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INTERVENTIONAL RADIOLOGY

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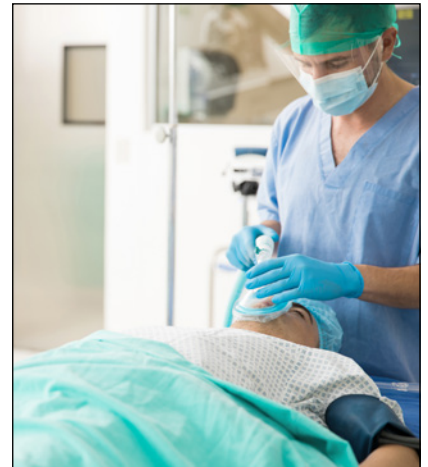
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PURPOSE

The purpose of The Journal is to promote legal nurse consulting within the medicallegal community; to provide novice and experienced legal nurse consultants (LNCs) with a quality professional publication; and to teach and inform LNCs about clinical practice, current legal issues, and professional development.

MANUSCRIPT SUBMISSION

The Journal accepts original articles, case studies, letters, and research. Query letters are welcomed but not required. Material must be original and never published before. A manuscript should be submitted with the understanding that it is not being sent to any other journal simultaneously. Manuscripts should be addressed to JLNC@aalnc.org. Please see the next page for Information for Authors before submitting.

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We send all submissions blinded to peer reviewers and return their blinded suggestions to the author. The final version may have minor editing for form and authors will have final approval before publication. Acceptance is based on the quality of the material and its importance to the audience.

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ARTICLE SUBMISSION

The Journal of Legal Nurse Consulting (JLNC), a refereed publication, is the official journal of the American Association of Legal Nurse Consultants (AALNC). We invite interested nurses and allied professionals to submit article queries or manuscripts that educate and inform our readership about current practice methods, professional development, and the promotion of legal nurse consulting within the medical-legal community. Manuscript submissions are peer-reviewed by professional LNCs with diverse professional backgrounds. The JLNC follows the ethical guidelines of COPE, the Committee on Publication Ethics, which may be reviewed at: <http://publicationethics.org/resources/code-conduct>.

We particularly encourage first-time authors to submit manuscripts. The editor will provide writing and conceptual assistance as needed. Please follow this checklist for articles submitted for consideration.

INSTRUCTIONS FOR TEXT

- Manuscript length: 1500 – 4000 words
- Use Word® format only (.doc or .docx)
- Submit only original manuscript not under consideration by other publications
- Put title and page number in a header on each page (using the Header feature in Word)
- Place author name, contact information, and article title on a separate title page, so author name can be blinded for peer review
- Text: Use APA style (Publication Manual of the American Psychological Association, 6th edition) (<https://owl.english.purdue.edu/owl/resource/560/01/>)
- Legal citations: Use The Bluebook: A Uniform System of Citation (15th ed.), Cambridge, MA: The Harvard Law Review Association
- Live links are encouraged. Please include the full URL for each. Be careful that any automatic formatting does not break links and that they are all fully functional.
- Note current retrieval date for all online references.
- Include a 100-word abstract and keywords on the first page
- Submit your article as an email attachment, with document title articlename.doc, e.g., wheelchairs.doc

INSTRUCTIONS FOR ART, FIGURES, TABLES, LINKS

- All photos, figures, and artwork should be in JPG or PDF format (JPG preferred for photos). Line art should have a minimum resolution of 1000 dpi, halftone art (photos) a minimum of 300 dpi, and combination art (line/tone) a minimum of 500 dpi.
- Each table, figure, photo, or art should be submitted as a separate file attachment, labeled to match its reference in text, with credits if needed (e.g., Table 1, Common nursing diagnoses in SCI; Figure 3, Time to endpoints by intervention, American Cancer Society, 2003)

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Acceptance will be based on the importance of the material for the audience and the quality of the material, and cannot be guaranteed. All accepted manuscripts are subject to editing, which may involve only minor changes of grammar, punctuation, paragraphing, etc. However, some editing may involve condensing or restructuring the narrative. Authors will be notified of extensive editing. Authors will approve the final revision for submission.

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Debbie Pritts
RN, LNCC

President, AALNC

A Message from the President

I became interested in legal nurse consulting in early 2000 after I received a postcard advertising a certificate course in legal nurse consulting. In the ensuing months I researched legal nurse consulting on the internet. In 2001 I took one of the courses offered, but struggled to get my business off the ground. I crafted my compelling elevator speech to spark interest in me and what I could do for an attorney, while making it feel natural in conversation. I still found it difficult to locate consulting opportunities and continued searching for ways to gain exposure. Then in 2003 I came across a picture of the WV Upper Ohio Valley AALNC chapter in our local newspaper (the social medium of the time). I was excited to locate a group of nurses who were successfully working as legal nurse consultants and I seized the opportunity by contacting a member. This was my key to success in legal nurse consulting! I found these nurses to be truly helpful and friendly, offering suggestions and inspiration on how to become successful.

My first step was joining AALNC. AALNC-sponsored conferences and networking groomed me to enhance my LNC skills. Many members suggested, asked, encouraged, and yes, pushed me to become more involved by presenting at local and national conferences and writing for a local chapter newspaper and the *JLNC*. I had never presented or written an article but with their guidance, encouragement and support, I got off to a start. My elevator speech paid off when an acquaintance contacted me about an LNC opportunity at the firm where she worked. The AALNC gave me the confidence I needed to accept that position and it has just grown from there. I flourished in my local chapter's activities; Karen Huff asked me many times to join a committee for our national organization. Initially I waved off these opportunities but finally took the next step and joined the Forum committee. The following year Sharon McQuown asked me to be Forum chair. That was overwhelming yet exciting, so I accepted. That led Karen Huff and Beth Zorn to ask me to consider applying for the board. And here I am. I am truly honored to be serving the AALNC and you, our members, as your 2017 – 2018 president.

I have attended every annual forum since I joined in 2003, always finding the education and networking invaluable. This year, I shared a slide of the faces of many LNCs I have met along my journey. I've been able to reach out to them when I needed information, research, support, whatever. This is what our amazing AALNC organization provides: a foundation of strong successful LNCs, "the achievers" in our industry, as past president Varsha Desai says.

As I return from this year's very successful forum in Portland, I'm again renewed with inspiration. I'm so happy that I took advantage of the opportunities presented to me by many members. My hope is that each and every one of you takes a look and asks yourself not only, "How can I benefit from our organization?" but also, "How can I contribute to our organization?" You all have distinct ways you can contribute creatively to polish each of our skills and when you present and share with others, that can lead to extraordinary results.

I'm looking forward to the coming year!

Sincerely,

Debbie Pritts, RN, LNCC

Editor's Note

We've just returned from the terrific annual AALNC Forum in Portland OR. Sharp eyes will note a few new editorial committee members; more will appear in the next issue. It was wonderful to see so many strong new, experienced, and seasoned legal nurse consultants coming together to share, support, and learn. Make your plans now to join us in Clearwater, FL on April 13-14, 2018!

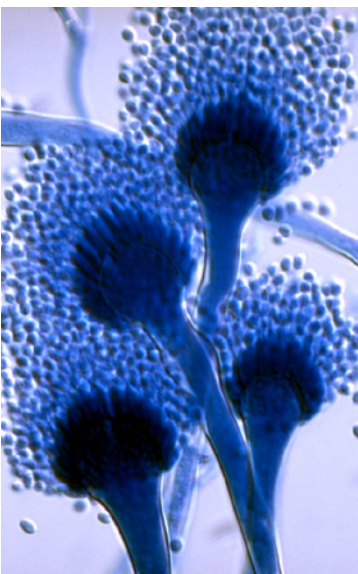
This issue, topics in interventional radiology, is getting put together just at the end of the first trial (of 14) involving fungal-contaminated preservative-free methylprednisolone, largely used for epidural injections for back pain. At least 64 people have died and more than 750 others in 20 states contracted fungal meningitis after being injected with materials from the New England Compounding Center in Framingham MA, licensed as a compounding pharmacy but found to be exceeding their scope of practice by manufacturing. According to the *Boston Globe*, December 17, 2014 and March 22, 2017,

In the summer of 2012, three batches of a steroid used to treat back pain were contaminated with a fungus, and more than 14,000 vials were distributed across the country. Doctors started to report that patients were getting sick from a mysterious illness. The illness was not identified until September 2012, when the Centers for Disease Control and Prevention determined there was a fungal meningitis outbreak. Investigators ultimately followed a trail of evidence back to NECC. Among the accusations in the indictment are that Cadden, Chin and others used expired ingredients in drugs, failed to properly sterilize drugs and failed to test drugs to make sure they were sterile. ... An FDA agent also said pharmacy technicians were instructed to lie on cleaning logs, showing rooms were properly cleaned when they had not been.



Wendie Howland
MN, RN-BC, CRRN,
CNLCP, LNCC

Editor, JLNLC



Aspergillus fumigatus



Exserohilum rostratum



Penicillium

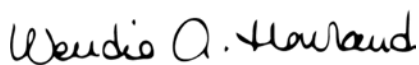
According to the CDC (HAN Dec. 3, 2012) microbial contamination was also found in NECC betamethasone, cardioplegia solution, and triamcinolone; they were also concerned about solutions used in eye surgery. Conditions in the facility were, frankly, appalling. The back door to the “sterile room” was found open to a recycling center on the same property and owned by the owner’s family (see photo of property at <https://goo.gl/images/NwGsKO>). There was standing water on the floor, obvious mold, dirty equipment, and rodent traces. CDC investigators cultured multiple Bacillus and fungal species, including Aspergillus, Cladosporium, and Penicillium. (Find a list of drugs and cultures at the CDC HAN Dec. 3, 2012, <https://emergency.cdc.gov/han/han00337.asp>).

In March 2017 federal court in Boston found co-founder Barry Cadden guilty of racketeering, conspiracy, and mail fraud; he escaped being held personally responsible for at least 25 deaths, second-degree murder. Sentencing is in June.

The supervising pharmacist, Glenn Chin, was arrested as he was about to board a flight for Hong Kong. His trial is next, for allegations of fraudulent record-keeping regarding sterility, among other charges. Another 12 defendants, including six pharmacists, the national sales director, and another co-owner, face charges including racketeering, mail fraud, conspiracy, and criminal contempt for transferring money from accounts after a court order freezing company assets; a company contracted to clean the facility face charges as well.

Though some vials appeared normal when dispensed to interventional radiology suites, some had visible black contamination or discoloration. Batch numbers were key to the ensuing investigations after patient illnesses occurred; it’s not clear if clinician suspicions prompted any investigation by facility or other agency professionals, or whether batch numbers were routinely recorded in patient records. Although procedures for compounding pharmacy and manufacturing licensing and ongoing surveillance have been upgraded since this major public health disaster, LNCs should be aware of these risks and of alerts from the CDC for immediate attention in any cases of infection contracted in similar cases. About 3500 patients or family survivors in many states have filed suits related to infections and related ongoing medical conditions.

Sincerely,



Wendie A. Howland
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Editor note: It has come to my attention that a phrase in my article in the March 2017 *JLNC* on volunteering for the Nurse Practice Advisory Panel in my state could lead to the perception that I do not support the mission of the AALNC as an organization of registered nurses whose practices are regulated by nurse practice acts and Boards of Nursing. I regret that misunderstanding, as this was not my opinion or intent. The phrase will be removed from the digital edition.

In the March 2017 *JLNC*, credentials for Patricia A. “Stormy” Green Wan, RN, BSHS, RNFA were listed inaccurately. We regret the error.

Test Your Case Screening Skills

You decide: reject, or investigate?
Answers on page 23.

Test Your Case Screening Skills

CASE #8

6/8/11 - Susan was referred to us by John Brown, Esq. She has DJD (back) diagnosed in 1980 and has had 9 back surgeries, 7 of which were done by Dr. Bill Clinton of Syracuse, NY. Her last surgery was 9/23/10 with Dr. Clinton (screws and rods - she thinks at L3, L4) and she doesn't know what happened and nobody has any answers but now she is bladder and bowel incontinent. Has to self cath. Consulted with a urologist/colo-rectal, Dr. Douglas, who has indicated to her that it was the surgeon's procedure that was responsible for her condition. Thursday she goes back to Douglas to see if she will need a permanent colostomy bag. Said DJD of the back runs in her family - dad, sister, nephew. She was hit by a car when she was 17 and she fell in the 70's and was put in traction. Other than that, no injuries. Her last surgery before this one was in 2002. She hasn't worked since 1992.

Is a widow living with relatives. Note: It was very hard to get any info out of her. I'm sure she's devastated. Said that nobody in her own area will sue Dr. Clinton.

CASE #9

Sam (22 yrs old) went to General Hospital after a car accident on 12/10/02. After the accident, he was coherent and conscious. On the 11th he was taken to the OR for ORIF of leg fracture. Had some type of aspiration incident during intubation. His course following the aspiration was complicated by the need for prolonged ventilation and neuromuscular blockade due to ARDS, septicemia, acute renal failure and paralysis following discontinuation of the paralytics. He remains paralyzed below the neck (but alert) today - two years later, residing in a nursing home due to his paralysis.

Check your answers on [page 23](#).



Visionary Treatment: Today's Interventional Radiology (IR)

Minda Lee Lockeretz RN, BSN, LNC

Keywords: Interventional radiology, radiology nursing, ARIN guidelines, standards of care, radiology perioperative period, radiology CPG, contrast media, metformin and contrast, radiology legal nurse consultant

The specialty service of interventional radiology (IR) is on healthcare's leading edge for less-invasive, lower-risk procedures. IR provides emergent, operative, critical, and radiological services to adult and pediatric populations with diverse needs. Covered topics include informed consent, perioperative regulation in IR, and IV contrast administration safety. Some radiologic and perioperative clinical care guidelines are highlighted for review.

SCOPE

For an interventional radiologist, the vascular system is the body's freeway, and the femoral, radial, and axillary arteries the on-ramps.

In acute "brain attack" stroke care in primary and comprehensive certified stroke centers, highly skilled neuro-interventional radiologists navigate the brain's arterial anatomy to restore blood flow to remote areas via endovascular clot retrieval. They also reduce risk or mitigate damage of cerebral aneurysm rupture by placing spring-shaped, flexible platinum coils inside delicate aneurysmal tissue. Successful cerebral aneurysm coiling through arterial puncture avoids open craniotomy and manual arterial clipping, with lowered risk and recovery time.

Interventionalists can also deliver precision oncological treatment through trans-arterial chemo embolization (TACE); directing chemotherapy-filled particles into secondary malignant liver tumors. Once deposited, the particles stop blood flow to the tumor for direct treatment, avoiding poorly-tolerated and often disabling effects of systemic chemotherapy.

Outside the vascular system, IR also provides techniques for precision pain management, tunneled pleural and abdominal catheters, and targeted abscess drainage using computerized tomography (CT) or ultrasonic guidance, amongst others.

The IR team of physicians, nurses, radiology technicians, and technologists provide a range of image-guided diagnostic, therapeutic, and definitive emergent, operative, critical, and radiological treatment services to adults and children. They may see diverse care needs as simple as a steroid hip injection and as complicated as treating the most delicate aneurysm.

The IR team of physicians, nurses, radiology technicians, and technologists provide a range of image-guided diagnostic, therapeutic, and definitive emergent, operative, critical, and radiological treatment services to adults and children.

Less-invasive, lower-risk special procedures using fluoroscopy, ultrasound (US), and computerized tomography (CT) for precise needle and catheter placement allow the interventionalist to navigate safe passage through the body to locate, diagnose and treat tiny, remote areas with significantly less patient pain and recovery time. Many procedures that were performed exclusively in the operating room have moved into interventional radiology, such as radiofrequency ablation, cryotherapy, kyphoplasty, implanting venous access devices (e.g., PORT-A-CATH®), and others. As medicine continually evolves, the specialty benefits from the latest visual and imaging technology, with highly sophisticated microwires, directional catheters, stents, and implantable media.

On a typical day in IR, outpatients arrive for routine and urgent care like para- and thoracentesis, PORT-A-CATH® and central line placement, pain management, computerized tomography (CT) or ultrasound guided biopsies of the lung, liver, kidney or other suspicious tissue locations. While accommodating the outpatient schedule, the inpatient queue fills with referrals from almost every service: gastric, nephrostomy, cholecystostomy, and chest tube placements; angiograms, venograms, and catheter-directed thrombolysis; and highly technical, difficult procedures like transjugular intrahepatic portosystemic shunts (TIPS) and spinal angiography.

The pacing and variety of IR case types and lengths offers nursing unique challenges from a fast-paced, often seemingly endless line of patients with acute, hyper-acute, and chronic needs. IR is considered a critical needs unit to provide pre-procedural, procedural, circulating, post-procedural, and discharging nurse-attendant care. The nurse's first obligation is providing safety, education, emotional and physical comfort to patients who may be apprehensive and in pain, or have life-threatening conditions. Documentation across the procedural continuum is critical for accurate medical records, device tracking, and physician to patient follow up.

GUIDELINES AND STANDARDS

As an extension of perioperative services, IR follows the operative guidelines and care standards of the Association of periOperative Registered Nurses (AORN). This includes (and is not limited to) the care environment. The IR team wear hospital-laundered scrubs and procedural sterile garments, monitor and regulate room temperature and humidity, and surgically prep and drape patients according to AORN's guidelines. Though IR's procedures are mostly performed through singular or dual needle placement, the attention to proper skin antisepsis, draping and procedural sterility still apply. Many procedures require long wires and cath-



Photo of Dr. Darren Orbach courtesy of Katherine C. Cohen with the kind permission of Boston Children's Hospital, Boston MA.

eters, so patients are often prepped and draped from head to toe. This allows a wide sterile area for instruments.

In many interventional radiology departments, radiology technicians (RTs) have dual responsibilities: performing imaging and scrubbing in. OR nurse staff teach and evaluate proper scrub technique, dry times, and

omitted. Perhaps the largest standard of care hurdle to overcome in IR is the timing of informed consent. Unlike planned surgery where a patient has time to develop a relationship and understanding with a physician, in IR, the patient and interventionalist may have their first encounter just outside the procedure room.

Unlike planned surgery where a patient has time to develop a relationship and understanding with a physician, in IR, the patient and interventionalist may have their first encounter just outside the procedure room.

other tenets of surgical asepsis and document them in the department's employee education logs. Legal nurse consultants should request these logs for IR-related cases.

The simplest expected standards of care may be performed incompletely, out of sequence, or inadvertently

In practice, many nurses find patients lack understanding of their physicians' treatment plans or how the treatments will occur. AORN's *Exhibit B: Perioperative Explications for the ANA Code of Ethics for Nurses* (AORN, 2015), highlights the perioperative nurse's responsibility to ensure the

patient's right to self-determination through informed consent (Association for Radiologic & Imaging Nursing [ARIN], 2014). The Association for Radiologic & Imaging Nursing (ARIN) also sheds light on radiologic specific informed consent in their published clinical practice guidelines (Association for Radiologic & Imaging Nursing [AORN], 2014). As the physician moves from case to case, the nurse must facilitate a timely, quiet meeting between patient, family or qualified representation, and performing physician to explain procedure risks and benefits. Then, the nurse as the patient's advocate ensures the patient's understanding through teaching and teach-back before documenting the patient's written authorization to proceed.

Because many physicians favor conscious sedation over general anesthesia for less invasive procedures, it is crucial for the physician to assess and document pre-sedation anesthesia scoring and tailor appropriate medication protocols to meet the patient's individual needs. Kyphoplasty, once done under laminar flow in the operating room, is now done with conscious sedation in the angiography

suite. Managing sedation and pain control during the procedure can be tricky when dealing with both narcotic-naïve and highly tolerant patients. A well-sedated, prone patient is easily awakened and may move involuntarily at the tympanic strike of a mallet to a “nail” in middle of his back. Careful pre-procedure nursing assessment and planning is vital for patient safety for a prone patient under moderate sedation, due to airway patency challenges. For this reason, many radiologists choose monitored anesthesia care (MAC) during these cases for optimal safety and medication effectiveness. (See [page 17](#))

DOCUMENTATION

When reviewing peri-procedure documentation, the LNC should look for evidence that the nurse reviewed and documented a professional, accurate patient assessment with targeted medical and procedural history, allergies, laboratory studies, and medications with the physician before the procedure. This provides necessary information for the physician to write pre-procedural and procedural orders unique to the patient. Clarifying correct patient identification, procedure, side, sight, allergies, and safe environmental conditions before any skin puncture or incision is referred to as a “time out.” The nurse documents the team’s agreement to proceed based on these as a critical step in the perioperative process. LNCs may access AORN’s pre-procedure checklist by going to www.AORN.org and searching “comprehensive surgical checklist.”

Documenting all implanted devices is a standard of care. These include stents, embolization materials, cement or glue-type media, tunneled venous catheters, inferior vena cava (IVC) filters, nephrostomy tubes, and others, and may include lot or batch numbers, serial

Because many physicians favor conscious sedation over general anesthesia for less invasive procedures, it is crucial for the physician to assess and document pre-sedation anesthesia scoring and tailor appropriate medication protocols to meet the patient’s individual needs.

numbers, or other identifying information. Product liability is a real concern. Tracking patients with implants is important for product recall and assessing untoward effects and events. Generally, specific implant information is found in procedural notes kept by the procedural IR nurse. Careful physician followup is essential.

Timing is important to know if removing an implant is necessary later. For example, inferior vena cava filters (IVC filters) can be particularly difficult and sometimes impossible to remove through conventional radiological means when grown into the endothelial walls of the vessel after years of silent residence.

VASCULAR CASES

Vascular access cases for hemodialysis and other patients with chronic illness needing long-term venous access solutions are common in IR. When arteriovenous shunts or fistulas require maintenance or revision, vascular access is needed urgently. IR is integral in restoring blood flow, dilating stenotic vessels and often de-clotting the venous access, allowing patients to resume their lives and schedules. Loss of vascular access through scarred, narrowed vessels provides significant challenges to the most skilled practitioner, and to the patient who is usually awake

and feels each jab of the needle. Loss of venous access can be life-threatening; some patients will need translumbar or transhepatic venous dialysis access. Nursing can help to provide thorough details of the patient’s known previous procedural history or direct the interventionalist to it, to avoid unnecessary prepping, draping, radiation, needle sticks and ultimate failure, at the expense of the patient. Documenting failed attempt locations is imperative in both nursing and physician procedural notes.

CONTRAST

The LNC can consult the independent Association for Radiologic & Imaging Nursing (ARIN) care standards and guidelines at www.arinursing.org. This includes specific radiological clinical guidelines about contrast media used in imaging for fluoroscopy and CT scans.

Contrast media are radiopaque oral or injectable substances that are used for clearly defining blood vessels and organs in general x-ray, angiography, computerized tomography, ultrasound, and MRI. There are many types of contrast and applications. In interventional radiology and CT, intravenous contrast contains iodine, to which many patients have documented sensitivity. Preventing anaphylaxis to contrast media is critically important. Many radiology depart-

As healthcare advances give us less-invasive, lower-risk ways to treat patients with a wide assortment of medical and surgical needs, IR is at the leading edge as a specialty.

ments have established radiologist prescribed medication protocols for pre-medication with oral or IV steroids and diphenhydramine. This premedication regimen starts at least 13 hours from imaging time. Nursing must document allergy history, confirmation of correctly administered preventative medications, and reporting previous contrast reactions to the radiologist for further medical assessment and planning.

It is important to account for all contrast media amounts given. “Some patients who receive IV contrast may experience deterioration of renal function (contrast-induced nephropathy) (Baerlocher, Asch, et al., 2013).” Contrast is excreted by the kidneys and patients who have chronic renal insufficiency walk a fine line between needing dialysis and not. To avoid subsequent contrast-induced nephrotoxicity, careful nursing review of medication and renal function lab work and communication with physicians regarding patient specific need is essential. ARIN’s guidelines for nephrotoxicity prevention or mitigation direct the care of the entire radiology team (Association for Radiologic & Imaging Nursing [ARIN], 2014).

With Type II diabetes mellitus on the rise worldwide, many patients take anti-hyperglycemic medications containing metformin. Metformin-associated lactic acidosis is due to the action of metformin in the liver. It can occur after IV contrast when contrast

results in transient or chronic renal failure, as the kidney cannot regulate acidosis normally. This is rare, but can be fatal in some patient populations (Association for Radiologic & Imaging Nursing [ARIN], 2014). Vigilant medication review of all patients receiving IV contrast should be performed pre-administration, and post-contrast instructions must be provided to the patient to hold metformin containing medications for forty-eight hours after contrast has been administered in case renal function is compromised. In addition, they should have renal function reassessed by their ordering physicians before metformin is restarted (Association for Radiologic & Imaging Nursing [ARIN], 2014). Sometimes contrast is deemed unnecessary by the radiologist, and in this case, prevention is the best medicine. Nursing provides a direct assessment, nursing diagnosis, care planning, implementation and evaluation of each patient’s individual needs and communicates them to the physicians and radiology team pre-procedure for consistent best-practice in contrast related imaging care. (Ed.: See also Contrast Extravasation, [page 13](#))

CONCLUSION

As healthcare advances give us less-invasive, lower-risk ways to treat patients with a wide assortment of medical and surgical needs, IR is at the leading edge as a specialty. As an interventional

radiology nurse providing day-to-day patient care, I can personally attest to seeing the benefits (and challenges) of many simple and complicated procedures performed through tiny puncture sites. From reanimation of hemiparetic limbs and speech post-acute stroke intervention to revascularization of clotted AV grafts and fistulas to preserve venous access, to the immediate pain relief of a patient’s vertebral compression fractures post kyphoplasty, interventional radiology is a daily wonder of science, technology, and medicine. LNCs working with cases involving IR will benefit by learning more about the complexities involved. 🐾

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Extravasation Injuries from Contrast Media in Radiology

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Keywords: extravasation, contrast agents, interventional radiology, pressure injector, intravenous therapy devices

The radiology department gives numerous intravenous (IV) contrast agents. These include paramagnetic agents for magnetic resonance imaging, contrast agents enhanced with a small amount of air for ultrasound procedures, and dozens of radiopharmaceutical agents in nuclear medicine. Iodinated contrast agents are used for regular projection radiography and for computed tomography (CT). CT scans may be done with or without contrast agents, but use of contrast will require a rapid injection over a very short time, and this combination can increase the risk of extravasation injury

to the patient. Extravasation is defined by the Infusion Nurses Society (INS) as, “inadvertent infiltration of vesicant solution or medication into surrounding tissue” (Gorski et al., 2016).

Remember normal serum osmolarity is between 280 to 295 mOsm/L. Any solution above 350 mOsm/L is hypertonic. Solutions above 900 mOsm/L are not recommended for injection through peripheral veins (Gorski et al., 2016).

Iodine enhances visualization of dense tissue in CT. There are 2 types, ionic and nonionic. Ionic agents have

extremely high osmolarity, from 1200 to 2400 mOsm/L, and are associated with high rates of adverse events. These are rarely used.

Nonionic contrast has a much lower osmolarity; however, most all are still hypertonic, with osmolarity from 290 mOsm/L to 844 mOsm/L. They are vesicants that can produce tissue damage, including necrotic ulcers.

PRESSURE INJECTION: RATES

For adults, volume injected is usually 100 to 125 mL, delivered with a specially-designed power injector pump

CT scans may be done with or without contrast agents, but use of contrast will require a rapid injection over a very short time, and this combination can increase the risk of extravasation injury to the patient.

at rates from 3 mL to 8 mL per second. Compare these these rates to a regular IV infusion at mL per hour: 3 mL/ second would be 10,800 mL/ hour; 8 mL/ second, 28,800 mL per hour!

These rapid rates are necessary to deliver the maximum amount of contrast to the organ to be visualized in the shortest amount of time. At 3 mL/second, injecting 100 mL would take 33 seconds; and 12.5 seconds at 8 mL/ second.

PRESSURE INJECTION: PRESSURE

A volumetric infusion pump usually will have a maximum pressure of ~5 per square inch (PSI). Pressure could rise anywhere in the system -- vein, catheter, or administration set-- due to a closed external clamp, kinked tubing or catheter, a venous valve, or catheter position in the vein. Most power injectors have a maximum infusion pressure rating of 325 PSI before alarming.

Short peripheral catheters are able to accept this level of pressure; however, some central venous catheters cannot. All devices within the infusion system – the catheter, extension set, and needleless connector should only be used for this purpose if they have a labeled indication for power injection. The legal cases I have reviewed do not involve any issues with failure of the devices being used and therefore manufacturers have not been named.

Many radiology departments now use warmed contrast; this decreases viscosity and thereby the force needed to inject.

POSITIONING

Large veins of the upper forearm or antecubital fossa are preferred for injection of contrast agents. CT scans of the chest and abdomen require the patient to extend both arms above the head during scanning, which likely to cause some bending of the elbow. However, this position brings the catheter tip, and the fluid jet, into direct contact with the vein wall, increasing the risk of extravasation. Special care is required to avoid any bending of the arm.

EXTRAVASATION

Neither volumetric infusion pumps nor power injectors have alarms related to changes in the fluid pathway. Only direct assessment of the infusion system and vein before, during, and after infusion can show whether any fluid has escaped from the catheter and vein.

The published rates for contrast extravasation are usually less than 1%. For a facility doing 12,000 CT scans with contrast annually, this would be approximately 1 extravasation per week. (Dykes, Bhargavan-Chatfield, & Dyer, 2015) Fortunately, most events are limited to only a small amount of contrast in the tissue and it heals without negative outcomes, but that is not always the case. After reviewing approximately 20 sets of medical records in lawsuits

involving contrast extravasation, I found they had several deviations of the standard of care in common.

STANDARDS OF CARE DEVIATIONS

American College of Radiologist (ACR) recommends using veins in the antecubital fossa or large veins of the forearm, and recommend rates of no more than 1.5 mL / second if a hand or wrist vein must be used (ACR, 2015). Areas of joint flexion like the hand, wrist, and antecubital have the highest rates of complications for all peripheral IV therapy; INS Standards of Practice state these sites should be avoided (Gorski et al., 2016).

Most reviewed cases had sites in the hand, volar (palm) aspect of the wrist, or the antecubital area. Radiology staff do not use arm boards to stabilize these joints during contrast injection. They may not have access to them or not know about the risks these sites create with movement and positioning. However, radiology technologists and nurses do have the responsibility for knowing these risks and facilitating safe injection by avoiding venous sites in any area of joint flexion.

Both INS and ACR recommend the use of plastic catheters over metal needles. However, the main problem is gauge (size). ACR states that a 20-gauge catheter is preferable for rates of 3 mL/second, yet many reviewed cases involved 18-gauge catheters.

ACR states, “Stable intravenous access is necessary,” yet provides no recommendations on how to ensure stability. INS Standards call for engineered catheter stabilization devices with joint stabilization (e.g., hand board). Tape and transparent membrane dressing are not adequate for catheter stabilization. Hand and elbow flexion is common with patient movement, e.g., transfers.



Perhaps the greatest problem is a lack of adequate site assessment before and during the contrast injection. Both ACR and INS emphasize this heavily. All devices, including short peripheral catheters, and sites should be assessed immediately before each use. In radiology, this means after patient positioning on the table and immediately before connection of the power injector administration set, even if the catheter was just placed.

Assessment includes:

- Visual inspection for changes in color
- Assess for presence of edema
- Manual flush with 5 to 10 mL saline via syringe
 - Do not use a saline flush from the power injector. A manual flush allows the operator to detect resistance, allowing further site inspection to find the problem.
- Aspirate blood return
 - Manual flushing allows for aspiration using slow, gentle retraction of the syringe plunger. Rapid, forceful aspiration can occlude the catheter lumen by pulling the vein wall or venous valve across the catheter lumen. Other tips for increasing blood return is use of a small syringe (e.g., 3 mL), and placing a tourniquet on the arm well above the catheter site. If those factors do not produce a blood return that is the color and consistency of whole blood upon aspiration, that site should not be used.

- Ask about discomfort at or around the site.
 - All patient complaints require careful attention. Many times, the patient complains of feeling cold in the area, a sign of infiltration/extravasation. Tingling or numbness are signs of nerve injury.

A short peripheral catheter should **ONLY** be used when it produces a brisk blood return, offers no resistance to flushing, produces no discomfort of any kind, and is less than 24 hours old. Older catheters have higher rates of complications.

ACR guidelines states that the CT technologist should remain with the patient for the first 15 seconds of injection time, observing the site. At the patient's very first complaint of pain during the injection, the technologist must stop the power injector pump immediately to limit the amount of contrast that escapes into the tissue. If stopping the injection is required, the technologist must start the procedure from the beginning, a process that uses technologist time. For this reason, some hesitate to interrupt the injection, allowing more contrast to enter the tissue.

TREATING EXTRAVASATION

ACR guidelines do not take a position on treating contrast extravasation with heat versus cold. However, there are at least 3 radiology studies supporting use of cold compresses (Amaral, Traubic, BenDavid, Reintamm, & Daneman,

2006; Wang, Cohan, Ellis, Adusumilli, & Dunnick, 2007; Wienbeck et al., 2010) and other publications reporting that applying heat exacerbates injury from extravasated hyperosmolar solutions.

DOCUMENTATION

Perhaps the most critical challenge in these cases is that there is rarely documentation from any CT staff. Contrast medium is a medication; IV catheter insertion and injection are invasive procedures. The absence of what, how, and where it was given, assessment, and outcome documentation is troubling at best. It also adds to case complexity, because the staff cannot remember the patient, event, or actions taken.

The investigating LNC should look for two other documents: first, obtain facility policies and procedures for peripheral IV catheter insertion, use in radiology, contrast administration, and complication identification and management. These should be compared to the applicable standards and guidelines from the American College of Radiology and the Infusion Nurses Society. Are the internal documents accurate and current? Did staff follow or deviate from the policy and procedure?

Second, obtain the staff education records on assessing and validating the competency of everyone involved in the patient's care. (Gorski et al., 2016) Effective July 1, 2015, the Joint Commission issued requirements for CT technologists to "participate in ongoing



Figure 1: The hand of a 50-year-old woman after receiving 100 mL of non-ionic contrast with a power injector

education that includes annual training on ... safe procedures for operation of the types of CT equipment they will use." (Joint Commission, 2015)

EXTRAVASATION OUTCOMES

Acute extremity compartment syndrome (AECS) presents with sudden, severe, unrelenting pain; this requires surgical decompression within 6 hours. Nerve injuries can occur with or without AECS and may develop into complex regional pain syndrome. Necrotic ulcers begin with blistering within a few hours and progress to necrotic ulceration. Figure 1 shows the hand of a 50-year-old woman after receiving 100 mL of non-ionic contrast with a power injector. She returned to the emergency department 5 hours after the CT. (Belzunegui, Louis, Torrededia, & Oteiza, 2011)

Patients at the greatest risk who require additional attention include those with barriers to effective communication, e.g., pediatrics and those with alteration in consciousness, such as sedation or dementia. Patients with impaired circulation or connective tissue disease, e.g.,

lupus or Raynaud's syndrome will have difficult venous access sites and may not perceive pain sensations appropriately. Patients with loss of muscle mass or subcutaneous tissue include older adults and cancer patients.

SUMMARY

Prevention of all extravasation injury is critical. This requires adequate policies and procedures written in accordance with evidence based standards and guidelines. Radiology staff must have the knowledge, critical thinking, and psychomotor skills to prevent this complication. Facilities must have adequate policies and procedures in place to protect patients, and staff must adhere to them. Contrast medium extravasation with permanent injuries are infrequent, but when they happen, they can be life-altering. 🐾

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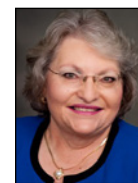
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A Comparison of Monitored Anesthesia Care (MAC) and Procedural Sedation and Analgesia (PSA): What LNCs Need to Know

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Keywords: Monitored anesthesia care, MAC, procedural sedation and analgesia, PSA, moderate sedation, conscious sedation

Monitored anesthesia care (MAC) is sedation administered by anesthesia providers. This may range from minimal to deep sedation. What was formerly called moderate (conscious) sedation is now procedural sedation and analgesia (PSA). PSA is a mild depression of consciousness achieved by the use of sedatives or a combination of sedatives and analgesics, and is often administered by RNs. Patients should be able to respond purposefully to verbal and tactile stimulation while under PSA, and no airway intervention should be necessary. A second nurse or associate is required to assist the physician with procedures because of the importance assigned to the task of monitoring the patient who is receiving PSA. This article addresses the differences between MAC and PSA, focusing on the role of the LNC in record analysis when a breach of standards of care is suspected. Case studies with Q&A are provided to assist the reader in understanding some challenges with reviewing possible sedation issues.

MONITORED ANESTHESIA CARE (MAC)

Monitored anesthesia care (MAC) is care of a spontaneously-breathing patient by an anesthesia provider, often including sedatives. The term covers situations from no sedation at all with an alert patient to approaching general anesthesia with the patient nonresponsive to painful stimuli. The anesthetist is responsible not only for administering the sedative, but also for monitoring, maintaining vital signs, and securing the airway. *Moderate (conscious) sedation* (procedural sedation and analgesia, PSA) may be given by non-anesthesia providers, such as ED physicians and RNs who have passed a competency assessment.

Procedure type and patient co-morbidities dictate what type of medications given. The anesthetist must obtain a thorough preoperative history and physical and communicate with the physician to determine the level of anesthetic required for the procedure.

MAC is often referred to as “twilight anesthesia,” as the patient may drift in and out of consciousness. Patients should be educated on the expected depth of anesthetic and likelihood of recall while under MAC. In a procedure requiring minimal to no sedation, e.g., cataract surgery, only midazolam (Versed) and fentanyl may be appropriate; a more invasive procedure, e.g., hysteroscopy with dilation, curettage and ablation, may require deeper anesthesia for comfort and safety.

Patients with comorbid conditions such as poor cardiac or pulmonary function may not tolerate a deeper anesthetic due to risk of cardiovascular collapse or inability to maintain adequate spontaneous ventilation. A patient with or at high risk for obstructive sleep apnea is at increased risk for loss of airway. Communication with the physician about the need for general anesthesia

with a secure airway should be considered and documented.

Procedures performed outside of the operating room create increased risk because the procedure may require prone or lateral positioning with the patient several feet away from the anesthetist, limiting ready access to the patient’s airway. A secure airway with spontaneous respirations regardless of anesthetic depth is optimal. Both the American Association of Nurse Anesthetists (AANA) and American Society of Anesthesiologists (ASA) have guidelines for monitoring, including pulse oximetry (SpO₂, for blood oxygen saturation), continuous electrocardiogram, blood pressure, and end-tidal carbon dioxide (EtCO₂, for ventilation). One problem that often arises is a decreased or lost EtCO₂ signal due to a patient breathing through the mouth while the cannula is in the nares. Signal loss can also occur with inadequate ventilation.

Even with these guidelines in place, many facilities do not have the equipment for EtCO₂ monitoring. Safe care remains the responsibility of the anesthetist. Monitoring can be done by other means, including esophageal stethoscope (for auscultation) or by holding the hand in front of the patient’s mouth and nose to feel exhaled breath. These can only be done in close proximity to the patient.

Risks of MAC include:

- patient movement
- disinhibition where the patient becomes confused and agitated rather than sedated
- aspiration
- apnea
- airway obstruction or loss
- desaturation, hypoxia, hypercarbia
- cardiovascular depression
- brain damage
- death

Rapid recognition of obstruction and apnea and immediate correction are vital. Because a patient can reach general anesthesia depth fairly quickly, emergency airway equipment with alternative adjuncts must be available, such as an oral airway, nasal trumpet, supraglottic devices, or other assist devices. General anesthesia with a secure airway is the back up to any other type of anesthetic.

Just because an airway becomes obstructed or a patient becomes apneic does not mean the standard of care has not been met, but they do require that the anesthetist recognizes the problem and corrects it rapidly prevent injury. Close monitoring of the patient and vigilance on behalf of the anesthetist are required for patient safety. Finally, staff must know when to call for help and when to abort a procedure.

PROCEDURAL SEDATION AND ANALGESIA (PSA)

Procedural sedation involves the use of short-acting analgesic and sedative medications to enable clinicians to perform procedures effectively while monitoring the patient closely for potential adverse effects. This process was previously (and inappropriately) termed “conscious sedation,” but because effective sedation often alters consciousness, the preferred term is now “procedural sedation and analgesia” (PSA). Providing sedation was once primarily the domain of anesthesia practitioners. However, emergency clinicians, critical care specialists, and various nurse specialists now routinely administer PSA (Frank, Robert L. et al., 2016) in many facility settings.

It can be challenging for the LNC to find relevant documentation, especially in an EMR. However, department/unit policies should be uniform throughout. ASA has responded to this challenging responsibility by developing practice guidelines for nonanesthesiologists who provide sedation and analgesia (Orlewicz MD et al., 2016).

Hospital nursing policies are generally based on evidence-based, comprehensive professional nursing organization guidelines. The Association of periOperative Registered Nurses (AORN), the American Association of Moderate Sedation Nurses (AAMSN), the American Association of Critical-Care Nurses (AACN), and the Emergency Nurses Association (ENA) have useful standards and position statements for reference. The American College of Emergency Physicians (ACEP) and ASA have also published guidelines, since this is not solely a nursing issue.

ACEP defines procedural sedation as "a technique of administering sedatives or dissociative agents with or without analgesics to induce a state that allows the patient to tolerate unpleasant procedures while maintaining cardiorespiratory function" (Orlewicz MD et al., 2016). RNs administer PSA under the supervision of a licensed independent practitioner (Ogg, 2016).

RN Scope of Practice is defined by state boards of nursing, state advisory opinions, declaratory rules, and other regulations. These direct whether it is within the scope of nursing practice to administer moderate sedation. Facility policies should be formulated in line with these directives (Ogg, 2016).

AAMSN's *Position Statement on the Role of the Registered Nurse in the Management of Patients Receiving Conscious Sedation for Short-term Therapeutic, Diagnostic, or Surgical Procedures* states, "The registered nurse will be knowledgeable and familiar with their [sic] institution's guidelines as well as The Joint Commission for Accreditation of Health Care Organizations (JCAHO), American Association of Nurse Anesthetists and the American Society of Anesthesiologists for patient monitoring, drug administration, and protocols for dealing with potential complications or emergency situations during and after sedation."



Another part of the *Position Statement* refers to the requirement for a second RN or associate to assist the physician with the procedure. The role of the sedation RN is to administer medications and monitor the patient, having no involvement in the actual procedure. This RN should have "...the knowledge and experience with medications used and skills to assess, interpret and intervene in the event of complications." The complete *Position Statement* can be viewed at this link: <https://aamsn.org/>.

A state-by-state list of guidelines and regulations is available on the ENA website (<https://www.ena.org/government/State/Documents/RNProceduralSedationRules.pdf>). This information was current as of June 1, 2015.

THE LNC'S ROLE

So what does this mean for the LNC reviewing a case of PSA with complications and compromised patient safety? The first line of inquiry should be details of staff involved in the procedure, with emphasis on determining that one RN was not responsible for sedation and assisting. The procedure note should state the names of all personnel and their roles.

Other documents needed are the facility policies on PSA and the training records of all RNs involved in the case. These should be in line with the state BON regulations, and will determine whether the RN's Scope of Practice for that state allows the administration of PSA and what training is required (e.g., competencies like ACLS). One caveat: not all BONs have specific directives on PSA. This is not unusual, but does not excuse the facility from having local policies that follow professional organization guidelines. These are accepted standards of safe patient care, according to accrediting organizations such as The Joint Commission.

The EMR often makes finding procedural documentation difficult. Sometimes it is easier to determine what is obvious by its absence, i.e., what experience tells you should be in the record but is not. At a minimum, charting should include:

- a vital signs grid/printout
- record of sedation levels
- medication administration sheet
- current H&P listing co-morbidities and medications

CASE STUDIES

When reading the scenarios, consider the following:

- Clinical situation, comorbidities, monitoring, staff present, documentation of critical procedure elements
- Data, both provided and missing
- What standard of care (SOC) was not met?
- “Red flags”?
- What scenario could have affected the outcome?
- Who was negligent -- and who was likely not?

Answers and discussion are on [page 22](#).

MAC Case Study

Prayer Ex Real. Toy v. Greenwood Leflore Hospital. No. 2014–CA–00440–SCT. 28 Jan. 2016

On September 17, 2008, a 54-year-old male underwent a right index finger amputation under monitored anesthesia care. He had multiple comorbidities, including cardiomyopathy, implanted cardiac defibrillator, and renal failure requiring dialysis via a right arm AV fistula. Intraoperatively, he was administered midazolam and fentanyl followed by a bolus of propofol to acquire an appropriate level of (deep) sedation for the patient to tolerate the procedure. A second bolus of propofol was administered after the patient was moving in response to the injection of local anesthetic.

Hypotension and bradycardia ensued, which the CRNA appropriately treated with ephedrine and atropine. He then began bag-mask ventilation. Positive EtCO₂ was noted and documented, but no blood pressure or pulse oximetry was recorded from 2:15-2:30 pm.

According to the testimony of the surgeon and CRNAs, the AV fistula had a notable pulsation until just before the

patient coded. A code blue was called at 2:29, and CPR was begun at 2:31. Normal sinus rhythm was noted on the monitor throughout, but was called pulseless electrical activity due to the patient's defibrillator and lack of pulse. He was intubated and resuscitated at 2:32, at which time he was purposefully reaching for the endotracheal tube, supporting the assessment of intact neurologic function. He was then transferred to the intensive care unit.

In the ICU, Toy responded only to painful stimuli until his death on October 5, 2008. His daughter, Tabitha Prayer, filed for wrongful death for overdosing with anesthesia, resulting in his neurologic outcome and ultimate death. The parties argued about the cause of the anoxic brain injury. "According to a radiographic exam taken on September 18, 2008, Toy still had neurologic function." In the ICU on September 21, his nurse did an assessment and noted that he was not being ventilated. Twenty-five minutes later, an ER physician reintubated Toy. It was argued that this resulted in the anoxic brain injury, not the anesthetic administered on September 17.

The defendants were found not guilty of wrongful death due to administration of anesthesia. While conflicting evidence was found in the records, this finding was supported on appeal.

What's your assessment? Answer is on [page 22](#).

PSA Case Study #1

A 55 year-old male with a long-term history of alcoholism was having a liver biopsy, as an outpatient in the IR suite, to investigate persistent elevation of his serum liver studies. At the beginning of the procedure there was one interventional radiologist performing the biopsy while RN #1 assisted him with the sterile procedure. Fentanyl 50 mcg x 2 doses and midazolam 4 mg were given IV. RN #2 was at the head of the bed continuously monitoring the patient. The circulating RN left the suite briefly to retrieve a necessary supply. During the short time of having one RN present, the MD asked RN #2 to “quickly” assist because the patient started to hemorrhage. As the bleeding took some time to resolve and RN #1 had not returned, the time that the patient was unattended became longer than expected. Suddenly the patient became apneic and was unresponsive. Code Blue was called but he subsequently expired.

The data below in Figure 1 was available post-procedure for review:

PSA Case Study #2

At 01:00 a 4-year-old girl, weighing 21 kg, was brought into the emergency department of a small rural hospital following an MVA in which she was unrestrained. She was immediately placed on an EKG monitor and a pulse oximeter device was clipped to her finger. She had clearly sustained a head injury noted by a hematoma to the right

Time	SBP	DBP	FIO ₂ /Delivery	O ₂ Sat	HR	RR	Cap RF	Neuro
14:50	150	85	2L/NC	96%	96	22		Awake
15:00	142	70	2L/NC	92%	80	16		
15:10	110	60	3L/NC	93%	92			
15:20	95	40	3L/NC	89%	115	10		Unrousable
15:30	60	38		75%	125	N/A		Coded
Physician: Dr. B.B.				Nurse(s): T.C. RN, G.A. RN				
Time Started: 14:50				Time Ended: 15:30				

Figure 1: Data of 55-year-old male patient, PSA Case Study #1

parietal area of the head and lacerations extending from the forehead to the right side of her head.

Upon arrival the patient was slightly lethargic but able to answer questions. Her mother was at the bedside and offered her daughter juice, which the patient easily swallowed. The patient was irritable and uncooperative. She complained of a headache that was described as 4/5 on the FACE scale. The nurse practitioner (APRN) caring for the patient called the physician, who had gone outside to smoke while on his break. The APRN ordered a CT of the head and asked the RN assigned to the child to notify the on-call radiology team. The radiologist said he would be there within 10 minutes and ordered 5 mg of oral morphine to keep the child calm for the procedure. The RN administered morphine 1 tsp. immediately.

The APRN began to remove some slivers of glass from the patient's forehead while the RN left to retrieve the appropriate suturing materials. At that moment a code was called in another room in the emergency department. The APRN recalled in his own deposition that he left the room to respond to the code believing the 4-year-old was stable and "her mother was also at her bedside." When the RN returned to the room with the suturing supplies (within 5 minutes according to her deposition), she noted that the patient's respiratory rate and effort were very shallow, and her heart rate had dropped to the 40's. The child was more lethargic and now obviously confused. She was immediately intubated and placed on a ventilator.

According to the APRN's deposition taken later, the physician was informed of the hematoma, the call to the radiology team and the order for oral morphine, and that the patient was answering questions as well as taking fluids without difficulty.

What's your assessment? Answer is on [page 22](#).

SUMMARY

MAC or PSA can present challenges for the LNC when reviewing a case for merit. Both types of sedation require patient monitoring, and staffing levels must be adequate to ensure patient safety. Record analysis should also focus on patient comorbidities and other factors affecting patient outcomes. The LNC plays a vital role in assisting attorneys to understand safe administration of sedation for procedures in various healthcare settings. 🐾

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networking at an annual AALNC conference in Atlanta and several mentors with giving her the final "push" and the confidence to go after her first client.

She attained a BSN in 1989 from Northeast Louisiana University in Monroe, Louisiana. In 2001, she completed her MSN in the Family Nurse Practitioner program from Belmont University in Nashville, Tennessee, where she currently resides. She is board certified by ANCC as a family nurse practitioner and a pediatric nurse practitioner. She can be reached at sldnashville@gmail.com



Joanne Walker, RN, BSEd, LNC attained a Bachelor of Science in Early Childhood Education at Towson University in Maryland

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Joanne returned to the US in 2003, studied legal nurse consulting and founded Clarity Medical Legal Consulting, doing behind-the-scenes reviewing cases for merit and testifying as an expert witness. She has participated in a joint webinar for AALNC and ABA, using her knowledge of GI standards of care. Joanne can be contacted at jwalklnc@yahoo.com



DISCUSSIONS

PSA Case Study #1

The patient was a 55-year old male with a long-term history of alcoholism having a liver biopsy, as an outpatient in the IR suite, to investigate persistent elevation of his serum liver studies.

Points to consider:

- What type of documentation did this facility use for outpatient procedures?
- Was there a current H&P?
- Did the intake RN do a complete admission, including all co-morbidities and current medications?
- What was the facility policy on staffing levels for IR procedures?
- Was the IR suite the optimal setting for this patient's procedure?

Comorbidities include chronic alcoholism and elevated liver enzymes. The scenario does not mention other labs,

so sepsis or chronic alcoholism could be responsible for the elevation of the liver enzymes. Though the dose of fentanyl might seem excessive, a typical alcoholic will require higher doses of sedatives and narcotics to achieve the desired level of sedation.

Red flags include that the RN assistant had to leave the room and then the RN assigned to monitor the patient was called away from the head of the bed to assist during an emergency. That scenario could definitely preclude a poor outcome for this patient. Staffing should be considered because RN #1 should not have left the room. Most facilities have a method of calling for supplies (in the first instance) and assistance (in the second).

Secondly, the competence and response of the physician must be considered. Determine whether his training and experience were adequate to perform this procedure. Also, the physician's calling the nurse to assist and remain

should be investigated. If the patient was hemorrhaging, how long did it take to get labs and begin giving blood? It is critical to prove how long the patient was unattended to know if that contributed to the poor outcome.

Documentation showed an obvious lack of monitoring according to the documents presented in this scenario. Look carefully at the hospital's policies and procedures for monitoring during an interventional radiology procedure to determine if two nurses should have been present at all times, how frequently all of the indicators on the flow sheet should have been assessed, and what parameters indicated the need to stop the procedure. The flow sheet only required the name of one RN. That constitutes a clear violation of organizational recommendations even though the facility approved this form. Of course, the code record would require scrutiny as well.

PSA Case Study #2

This was a child who had received a head injury while unrestrained in an MVA. Points to consider:

- Was this the most suitable venue to treat this pediatric patient?
- Consider staffing. Did the APRN and RN usually deal with adults?
- What is SOC for a radiologist when prescribing sedation for a child before actually assessing that patient, i.e. issuing a medication order using information of another provider (the APRN)?
- What is the facility policy for physicians taking breaks?
- Did the physician return immediately when Code Blue was called for another patient?

The staffing of this facility seemed inadequate for several reasons. There was only one medical provider in the ED (the APRN) when the physician took a break. The APRN left the child in the sole care of her mother while he responded to a code in another room. Also, the RN seemed to have a lot of responsibility. You would want to obtain training records for all on-duty staff to ascertain their level of competence with a pediatric patient.

Red flags in this case are:

- small rural ED
- a pediatric patient who was unrestrained in an MVA, with an obvious head injury, severity yet to be determined
- lethargy, irritability, and headache—all indications of a head injury that could worsen at any moment
- the absence of the physician with two critical patients in the small ED simultaneously, which most likely contributed to the complications of this patient (and perhaps the other patient)

Documentation issues include lack of times for:

- notification of the radiologist

- morphine administration
- return of the APRN to the child's room
- return of the RN to the child's room
- return of the ED physician to the department

Morphine is not advised in head injury, due to the possibility of respiratory depression. Not only would the radiologist be negligent for prescribing morphine, but the RN would also be held liable for giving it. Other concerns with the morphine include the dose. Morphine elixir is generally concentrated as 10 mg per 5 ml. If that was the case, as proven by the MAR, the RN administered twice the ordered dose, leading to the respiratory depression.

Breaches of the SOC:

- failure to administer an opioid at the dose prescribed
- failure to monitor a patient following administration of an opioid
- failure to use appropriate equipment to monitor a pediatric patient
- leaving a pediatric patient in the care of an untrained family member after administration of an opioid

The RN was not negligent to leave the patient in the care of the APRN while she retrieved supplies. However, the assigned RN was responsible for adequate monitoring of the patient. Leaving the patient unmonitored after receiving morphine was negligent, even if the mother was present. Non-medical persons are not expected or trained to recognize or respond to problems or symptoms of distress.

It is typical in most states for the physician to be responsible for the care provided by an APRN or PA practicing in the ED. In fact, the physician generally has to co-sign any work done by the APRN. Whether the MD signed the note or not, he would still be responsible for the care of the patient.

Check Your Answers

Test Your Case Screening Skills Page 7

#8 Reject

- Generally “failed back syndrome” cases present many challenges for plaintiff – hard to prove malpractice vs scar tissue and other problems resulting from multiple back surgeries.
- Complication of bowel/bladder incontinence may be worth investigating, but if operative report unremarkable, difficult to establish negligence.
- In this case, multiple prior back surgeries may have increased the risk of injury to sacral nerves.

#9 Investigate

Catastrophic injury

- Family initially contacted us because he remained paralyzed after paralytic discontinued.
- Review of records revealed no malpractice issue related to paralytics.
- There were, however, multiple departures related to method of intubation (LMA) which failed to protect airway in a patient at high risk for aspiration (**obese; GERD**).

Disposition - settled for \$5,300,000 at mediation



Could Your Expert Witness Cost Your Attorney \$1 Million?

James Hanus, RN, BSN, OCN, MHA

Keywords: Expert Witness, Motion in limine, Sanctions

The Fall 2015 JLNC included an article “Could Your Expert Witness Cost Your Attorney \$1 Million?” (Hanus, 2015) referring to a medical malpractice trial in the Philadelphia Common Plea Court, *Sutch v. Roxborough Memorial Hospital*. This is an update to this interesting cautionary tale.

SUMMARY:

Plaintiff alleged that the adult patient came to the emergency room and during work-up a chest x-ray showed a 2.3cm

nodule in the patient’s left lung. The suit alleged that, during the patient’s time in the ER and during the overnight hospitalization, none of the physicians involved in the patient’s care ever told the patient or family members about this lesion, nor did they recommend any follow-up physician consultations.

The suit alleged that 20 months later the patient was diagnosed with an 8cm lung mass and Stage IV lung cancer. He died 6 months later.

During a hearing regarding pretrial motions, plaintiff counsel submitted a motion *in limine* to prevent any witness from offering testimony regarding the patient’s past smoking history. The trial judge’s order of 5/16/12 stated that anyone who offers testimony in the case is prevented from “*presenting any evidence, testimony and/or argument regarding the decedent’s smoking history.*”

Fifteen days later the defense physician expert witness was asked by the defense attorney under direct examination

about the risk factors of cardiac disease. The physician expert testified that the patient had a 50-year smoking history. The plaintiff moved for a mistrial, which the judge denied and instead used a “curative instruction” to the jury to disregard the expert’s testimony. Four days later the jury awarded the plaintiff \$190,000.

The defense appealed the award based on the assertion that the court should have granted the motion for a mistrial, and a new trial was granted. However, that jury awarded \$2 million to the plaintiff.

The judge at the retrial (the same judge as the original trial) sanctioned the defense counsel \$946,197 to compensate the plaintiff for the cost retrial because the judge ruled that it was the defense attorney’s fault that the defense

expert witness physician violated the pretrial order. To enforce the sanctions the judge ordered the seizure of the personal assets of the attorney and of her firm.

UPDATE

In June, 2016 an appeal of the sanctions was heard by the Pennsylvania Superior Court in *Sutch v. Roxborough Memorial Hospital*, 2016 PA Super 126, June 15, 2016². In a unanimous decision, the Court reversed and vacated all of the sanctions by the trial judge.

The Court cited the reasons they overturned the sanctions:

- The sanctions were excessive
- The trial judge violated the attorney’s due process rights by not holding a hearing on the financial consequenc-

es of the sanctions, both personally and to her firm

- The court record did not support the sanctions
- The record shows that the expert witness was told by the attorney that any mention of the patient’s smoking history had been forbidden by the judge. In fact the record shows that two separate witnesses testified that they overheard the attorney inform the expert witness about the judge’s order.

The case then went back to the Philadelphia Common Plea Court, which then sanctioned the defense attorney for \$44,693 that the estate of the decedent claimed were incurred during the re-trial. The attorney appealed this sanction to the Superior Court of Pennsylvania which decided on November 15,

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2016 (Sutch v. Roxborough Memorial Hospital 2016 PA Super 251)³ to affirm the sanction.

The Supreme Court of Pennsylvania on December 5, 2016 issued a one-page order denying an appeal⁴.

STAY TUNED

This case continues. On January 5, 2017 *The Legal Intelligencer* reported⁵ that the defense attorney had filed a “praecipe to issue a writ of summons” against three attorneys and two law firms involved in this case and is seeking recovery of more than \$50,000. ☛

REFERENCES

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GLOSSARY

Motion in limine (*lim-in-nay*) n. Latin for “threshold,” a motion made at the start of a trial requesting that the judge rule that certain evidence may not be introduced in trial.

<http://dictionary.law.com/Default.aspx?selected=1291>

Praecipe (*pree-suh-pee* or *pres-uh-pee*)

A written order (also called a writ) that commands a defendant to do something or to show why it should not be done.

In this case, Writ of Summons and accompanying writ of summons that may be used to commence a civil lawsuit in a Pennsylvania state Court of Common Pleas. This Standard Document contains integrated drafting notes with important



explanations and tips for drafting the caption, the body of the praecipe, the signature block, and the writ.



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government and commercial insurance claims with an average success rate of

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XXVIII.4, December 2017 — Employment Law and
New Author Supplement

XXVIX.1, March 2017 — Product Liability, Medical
Devices, FDA, Toxic Tort

XXVIX.2, June 2017 — EHR Revisited

XXVIX.3, September 2017 — Trials

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