnia & depression.

Her physical exam, which included a brief neurological evaluation, was normal. The internist attributed her headaches to the recent stress in her life, and diagnosed her with 1) transformed migraine headaches, 2) chronic dysthymia, and 3) chronic insomnia. After the patient started on Depakote as a

prophylactic for her headaches, she experienced some short-lived relief.

During the following five months, the pain returned in full, dosages of the initial medications were adjusted, exams were normal, and the internist eventually switched the medication to Zoloft and Ambien. When he referred the patient to counseling, she did not return.

The patient then presented to her PCP with complaints of daily migraine headaches. Her PCP attributed her headaches to stress and her caffeine intake. She was given Tylenol, Klonopin, and aspirin.

A year later, the patient again saw her PCP for the headaches, which were now waking her up. She patient was started on Buspar. Counseling was again recommended, which the patient soon started.

Within four months—two years after her first complaint to the internist—the patient self-referred to a neurologist for evaluation of her headaches. Her neurological exam was normal. The neurologist diagnosed rebound headaches and advised the patient to alternate between Tylenol and Ibuprofen.

Two weeks after this neurology appointment, the patient was found slumped over the steering wheel at a red light. A CT scan at the hospital revealed a large, right temporal parenchymal hematoma. There was also a right subdural hematoma. The patient had fixed pupils and continued to be unresponsive. CTA revealed multiple aneurysms, (the largest in the middle cerebral artery). After emergency surgery, the patient developed asystole for 30 minutes. The family declared her a DNR, and the patient was pronounced dead.

Case Study

Failure to Connect the Dots During Multiple Visits

Clinical Sequence

A 38-year-old male first presented to a multi-site primary care practice with a primary complaint of hemorrhoids. The physician diagnosed a bleeding hemorrhoid and gave the patient educational material to follow (blood pressure was 138/94). Seven months later, the patient was seen by the same physician, as well as a nurse practitioner, with a chief complaint of earwax (BP 110/90).

He was next seen in the practice two years later, by a different physician, for a persistent cough (BP 132/100). The diagnosis was bronchitis, hypertension, and smoking

dependency. He received prescriptions for antibiotics and cough medicine. In addition, the physician recommended smoking cessation and asked the patient to return in one month for a blood pressure check. The patient did not return for the check up.

Seven months after that visit, the patient returned with right ankle pain (BP 144/98). He was seen by a third physician, who diagnosed a sprained ankle and prescribed Ibuprofen and an air cast. The patient returned for a one-month follow up with one of the earlier physicians, with continued ankle pain and swelling (BP 134/92). He received Indocine for his ankle pain, as well as recommendations that he follow a low salt diet, exercise regularly, and return in 3-6 months to have his blood pressure rechecked.

He returned in two months with continued foot and ankle complaints. He was seen by an NP, who referred the patient to Orthopedics (BP 130/88). When seen by Orthopedics a week later, his X-rays were negative for a fracture. He was placed in a walking cast, which was removed three weeks later.

Nine months later, the patient was treated for hemorrhoids (no BP noted). During a subsequent appointment soon after, the patient has earwax removed by an NP (BP 122/88).

The patient returned again six months after that, and was seen by a fourth physician. who diagnosed bronchitis (BP 144/88). In less than a month, he was seen for hemorrhoids (BP 165/105, upon repeat 130/90). The patient was asked to follow up with his PCP.

Two days later, the patient was seen by an NP for a routine health maintenance exam and blood pressure follow up. He was noted to have no family history of hypertension, but a positive history for diabetes. Blood work was obtained, and the patient was educated about life style changes and advised to return in three weeks for blood pressure follow up. The patient did not keep that appointment.

Two months later, the patient was seen by an NP to follow up on hypertension and laboratories. The NP's impression was hypertension, hypothyroidism, and hypercholesterolemia. She prescribed medication for hypothyroidism and discussed smoking cessation. The patient was asked to return in 6-8 weeks.

Two months after that, at age 43, the patient was found dead by his wife, after having an acute myocardial infarction.

Case Study

Boy Dies after Missed Ischemic Bowel

Clinical Sequence

A four-year-old boy with no significant past medical history was brought to the pediatrician in the morning after a night of vomiting, abdominal pain, and an inability to tolerate clear liquids (no fever). The child was evaluated and diagnosed with influenza. The parents were advised to push fluids at home, but to go to the ED for IV hydration if he was still unable to drink and the vomiting continued.

At 1:30 p.m., his parents called the pediatrician's office to report that the symptoms were continuing; they were instructed to go to the hospital. The child was carried into the ED by his mother, an IV was immediately placed, and he was hydrated for the full three hours of his stay. An ED physician examined the child, and recommended an abdominal X-ray. Blood work revealed an elevated WBC and elevated platelet count. Chemistries were consistent with dehydration. Radiology findings read by the ED physician state "no obstruction."

During this time, the patient was only able to tolerate half a popsicle. At the end of three hours, the patient was discharged (no documentation of an examination by the doctor prior to discharge).

After discharge, a subsequent reading of the radiology findings indicated an ileus. The family is unclear as to whether they received discharge instructions or parameters for readmission; neither is documented in the record. When the family went home, each parent took a shift with the child during the night. He continued vomiting, was unable to tolerate either liquids or Tylenol, and began running a fever. At 3:00 a.m. the boy awoke vomiting and asked for his father who then assumed care. At 5:45 a.m., the father awoke when he heard his son make a "gurgling sound." He noticed his child was unresponsive, limp and clammy, and he called 911. The EMTs noted no spontaneous respirations or pulse, and his pupils were dilated. Resuscitation efforts at the hospital were not successful.

Following an autopsy, the medical examiner called the father and stated that death was caused by an ischemic ileum, a twisting of intestine that cuts off blood supply, which lasted for greater than 12 hours. In addition, the medical examiner told the father that the condition should have been picked up in the ED and on X-ray, and that this was a "classic malpractice issue."

The father requested a meeting with the hospital and the ED physician. He brought some Internet-based articles and drafted a set of questions to gain greater insight on why further tests were not ordered and why his child was not admitted. The family's perception of the meeting was that

questions remained unanswered and the information obtained from the Internet were discounted. After the meeting, they sought legal representation.

Case Study

PCP/Specialist Communication Undermines Prostate Cancer Defense

Clinical Sequence

A 66-year-old Spanish-speaking male with limited English proficiency saw his primary care physician for symptoms of nocturia and polyuria. The patient's family often accompanied him to his appointments so they could help with translation. The PCP ordered a PSA test, and the level was 12.8 (normal 0-4), prompting a urology referral for further evaluation. The patient was not directly informed of the elevated PSA level; a formal referral outlining the reason for the consult, including a high PSA level, was not documented.

During his initial evaluation of the patient, the urologist referenced lower urinary tract symptoms and nocturia as the reason for referral. A GU examination and DRE were normal. The urologist diagnosed BPH and started the patient on Flomax and Ditropan. No lab values were drawn, but the patient was advised to follow up in a few weeks.

At the follow up appointment with the urologist four weeks later, the patient reported an improvement in symptoms. The urologist repeated the GU exam and DRE, which were unchanged. The patient was advised to follow up in one year with a plan to obtain a PSA level at that time.

The following year, during follow up with the urologist, another GU exam and DRE were unremarkable. The patient's PSA was 13.3, which raised concern for prostate cancer. A transrectal ultrasound with a needle biopsy confirmed the diagnosis of adenocarcinoma of the prostate, with a gleason score of 7 on the right lobe and 9 on the left. During a follow-up visit to the urologist's office with his son, the patient was told that he had advanced prostate cancer. He was referred to a radiation oncologist.

The initial evaluation with the radiation oncologist occurred the following month. A bone scan and abdominal/pelvic CT showed no obvious adenopathy or metastases; however on GU exam and DRE, the oncologist identified a fixed pelvic mass with perineural invasion. All treatment recommendations were reviewed through an interpreter. The patient was advised that the cancer was inoperable due to invasion of seminal vesicles and perineural invasion, and that his only option was radiation therapy. The patient was given eight weeks of radiation therapy and two years of hormone therapy. He completed treatment recommendations and his last PSA was normal. The

patient, who continues to be monitored, was advised that the advanced stage of the cancer meant he was at high risk of failing local therapy.

Case Study

MD Indecision Blamed for Compromised Baby

Clinical Sequence

A 33-year-old woman, G7 P5 with a high BMI of 40.5, a history of asthma, gestational diabetes and chronic hypertension controlled with 50 mg of atenolol, was admitted in active labor at term. The midwife examined her and found her fetus in transverse lie and her cervix dilated to 5cm and 100 percent effaced. The fetal heart rate tracing was reassuring, with a baseline of 130 bpm, moderate variability, some accelerations and no decelerations. The obstetrician on-call performed an ultrasound and confirmed fetal transverse lie, with back down. The obstetrician discussed the option of proceeding with a cesarean delivery versus attempting an external cephalic version followed by a vaginal delivery. The patient agreed to external version, but if not successful to proceed with a cesarean delivery and post partum tubal ligation.

Surgical consent was obtained. An epidural was placed after several attempts, and post-epidural ultrasound showed the fetus was now vertex but not engaged in the pelvis. The fetal

heart was bradycardic and controlled artificial rupture of the membranes was performed in the operating room, yielding clear fluid. Fetal bradycardia of 70 bpm was confirmed, lasting about 5 minutes before spontaneous recovery to a rate of 110-120. The cervix was 5-6 centimeters dilated and 80 percent effaced. A fetal scalp electrode was applied after several unsuccessful attempts, and variable decelerations were seen. The fetal heart rate accelerated in response to scalp stimulation but variable decelerations persisted.

The patient was moved from the operating room back to the labor room and within the hour her cervix was 6-7 cm and fetal vertex at -3 station. A cesarean section was called because of fetal bradycardia of 70 bpm, but then cancelled as the fetal heart rate recovered. A fetal scalp ph was attempted, but failed. The patient repeatedly asked the OB if everything was ok and the OB repeatedly said, "he's ok, he'll be fine."

Over the next two hours, minimal variability and recurrent variable decelerations were noted, with the baseline rising to 180 bpm. A cesarean section was called again for fetal bradycardia of 70 bpm but again cancelled as the fetal heart rate recovered. Deep variable decelerations persisted, with a baseline of 180 bpm and absent variability.

The obstetrician involved in this case had less than 5 years post-residency experience and demonstrated indecision and

frequent change in the plan of care for managing the patient's labor and delivery. The nurse was initially reluctant to express her concerns to the obstetrician or her charge nurse. After several hours of a non-reassuring fetal heart rate tracing, the nurse notified the charge nurse and the charge nurse spoke to the obstetrician but the clinical discord was not resolved, and no further action was taken.

The patient became fully dilated, and a fetal scalp ph of 6.9 was obtained. She was taken to the operating room and had a spontaneous vaginal delivery of a liveborn male infant with a tight, double nuchal cord. The pediatric team arrived to resuscitate a limp, cyanotic baby. APGARS were 1 at 1min., 3 at 5min. and 5 at 10min., and the initial cord ph was 6.8. The infant was transferred to the intensive care unit and developed disseminated intravascular coagulation, acute renal failure and seizures. Hypoxic-ischemic encephalopathy was diagnosed; life support was withdrawn; and the infant died on day four of life.

Case Study

Attending Needed at Bedside for Emergency Abdominal DX

Clinical Sequence

A 41-year-old female presented to the emergency room with severe abdominal pain. She had undergone a Roux-en-y gastric bypass two years previously. At 2 p.m., during an exam by a second-year resident, the patient described her pain 10 on a scale of 1-10, with 10 being the worst, and radiation to the back. She was afebrile and her white blood count was 8.3. At 4 p.m., her pain was still 10/10 and she received Morphine. A nasogastric tube was placed at 4:30 p.m., with little relief. The patient received a second dose of Morphine at 5 p.m.

At 6 p.m., the resident noted that the abdomen was firm and distended with guarding and rebound. A CT abdominal scan was consistent with a partial/early small bowel obstruction and showed a single gallstone. The resident notified the chief resident and the covering attending. They admitted the patient overnight for monitoring with serial abdominal exams. The attending was still in the hospital at this time but did not see the patient before leaving.

At 7:25 and 7:45 that evening, the patient required two additional doses of Morphine. The patient continued "in agony," according to nursing notes. At 11 p.m., her pain was still 10/10, too uncomfortable to be interviewed by the oncoming nurse. She received additional doses of Morphine through the evening.

At midnight, the resident called the attending surgeon at home with concerns about the continued severe pain. The attending asked the resident to call the chief resident on-call to examine the patient and to stop the narcotics. When the attending did not receive a repeat phone call, he assumed that the chief resident did not feel that urgent surgery was needed.

At 1 a.m., the resident spoke with the chief resident, who was not in the hospital. The junior resident relayed her concern about the patient's high level of pain. The chief resident did not come in to examine the patient, apparently attributing the patient's pain to cholecystitis because of the gallstone seen on ultrasound. Throughout the night, the patient's condition did not improve.

By 5:40 a.m., the patient complained of worsening abdominal pain and developed a fever of 102 degrees. The chief resident was notified. At 7 a.m., the attending surgeon examined the patient for the first time, and began emergency surgery at 9 a.m.. The surgeons found an intestinal volvulus in the distal ileum, and removed 75 centimeters of necrotic small bowel.

Case Study

Breast Lump Complaint Wrongly Followed With Screening Test

Clinical Sequence

A 39-year-old female went to see her OB/Gyn after noting a lump in her left breast while showering. During that visit she explained to her physician that she was concerned because she just had a friend die of breast cancer. The physician performed a breast exam. Finding no abnormalities, he ordered a screening mammogram (breast care guidelines suggest routine screening begin at age 40).

Three months later, the patient went for her mammogram. Even though she had identified a lump, she completed the radiology questionnaire by marking the "no abnormalities" box, because her physician had not identified any on exam. The screening mammogram results noted the following: "very dense stromal pattern, which reduce the sensitivity of the study for detection of cancer; there is no focal abnormality or other findings suggestive of malignancy – recommendation: annual screening".

The patient next visited her physician three months later, when she thought she might be pregnant. At that time, the physician did not review the results of the mammogram, nor did he examine her breasts or inquire as to whether the patient had noticed any other changes.

Six months later, the patient returned to her physician for her routine annual exam. She told her physician that she could still feel the lump in her breast, and that her periods had become irregular. Examining the breasts during this visit, the physician noted a suspicious area in the patient's left breast. A surgical consult and ultrasound detected a 2.5 cm mass. Mammogram, biopsy, MRI and laboratory testing [estrogen receptor (+) and progesterone receptor (+)] revealed a Stage IV, invasive, ductile breast cancer with metastasis to her spine. Upon further investigation it was noted that the patient had a fairly strong family history of breast cancer; a maternal aunt was diagnosed at age 50 and a paternal cousin was diagnosed at age 36. Prior to this, a family history of breast cancer had not been documented.

The patient has since undergone a radical mastectomy with axillary dissection, radiation therapy, chemotherapy and a bilateral oopherectomy. She has also sustained multiple compression fractures due to the metastasis to her spine.

Case Study

Failed Physician-Nurse Communication

Clinical Sequence

A 48-year-old morbidly obese woman with diabetes and sleep apnea (treated with nightly nasal CPAP), required surgery for a

detached retina. Two days before surgery, during her preoperative evaluation with a locum tenens physician in her PCP's office, she reported a 3–4 day history of phlegm-producing cough and intermittent shortness of breath. Her EKG was within normal limits with no acute changes. The physician diagnosed her with acute bronchitis and prescribed antibiotics and a bronchodilator. He also sent the patient's pre-operative report to her surgeon, and discussed all relevant findings. Because the patient's procedure was scheduled as day surgery, the physician did not order post-op CPAP.

During the patient's pre-operative interview, the anesthesiologist noted the patient's acute bronchitis and sleep apnea. No respiratory assessment was documented.

Surgery was performed without complications. Given the patient's history of sleep apnea and the late afternoon surgery, her daughter requested that the patient be admitted overnight for observation.

6:30 p.m. Stable, alert, and oriented, the patient was transferred to the floor. The floor nurse received the patient without a report or any mention of her sleep apnea.

7:00 p.m. Shift change

8:00 p.m. The patient—one of eight the incoming nurse was responsible for—complained of eye pain and was given Demerol (PO).

8:30 p.m. The patient vomited and the nurse assumed that the pain medication had been expelled. Despite a clear order to contact the physician for uncontrolled eye pain, the nurse administered an antiemetic and another dose of Demerol (IM) without notifying the physician.

9:30 p.m. The patient again complained of inadequate pain control. The nurse contacted the physician, who ordered a different antiemetic and pain medication. After receiving both medications and being encouraged to lie down, the patient appeared comfortable and began to fall asleep.

11:45 p.m. Upon checking the patient and finding her to be lethargic with cool, moist skin, the nurse called the lab to draw her blood sugar. While waiting, the nurse gave the patient a glass of orange juice. Her blood sugar was 278 and she seemed more alert.

12:45 a.m. The patient again appeared lethargic but arousable. The nurse, concerned for her patient, asked the charge nurse to assess her. He felt the pain medications had taken effect and the patient was sleeping comfortably; the physician was not contacted.

1:15 a.m. The nurse found the patient without a pulse or respirations and called a code. The patient was resuscitated, but upon transfer to an ICU at a neighboring hospital, she was declared dead.

Case Study

An Unsupervised Dosing Error

Clinical Sequence

A 32-year-old patient, with a history of neurocardiogenic syncope, delivered a healthy infant via elective cesarean section. After the delivery, the staff anesthesiologist exited the room and left an anesthesia resident to care for the patient. When the patient's blood pressure began to drop, the resident decided to administer ephedrine to restore blood pressure. She could not find the ephedrine, so she decided to use neosynephrine, choosing a dose of 500mg (10 times the usual dose) without diluting it. After receiving the medication, the patient experienced hypertension, tachycardia, and pulmonary edema. She was transferred to the intensive care unit for an extended stay and requires lifelong monitoring for cardiac-related complications. The resident left the program following this event.

Case Study

Missed Opportunities in the ED

Clinical Sequence

At 12:30 p.m., Tuesday, a four-year-old boy with a history of surgical repair of a volvulus (at age two) was brought to the emergency department (ED) due to increased lethargy, bilious vomiting for 18 hours, and constipation for two days. On admission, the patient was afebrile, his pulse was 180, and his respiratory rate was 44. The white blood count was 2.4, with a shift to the left; BUN was 27 with a serum bicarbonate level of 20.

At 2:00 p.m., the ED flow sheet stated “awaiting general surgical consult.”

At 3:30 pm, KUB films showed “dilated loops of bowel, which may represent a partial or early small bowel obstruction.” Placement of a nasogastric tube immediately drained 400cc of bilious fluid. The patient was given two boluses of 250cc of normal saline, followed by five percent dextrose in half normal saline at 40cc per hour. The child was diagnosed with “partial small bowel obstruction” and was admitted to the surgical service.

At 4:00 p.m., the patient was seen by a surgical intern (PGY1). She took the X-rays to the attending surgeon of record (who was in the operating room with another patient) and his surgical assistant, a fourth-year general surgery resident. The

attending, who had performed this child's first surgery two years prior, and the resident agreed that the films showed a partial small bowel obstruction. The attending ordered that IV fluids be continued, that additional labs be ordered, that an additional KUB be obtained at 7:00 p.m., and that an infectious disease consult see the child once he was moved to a surgical floor (which occurred around 6:00 p.m.).

At 6:00 p.m., when the attending surgeon finished his prior case, and just prior to his leaving the hospital for the day, he asked the fourth-year resident to see the boy with the bowel obstruction.

At 6:30 p.m., the resident found the patient's abdomen non-distended with no signs of peritonitis. She ordered that the repeat KUB and labs be obtained then, rather than 7:00 p.m. She was aware that the blood count had a shift to the left.

At 6:45 p.m., the KUB films showed a worsening small bowel dilatation consistent with a small bowel obstruction (Radiology's official read would be Wednesday morning). At 7:00 p.m., the resident phoned the attending surgeon with the results of her exam: she believed that the patient looked stable, but had not yet seen the repeat X-rays.

From 7:00-9:00 p.m., the general surgery resident was on evening rounds and, thus, did not see the 6:45 film.

At 9:00 p.m., a nurse notified the resident that the child did not look right and he was not responding to a needle stick. The resident left rounds and found the child lethargic, with a heart rate in the 180s.

At 9:45 p.m. the general surgery resident then asked the senior resident (a pediatric surgical fellow) to see the patient. He ordered a third set of films (the child fainted in X- ray), which showed more clearly that a closed loop obstruction had occurred, and contacted the on-call surgeon.

At 10:15 p.m., the on-call surgeon prepped for emergency surgery. Antibiotic therapy was instituted and the patient was taken to the OR around 10:45 p.m. A 12-inch segment of dead bowel had to be removed. During surgery, the patient suffered cardiovascular collapse, lost his aortic pulse, and had to be resuscitated via CPR. The post-operative course was complicated by hypotension due to overwhelming sepsis and terminal shock. ECMO (heart-lung machine) was required to keep the child alive.

Case Study

Multiple Complaints and Non-compliance

Clinical Sequence

In early March, six weeks after an unremarkable physical exam by a prior physician, a 62-year-old male truck driver saw his new primary care physician (PCP) for complaints of rectal bleeding. The patient, who had no record of any colorectcal cancer screening, reported no prior history of occult blood, and no family history of colorectal cancer. After a rectal exam showed blood, the PCP diagnosed it as “most likely hemorrhoidal.” He prescribed Citrucel and suppositories for hemorrhoid relief and documented that the patient would need imaging of some kind in the near future. The PCP instructed the patient to follow up in two weeks, and advised that a colonoscopy should be scheduled. No follow up appointment or imaging took place.

In May, the patient called the office for complaint of bloating and abdominal pain. The nurse he spoke to recommended that he alter his diet; no appointment with the PCP was requested or offered. In July, the patient again called the office with a complaint of abdominal discomfort, but did not make an appointment with his PCP. The PCP was unaware of the phone call.

In late November, the patient presented to the Emergency Department (ED) with anorexia, abdominal pain, and nausea (his stool was negative for blood). A physician assistant

diagnosed a partial intestinal obstruction and discharged the patient with Pepcid for GERD. Three days later, the patient returned to the ED in severe, persistent abdominal pain and was rushed to surgery for a presumed bowel obstruction. The patient died two days after the surgery, which revealed advance colorectal cancer.

Case Study

Unfamiliarity Breeds Contempt

Clinical Sequence

A 33-year-old mother of one with a history of diethylstilbestrol (DES) exposure was found to have a fetal demise at approximately 34 weeks gestation, presumably related to a cord accident. After a discussion involving the patient, her husband, and the obstetrician who had delivered her first baby by cesarean section, a decision was made to attempt induction and vaginal delivery. Pitocin induction was begun by a physician in the obstetrics group practice treating the patient, and then assumed by a covering physician outside that practice.

As the induction proceeded, the patient developed increasing pain and bleeding. The covering obstetrician noted in the record the possibility of a placental abruption. In the differential diagnosis, uterine rupture was among the more

remote possibilities, given the stability of the patient's vital signs and continued progression of labor.

Coagulation studies were monitored during labor and did not indicate excessive bleeding problems. A low grade fever resulted in the administration of antibiotics prior to delivery. The stillborn fetus was delivered by a member of the obstetrics group practice. The patient was discharged the next day, and returned three days later complaining of chills, fever, and pain. She received additional antibiotics and declined to have an ultrasound done.

Seven days after her discharge (nine days after the delivery), the patient’s fever recurred and she was re-admitted to the hospital for triple intravenous antibiotics. Ultrasound showed a mass within the uterine cavity and disruption of the uterine wall in an area not near the previous cesarean section scar. The patient would require major reconstructive surgery if another pregnancy was contemplated.

Case Study

Girl Loses Ovary After Repeat ED Visits, Delayed Diagnosis

Clinical Sequence

A slightly obese 9-year-old girl saw her pediatrician in the hospital clinic for complaints of abdominal pain, nausea, and vomiting that started within the previous 24 hours. On exam, she was afebrile, her vital signs were stable, and she was tender to percussion in the right mid-lower abdomen. The physician noted “rule out appendicitis versus renal colic” in her record, and he sent the girl to the ED for CBC, urinalysis, urine culture, and KUB. The ED resident examined the patient and noted diffuse tenderness in the right lower quadrant, no guarding or rebound, and no pain jumping up and down. The patient denied any change in her bowel movements. She rated the pain as varying from 5/10 to 10/10 and stated it did not respond to Tylenol. The urinalysis and KUB were negative. Her CBC and electrolytes were normal except for slightly elevated neutrophils. Without obtaining a formal consult, the attending spoke to a pediatric surgeon and they concluded it was a non-surgical abdomen. The patient was discharged with a diagnosis of abdominal pain, and instructed to have a light diet and call her pediatrician if the pain or vomiting resumed.

The patient returned to the ED one hour later with increased abdominal pain and vomiting. She was examined by the same resident, who noted that her abdomen was diffusely tender, bowel sounds present, no guarding, and she was afebrile. The assessment was non-surgical abdomen, and the plan was to hydrate. The nurse noted at one point that the patient was screaming in pain, in a knee to chest position. She notified the

attending, who examined the patient, reviewed the resident's note, and indicated that the patient "looked well. No acute distress." The patient's mother questioned whether an ultrasound or other imaging test was needed. The attending dismissed the suggestion, telling her that the symptoms did not warrant it. The patient was discharged home.

The next day, the girl returned to the ED with right lower quadrant abdominal pain and vomiting (5-6 times). She described the pain as episodic. A different resident examined her: she was afebrile and had mild tenderness in both lower quadrants, no guarding, minimal rebound, and normal bowel sounds. No rectal exam was documented. She had not had a stool that day. The attending ED physician believed that the previous day's attending obtained a surgical consult. He diagnosed constipation and ordered an enema, after which the patient reported feeling better. She was discharged home with instructions to increase fluid intake, take mineral oil, increase fiber in her diet, and contact her pediatrician to let her know how she was doing.

Three days later, the patient was seen by her pediatrician for continued complaints of abdominal pain and vomiting. She had a slightly elevated temperature and was orthostatic. Her abdomen was quiet with increased guarding, and she was sent again to the ED. Her white count and sed rate were elevated. A CT scan showed a normal appendix but the presence of a

complex pelvic mass. Ultrasound showed torsion of the right ovary, and she was taken to the OR where infarction of the right ovary was confirmed. They removed the right ovary and fallopian tube, and the patient had an uneventful postoperative course.

Case Study

Unprepared for Labor & Delivery Worst Case Scenario

Clinical Sequence

The 25-year-old mother of a three-year-old was scheduled for induction to deliver twin boys at her community hospital. Her pregnancy was uncomplicated, except that the non-presenting twin was in a breech presentation. In planning the delivery, the obstetrician requested portable ultrasound equipment and asked Anesthesia to be on hand.

Following induction via Pitocin, the first twin was delivered vaginally, without difficulty. When the obstetrician encountered problems delivering the second fetus, he re-confirmed that it was still a breech presentation. During an attempt to turn the baby via internal cephalic version, the obstetrician intentionally ruptured the membranes. The umbilical cord was wrapped around the baby's feet and lower body. As the obstetrician further attempted to re-position the

baby head-first for a vaginal delivery, the cervix contracted on his hand. The anesthesiologist, who had been called away, was called back to administer nitrous oxide to relax the uterus for further attempts to reposition the baby.

No ultrasound equipment was present in the delivery room, so the nurse monitored the fetal heart rate with a hand held device. At one point, while the obstetrician was attempting to reposition the second twin, the fetal heart rate dropped to 43 BPM. After eight minutes and no success at turning the fetus, the obstetrician called for a C-section.

The baby was born with very low Apgars, no gag reflex, and an EEG demonstrated severe brain damage. He was diagnosed with spastic quadriplegia, was blind, and died five months after birth.

Case Study

Teamwork Failures in Labor and Delivery

Clinical Sequence

In the 41st week of her first pregnancy, a 38-year-old woman arrived at Labor and Delivery at 6:30 a.m. for a planned induction of labor due to mild, pregnancy-induced, hypertension.

6:45 a.m.

After intra-vaginal placement of misoprostol, the nurse observed her briefly and, at 11:00 a.m., discharged her from the unit. She went for a walk with her husband in a park next to the hospital.

Noon

Patient's membranes spontaneously ruptured and she returned to the labor and delivery unit. A recently hired, new graduate, nurse admitted the patient, took her vital signs, and checked the fetal heart rate. The mother's blood pressure was 176/95 but the nurse thought this was related to nausea, vomiting, and discomfort from the contractions.

12:10 p.m.

The resident examined the mother, determined that her cervix was 5-6 cm, 90 percent effaced and the vertex was at 0 station. An internal fetal heart monitor was placed because The mother's vomiting and discomfort caused her to move around too much in the bed, making it hard to record the fetal heart rate with an external monitor. The internal monitor revealed a steady fetal heart rate of 120 and no decelerations.

2:05 p.m.

The mother continued to complain of painful contractions and requested an epidural. Shortly after placement of the epidural,

the monitor recorded a prolonged fetal heart rate deceleration. The heart rate returned slowly to the baseline rate of 120 as the nurse repositioned the mother, increased her intravenous fluids and administered oxygen by mask.

2:15 p.m.

An epidural analgesia infusion pump was started. The fetal heart rate strip indicated another deceleration that recovered to baseline. The nurse informed the resident who checked the tracing and told her to "keep an eye on things."

2:45 p.m.

The primary nurse noted in the labor record that the baseline fetal heart rate was "unstable, between 100-120" but she did not report this to the resident.

3:05 p.m.

The nurse recorded that the fetal heart rate was "flat, no variability." As the nurse was documenting this as a non-reassuring fetal heart rate pattern, the patient expressed a strong urge to push and the nurse called for an exam.

3:20 p.m.

A resident came to the bedside, examined the mother and noted that she was fully dilated with the caput at +1. A brief update was written in the chart, but the clinician who had performed the exam was not noted.

3:30 p.m.

The mother was repositioned and began pushing.

4:05 p.m.

The fetal heart rate suddenly dropped and remained profoundly bradycardic for 11 minutes. The resident was called and attempted a vacuum delivery since the fetal head was at +2 station, The attending then entered and attempted forceps delivery.

4:35 p.m.

An emergency cesarean delivery was performed; the baby was stillborn. The physician identified a uterine rupture that required significant blood replacement.

Case Study

Missed Complication

Clinical Sequence

A 47-year-old underwent surgical repair of his herniated left L4-L5 disk. The staff neurosurgeon scheduled the operation and was on-hand during the initial positioning. The surgery was performed by the chief neurosurgical resident who had done approximately 100 of these procedures. Near the end, the staff neurosurgeon returned to inspect the site and removed a small disk fragment. Post-operatively, the patient's blood pressure initially dropped to 90/30 (40 points below his pre-operative systolic reading) and his heart rate increased. The chief neurosurgery resident saw the patient and ordered extra fluids. The patient's systolic pressure came up to 100;soon after, the chief neurosurgery resident went off duty and an anesthesia resident assumed responsibility. Three times, nurses informed the anesthesia resident of the patient's persistent low blood pressure. No further diagnostic testing was performed and he was not examined. At8:30 p.m., the anesthesia resident decided to transfer the patient to the floor. Upon arrival to the floor, the patient's blood pressure was 86/43. At 10:00 p.m., he was given Percocet for relief of abdominal pain. No other record of his vitals signs was made until 10:40 p.m.

At that time, the patient again became unresponsive when his systolic blood pressure dipped below 60. After the first event, fluids and oxygen helped, but a second event was followed by progressive respiratory decline leading to apnea—at which point a code was called. At that time, his hematocrit was 14.

The patient was transferred to the medical intensive care unit. His abdomen was distended; an emergency thoracotomy was done and the aorta clamped. He was taken to the OR for a laparotomy; a large amount of blood was found in the peritoneal cavity and the surgeon could see that the left iliac vein was avulsed from the inferior vena cava (apparently triggered when bone fragments adhered to it were removed). After receiving massive amounts of blood and blood products, the patient developed acoagulopathy. With no chance for his recovery, the patient's family chose to discontinue life support.

Case Study

Results Recorded for a Test not Performed

Clinical Sequence

A 30-year-old woman (G3,P1,TAB1) was followed primarily by a nurse practitioner (NP) throughout her uneventful, second pregnancy. The same NP had cared for her during her prior pregnancy. The patient was healthy with no risk factors and had no complications with her prior pregnancy and delivery. At eight weeks, she began routine prenatal care at a hospital-based clinic.

At 11 weeks, the NP counseled the patient regarding optional alpha-fetoprotein (AFP) and HIV tests. The patient was informed that the AFP, which may identify spina bifida and Down's syndrome, is usually performed between the 15th and 18th week of the pregnancy. She was further instructed that patients whose AFP is abnormal typically undergo additional testing such as ultrasound and amniocentesis to aid a more definitive diagnosis. (During her first pregnancy, this patient's AFP test had been normal.)

At 16 weeks, the patient was seen by a third-year resident. Her examination was normal and the baby's size was appropriate for its age. The physician ordered a growth ultrasound for 18 weeks but did not order the AFP, which typically would have been done at this visit.

At her scheduled visit at 20 weeks, the patient saw the NP who reviewed her record and noted that an ultrasound performed at 18 weeks indicated a normal fetus. The NP also documented that an AFP had been performed and was normal. The patient received routine prenatal care for the remainder of her pregnancy. Following delivery, the baby was diagnosed with Down's syndrome and a cardiac anomaly which required cardiac surgery a year later.

The clinicians met with the parents and explained that the AFP results (from her first pregnancy) in her record had been

errantly interpreted as being the results of a test during her second pregnancy.

Case Study

Not Offered Screening Test Before Colorectal Cancer

Clinical Sequence

A 62-year-old female patient presented in March 1996 to her long-time PCP with complaints of blood in her stool. A guaiac test in the office was negative. Her past medical history included hypertension, arthritis, peptic ulcer disease, obesity, and coronary artery disease. She had never received colorectal cancer screening. Based on a 20-year relationship that included frequently missed appointments, the physician believed she would refuse screening tests for colorectal cancer.

She returned in June with a complaint of abdominal pain. The physician prescribed an H2 blocker, Zantac, and noted a plan to obtain a right upper quadrant ultrasound if there was no improvement in her symptoms. The record does not indicate that a stool guaiac was obtained at that exam or if the patient was still reporting blood in her stool.

Failing to keep the next two appointments, the patient presented in August of the same year with improvement of her abdominal pain on Zantac and a stable weight. The patient was not anemic, and a CEA was within normal limits.

During the next two years the patient was seen for chest, abdominal and back pain, as well as hypertension She was treated with Biaxin and Prilosec for presumptive H. Pylori. Documentation was minimal in the visit notes, with no evidence of a comprehensive examination during this period or the years prior.

A visit on May 13, 1999 included a comprehensive examination. The physician noted a nine-pound weight loss, and a review of systems, including gastrointestinal and urinary, that he characterized as negative “in general.” Documentation does not include family history, although subsequent legal investigation revealed that the patient’s sister had died of colon and lung cancer in 1995. The patient had a pelvic exam during this visit, yet there is no documentation that a rectal examination was performed. Subsequently the patient had a screening mammogram. Lab results included low MCV/MCH; hemoglobin was 12.1, and hematocrit was 37 percent, both on the low end of the normal range and decreased somewhat from previous measures. Recommendations on the lab sheet

suggest follow up to include additional hemoglobin and stool tests. However, the record does not indicate that this information was ever communicated to the patient.

The patient next presented to the practice four months later, on September 9, 1999, with complaints of a tooth infection. Care included assessment of her oral cavity, tooth, lungs and extremities. Follow up included a dental appointment and an appointment with her physician, which she did not keep. There is no evidence that the NP addressed the recommendations in the lab report from four months prior, including follow-up hemoglobin and stool tests.

In November, the patient went to the ED complaining of chest and abdominal pain. Chest X-ray was positive for pulmonary nodules and suggestive of metastatic disease. She died from metastatic colorectal cancer a month later.

Case Study

Defending Appropriate Care in Light of Tragic Outcome

Clinical Sequence

At the end of an unremarkable pregnancy, a 21-year-old G1P0 came to the hospital early in the morning two days before her due date. She was leaking fluid and thought her membranes had ruptured. Electronic fetal monitor readings were reassuring. The patient was told that, although she was leaking amniotic fluid, her membranes were still intact, and she was discharged. Later that same day she returned to the hospital still leaking fluid. An ultrasound showed borderline low amniotic fluid and she was, again, sent home. The next day, when her membranes did rupture, she called her obstetrician, who told her to go directly to the hospital.

The patient was admitted to labor and delivery, received Pitocin and made adequate progress over the next several hours. She developed a fever and was given antibiotics. Two scalp pH tests, performed in response to late decelerations, were normal. Her baby daughter was delivered vaginally, with Apgars of 2, 5, and 6. Continuous seizures began hours after birth, and a brain CT was consistent with diffuse hypoxic ischemic change and cerebral edema.

Case Study

From Chronic Problems to an Acute Dilemma

Clinical Sequence

On Monday, a 43-year-old obese male presented to the emergency department (ED) with severe abdominal pain, vomiting, and chills. He described six previous episodes. An extensive diagnostic work-up that included a small bowel series, CT scans, colonoscopy, and laparotomy, failed to identify a definite cause of his pain.

The ED physician interpreted the KUB (kidney, ureter, and bladder X-ray) as not indicative of a small-bowel obstruction. The patient received pain medication and intravenous fluids and was instructed to see his primary care physician PCP) if his symptoms persisted. The ED physician informed the PCP who, as a result of a recent insurance change, had not yet seen (or met) this patient. The PCP dictated a note for the patient's medical record.

On Tuesday, the patient presented to the PCP's office with continued nausea. The physician on duty (who was not the PCP contacted the night before) had a copy of the ED report faxed to his office. Relying on the report that the KUB was normal, he neither ordered further X-rays nor obtained a surgical consult. Simultaneously, the hospital radiologist dictated her report on the KUB stating "several moderately distended loops of small bowel in the right upper quadrant which may represent a small bowel obstruction; follow-up films recommended." The Radiology report went directly to

the patient's record, but not to the ED or the PCP (or the covering internist).

Over the next two days, two physicians and a physician assistant (PA) examined the patient. Palliative treatments provided temporary relief, but multiple tests and exams failed to fully identify the source of his abdominal pain. The PA did find out—and noted in the record—that a laparotomy done several years prior showed this patient had sarcoid adhesive disease.

Early Friday morning, the patient, now acutely ill, was rushed to the ED with abdominal pain, nausea, vomiting, and a new problem—shortness of breath. The surgeon on call obtained the chronology of events since Monday, as described by the patient. Unaware of the patient's history of sarcoid adhesive disease, the surgeon elected to rule out a pulmonary embolism and ordered a VQ scan followed by an abdominal CT scan. He then left to see other patients.

Friday evening, the surgeon returned to see the patient and learned of an earlier hypotensive episode, abnormal blood work, and the CT scan performed in the late afternoon. The patient was prepped for surgery, but suffered a brief run of ventricular tachycardia followed by atrial fibrillation. Resuscitative measures were unsuccessful. Autopsy identified that the cause of death was a strangulated bowel.

Case Study

Dodging Responsibility and Placing Blame

Clinical Sequence

A one-day-old girl was transferred from a community hospital to a larger city hospital to rule out a GI bleed. An IV line in her right foot was used to infuse calcium gluconate. Over the next two days, an entry into her medical record during each shift indicated that the IV was running well. On the third day, during the overnight shift, the nurse noted an IV slough with a darkened area at the IV site.

Later that day, the patient was transferred to the ICU. A transfer note specified the time the infiltrate was noted and commented that the IV site had been checked prior to transfer; however, those details did not appear in the patient's chart. In addition, the nursing flow sheets from the shift when the infiltration was discovered, and the one preceding it, contained scratch-outs and re-writing over the original IV infusion numbers.

When they came in that morning, the parents discovered their daughter's injury and were upset that the staff had not notified them. When questioned by the parents, the staff characterized the injury as a blister. Subsequently, the parents

were told by one of the physicians that the IV medication was very caustic—and was “usually given for babies with heart problems.” The parents had not been told their daughter had heart problems (she did not). Another physician intimated that the problem originated in the community hospital. A third physician told the parents that the infiltrate should not have occurred—and that he would not blame them if they took their child out of the hospital immediately. Two days later, when the child was discharged, her parents were surprised by the extent of her injury.

Case Study

Discharged from ED Before MI Death

Clinical Sequence

A 51-year-old traveling salesman began to experience chest pain and weakness while driving out of state. He presented to a nearby ED with complaints of a dull ache in his left arm and chest for about seven hours, numbness in the left arm, as well as some weakness when closing his car door. He did not complain of shortness of breath, diaphoresis, or nausea. His medical history included GERD (the date of onset was unclear – but he was taking Zantac), and in the prior 18 months: hernia repair, appendectomy, and a dislocated shoulder. He was a non-smoker and had no known history of coronary artery disease (CAD).

Upon presentation to the ED at 11:30 a.m., the patient's vital signs were: BP 135/96, HR 130, and RR 20. Findings on EKG revealed sinus tachycardia at 114 with anterior hemi block. General laboratory tests were ordered to rule out myocardial infarction, and at approximately noon the patient received nitroglycerin sublingually. His pain level at that time was 4/10. Twenty-five minutes later, his pain level was 2/10, and a second nitroglycerin tablet was given. Vital signs at that time were BP 100/75, HR 128, and RR 20.

At 1:10 p.m., the patient's pain level was zero and vitals were 133/89, HR 114, and RR 20. While awaiting the Troponin results, the ED physician ordered an exercise stress test (without imaging). A cardiologist administered the test, which lasted only three minutes secondary to patient fatigue. Results of the stress test were reported back to the ED physician as within normal limits; the patient experienced no chest pain and there were no ST/T changes noted.

An hour later, all of the laboratory findings were back and included: CBC wnl, lytes sl low, BS 113 (↑), BUN 119 (↑), HGOT 14 (sl ↓), and Troponin .33 (↑ - lab slip stated: recommend clinical correlation and repeat in 3-6 hours). Enzymes were done once and reported as normal.

The patient was discharged at 3:30 with a diagnosis of recurrent GERD. His discharge instructions included: maintain

diet (avoid caffeine and continue low fat diet), take Prilosec as ordered, and follow-up with his (home-state) PCP.

Ten days later, while watching TV at home with his family, the patient died. Autopsy results revealed that the patient died of a fatal cardiac arrhythmia, that he had CAD with 80-90 percent stenosis, and that he had had an MI—probably 7-10 days prior to his death.

Case Study

Vague Talk Between OB and RN Caused Delay

Clinical Sequence

A 26-year-old female, G3-P0-Tab2, with a full term uncomplicated pregnancy, experienced pain and leaking fluid. She was unsure if she was in labor, and called her obstetrician, who advised her to use a peripad, rest, and call back if the symptoms increased. About two hours later she went to the ED in severe pain. She was admitted to the Labor & Delivery unit at 8:15 p.m., presenting with leaking green/brown fluid.

The L&D nurse placed an electronic fetal monitor (EFM). The patient was 1-2cm dilated and 50 percent effaced. Per EFM, the fetus was showing heart rate decelerations to 90 and

decreased beat-to-beat variability. Meconium was present on the patient's peri-pad. The patient requested analgesics for pain, and the RN called the obstetrician. She advised him that the EFM strip looked good, and requested an order for Nubain IM for pain, which was administered shortly thereafter.

The obstetrician arrived at 9:20 p.m. Meconium was still present, and the EFM strip showed some decelerations and decreased variability. The obstetrician questioned if it might be due to either the Nubain or to the EFM picking up the maternal pulse. He decided to treat her conservatively with hydration and oxygen. The patient was 3cm dilated, and she received an epidural.

At 10:50 p.m., as the EFM showed late decelerations and decreased variability, the RN called the obstetrician to the patient's room. The patient was now 5cm dilated. Fetal scalp PH tests were performed by the obstetrician, and results were abnormal at 7.15. The obstetrician determined the fetus was in distress, and ordered an emergency C-section.

An infant girl was born at 11:24 p.m., weighing 2940 grams, with Apgar scores of 1 at 1 min., 5 at 5 min. and 7 at 10 min. Her heart rate was less than 80, and she required vigorous resuscitation. Upon admission to the neonatal ICU, the baby's hematocrit was noted to be only 12; the retic count was 12.3, and cord PH was 7.001. A Kleihauer-Betke test revealed

significant feto-maternal bleed. The infant ultimately developed seizures and was diagnosed with hypoxic ischemic encephalopathy. She suffers neurological sequelae from CP, such as: right sided hemiparesis, cognitive difficulty and speech delays.

Case Study

Delayed Heart Care Due to Lack of Expertise, Hospital Capability

Clinical Sequence

A 74-year-old female with a cardiac history underwent placement of a cardiac pacemaker at her community hospital due to sick sinus syndrome. The day after being discharged home (a Saturday), she returned to the hospital by ambulance, complaining of severe substernal chest pain at rest radiating from shoulder to shoulder, accompanied by mild shortness of breath and lightheadedness. She was given nitroglycerine sublingual with some improvement, and she became pain free after IV morphine. The on-call cardiologist (a moonlighting Cardiology fellow who was reached by phone at another hospital) recommended admission to the ICU and treatment for unstable angina, including aspirin, heparin, and nitroglycerine.

Approximately four hours later, the covering cardiologist saw the patient. Her vital signs had stabilized, and labs were normal. The chest X-ray suggested hypertrophic non-obstructive cardiomyopathy. The differential diagnoses included unstable angina and aortic dissection. The plan called for an echocardiogram in the morning due to findings on the chest X-ray. The hospital had no echocardiogram facilities after hours. The possibility of transfer to a tertiary hospital was discussed—but decided against, as the patient appeared stable and her primary cardiologist was at this hospital.

Later that night the patient was found writhing in bed with difficulty breathing. She was speaking in Portuguese, which her family said indicated she was in severe pain. Upon exam by the covering physician, the differential diagnoses now included: pericardial effusion (due to complication from pacemaker insertion); aortic dissection; ischemia; congestive heart failure; and pulmonary embolism. The Heparin and Plavix were discontinued, and repeat tests (chest X-ray, arterial blood gas) were reassuring. A CT scan was ordered but not done stat because the patient appeared to be more stable and was resting comfortably.

A moonlighting Infectious Disease fellow covering the ICU performed a limited echocardiogram that he thought might show a small effusion, but he was not expert in this procedure. On the phone with the on-call cardiologist, he

reviewed all possible diagnoses, including pericardial effusion. The patient was not tachycardic and did not have pulsus paradox — both symptoms that would have suggested tamponade. It is unclear if the Infectious Disease fellow told the cardiologist that he did a limited echocardiogram. The cardiologist still considered aortic dissection; he planned to come in and do another echocardiogram early in the morning.

Approximately two hours later, the patient was found restless and moaning in Portuguese again, with worrisome vitals. The covering cardiologist came and performed an echocardiogram, which revealed a pericardial effusion. A discrepancy between the patient's blood pressure in her right and left arms led the cardiologist to still suspect aortic dissection. He felt that, if the patient was having a dissection, then a tap for the effusion could result in death. He wanted to have back up surgeons available and to do the procedure in a cardiac cath lab—neither of which were available at this hospital.

The patient was eventually transferred to a tertiary care facility, where an emergency pericardiocentesis removed one liter of blood. Subsequently, she had a cardiac arrest; developed diffuse anoxia of the brain, went into a coma, and died four days later.

Case Study

Treatment Delayed Despite Multiple Visits and Phone Calls

Clinical Sequence

A 33-year-old restaurant worker presented at an urgent care center with a deep hand laceration. He was triaged by a physician's assistant (PA), sent to the surgery department, and treated by a nurse practitioner (NP). The NP irrigated, sutured, and dressed the wound. The patient was given oral instructions on wound care and the signs and symptoms of infection.

The next day, the patient called the center with complaints of extreme pain. The treating NP prescribed Tylenol with Codeine. Five hours later, the patient called the NP again stating that the pain medication had been ineffective and that he was now having chills. The NP advised him to take an anti-inflammatory agent. Later that same day, the patient called the center again reporting a fever. He was seen that evening by the PA who had done his initial triage.

The PA examined the patient's hand and found the wound to be reddened, swollen, and hot. A lymphangitis (red streaking) was also noted which extended just distally to the antecubital fossa, indicating that the lymphatic system was also involved

in the infection process. The patient was febrile (100) even after several doses of ibuprofen. The PA diagnosed abscess formation, lymphangitis, and significant cellulitis.

After consulting with the covering surgeon, the PA removed six of the nine sutures and observed spontaneous evacuation of purulent material, including old non-clotted blood. The wound was cultured, irrigated with saline and peroxide, and dressed. The lymphangitis and cellulitis were delineated.

The patient was given intravenous antibiotics and discharged home on oral dicloxacillin. A follow-up appointment was made for the next morning. He was instructed to keep the limb elevated and go to the ED if fever or chills developed. Subsequently, the CBC revealed a WBC of 17,000, and the culture was positive for streptococcal and staphylococcus organisms.

The following morning, the patient presented at the center with severe pain with passive motion of the digits and increased edema. He was admitted to the hospital where he underwent three irrigation and debridement procedures and received IV antibiotics. He was discharged home with occupational therapy and IV antibiotics. He was left with scarring and some loss of function of his left hand.

Case Study

Patient receives blood transfusion against her wishes

Clinical Sequence

A 44-year-old woman was admitted to the hospital with necrotizing pancreatitis. She had significant blood loss and a dropping hematocrit. With the severity of her condition, death was imminent. Both the resident and the attending were aware the patient was a Jehovah's Witness. She had been intubated and was in ICU where she was told by the attending that he would not perform surgery without a blood transfusion and that, without the surgery, she would die.

The insured attending felt the patient was competent when she nodded her consent for a blood transfusion. He contacted the hospital's in-house counsel, who recommended doing "what was medically necessary." The patient's husband, who had a handwritten note from his wife stating "please don't let me die," gave oral permission for the blood transfusion.

After permission was obtained, the patient was taken to surgery and given blood transfusions. Over a four month hospitalization, the patient underwent more than 20 procedures with more than 30 transfusions.

Case Study

Failure to Attend to the Main Concern

Clinical Sequence

A 21-year-old woman with a history of multiple birth defects, was scheduled for hip surgery. She was non-verbal (but could communicate with facial expressions, and to a limited extent, via a computer translator) and dependent on family members for all aspects of daily living. She also suffered mild diabetes insipidus (DI), otherwise known as “water diabetes.” DI is a rare disease in which the kidneys produce abnormally large volumes of diluted urine. This patient’s DI was managed at home by her mother with careful attention to her fluid intake. Three years prior to this surgery, she had undergone a similar orthopedic procedure and had an extended admission due to hypernatremia.

Two weeks prior to surgery, at the pre-op appointment, the patient’s mother reminded the surgeon—and the resident assisting him—of her daughter’s DI and her previous post-op complication. They acknowledged her concern, and the attending told her to “make sure” that the anesthesiologist understood. The mother spoke with the anesthesiologist later that day.

Upon admission, the patient's DI was documented by the nurse practitioner on the anesthesia assessment form. Pre-op serum sodium was in the normal range (normal = 135-148). Because of the patient's DI, the anesthesiologist closely monitored her electrolytes during surgery.

Halfway through the procedure, the resident surgeon was called to another case. He was replaced by an orthopedic fellow, who did not know the patient, and the surgery was completed successfully. Immediately after the surgery, the attending surgeon left for vacation. The fellow wrote the post-op orders but—unfamiliar with the patient's medical history—did not include serial labs or adequate fluid intake. The PACU nurse did not pay particular attention to the patient's electrolytes or fluid balance. The patient was transferred to the floor, where the nurse was unaware of her DI.

The next day, the mother told the nurse on duty that her daughter had DI, and gave her a worksheet of what her hour-by-hour fluid intake should be. This nurse made note of it, but did not follow up on it, assuming the physician's orders covered the patient's needs. The patient was visited by the orthopedic resident each post-op day.

Four days post-op, she became somnolent and experienced seizure-like activity. Not understanding DI, the nurses had not made it known when the patient was becoming more

withdrawn. When she slipped into a coma and developed aspiration pneumonia, a chart review indicated that her sodium levels had gone unchecked for three days; upon testing, it was 185. She was transferred to the MICU where, over several days, her electrolyte and fluid imbalance was corrected. An MRI showed brain damage (including changes of osmotic demyelinating syndrome of the pons, thalamus, cerebellum, and basal ganglia). She is no longer able to communicate in any fashion with her family and now lives in a long-term nursing home.

Case Study

A Less-Than-Thorough Work-up for Chest Pain

Clinical Sequence

A 32-year-old male smoker presented to his local emergency department (ED) after two days of chest pain radiating to both arms. The pain, which had last occurred one hour prior to presentation, occurred at rest and was associated with shortness of breath and palpitations. The patient denied any drug use. He told the triage nurse his father had suffered an MI at age 35.

In the ED, the patient, who also presented with a hard cough, was found to be tender over the anterior part of his chest wall; his EKG and chest X-ray were read as normal (no

enzymes test done). The patient was diagnosed with costochondritis and sent home with anti-inflammatory medications, narcotic pain medications, antibiotics, and instructions on chest pain. The patient's vital signs at discharge were not recorded; he was noted to be pain-free.

Eight hours later, the patient returned to the ED complaining of crushing chest pain, shortness of breath, dizziness, and radiation of his pain to his left arm. He told the triage nurse, "I was just discharged, but I'm still having chest pain." He was seen by a different physician and he now reported cocaine use a week prior. This attending interpreted a repeat EKG as showing elevations of the patient's ST segments in the inferior leads consistent with an acute inferior myocardial infarction. He was given aspirin and morphine, and was placed on heparin and nitroglycerin. His cardiac enzymes were negative. He was immediately transferred to a tertiary teaching hospital for emergent cardiac catheterization.

During this history taking at the receiving hospital, the patient explained that his father had had his first MI at age 20, and died of an MI at age 37. The cardiology service took the patient to the catheterization lab. Almost 12 hours after his initial visit to the community hospital, the patient's repeat cardiac enzymes were positive for a myocardial infarction. Catheterization revealed 95 percent left circumflex stenosis. A stent was placed and medications were started. Two days

later, an echocardiogram performed prior to discharge revealed a significantly reduced ejection fraction of 35 percent. At discharge, the patient was pain free.

Six days later, the patient was readmitted to the cardiology service with a recurrence of his chest pain. His diagnostic work up, including a repeat catheterization, did not reveal significant disease. His medical treatment was optimized and he was discharged home.

Case Study

Reliance on Patient's Self Diagnosis Obscures Fatal Condition

Clinical Sequence

A 31-year-old male presented to the emergency department (ED) at 9:00 a.m. for evaluation of bilateral low abdominal pain, vomiting, and diarrhea that began earlier that morning. He was seen by a triage nurse who documented a set of vital signs (T 96.0, P 81, BP 115/60); a history significant for a right anterior cruciate ligament reconstruction; and a medication list that included Plavix and Oxycontin. The triage note also included a statement by the patient that he had been seen, at another ED, for similar symptoms two weeks prior and diagnosed with narcotics withdrawal.

A nursing flow sheet begun at 9:30 a.m. noted that the patient appeared diaphoretic and pale. He was doubled over with “multiple ecchymotic areas over his entire body,” and states “he is withdrawing from Oxycontin.” The on-duty physician (a moonlighting gastroenterologist) examined the patient and an intravenous line was established; he was treated with 1000 ml of normal saline. A second set of vital signs was recorded at 10:00 a.m. (HR 67, RR 20, BP 96/45).

The physician’s evaluation noted “moderate distress,” and on abdominal exam “faint bowel sounds, soft, nontender except for mild tenderness bilaterally in the lower quadrants... no rebound or guarding.”

Laboratory evaluation revealed a white blood count of 12.3; hematocrit normal; platelet count 346,000; and normal basic chemistry and liver function tests. Radiographs (KUB and upright) were interpreted to reveal a non-specific bowel gas pattern. The physician made a diagnosis of narcotic withdrawal, referring to the patient’s history of opioid dependence for chronic pain following his knee operation, as well as to a recent visit for abdominal pain to another hospital, where he was diagnosed with narcotic withdrawal. After treatment with Compazine and clonidine, improvement in the patient’s symptoms was documented.

The patient declined a referral to a detox center. He was discharged at 3:00 p.m. with a prescription for a clonidine patch and instructions to follow up for detox. He filled his prescription and went home. Later that evening, his wife found him on the bathroom floor, unresponsive. EMS providers, who were dispatched at 9:00 p.m., found him to be in an asystolic cardiac arrest; CPR was performed. He was transported back to the hospital, where CPR was continued, but died at 10:30 p.m.

Autopsy identified a sigmoid perforation with associated peritonitis and septicemia as the cause of death. A later finding of Ehrlers Danlos syndrome in the patient's daughter raised the possibility of a predisposing condition.

Case Study

Incidental Finding Not Followed

Clinical Sequence

About three weeks after swallowing a dental crown, a 39-year-old woman went to a thoracic surgeon who ordered a thorax CT scan, which confirmed that she had aspirated a foreign object. The radiology report also included an (incidental) finding of a 1cm x 6mm nodule in the patient's right upper lobe; follow up with a CT scan within three months was recommended. The report was posted immediately in the

hospital’s computerized system. There is no documentation of any direct communication between Radiology and the surgeon. The primary care physician did not receive a copy of the report.

Two days after the CT scan, a bronchoscopy was performed to remove the dental crown. During the procedure, the surgeon and Radiology discussed the CT scan, but it was not available in the OR. The patient did not return to the surgeon for recommended follow-up. The surgeon did not initiate follow up with her about the lung nodule.

Nearly three years later, a chest X-ray prompted by persistent shoulder pain showed a right apical mass. The patient was subsequently diagnosed with lung cancer. She expressed anger and sadness upon learning of the earlier CT finding of a suspicious mass, and requested a change of PCPs. Following two years of aggressive treatment, the patient experienced regional recurrence suggestive of metastatic disease, with a grim prognosis.

Case Study

Complications Follow Questionable Induction of Labor

Clinical Sequence

A healthy 30-year-old, with no known allergies, entered Labor and Delivery for induction at 40 weeks. This was her fourth pregnancy, including two previous live births. The patient had a McDonald's cerclage at 14 weeks gestation which was removed by her obstetrician at 36 weeks. Her cervix was notable for the laceration and scarring at the 4 o'clock position. Her obstetrician scheduled an induction of labor (the indication for this was not documented). Examination in Labor and Delivery revealed that her cervix was 1cm dilated. Pitocin was ordered to induce labor, and the obstetrician attempted rupture of amniotic membrane on three separate occasions over six hours without success. The fetal heart rate (FHR) tracing was reactive throughout the day. Pitocin was stopped in the late afternoon because the patient's cervix did not dilate. She was sent home with plans to return in a few days.

Six days later, the patient returned for a second induction.

9:00 a.m.

Her cervix was 1-2cm and long, and the FHR had mild-moderate variability. with a baseline of 140-150 beats per minute (bpm). Prostin gel was placed to ripen the cervix and Pitocin started "per protocol."

12:30 p.m.

Her cervix was 2-3cm dilated and the FHR tracing had moderate variability with occasional variable decelerations.

1:30 p.m.

She received an epidural for pain relief, and her cervix was about 4cm dilated. Her amniotic fluid sac ruptured spontaneously and a “small amount, blood-tinged” fluid was noted.

3:00 p.m.

Her cervix was 5cm dilated, the FHR was 140bpm with minimal variability and variable decelerations around the time of contractions.

7:00 p.m.

Her cervix was 8cm dilated and the fetal head at 1+/2+ station. The FHR was 160-170bpm with minimal variability and variable decelerations, some with slow return to baseline. The patient complained of left-sided pain and her epidural was reinforced.

7:30 p.m.

Her cervix was an “anterior lip.” The FHR was 170bpm with persistent variable decelerations.

9:00 p.m.

The FHR baseline was 170bpm with deep decelerations. An intrauterine pressure catheter was used to record contractions. The patient complained of severe pain and a fetal scalp electrode was applied.

9:35 p.m.

No cervical change. The FHR was 170bpm with deep decelerations. The obstetrician decided to deliver by cesarean section.

A female infant was found free-floating in the abdomen, requiring resuscitation. The mother's uterus and bladder had ruptured. The infant was severely asphyxiated with extensive neurologic injury, and died at three weeks.

Case Study

Communication Gaps Hinder Preventative Measures

Clinical Sequence

Because of her strong family history of breast and ovarian cancer, a 45-year-old patient was referred to a clinic that provides cancer risk assessment. She met with both an oncologist and genetic counselor, and reported that her mother was diagnosed with breast cancer at age 56 and that a cousin was diagnosed at age 30. Genetic testing was discussed

as an option, but the patient was concerned it would affect her health insurance because—at that time—legal protections for such information were not available. The patient was advised to follow up in a year in order to update her family history and review any new clinical information.

A year later, the patient was seen for the first time by a new gynecologist for annual breast and pelvic exams, which were considered normal. The patient told the gynecologist she wanted her ovaries removed, due to her family history. The gynecologist advised against an oophorectomy, explaining to the patient that her ovaries appeared healthy and she needed the estrogen because her risk for developing osteoporosis was high.

Within a year, the patient was diagnosed with ductal carcinoma in situ. Her oncologist updated her family history to include her breast cancer diagnosis, her sister's breast cancer diagnosis at age 46, and her maternal grandmother's ovarian cancer diagnosis at age 52—information she had provided inconsistently during prior history takings. The patient was placed on Tamoxifen.

Six months later, during her annual physical, the patient's gynecologist palpated a mass between the rectum and vaginal septum. The gynecologist told the patient that he would evaluate the ovaries during a laparoscopic surgery to remove

the mass. He told her he would only biopsy and possibly remove the ovaries if they looked abnormal. During surgery, the mass was found to be benign; the ovaries appeared healthy and were not removed.

At the following year's annual gynecologic exam and pelvic ultrasound, the patient again discussed removing her ovaries with the gynecologist. He advised against it as long as she was still menstruating, and because she was already showing early signs of osteoporosis. The gynecologist was unaware that the patient was taking Tamoxifen for her breast cancer, which countered the estrogen benefit of maintaining the ovaries.

Within six months of this exchange, the patient complained of lower pelvic pressure and pain and was diagnosed with ovarian cancer. She underwent a total abdominal hysterectomy, bilateral salpingo-oophorectomy, and sigmoid colectomy. She was found to have extensive additional adenocarcinoma involvement through out her pelvis, and her five-year prognosis is poor.

Case Study

Primary Complaint Masks Breast Cancer

Clinical Sequence

A 52-year-old mildly obese woman with a history of hypertension and fibrocystic breast changes was seen by her PCP for a physical exam. The patient had had yearly screening mammograms, which were negative, and she had no family history of breast cancer. The physician noted in the chart “multiple nodularity” of both breasts, but did not indicate the nodular findings were significant. A (previously-scheduled) screening mammogram conducted the following month showed no changes in the patient’s breasts.

One year later, the patient was seen again by her PCP and diagnosed with hidradenitis (a chronic, pus-producing disease process caused by obstruction of the hair follicles and secondary infection and inflammation of certain sweat glands). The PCP did not document his findings in the chart. The patient was treated with antibiotics, and returned 10 days later, when the PCP noted “hidradenitis improved.” No breast exam was documented at either visit. The patient already had an appointment for a prescheduled screening mammogram one month later.

The mammogram requisition form, under clinical history, noted “large increase left breast tissue 12:00 as opposed to right,” and the box next to the question Have you or your physician felt a lump in your breast? was checked YES (on the patient’s previous screening mammograms, this question was checked NO.) The mammogram results were reported as

normal. The physician did not initial the hard copy to indicate he had reviewed the screening mammogram report, nor did he mention the findings in the medical record. He did not discuss with the patient the increased breast tissue and presence of a lump that were mentioned on the requisition form and the hard copy of the report.

Seven months later, the patient was again diagnosed with hidradenitis, which resolved with antibiotics. On exam, the PCP noted a large node on the left axilla. When the nodes persisted during two re-examinations over the next four weeks, the patient was sent for a diagnostic mammogram followed by a biopsy. She was diagnosed with inflammatory breast cancer and underwent aggressive treatment. She died four years later at age 56.

Case Study

Blindness Following Spine Surgery

Clinical Sequence

A 20-year-old male with insulin dependent diabetes, injured his back on a submerged rock while jumping off a boat dock at a friend’s home. He was taken by ambulance to a local hospital, then transported to a Boston Emergency Department. He arrived at 8:30 p.m., Saturday, June 28th.

In the ED, The patient was seen by a neurosurgeon and an orthopedic resident. A neurological exam performed shortly after admission showed upper leg weakness and no reflexes in his lower extremities; X-rays revealed a burst fracture of his lumbar spine at L-4. The resident placed the patient on steroids and had him admitted. Over the next 40 hours, the patient's neurological condition improved, although he had decreased sensation below both knees, and no reflexes in either leg.

Monday afternoon, a staff orthopedic surgeon reviewed the patient's X-rays and advised the orthopedic resident that surgery was necessary. Tuesday morning, the staff surgeon discussed with the patient (and his mother) the risks of the surgery, including nerve and vessel damage, bleeding, infection, and non-union. Neither the surgeon, the patient, nor the record recall a discussion regarding the risk of vision loss.

The surgery started at 1:30 p.m. Wednesday with the patient on his back. The attending orthopedic surgeon (assisted by a general surgery resident) removed part of the vertebra and bone fragments at L-4. He then placed a cage in the area of the partially removed vertebra. Six hours after the procedure began, after verification from the anesthesia resident that the patient was stable enough for the second stage of the procedure, the patient was turned face down. The surgeon then mechanically secured the spine. He elected not to extend

the surgery further to remove one bone fragment in the spinal cord that he determined was not pressing on any nerve roots. The posterior surgery ended at 1:45 a.m., Thursday, July 3rd. During the 12 hours of surgery, the patient lost nine liters of blood, which required administration of 23,000cc of fluid.

Post-op, the attending surgeon left for a camping trip in Maine. The patient was taken to the ICU and remained intubated. His face was swollen from the fluid replacement and he did not open his eyes for most of the day, Thursday. Around 7:00 p.m., the patient complained he couldn't see. When the ICU staff was unable to reach the attending surgeon, they consulted with Ophthalmology and Neurology. Hyperbaric oxygen treatments were discussed. At midnight, another surgeon examined the patient, who was now blind. Testing revealed that damage to the posterior optic nerve—likely caused by the heavy blood loss during the spine surgery—had caused the vision loss.

In addition to the permanent vision loss, the patient also suffered permanent paralysis of the front muscles of his right lower leg, causing foot drop.

Case Study

Missed Opportunities to Diagnose Pancreatitis

Clinical Sequence

Four months after giving birth, a 28-year-old patient presented at her physician's office with complaints of epigastric, upper abdominal, and lower chest pain. She was seen by one of her physician's associates, who confirmed epigastric tenderness and diagnosed gastroesophageal reflux disease, or GERD. The patient openly disagreed, saying it did not "feel like heartburn."

Nonetheless, the physician prescribed ranitidine to reduce acid production. He also told the patient to make a follow-up appointment within four weeks if the pain did not subside, and that further diagnostic testing would be considered at that point.

The patient continued to experience pain, but did not make a second appointment. Two months later, when she brought her infant in for his six month visit, she sought out her primary care physician—even though she did not have an appointment. She conveyed what his colleague had diagnosed two months earlier and what medication she had been prescribed. The patient also informed him that the pain had not decreased. Her PCP wrote a prescription for another medication. He did not order any diagnostic testing.

Three months after that—five months after her initial complaints of discomfort— the patient returned to her primary care physician complaining of severe vomiting,

diarrhea, reduced urination, and upper abdominal pain so severe that it made her cry, over the previous 24 hours. He found epigastric tenderness and administered a “GI cocktail” of Xylocaine, a local anesthetic, and Maalox. He performed no laboratory tests or radiological studies. The patient was discharged to home.

Later that day, the patient became so ill that she presented at a local emergency department where she was diagnosed with acute pancreatitis. She was found to have acute renal failure/anuria and irreversible kidney damage. After several months of dialysis treatments, the patient underwent a renal transplant that later failed. She is currently on dialysis.

Case Study

Inadequate Supervision in the O.R.

Clinical Sequence

A 53-year-old female underwent total right knee replacement. Because the patient was large and her knee was arthritic-her bones were more dense than normal. The resident who was performing most of the procedure encountered more resistance than usual as he used a saw to cut a notch in the femur. The saw vibrated excessively, and the resident accidentally severed the patient’s posterior cruciate ligament and removed an excess amount of bone from the femur. The

largest available implant available in the OR was used, though a larger one would have fit better.

No explanation was given to the patient or her husband as to why the surgery took longer than expected or that unexpected complications had been encountered. In the operative note, the attending surgeon documented that the patient had no functioning posterior cruciate ligament, but did not state the reason.

One month post-op, the patient's knee dislocated. An X-ray showed that the implant was malaligned. For a revision surgery, the orthopedist used a larger implant to try to stabilize the knee and prevent dislocation. Postoperatively the patient had moderate laxity of her ligaments and the knee was unstable. The patient proceeded with physical therapy.

One year later, the patient had her other (left) knee replaced by the same orthopedic surgeon. The surgery was successful, but on the third day post-op, the patient's right knee dislocated again. A second revision was done and a still larger implant was used to attempt to stabilize the right knee.

The patient did well for about two years, then experienced another dislocation of her right knee. Because the patient's surgeon was traveling abroad, she was seen by a different orthopedic surgeon. This surgeon showed the patient on X-ray

that too much bone had been removed in the original surgery of her right knee. He explained that this caused her ligaments not to function properly, leading to the dislocations. A new total replacement of the right knee was successful; however, the patient has constant pain, is unable to climb stairs, and cannot stand for long periods. The likelihood is that she will need to have her right knee fused in the future.

Case Study

Narrow Diagnostic Focus in the ED

Clinical Sequence

29-year-old female with a one-month history of treatment (Tagamet) for presumed peptic ulcer disease (PUD) presented late at night to the Emergency Department (ED) with 36 hours of severe left-side abdominal pain. The patient was evaluated by both a resident and an Emergency Medicine attending. She had a soft abdomen with left upper quadrant pain, epigastric tenderness, and guaiac negative stool. A KUB revealed no obstruction and no acute abnormalities. She received Zantac and Phenergan without relief; she later received IV fluids, Maalox, viscous lidocaine, and Demerol (25mg IV x 3) with improvement in pain. After six hours in the ED-with improved abdominal symptoms-the patient was discharged home with instructions to follow-up with her PCP as soon as possible.

When the patient saw her PCP later that day, she described her ED visit, stating that she was still experiencing some abdominal discomfort. After further tests, including a repeat KUB, did not reveal any evidence of bowel obstruction, the PCP sent the patient home with instructions to return with any worsening symptoms.Later that afternoon the patient passed some bloody stool, which she attributed to her PUD. Six hours later, feeling *out of it*, her husband brought her back to the ED for another evaluation. She arrived tachycardic, hypotensive, pale, and in moderate distress.

In the ED, a repeat KUB revealed multiple loops of dilated small bowel consistent with a distal small bowel obstruction. In the OR, the patient was found to have bowel ischemia requiring two abdominal surgeries complicated by short-gut syndrome and a one-month hospital admission. The patient eventually returned home and to part-time work.

Case Study

Failure to Rule Out Bacterial Meningitis

Clinical Sequence

A previously healthy three-month-old (14 weeks) presented to her primary care physician's (PCP) office for a two-day fever. She was discharged with the diagnosis of a viral illness. Two days later she was taken to the Emergency Department (ED),

where her mother reported continued fevers, nasal congestion (for the prior two weeks), a runny nose, and a cough. Her temperature was 102.5°F, but she appeared, otherwise, well. No lab tests were ordered; the child was discharged home with the diagnosis of a viral illness.

Five days later, the baby was brought to her PCP's office with the primary complaint of no bowel movement and fevers up to 101°F at home for the past two days. She had been eating well and had good urine output. In the office, her temperature was 104.9°F, she was crying (but consolable), her tympanic membranes, oropharynx, and lungs were clear. Her neck was supple and no rashes were present. The PCP sent the baby to the ED for a fever work up.

In the ED, her temperature was 103.6°F; she was alert, but uncomfortable. A WBC was 14,290 with 46 bands, urinalysis showed trace protein and rare WBC; her urine and blood cultures were pending. The patient was observed for two hours, then discharged with Tylenol; her mother was told to call in a few days for the culture results. Post-discharge, her blood culture was found positive for streptococcus. The ED physician relayed this information to the physician covering for the PCP...who then informed both the PCP and the mother of these results.

The next day, the mother took her daughter to the PCP's office where she was found to be febrile, irritable, and sleepy. After reviewing the labs from the prior day, the PCP diagnosed bacteremia. He gave the patient antibiotic ceftriaxone 360mg IM, and told the mother to increase her fluids and follow up in 24 hours or go to the ED if the symptoms became worse. At 6 p.m., the mother brought her daughter to the ED due to inconsolable crying, gasping for air, left eye swelling, decreased oral input. and decreased urine output. Her temperature was 102.6°F, heart rate 200, and respiratory rate 60. She was crying, irritable, tachycardic, mottled, and had a capillary refill time of five seconds. She was given IV fluid, IV ceftriaxone, and IV vancomycin. A lumbar puncture was positive for meningitis. The patient was admitted to the PICU, intubated, and had a seizure and severe neurological injury leaving her blind and deaf. She has a seizure disorder and a ventricular peritoneal shunt.

Case Study

Missed MI Despite Family History

Clinical Sequence

A 42-year-old uninsured woman, who had not seen a doctor in 20 years, presented to the emergency department (ED) at 7:50 a.m., complaining of chest pain and trouble breathing. She was accompanied by her husband and her son, who helped

interpret because English was her second language. The husband reported that his wife had been experiencing chest pain since 11:00 the prior evening, which she treated with aspirin. In the morning, she had sudden onset of severe chest pain and fainted on her bed.

The patient was first seen by the ED attending and then by a resident. Her initial vital signs were: HR:107, BP:146/99, RR:29. Her chest pain was documented as "sudden onset, right-sided, sharp, under the right breast, started while the patient was lying in bed and worse with inspiration, movement, and palpation." The patient's medical history was documented by the resident as: "fainting spells, no family history of coronary artery disease or clots, father suffered a stroke."

At 8:00 a.m., the patient's initial EKG evidenced changes, which the ED physicians interpreted as non-specific, possibly due to the rapid heart rate. A chest X-ray did not indicate acute cardiopulmonary process. The differential diagnoses included acute costochondritis, pulmonary embolus, and atypical cardiac chest pain. The patient received IV Toradol for pain, which was reduced within an hour. Her labs were significant for elevated glucose, which was noted as potentially stress-related or non-diagnosed diabetes. At 9:30, a second EKG showed continued tachycardia, HR:103; and improvement of the previous ST wave changes (but still some

subtle abnormalities). The ED physicians interpreted the second EKG as reassuring.

At 10:30 a.m., while the patient was still being monitored, the son drove his father to his office so he could make arrangements to be with his wife. When the son returned to the ED at 11:00 a.m., his mother was being discharged with a diagnosis of rib pain, with instructions to follow up with a physician at a local clinic the next day, or to return to the ED for worsening symptoms. Her pre-discharge vital signs (documented at 10:15) were: HR:115 and RR:28. Her last recorded blood pressure (taken at 8:45 a.m.) was 140/99.

About four hours post-discharge, the patient's family called for an ambulance because of worsening chest pain. The EKG taken en route to the hospital showed signs of ischemia. Paramedics were unable to auscultate a blood pressure, and the patient died in the ED.

Case Study

Death by Complication

Clinical Sequence

A 39-year-old underwent surgical repair of his herniated left L4-L5 disk, with the understanding from the consent discussion that he would likely be discharged to home the

next day. The staff neurosurgeon scheduled the operation and was on hand during the initial positioning. The surgery was performed by the chief neurosurgical resident, who had done approximately 100 of these procedures. Near the end, the staff neurosurgeon returned to inspect the site and removed a small disk fragment.

Post-operatively, the patient's blood pressure dropped to 90/30 (40 points below his pre-operative systolic reading) and his heart rate increased. The chief neurosurgery resident saw the patient and ordered extra fluids. The patient's systolic pressure came up to 100; soon after, the chief neurosurgery resident went off duty and an anesthesia resident assumed responsibility. Three times, nurses informed the anesthesia resident of the patient's persistent low blood pressure. No further diagnostic testing was performed and the patient was not examined. At 8:30 p.m., the anesthesia resident decided to transfer the patient to the floor.

Upon arrival to the floor, the patient's blood pressure was 86/43. At 10:00 p.m., he was given Percocet for abdominal pain relief. No other record of his vitals signs was made until 10:40 p.m. At that time, the patient again became unresponsive when his systolic blood pressure dipped below 60. After the first event, fluids and oxygen helped, but a second event was followed by progressive respiratory decline leading to apnea—

at which point a code was called. At that time, his hematocrit was 14.

The patient was transferred to the medical intensive care unit. His abdomen was distended; an emergency thoracotomy was done and the aorta clamped. He was taken to the OR for a laparotomy; a large amount of blood was found in the peritoneal cavity and the surgeon could see that the left iliac vein was avulsed from the inferior venacava (apparently triggered when bone fragments adhered to it were removed). After receiving massive amounts of blood and blood products, the patient developed a coagulopathy. With no chance for his recovery, the patient's family chose to discontinue life support.

Case Study

Misplaced and Misread: Patient's Death Follows Multiple Mix-ups

Clinical Sequence

Over Easter weekend, a 70-year-old semi-retired sportswriter with metastatic prostate cancer had a ureteral stent placed to relieve obstruction. The staff urologist who performed the procedure signed off at its conclusion.

The patient had significant pain following the procedure and was admitted overnight for observation. The resident on duty consulted by phone with the urologist. Subsequently, two radiology residents reviewed the post-procedure KUB (kidneys, ureter, bladder X-ray) to check the placement of the stent and (mistakenly) judged it to be properly placed. The next afternoon, a radiology fellow confirmed the residents' (incorrect) judgment and the patient was discharged home.

On Monday morning, after two days of pain, the patient went to the hospital Emergency Department (ED). A repeat KUB suggested that the stent was not in proper position, and an abdominal CT scan was ordered to check the placement. Before the test was performed, the patient was assigned to a bed in the inpatient unit, but was kept in the ED to await his CT. During a nine-hour wait, the patient's wife repeatedly complained to the ED staff that her husband was in severe pain. The patient received analgesics in response. No explanation was given to the patient or his wife for the delay.

At 6:00 p.m., the ED resident who had ordered the CT checked on the status of this patient. He discovered that the patient had been removed from the CT schedule because another patient with the same name had received a scan and been discharged. He informed the patient that this name mix up was the cause of the delay and scheduled an immediate CT scan.

The scan showed that the stent had perforated the patient's ureter. A percutaneous nephrostomy was performed urgently under conscious sedation and a drain placed. Despite the sedation, the patient's pain made positioning difficult, and he needed to be restrained. Near the conclusion of the procedure, the patient suffered a respiratory and then a cardiac arrest. He sustained severe brain damage.

At the request of the family, a conference was convened several days later to review the event. The radiology and urology residents presented their part of his care, but could not agree on the chain of responsibility.

The patient died four months later. Although his prognosis had been poor prior to the perforation, his death was attributed to the complications related to his conscious sedation.