The Journal of
Legal Nurse Consulting

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▲ Liability Lessons for Legal Nurse Consultants
   Part Two: A Case Study with Risk Management Strategies

▲ Introduction to Dental Implants for the Legal Nurse Consultant

▲ Acetylcysteine (N-acety-L-cysteine):
   Antidote and Toxic Agent

▲ Nursing Malpractice: Costs, Trends, and Issues
The Journal of Legal Nurse Consulting

Purpose

The purpose of The Journal is to promote legal nurse consulting within the medical-legal community; to provide both 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.

Manuscript Review Process

Submissions are peer-reviewed by eminent professional LNCs with diverse professional backgrounds. Manuscript assistance can be provided upon request to the editor. Acceptance is based on the quality of the material and its importance to the audience.

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A Case Study with Risk Management Strategies .................................................................4
Julie Dickinson MBA, BSN, RN, LNCC, Elizabeth Zorn BSN, RN, LNCC, and Robin Burroughs, RN, CHRM, CPHRM
Legal nurse consultants (LNCs), like members of the healthcare field, must be aware of potential areas of professional liability exposure and employ risk management principles in their practice. This two-part series offers LNCs the opportunity to identify common LNC liabilities, assess their own consulting practice, and apply this knowledge as a means of engaging in risk reduction. In Part One, an overview of actual cases and claims involving LNCs was discussed to highlight the common areas of potential LNC liability, and key “take-aways” were presented for LNCs to apply to their own consulting practice. An in-depth case study is provided in Part Two, which offers a closer look at an actual lawsuit involving alleged LNC negligence and discusses the principles of risk reduction learned therein.

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Dental implants have been in dentistry for more than 50 years. In that time, the implant has evolved from a simple metal fixture to support a denture to a sophisticated titanium alloy, which can replace many teeth or simply one tooth in form and function. Dental implants have many unique features. They can be placed by any licensed dentist. Although dental implants are highly successful, they are not for every patient. Proper planning and execution of the plan play an important role in the success of the implant. Complications are rare but may be serious if vital anatomy of the jaw is compromised or injured during implant surgery. When reviewing a dental implant malpractice case, the legal nurse consultant must consider many factors, such as the patient’s dental and systemic health, the surgical procedure, the qualifications of the dentist, the informed consent process, the complication that precipitated the malpractice claim, and how the complication was addressed by the dentist.

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This article will address the antidote Acetylcysteine. A brief history of how Acetylcysteine evolved as the preferred antidote for acetaminophen toxicity is provided, even though the exact dose, duration of therapy, and its mechanism of action remain unknown. Included are the current United States (U.S.) Acetylcysteine guidelines. As legal cases are lacking, 15 case reports are identified, whereby minor to severe adverse effects have been attributed to Acetylcysteine therapy. Quality improvement recommendations are provided to assist the legal nurse consultant (LNC) when reviewing Acetylcysteine therapy cases for merit.

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Despite continuous efforts to educate nurses on the law and their professional responsibilities through nursing programs and continuing education courses, the number of nurses named as defendants in malpractice actions continues to increase. The National Practitioner Data Board (NPDB) classifies “professional nurses” into five licensure categories: non-specialized registered nurse, nurse practitioner, nurse anesthetist, nurse midwife, and clinical nurse specialist.

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Correction:
The Spring 2014 issue of The Journal of Legal Nurse Consulting originally published Eileen Watson, EdD, RN, MSN, ANP, GNP, LNCC’s article under an incorrect title and as a Department. Dr. Watson’s article has now been correctly published as a Feature under the original title. The Journal of Legal Nurse Consulting regrets this error.
A Time of Transition

Dear Colleagues,

Spring has always been a time of transition, and this year is no different. We are excited to share with you some forthcoming changes in the Journal and for AALNC.

In 2011, due to budget constraints and other factors, publication of the Journal was reduced from four issues per year to two. As shared at the 2013 AALNC Annual Business Meeting, held in conjunction with the Legal Nurse Consulting Educational and Networking Forum in Chicago, AALNC is back on stable financial ground. The Board is reinvesting money into the Association to provide you with the resources you need to succeed in the specialty practice of legal nurse consulting. One such investment is the Journal.

The Journal of Legal Nurse Consulting has long been a valuable resource for legal nurse consultants and other related industry professionals. It is a staple of our Association, and returning the Journal back to quarterly publication has always been the goal of the AALNC Board of Directors. The Board has developed a new vision for the Journal, and we are pleased to announce that we are taking steps to return to publishing four annual issues.

As you can see, the Journal is now digital! We understand how busy you are, and we are confident that you will find this new format to be valuable. Not only is it compatible with smart phones and tablet computers (such as iPhones and iPads), it is also interactive! Click on an item in the Table of Contents to go directly to that article. Click on an advertisement to see the company’s website.

In the coming issues, the Journal will also see a transition in its Editor. The AALNC Board of Directors wishes to extend our heartfelt thanks and appreciation to Bonnie Rogers for serving as the Journal’s Editor-in-Chief for the past four years. Under her leadership, the Journal has continued its standard of publishing high-quality, peer-reviewed articles, information, and resources to assist you in your practice. In addition, we thank Ann Peterson for serving as the guest Editor of the Fall 2014 issue of the Journal, which will focus on nursing home topics. More information about this specific evolution will be forthcoming.

Despite these transitions, what will not change is the caliber of the Journal. The AALNC Board of Directors and the Journal’s Editorial Board remain dedicated to maintaining the standard of excellence upon which the Journal has been built. This unwavering commitment to the Journal and to the Association will also continue through the upcoming transition in AALNC leadership at the 2014 Forum in Denver.

We hope that you enjoy the content in this issue, find the new digital format to be helpful, and embrace this time of transition for AALNC and the Journal of Legal Nurse Consulting.

Respectfully,

Julie Dickinson
President Elect, American Association of Legal Nurse Consultants

Elizabeth Zorn
President, American Association of Legal Nurse Consultants
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Questions? Email info@aalnc.org or call 877/402-2562.
Introduction

To provide legal nurse consultants (LNCs) with an understanding of potential areas of risk exposure in this specialty practice of nursing, Part One of this two-part series reviewed summaries of actual cases and claims involving LNCs to illustrate these areas, and it offered key “take-aways” for LNCs to apply to their own practice. These principles of risk reduction are further explored in this Part Two article through the examination of an actual lawsuit involving a LNC.

Professional liability claims may be asserted against nursing professionals working in a myriad of specialties, including legal nurse consulting. This case study involves a LNC who provided advice as well as written work products to an attorney-client.

Case Summary:

The insured was an associate’s degree prepared registered nurse who had recently completed her training and certificate course as a LNC. She then advertised her availability to the legal community for screening medical malpractice cases for “merit”. She was engaged by an attorney-client to review the medical records of a client he represented in a medical malpractice action. The attorney-client had managed a small number of medical malpractice cases but had never taken such a case to trial. Neither had the attorney ever engaged the services of a LNC.

The patient had undergone unsuccessful abdominal surgery for removal of a mass. The mass had been identified pre-operatively by both a computed tomography (CT) scan and magnetic resonance imaging (MRI) but could not be found by the surgeon during the operative procedure and was, therefore, not removed. The patient suffered additional postoperative complications, including the need for additional surgery and sought to sue the surgeon and the hospital for negligence.

The LNC accepted the assignment from the attorney-client to review the client’s medical records and provide her written findings. Following her review, she provided the attorney with a written statement that the surgeon and the hospital were both negligent in the patient’s care. She cited the surgeon’s failure to have copies of the CT and MRI films available in the operating room and the LNC further cited his failure to obtain the assistance of another surgeon when he was unable to locate the mass. She also noted the hospital’s failure to have appropriate procedures in place to ensure the patient’s care and safety. She included a statement in her report that if litigation were pursued, a physician expert witness would be required to medically certify that the surgeon acted outside the standard of care.

The attorney-client had not previously utilized the services of a LNC. In addition to requiring the LNC to review the medical records and provide a written assessment of her findings, he asked her to sign a certificate of merit. The certificate of merit was statutorily required when filing a medical malpractice action to verify that malpractice had occurred. Because of the LNC’s recent entry into the profession, she was unclear about her authority to sign the certificate and initially declined. The attorney and his paralegal repeatedly urged the LNC to sign the certificate of merit, and she eventually agreed to sign the document but did not date it and did not have her signature witnessed.

Approximately three months later, the attorney-client’s paralegal contacted the LNC and after considerable reassurance, convinced her that she indeed was authorized to
sign the certificate of merit. The attorney further coerced her into backdating the document to the date she had originally signed it and submitted her written assessment of the case. The attorney filed the case utilizing this backdated certificate of merit signed by the LNC. This issue became a major factor in the case as the court disallowed the plaintiff’s cause of action against the surgeon, in part, because the certificate of merit was not signed by a physician and was improper.

The patient sued the attorney and the LNC for negligence. The surgeon subsequently sued the LNC, her attorney-client and his law firm, alleging that they had engaged in “malicious prosecution, fraud, and civil conspiracy.” He further alleged that the LNC had acted outside her scope of practice and inflicted severe emotional distress upon him. The latter allegation pertained to her written report and opinion that the surgeon had breached the standard of care when, as alleged by the surgeon, she was not qualified to provide either a legal or medical opinion regarding the medical standard of care.

Because the surgeon asserted malicious prosecution, in order to successfully defend the LNC, it became necessary to prove that the surgeon had, indeed acted outside the standard of care. A physician expert was engaged and stated that the surgeon and hospital had breached the standard of care by: 1) failing to have the patient’s radiographs in the operating suite; and 2) not obtaining/providing assistance in the operating room when the known mass could not be located. The expert further stated that had he been asked, he would have signed the certificate of merit for the lawsuit against the surgeon.

The LNC then sued her attorney-client for repeatedly misleading her regarding her authority and for coercing her into signing and then backdating the certificate of merit. Her attorney-client subsequently entered into a cross-claim against his own LNC, stating she had misrepresented herself as competent to render legal opinions in medical malpractice matters. However, in his deposition testimony, the attorney stated that the LNC recommended consultation with a physician expert if he planned to take the case to trial. Clearly, neither the LNC nor the attorney was certain of the applicable statutory requirements for the certificate of merit or the LNC’s scope of practice, representing the primary cause for the subsequent litigation.

Several motions were filed by the multiple parties. The court refused the motion to dismiss the LNC from the surgeon’s case. She sought a settlement, but the surgeon’s attorney would not agree to a reasonable settlement amount. Court-ordered mediation of the surgeon’s case against the LNC was unsuccessful for the same reason.

Eventually, the surgeon’s claim against the LNC was settled for a five-figure amount. The LNC and her attorney-client dropped their cross-claims. The attorney-client settled the surgeon’s claim against him and his firm with payments on behalf of himself, his law firm, and his paralegal. The settlement amounts were confidential and are not available. Any settlement amounts awarded to the patient by the surgeon or hospital are unknown.

**Indemnity Settlement Payment:** Low five-figure range

**Legal Expenses:** Low six-figure range

The indemnity payment reflects only the payment made on behalf of the LNC to the surgeon. Expense payments reflect the cost for engaging the physician expert, court costs and legal fees to defend the surgeon’s case against the LNC as well as managing the cross-claims between the nurse legal consultant and the attorney-client.

**Resolution**

The LNC was deemed to have acted within her scope of practice in her review of the medical records and issuance of her findings. In the state where the incident occurred, only a physician was qualified to sign a certificate of merit. Therefore, by signing the certificate of merit, she transcended the scope of her practice. Further, she backdated a legal document and also signed the legal document outside the presence of a state-required notary public.

**Risk Management Comments**

The LNC was unclear regarding her scope of practice. She accepted an engagement with an attorney who had never previously worked with a LNC and who was insufficiently experienced in the management of medical malpractice litigation. She used some questionable legal terminology in her written summary of the patient’s records, but her opinions were within her area of clinical experience. She was unclear regarding her authority to sign the certificate of merit and did not verify her authority before signing the document. Finally, she backdated the document which she knew to be improper.

**Risk Management Recommendations**

2. Know and adhere to AALNC’s Code of Ethics and Conduct (AALNC, 2009).
3. Ensure the attorney-client is qualified and experienced in the type of case for which the LNC has been requested to work.
4. Clarify the specific roles of all members of the attorney-client’s team prior to accepting an assignment, including the roles of the LNC, the paralegal/legal assistant, the legal secretary, and the attorney.
5. Ensure that the attorney-client will provide adequate legal support and supervision to all members of the team.
6. Solicit information from the attorney-client about his or her expectations related to the LNC’s work product/advice, including whether the attorney-client desires the nurse to serve as a testifying expert.
7. Know and adhere to the applicable state/federal statutes related to expert qualifications in the state in which the LNC works.
8. Seek an objective legal opinion or contact the American Association of Legal Nurse Consultants for assistance if asked to perform a task that is previously unknown to the LNC or is in any way unclear regarding its appropriateness within the LNC’s scope of practice.

Valuable insight can be gained from reviewing real claims involving actual or potential LNC negligence. By learning and applying the risk management lessons discussed in this two-part series, the LNC can strive to minimize his/her liability exposure.

References

Julie Dickinson MBA, BSN, RN, LNCC has worked for Fontaine Alissi P.C., a defense law firm in Hartford, CT, since 2008. Since joining AALNC in 2007, Dickinson has been involved in numerous projects and committees and has authored and lectured on a variety of topics for the association. She served for two years as the founding President of the Connecticut Chapter of AALNC and is board certified as an LNCC. Since 2011, Dickinson has served on the AALNC Board of Directors and is currently serving as President-Elect.

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Introduction

Since their introduction into dentistry by Dr. Per-Ingvar Branemark in the 1960s, dental implants have become a highly successful, predictable, and cost-effective method of treatment for patients missing one or more teeth (Wittneben et al., 2013). Dental implants have evolved to become easier to place and restore. The dental implant of today is far superior in composition and compatibility than those of only 20 years ago. Dental implants today provide the patient and dentist with a plethora of options to restore form and function of the natural dentition (Romeo et al., 2004; Wittneben et al., 2013).

There are many brands of implants on the market today. Despite the wide variety of companies making root form dental implants, these devices share some basic concepts. Almost every implant in the market today is threaded like a screw with an internal connection for an abutment. The surface of the implant is roughened to increase the surface area and, hence, bonding strength of the implant to the bone. Many implants are also coated with plasma or hydroxyapatite to accelerate and strengthen bonding to the bone. Lastly, all implants are made of titanium or titanium alloy to ensure biocompatibility. Other implants such as staple and blade implants are available today, but constitute a small percentage of the implant market and thus will not be considered for this article (Aljateeli & Wang, 2013b; Romeo et al., 2004).

Anatomy of an Implant

A dental implant is a titanium fixture (post) that is surgically placed into the patient’s jaw bone. Once the dental implant has bonded to the bone (a process called osseointegration), the abutment may be placed (Sakka, Baroudi, & Nassani, 2012). The abutment fits into the center of the dental implant, is held into position with a screw, and protrudes through the mucosa into the mouth. A custom prosthesis is then fabricated to cover the abutment and service a functioning tooth. (See Box for glossary of terms).

Dental Implant Workup and Evaluation

Evaluation of patients for dental implant treatment includes a review of past medical history to determine suitability as candidates for surgery. Absolute contraindications for dental implants are rare and are a byproduct of the patient’s overall systemic health. Relative contraindications include use of tobacco, diabetes mellitus, Sjogren’s syndrome, use of bisphosphonates, active infection, heavy bruxism (teeth grinding), extended use of corticosteroids, inadequate interarch space, and advanced periodontal disease (Chanavaz, 1998; Ng, Wong, & Liston, 2012). Clinical evaluation of the patient’s existing oral health is also an important part of the workup.

Evaluation and documentation of existing caries, restorations, periodontal health, missing teeth, and occlusion class should be done. Pre-operative radiographs such as periapical (small radiograph limited to one of two teeth and designed to show the crown and apices of the teeth), panoramic plain film (panoramic radiograph of the maxilla, mandible, teeth, and associated structures), and/or panoramic radiographs will assist the dentist in treatment planning in the case. In selected cases, a Cone Beam CT (CBCT) may be appropriate to determine quality and quantity of bone, the proximity of adjacent vital anatomy (infra alveolar nerve, maxillary sinus, roots of adjacent teeth), and appropriate surgical placement of the dental implant (Chanavaz, 1998).

The three dimensional rendering of maxilla-facial structures with a CBCT provides the dentist with greater anatomic truth of the patient’s anatomy. This increased knowledge can translate into greater success for the implant dentist when employed properly in diagnosis, treatment planning, and treatment execution (Chanavaz, 1998).
If a patient does not have sufficient quantity of bone for dental implant, placement grafting may be done to provide suitable osseous anatomy to facilitate dental implant placement. Graft material can be taken from another species (xenograft) or the same species (allograft). Autografting from the chin, tibia, or hip may be indicated to provide sufficient volume of bone. In selected cases, use of synthetic grafting material, such as rh-BMP-2 may represent a suitable alternative to autografting in cases requiring large volumes of bone for dental implant therapy (AlGhamdi, Shibly, & Ciancio, 2010; Misch & Dietsh, 1993).

**Informed Consent**

As with all surgical procedures, dental implant placement must be accompanied by an appropriate surgical consent. The consent must include a diagnosis, the proposed procedure, the risk and benefits of the procedure, the possible alternatives to the procedure, and the possible consequences of not having the procedure performed. Factors that should be emphasized in the consent process and document include damage to the inferior alveolar nerve, damage to adjacent anatomy, and possible infection (Curley, 2011; Graskemper, 2005).

**Dental Implant Surgery**

The placement of a dental implant is a surgical event and thus requires appropriate informed consent. Once the patient is sufficiently anesthetized with local anesthesia, and sedation if preferred, a full thickness incision is made through the mucosa deep to the bone. Soft tissue is then reflected to expose the alveolar bony ridge. Next, using gradually increasing size drill bits, a hole (osteotomy) is created in the alveolar bone to receive the dental implant.

The preparation of the osteotomy is a delicate and precise process. Great care must be exercised to avoid inadvertent contact, damage to adjacent vital structures, and inaccurate placement of the dental implant. The size and position of the osteotomy in the jaw will be determined preoperatively by evaluation of x-rays, models, and the patient. A surgical drill guide, which directs the drill bits generating the osteotomy, may be fabricated to assist the surgeon in the placement of the osteotomy and implant. To minimize heat production when drilling, copious quantities of cool water or normal saline must be employed to prevent bone cell necrosis (Ng et al., 2012).

Once the osteotomy is prepared to the appropriate size, the dental implant is placed either by hand or hand piece under low speed and copious irrigation, until the platform surface of the dental implants is flush with the alveolar ridge. At this time, the initial stability of the implants is tested by reverse torque or radiofrequency analysis (Ahmad & Kelly, 2013; Makary, Rebaudi, Sammartino, & Naaman, 2012; Shokri & Daraeighadikolaei, 2013; Trisi, Todisco, Consolo, & Travaglini, 2011). The more stable the implant is in the bone initially, the more likely it will osseointegrate and be successful (Aljateeli & Wang, 2013a; Sakka et al., 2012).

Postoperative care includes meticulous oral hygiene at the surgery site. Oral rinsing with Peridex® is recommended. Antibiotics after implant surgery is common practice but has been shown to be of limited value (Esposito, Grusovin, Loli, Coulthard, & Worthington, 2010; Powell, Mealey, Deas, McDonnell, & Moritz, 2005). A postoperative visit one or two weeks after the surgical placement of the implant is recommended to assess patient healing. A post placement radiograph (periapical or panorex) is recommended to evaluate implant placement. After three to six months, the implant is uncovered and osseointegration is checked via reverse torque or radiofrequency. If the implant is integrated, it can then be restored (Ahmad & Kelly, 2013; Makary et al., 2012; Shokri & Daraeighadikolaei, 2013; Trisi et al., 2011).

**Dental Implant Benefits**

Implants offer the patient and dentist many benefits. They function as a foundation upon which a prosthesis can be fabricated to assist the patient in mastication, speech, and aesthetics. Dental implants can replace single or multiple teeth, depending on the patient’s needs, without altering the patient’s existing dentition. Because the dental implant is an intraosseous device, once restored, it produces stress on the bone. This stress helps to maintain bone volume and facial architecture, and according to Wolff’s law, ceases or at least minimizes atrophy of the remaining bone.

**Dental Implant Risk**

With proper treatment planning, placement, and restoration, properly placed dental implants represent minimal risk to the patient. As with any surgery, pain, bleeding, and possible damage to adjacent anatomy during surgery are possible. Postoperative infection with dental implants is rare but may occur (Wittneben et al., 2013). Dental implants and abutments rarely fracture but may if not restored properly. Failure to properly care for dental implants by practicing good oral hygiene can lead to peri-implantitis with significant bone loss, soft tissue recession, pain, and possibly loss of the dental implant (Sakka et al., 2012; Wittneben et al., 2013).

**The Implant Dentist**

Dental implants may be placed by any licensed dentist. In the United States, the majority of dental implants are placed by an oral surgeon, periodontist, prosthodontist, and general dentist. When a specialist, such as oral surgeon or periodontist places the implant, the restoration is done by a general dentist or prosthodontist. To increase the success with such team-oriented treatment, appropriate detailed communication between dental providers is essential to provide the patient with the best possible care (Ng et al., 2012).

There are many levels of training pertaining to dental implant surgery and restoration. Since implant surgery and restoration are addressed only on an introductory level in
some dental schools, most dentists and dental specialists placing and restoring implants gain their knowledge and experience through residency programs or through one of the many postgraduate implant institute programs taught in the United States or abroad. Implant teaching programs range from a weekend introductory course to an advanced curriculum lasting up to one year. In general, the longer programs provide more education and practical experience. That being said, attendance at such continuing education dental implant programs is not mandatory for a dentist placing and restoring dental implants (Wheeler & Bollinger, 2009).

There are three principle dental implant-focused organizations active in dentistry today, including the American Association of Implant Dentistry (AAID), the International College of Oral Implantologists (ICOI), and the Academy of Osseointegration (AO). Each organization functions to provide continuing education, credentialing, and mentoring to its dentist members. All have varying levels of educational experience and competence.

Complications

Some of the more common complications of dental implants include non-restorability due to improper placement, peri-implantitis, infection, fracture of the abutment screw, gingival recession, and loss of the implant secondary to its failure to osseointegrate. Most complications are limited and can be successfully addressed with local measures such as antibiotics, debridement, screw replacement, or soft tissue grafting. Failed implants and implants that demonstrates mobility or pathosis must be removed (Kohner, 1992; Wanner, Manegold-Brauer, & Brauer, 2013).

A significant complication of dental implant surgery is an encounter with the inferior alveolar nerve by the drill and/or dental implant. The incidence of documented “sensory disturbance” to the Inferior Alveolar Nerve (IAN) post implant placement ranges from 0% to 40% (Berglundh, Persson, & Klinge, 2002; Goodacre, Bernal, Rungcharassaeng, & Kan, 2003). Trauma to the IAN can occur in the preparation of the osteotomy by an encounter of the drill bit with the nerve, or direct contact of the implant with the IAN, or via pressure on the IAN by encroachment of the implant (Bagheri & Meyer, 2011). Any encounter with the nerve by the drill bit or implant can produce a variety of “neurosensory disturbances,” such as pain (allodynia), increased sensation (hyperesthesia), decreased sensation (paraesthesia), or total loss of sensation (anesthesia). The altered sensation of neurosensory stimuli may be transient or permanent depending on the degree to which the nerve is compromised (Bagheri & Meyer, 2011; Gregg, 2000; Meyer, 1996).

Treatment of the IAN injured patient must consider the etiology and type of injury. If post placement radiographs show no contact with the IAN, then it may be surmised injury occurred during osteotomy preparation. If the implant is seen on radiograph to be contacting, transecting, or encroaching on the IAN then the dentist should consider removing the implant in an attempt to minimize the injury (Bagheri & Meyer, 2011; Gregg, 2000; Meyer, 1996).

Nerve injuries can be divided into three principle categories: neuropraxia, axontomesis, and neurotomesis. In neuropraxia, damage to the nerve is transient and results in temporary interruption of sensory stimuli without damage to the anatomy of the nerve. Recovery should be complete in four weeks. In axontomesis, partial transection of the nerve takes place, producing interruption of sensory stimuli that may or may not recover. In neurotomesis the nerve is completely transected and total interruption of sensory stimuli (anesthesia) occurs. Spontaneous recovery is not possible. Dysethesia (painful sensation upon stimuli) often accompanies such an injury (Bagheri & Meyer, 2011; Meyer, 1996).

Upon recognition of any alteration in neurosensory status, evaluation and appropriate follow-up are important parts of any treatment of a patient with the nerve injury after dental surgery (Bagheri & Meyer, 2011; Strauss, Ziccardi, & Janal, 2006). Frequent, often monthly, evaluation of the nerve injury patient to assess recovery progression is important and can affect the ultimate recovery of the patient. Should recovery cease or the patient’s nerve condition exacerbate, appropriate referral to a specialist who addresses such injuries should be facilitated by the operating dentist. This should occur between three to six months post-surgery or immediately after an observed IAN injury (Bagheri & Meyer, 2011; Strauss et al., 2006).

The Legal Nurse Consultant Role in Evaluating Dental Implant Malpractice Cases

When reviewing a dental malpractice case, the legal nurse consultant (LNC) must start at the beginning. Was the patient a suitable candidate for dental implant therapy? As stated earlier, absolute contraindication for dental implant therapy is a factor of a patient’s overall health. Thus, a patient with advanced Alzheimer’s or Parkinson’s disease is not a candidate for dental implant therapy because of the lack of ability to properly care for the implants. Relative contraindications for dental implant therapy previously discussed lower the implant success rate.

The informed consent process should be critically evaluated by the LNC. The dentist must discuss the risk and benefits of dental implant therapy. The many options and alternatives to implant therapy (partial or complete dentures, crown and bridge, or doing nothing) must be addressed. Cost must also be part of the discussion, as finances often play an important and often deciding role in the final treatment plan.

The LNC should evaluate the dentist and/or dental specialist involved in the patient’s care. Since no special training is required or mandated to place and/or restore dental implants, lack of continuing education in dental implantation and/or membership in one of the three implant organizations mentioned earlier can indicate the dentist may not be current in his/her education and knowledge of dental
Dental implants represent a superior method of treatment for many patients missing at least one tooth. Proper utilization of implant therapy involves detailed treatment planning, diagnosis, and work-up in conjunction with skilled surgical placement and restoration. To place and/or restore dental implants requires considerable post graduate education via a residency or dental implant training program. Most complications involving dental implants are minor and can be addressed with minimal additional surgical or restorative care. Injury to the inferior alveolar nerve represents a serious condition that must be promptly and properly addressed by the surgeon. In evaluating a dental implant malpractice case, the LNC must consider many issues, including, but not limited to the patient’s acceptance of dental implant therapy, the dentist’s experience with implants, complications arising from the dental implant therapy, and the manner in which the complication was addressed by the dental professional.

Glossary

Dental implant: a metal fixture (post) that screws into the bone upon which an abutment and prosthesis are placed

Abutment: a metal or ceramic fixture that is placed into the implant and protrudes through the mucosa upon which a prosthesis is placed

Osteotomy: the hole created in the bone to receive the implant

Crown: the prosthesis that covers the abutment and functions in mastication, speech, and esthetics

Osseointegration: the process by which the bone and the implant chemically and mechanically bond

CBCT: Cone Beam Computed Tomography. A specialized radiological study that provides exceptional anatomic truth of the maxilla-facial structures

References


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Dr. Whitesides lectures on many contemporary topics in oral-maxillofacial surgery including dental implants, medical emergencies in the dental office, and risk management. He is currently on the faculty at the Medical College of Georgia Maxi-Course and the California Implant Institute.
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Acetylcysteine (N-acety-L-cysteine): Antidote and Toxic Agent

M. Thomas Quail, MS Ed, R.N., LNC, EMT-B and Edward W. Boyer MD, PhD

This article will address the antidote Acetylcysteine. A brief history of how Acetylcysteine evolved as the preferred antidote for acetaminophen toxicity is provided, even though the exact dose, duration of therapy and its mechanism of action remain unknown. Included are the current United States (U.S.) Acetylcysteine guidelines. Since legal cases are lacking, 15 case reports are identified, whereby minor to severe adverse effects have been attributed to Acetylcysteine therapy. Quality improvement recommendations are provided to assist the legal nurse consultant (LNC) when reviewing Acetylcysteine therapy cases for merit.

Introduction
The oral/inhalation formula of Acetylcysteine was approved by the U.S. Food and Drug Administration (FDA) in 1963 and is commonly used as a mucolytic agent for patients suffering from chronic bronchopulmonary conditions and as a preparation for diagnostic bronchial studies.

It is used (off-label) for the prevention of contrast-induced renal dysfunction and distal intestinal obstruction syndrome (meconium ileus equivalent) (Lexicomp Drug Reference Handbooks, 2013; U.S. Food and Drug Administration (US FDA) Approved Drug Products, 2013).

Acetylcysteine has long been used and became the recognized antidote for acetaminophen (paracetamol) toxicity and continues to be extensively studied as an antioxidant agent against other liver toxins (Culley & Krenzelok, 2005.; Dawson, Norbeck, Anundi, & Moldéus, 1984; Lee, Larson, & Stravitz, 2011; McNeil Consumer Healthcare, 2005, 2010; Millea, 2009.; Prescott, et al., 1979; Rumack & Bateman, 2012; Smilkstein, Knapp, Kulig, & Rumack, 1988).

Acetylcysteine is the N-Acetyl derivative of the naturally occurring amino acid cysteine (US FDA Center for Drug Evaluation and Research (CDER), New Drug Application (NDA) # 21-539, 2002). It is also known as Mercapturic Acid, N-acety-L-cysteine, N-acetylcysteine, or NAC (Lexicomp, 2013).

Background
Acetaminophen toxicity is the leading cause of acute liver injury and death from acute liver failure in the U.S. It is the number one analgesic reported to U. S. poison centers due to therapeutic misadventures or overdose (Algren, 2008; Bronstein, Spyker, Cantilena, Jr., Rumack, & Dart, 2012; Farrell, Tarabar, Burns, Fernandez, Van De Voort, 2012; Shannon & Salhanick, 2007; Smilkstein et al., 1988; Treinen-Mosle, 2003).

The latest annual report from the American Association of Poison Control Centers (AAPCC) identified acetaminophen as accounting for 165,552 (16.3%) therapeutic misadventures to include overdoses (Bronstein, et al., 2012). In addition, the AAPCC reported that acetylcysteine was administered to 25,408 patients (I.V. 18,423; P.O. 6,985) known or suspected to be toxic from acetaminophen (Bronstein, et al., 2012).

A patient who has acetaminophen toxicity has depleted their glutathione stores below 30%. Glutathione is an antioxidant that prevents damage to liver cells. When glutathione is depleted the toxic metabolite N-acetyl-p-benzoquinone imine (NAPQI) becomes readily available. NAPQI binds to the macromolecules in the hepatocyte, causing cellular death and hepatic necrosis (Algren, 2008; Kao et al., 2003; McNeil, 2005, 2010; Quail & Boyer, 2013; Shannon & Salhanick, 2007).

James (2013) reported that “… more than 400,000 preventable adverse events…” contribute to the death of patients while in the hospital each year, far surpassing the 1999 report by the Institute of Medicine (p.127). The LNC must be aware that acetylcysteine therapy is not without its share of controversy, complications, and risks. For starters, the medical literature identifies various treatment protocols, including dosing, ideal routes, and duration of therapy which are misleading and often confusing for the healthcare provider. In addition, a variety of adverse effects have been attributed to acetylcysteine therapy, ranging from nausea to death (Commission on Human Medicines, 2012; McIntyre, McDonald-Taylor & Greene, 2013; Mroz, L.S., Benitez, J.G. & Krenzelok, E.P., 1997; Pakravan et al., 2008.; Sandilands & Bateman, 2009; Waring, 2012.; Zyoud, Awang, Syed-Sulaiman, Sweileh, & Al-Jabi, 2010., Zyoud, Awang, Sulaiman, & Al-Jabi, 2011).

The LNC should be aware that acetylcysteine therapy-related anaphylactoid reactions occur (2%-77%) and iatrogenic dosing errors are common (33%-49%). Finally, children are at a greater risk, due to a potential for fluid overload, and require adjustments to the infusion volume when acetylcysteine therapy is ordered (Algren, 2008;
Acetylcysteine History

Older published literature tends to use the term N-acetyl-L-cysteine while newer published literature uses acetylcysteine. Rumack and Bateman (2012) and Waring (2012) eloquently describe the history and rationale for the use of Acetylcysteine as the antidote for acetaminophen toxicity. They also describe how the dose, duration, and continuation of therapy were based on published articles and case reports and not from FDA approved clinical trials. Today there are still many questions concerning Acetylcysteine therapy when determining an optimal dose and concentration, and adverse effects associated with this drug. In addition, the LNC must ensure that policies, procedures, and safety measures were in place during the oral (PO) or intravenous (IV) drug compounding, drug administration, and assay monitoring. The LNC must also determine if prophylactic measures, such as antiemetics, antihistamines, or corticosteroids, were provided in order to achieve the therapeutic benefit from acetylcysteine (Waring, 2008, 2012).

Acetylcysteine might protect the liver against paracetamol toxicity and debated the use of methionine which continues to be debated today (Senarathna, Sri Ranganathan, Buckley, & Fernandopulle, 2012; Terneus, Brown, Carpenter, Valentovic, 2008; Terneus, Kinningham, Carpenter, Sullivan, & Valentovic, 2007; Waring, 2012, p. 2).

As a result of these discoveries, Dr. Rumack applied to the FDA for approval of oral acetylcysteine as an antidote for acetaminophen toxicity in the U.S. The FDA required him to perform a prospective clinical trial to demonstrate its efficacy (Rumack & Bateman, 2012). Two published articles questioned the ethics of such a trial, which led the FDA to deny his request.

Rumack and Bateman (2012) reported the efficacy at that time “… was based on a small number of cases [which] showing [sic] substantial benefit” (p.92). Consequently, an understanding of acetylcysteine optimal dose, route, and duration of therapy remain lacking (Klein-Schwartz & Doyon, 2011; Rumack & Bateman, 2012; Smilkstein et al., 1988; Yarema, et al., 2009). In 1985, the FDA granted approval of Acetylcysteine oral formula as the antidote for the treatment of acetaminophen toxicity (Klein-Schwartz & Doyon, 2011; McNeil, 2005, 2010; Rumack & Bateman, 2012; Sandilands & Bateman, 2009; Smilkstein et al., 1988; Waring, 2012; Yarema, et al., 2009).

Next were concerns of controlling the adverse effects caused by the oral Acetylcysteine formula and for those patients who had contraindications to oral therapy. Acetylcysteine clinical effects, combined with the clinical effects seen from acetaminophen toxicity, are nausea and vomiting. Patients who truly cannot tolerate oral Acetylcysteine or who have severe acetaminophen toxicity may develop refractory nausea and vomiting (Kao et al., 2003; Smollin, 2010).

Contraindications to oral therapy are patients with an altered level of consciousness, bowel obstruction, gastrointestinal bleeding, ongoing activated charcoal decontamination, or young children (Algren, 2008; Culley & Krenzelok, 2005; Kao et al., 2003; Smollin, 2010; Yip et al., 1998). These concerns led to an intravenous formula
being developed; however, it was initially only available in European countries.

After years of success using the intravenous formula, U.S. physicians were prompted to develop a protocol and begin administering oral Acetylcysteine intravenously (off-label). This was done by first filtering the oral formula and then injecting it. This decreased the adverse effects from oral Acetylcysteine, hospital length of stay, and the cost. (Algren, 2008; Culley & Krenzelok, 2005; Gonzalez & Hinson, 2013; Kao et al., 2003; Rumack & Bateman, 2012; Sandilands & Bateman, 2009; Tomaszewski, 2006; Waring, 2012; Yip et al., 1998). This latest protocol decreased therapy from 72 hours to 20 hours and from an estimated cost of $212.30 (IV) to $34.30 (PO given IV) based on 2004 values according to Culley and Krenzelok (2005) study.

In 2004, the FDA approved an intravenous formula of Acetylcysteine to be administered over a 20-hour period, based on Prescott’s 1979 European protocol. The original approval consisted of a loading dose being infused over 15 minutes followed by two maintenance doses being infused over four and 16 hours respectively (Klein-Schwartz & Doyon, 2011; Prescott, et al., 1979; US FDA CDER, NDA 21-539, 2002; Waring, 2012).

In 2006, the loading dose time was changed from a 15-minute infusion to a 30-minute infusion, due to the high rate of adverse effects that were being reported. This resulted in the current 21-hour Acetylcysteine infusion regimen (Culley & Krenzelok, 2005; Elms, Owen, Albertson, & Sutter, 2011; Hayes et al., 2008; Klein-Schwartz & Doyon, 2011; McNeil, 2005, 2010; Smollin, 2010; US FDA CDER, NDA 21-539/S-004; US FDA Approved Drug Products, 2013; Waring, 2012).


Acetylcysteine Presumed Mechanism of Action

Acetylcysteine chemical structure is considered comparable to glutathione, the body’s protective mechanism against liver toxins. As glutathione becomes depleted, because of acetaminophen toxicity, glutathione stores are activated to defend against the toxic metabolite, NAPQI. If glutathione stores become significantly depleted, the liver cells become necrotic. It is thought that Acetylcysteine acts like glutathione and protects the liver from NAPQI (Sandilands & Bateman, 2009; Shannon & Salhanick, 2007).

Harrison, Wendon, Gimson, Alexander, and Williams (1991) demonstrated that patients with fulminant hepatic failure benefited from Acetylcysteine therapy by increasing tissue oxygen consumption. Klein-Schwartz and Doyon (2011) later reported that NAPQI-induced cellular injury causes the tissue hypoxia while, “...acetylcysteine improves … the microcirculatory blood flow in the liver and other organs by increasing oxygen consumption” (p. 120).

Elms, Owen, Albertson, and Sutter (2011) then reported that acetylcysteine has four basic mechanisms of action. It limits acetaminophen toxicity by the following:

- replenishing endogenous glutathione
- directly converting the acetaminophen metabolite NAPQI to a non-toxic metabolite
- facilitating the increased formation of N-acetyl-paminophenol-sulfate
- buffering cellular damage from NAPQI by acting as a reducing agent (p.1)

Waring (2012), who later reported in animal studies of paracetamol-induced liver injury, suggested that a “…primary mechanism of acetylcysteine is the provision of cysteine to stimulate replenishment of glutathione to allow for the detoxification of NAPQI” (p.2).

He continued, “…Acetylcysteine prevents glutathione depletion and minimizes hepatocyte injury caused by a number of different toxins” suggesting “…that the therapeutic mechanism of Acetylcysteine may be more complex than [just the] restoration of glutathione alone” (Waring, 2012, p. 2).

Decontamination

Patients suspected of acetaminophen toxicity must first be decontaminated using the current standard of care (activated charcoal). Extended release acetaminophen, massive acetaminophen overdoses, or acetaminophen combination products may require additional decontamination (multi-dose activated charcoal, lavage, hemodialysis, or hemoperfusion), in addition to the administration of Acetylcysteine therapy, all within a timely manner (McNeil, 2005, 2010; Smith, Howland, Hoffman, & Nelson, 2008).

Determine if Toxic

Though Matthew’s work (Rumack & Bateman, 2012), theorized acetaminophen toxicity was based on its half-life, clinicians should not determine if a patient is toxic based on acetaminophen half-life when they are considering Acetylcysteine therapy (Dart, et al., 2006; Gosselin, 2013). The clinician determines if the patient is acetaminophen toxic based on the patient’s history and a true four-hour acetaminophen serum level plotted on the modified Rumack-Matthews Nomogram (Quail & Boyer, 2013; Shannon & Salhanick, 2007). Acetaminophen levels obtained prior to four-hours or after 24-hours can not be interpreted using the nomogram (Dart, et al., 2006; Gosselin, 2013).

Extended release acetaminophen or acetaminophen combination products require additional acetaminophen assays four to six-hours after the initial assay, to ensure that a peak toxic level has been reached (McNeil, 2005, 2010). Serial acetaminophen levels are not necessary to follow once the acetaminophen assay begins to decline. If either the initial acetaminophen level and/or the true four-hour level is
that, “regardless of [acetylcysteine] route of administration (Acetadote Package Insert, 2013; Lexicomp, 2013). The LNC must be aware that there are many different Acetylcysteine protocols used for acetaminophen toxicity therapy in the medical literature, within and outside the United States. These include a 24, 52, 62, and 72 hour oral therapy and a 20, 21, 45, 48, and 52 hour IV therapy (Gosselin, 2013; Kao et al., 2003; Perry & Shannon, 1998; Prescott, 2004; Shannon & Salhanick, 2007; Waring, 2012). Smollin (2010) and Hayes, Klein-Schwartz, and Doyon, (2008) report that these different hours of therapy published in the older medical literature has lead to confusion over when to stop treatment, because it varies from the current therapy and protocols and is often misleading. As a result, health care providers have generated Acetylcysteine treatment guidelines that vary from a definitive timeline endpoint, which supports the notion that precise protocols are of lesser importance than the timeliness of Acetylcysteine administration.

### Dosing Therapy

The LNC must be aware that there are many different Acetylcysteine protocols used for acetaminophen toxicity therapy in the medical literature, within and outside the United States. These include a 24, 52, 62, and 72 hour oral therapy and a 20, 21, 45, 48, and 52 hour IV therapy (Gosselin, 2013; Kao et al., 2003; Perry & Shannon, 1998; Prescott, 2004; Shannon & Salhanick, 2007; Waring, 2012). Smollin (2010) and Hayes, Klein-Schwartz, and Doyon, (2008) report that these different hours of therapy published in the older medical literature has lead to confusion over when to stop treatment, because it varies from the current therapy and protocols and is often misleading. As a result, health care providers have generated Acetylcysteine treatment guidelines that vary from a definitive timeline endpoint, which supports the notion that precise protocols are of lesser importance than the timeliness of Acetylcysteine administration.

### PO Formula

Rumack’s initial U.S. application for oral Acetylcysteine therapy was based on 60 hours, because of the half-life seen with acetaminophen toxicity. The FDA then added a safety margin to his protocol leading to the current 72-hour oral protocol (Rumack & Bateman, 2012; Prescott, 2004; Waring, W. S., 2012).

Acetylcysteine dosing consists of a “loading dose” followed by “maintenance doses.” The loading dose is not well tolerated and approximately 50% of patients vomit (Culley & Krenzelok, 2005; Waring, 2012). If at any time the patient...
vomits any of the oral formula dose within one hour after administration, that dose must be repeated until the entire treatment protocol is completed. Methods to decrease the nausea and vomiting include antiemetics, nasogastric tube, and/or using the IV formula (Culley & Krenzelok, 2005; Waring, 2012).

Rumack and Bateman (2012) and others reported, patients who present 16 to 24 hours after ingestion have demonstrated that acetylcysteine oral formula provided a better protection to the liver. This is thought to be most likely due to the quantity of the loading dose and the first pass effect of metabolism (Elms, et al. 2011; Gosselin, 2013; Hayes et al., 2008; Klein-Schwartz & Doyon, 2011; Prescott, 2004; Smilkstein et al., 1988; Ternullo, 2006; Waring, 2012; Yarema, et al., 2009).

Acetylcysteine is thought to be beneficial for patients preventing greater than 24-hours; however, additional research is still needed. A toxicologist consult is prudent for these patients (Lexicomp, 2013; O’Geen, et al., 2013; Rumack & Bateman, 2012; Yarema, et al., 2009).

The recommended standard protocols used in the U.S. that can be modified during a toxicologist consult are:

**Acetylcysteine TREATMENT PROTOCOLS (U.S.)**

**Oral (PO) Formula = 72 hour protocol**

**Adults and Pediatric Patients**
- The 72-hour protocol consists of 18 doses. The total dose delivered is 1,330 mg/kg (Acetadote, 2013).
- Elms, et al. (2011) reported that disadvantages to the oral protocol are poor tolerance and poor adherence to the treatment regime.
- Acetylcysteine has the odor of rotten eggs and may be unpleasant to ingest (Sandilands & Bateman, 2009; Klein-Schwartz & Doyon, 2011).
- Drinking the solution through a straw with the container covered and the formula over ice decreases the odor of the oral formula (Lexicomp, 2013).

**PO Dosing**
- Dilute oral solution with a soft drink or orange juice to produce a 5% solution.
- Loading dose =140 mg/kg x 1 dose
- Maintenance doses of 70 mg/kg every 4 hours, times 17 doses until all doses are administered (Lexicomp, 2013; Smollin, 2010).

**PO ADVERSE EFFECTS**

**Mild:** Oral acetylcysteine is associated with nausea and vomiting in 50% of acetaminophen poisoned patients. Diarrhea and headaches have been reported (Culley & Krenzelok, 2005; Prescott, 2004; Kao et al., 2003; Waring, 2012). Therapeutic doses of the oral formula may cause a rise in liver function tests (Bailey & Andres, 1987).

**Moderate:** Refractory nausea and vomiting.

**Severe:** Angioedema and hypotension.

**Intravenous (IV) Formula = 21-hour Protocol**

Since the development of the IV formula, there has been a significant shift away from the oral formula. The current IV formula is a 21-hour protocol. It too has a loading dose; however, only two maintenance doses are needed, each with different infusion rates and drug volumes. Patients typically will develop mild to severe adverse effects during the loading dose phase; however, vomiting is less frequent (0-12%) than in the oral formula (Culley & Krenzelok, 2005; Gonzalez & Hinson, 2013; Zyoud et al., 2010).

If adverse effects should occur, the IV may be stopped until the effects subside or are treated. Methods to decrease the adverse effects include antihistamines, corticosteroids, inhaled beta-agonists, and in severe cases, intramuscular adrenaline (Sandilands & Bateman, 2009; Ternullo, 2006; Zyoud et al., 2010). The acetylcysteine infusion should then be restarted until the entire treatment protocol is completed, because a premature discontinuation of IV Acetylcysteine therapy has caused hepatic injury (Yarema, et al., 2009).

The package insert has specific instructions and adjustments regarding fluid volume. In children, the volume must be adjusted accordingly, because of the potential for fluid overload resulting in hyponatremia, seizure, and death. Adjustments are also needed for patients who require fluid restrictions; whose weight is more than 100 kg.; or when the patient’s weight is less than 40 kg. (Acetadote, 2013; Elms, et al., 2011; Lexicomp, 2013; Smollin, 2010; US FDA Approved Drug Products, 2013).

**IV Dosing**
- The total dose of Acetylcysteine is 300 mg/kg over 21 hours administered in three separate doses, with no interruption in therapy.
- IV Acetylcysteine is administered via a 3-bag method each with its own unique volume, rate of infusion, and volume of diluent.
- Acetadote is compatible with the following diluents: 5% Dextrose in Water, 0.45% Sodium Chloride Injection, and Sterile Water for Injection.
- Maintenance dose infusion bag #2 - Infusion rate is 12.5 mg/kg/hour.
- Maintenance dose infusion bag #3 - Infusion rate is 6.25 mg/kg/hour.
- Caution as to not delay Acetylcysteine administration while waiting for the pharmacy to deliver the second and third infusion bags (Elms, et al., 2011).

**Patients weigh 5 kg to 20 kg:**
- Loading Dose: 150 mg/kg diluted in 3 mL/kg of diluent administered over one hour.
• Second Dose: 50 mg/kg diluted in 7 mL/kg of diluent* administered over four hours
• Third Dose: 100 mg/kg diluted in 14 mL/kg of diluent* administered over 16 hours

Patients weigh 21 kg to 40 kg:
• Loading Dose: 150 mg/kg diluted in 100 mL of diluent* administered over 1 hour
• Second Dose: 50 mg/kg diluted in 250 mL of diluent* administered over 4 hours
• Third Dose: 100 mg/kg diluted in 500 mL of diluent* administered over 16 hours

Patients weigh 41 kg to 100 kg:
• Loading Dose: 150 mg/kg diluted in 200 mL of diluent* administered over 1 hour
• Second Dose: 50 mg/kg diluted in 500 mL of diluent* administered over 4 hours
• Third Dose: 100 mg/kg diluted in 1000 mL of diluent* administered over 16 hours

IV ADVERSE EFFECTS
• IV Acetylcysteine usually has more adverse effects than the PO formula (Algren, 2008; Sandilands & Bateman, 2009; Shannon & Salhanick, 2007).
• In therapeutic dosing, IV Acetylcysteine has caused cardiac arrest (Elms, et al., 2011; Cassidy & Tracey, 2008; Sandilands & Bateman, 2009; Sunman, Hughes, & Sever, 1992).
• ST depression, T wave inversion, asystole, and myocardial ischemia have all been documented (Elms, et al., 2011).
• Specific ethnic groups were associated with the development of adverse effects (Schmidt, 2013).

Mild:
Angioedema, flushing, headache, rash, urticaria, vasodilatation.

Moderate:
Bronchospasm, hypotension, pruritus, tachycardia.

Severe:
Anaphylactoid reactions
• The first reported anaphylactoid reaction from Acetylcysteine was reported in 1982 (Sandilands & Bateman, 2009).
• Anaphylactoid reactions are non-immunogenic and “… do not require previous sensitization” unlike Anaphylactic reactions which “… require a prior sensitization (Elms, et al., 2011, p.2).
• Anaphylactoid reactions appear to be associated with low serum acetaminophen levels (Elms, et al., 2011; Kao et al., 2003; Schmidt, 2013; Smollin, 2010; Waring, Stephen, Robinson, Dow, & Pettie, 2008; Waring, 2012; Zyoud et al., 2010).

PO administered IV Protocols
• Prior to the availability of IV Acetylcysteine or in regions where IV Acetylcysteine was not available; the oral/inhalation formula would be administered (off label) via the IV route.
• The oral solution prepared as an intravenous solution has an extended stability of 60 hours (Culley & Krenzelok, 2005); however, most PO administered IV protocols afford a 24-hour expiration date.

Preparations
Lexicomp (2013, p.37) Lexicomp makes note that only the 72-hour oral and 21-hour IV regimens are FDA approved. They list under IV administration both the 3-bag method and the PO administered IV. Lexicomp references Yip’s (1998) protocol as follows, “If the commercial IV form is unavailable, the solution for inhalation has been used. Each dose should be infused through a 0.2 micron Millipore filter (in-line) over 60 minutes. The IV administration of the solution for oral/inhalation is not USP-797 compliant” (See Legal Risks).
Shannon & Salhanick (2007, p. 830) protocol is, “The oral preparation… of Acetylcysteine is given as a 5% solution in saline administered through a 22-ug filter. IV dosing is identical to the oral procedure of 140 mg/kg loading dose followed by 17 maintenance doses of 70 mg/kg.”

Culley & Krenzelok (2005, p. 138-139) protocol is, “Draw up the desired volume [of inhalation] Acetylcysteine 20% into a syringe and filter the solution using a Millipore filter (0.2 micron preferred). The solution is then injected into a sterile glass evacuated container and a sufficient amount of 5% dextrose in water solution is added to produce a 1:5 dilution.”

Yip, Dart, & Hurlbut (1998, p. 41) protocol is to “… first obtain informed consent.” Then dilute [oral] 20% Acetylcysteine solution to 3% solution with 5% dextrose in water.

“Administer a loading dose of Acetylcysteine; 140 mg/kg infused through a peripheral intravenous catheter over one hour using an in-line 0.2-u millipore filter. Administer maintenance doses of Acetylcysteine at 70 mg/kg/dose 4-hours after initiating the loading dose, then continue maintenance doses every 4 hours, each infused over one-hour through the in-line filter. The protocol is 13 doses, a loading dose and 48-hours of therapy.

PO Administered IV

ADVERSE EFFECTS
• Adverse effects reported from the PO formula administered IV is 0-11%.
• Adverse effects include rash, hives, and dyspnea (Kao et al., 2003).
• Yip, Dart, & Hurlbut (1998) reported his adverse effects were infrequent and mild and did not preclude further IV administration. He cited other case reports as having rash, hives, throat tightness, dyspnea, and bronchospasm.
PRECAUTIONS/ RISK FACTORS

All Protocols

• Caution in patients with previous hypersensitivity reactions to Acetylcysteine.
• Caution in patients with a history of asthma or a history of bronchospasm, which has led to death (Appelboam, Dargan, & Knighton, 2002).

Legal Risks Compounding:

Controversy exists regarding the compounding of Acetylcysteine.
• Culley & Krenzelok (2005) stated, “While there are no laws prohibiting the compounding of inhalation Acetylcysteine as an intravenous preparation, the issue of using an unapproved drug for intravenous use, when an intravenous product is available commercially, creates the potential for significant medical and legal risk” (p. 139).
• Tomaszewski (2006, p. 87) stated, “… the U.S. Supreme Court has ruled that the “off-label usage of medical devices is an accepted and necessary corollary of the FDA’s mission to regulate” (Buckman Co. v. Plaintiffs’ Legal Comm. (98-1768) 531, U.S. 341 (2001); 159 F.3d 817, reversed).
• Tomaszewski (2006, p. 87) continued, “… that health care practitioners can prescribe or administer any legally marketed device to a patient” without limitation or interference. The Center for Drug Evaluation and Research confirmed this stance, stating that “neither the FDA nor the Federal government regulate the practice of medicine,” and “any approved product may be used by a licensed practitioner for uses other than those stated in the product label.”
• U.S. Pharmacopeial Convention (2013). The first set of enforceable sterile compounding standards was issued by the United States Pharmacopeia (USP) National Formulary is Chapter 797 (USP 797). This chapter describes the guidelines, procedures, and compliance requirements for compounding sterile preparations, and it sets the standards that apply to all settings in which sterile preparations are compounded. The IV administration of Acetylcysteine solution for oral/inhalation is not USP-797 compliant.

PREGNANCY RISK

Pregnancy Category B

There are no adequate and well controlled studies in pregnancy. Acetylcysteine should be used during pregnancy only if clearly needed when a patient has acetaminophen toxicity (Shannon & Salhanick, 2007; McNeil, 2005, 2010).

DOSING ERRORS
(Under and Overdosing)


Ferner, et al., (2001) conducted a prospective study by collecting Acetylcysteine samples (n=184) before and after infusion. He then measured the concentrations in each infusion bag and reported that the intended delivered dose deviated (under or over) from the intended prescribed dose. He found inadequate mixing errors in 9% of the infusion bags, calculation errors in 5%, and drawing up and measuring errors in 3% of the samples.

Elms, et al. (2011) stated that the majority of errors reported are due to the difficulty in preparing and administering the IV Acetylcysteine formula. He reported that errors are as high as 33%, causing 18.6% of the patients to have a delay or an interruption in therapy for greater than one hour.

Sandilands and Bateman (2009) reported that “… patients who receive inadvertent overdoses of Acetylcysteine have an increased rate of anaphylactoid reactions” by 73% (p.85).

European countries who have had 30 years of experience using IV Acetylcysteine reported as having five adverse drug reaction deaths (Commission on Human Medicines, 2012). The National Patient Safety Agency (NPSA) of the United Kingdom reported 645 iatrogenic errors from IV Acetylcysteine between 2007 and 2011. They indicated the incorrect rate of infusion accounted for 39.0% of errors; incorrect infusion volume (13.6%); incorrect solution (11.9%); incorrect dose prescribed (8.4%); and omitted or delayed dose (8.4%) (Commission on Human Medicines, 2012).

Legal Cases

An internet search was performed by author MTQ for legal actions or settlements, using Find Law, Lexis® Web, and Justia. No legal actions or settlements were located for adverse effects caused from Acetylcysteine under or overdose. A search using the U.S National Library of Medicine Pub Med database; however, yielded many case reports involving adverse effects from Acetylcysteine. These included administering it in therapeutic, over, or under dosing.

Presented here are 15 cases (Table) involving Acetylcysteine administration listed by their various routes. Some of the 15 case reports indicated that legal action was in progress; however, only one case (Case #6) was located indicating that a settlement had been reached. The authors suspect that if other settlements have occurred, the parties
involved may have had to sign a non-disclosure agreement which would not appear when searching the legal web sites.

Discussion and the Role for the LNC

To paraphrase Paracelsus (1493-1541) the father of toxicology, “All substances known to man are poisons, only the dose determines the effect,” which is true when administering Acetylcysteine (Gallo, 2003, p.4). Considered almost innocuous and with little to no adverse effects, acetylcysteine is the recognized antidote that protects the liver from the toxic metabolite NAPQI caused by acetaminophen toxicity.

The role for the LNC is to understand acetaminophen toxicity and the rationale for why acetylcysteine therapy was begun in the first place. Clinicians have ordered acetylcysteine therapy prophylactically, while waiting for a true four-hour serum acetaminophen level, causing unnecessary adverse effects, including death (Cases # 3, 10, 12). However, once the patient is considered, acetaminophen toxic Acetylcysteine therapy must be started immediately to protect the liver from further damage and should continue until the patient's clinical effects subside and the liver enzymes resolve to within normal levels. The LNC should now determine if the proper quality control measures were in place and utilized by all staff involved when acetylcysteine is ordered.

Since the IV formula has been available, the medical community prefers to administer it over the PO formula for various reasons as previously mentioned. The IV formula, however, is generally more complicated than the PO formula. Iatrogenic dosing errors may occur in any aspect of the patient's therapy, which may cause severe adverse effects. Two to ten-fold errors have caused seizures, myocardial infarction, electro-cardiogram changes, cerebral edema, and death.

Advocates are attempting to decrease the iatrogenic dosing error rate by standardizing IV acetylcysteine dosing to avoid the current confusion when preparing the three infusion bags. Suggestions include developing a weight-based method, which is controversial and considered an off-label use. Other suggestions include stringent protocols and additional quality improvement guidelines such as:

- Computerized assisted prescribing
- Contacting the local poison control center for guidance and consultation
- Decreasing the loading dose
- Developing simpler dosing regimes such as 1 or 2-bag similar volume therapy
- Improving staff communications at all levels when administering acetylcysteine
- Improving patient handoffs
- Introducing additional safety measures specific to acetylcysteine therapy
- Ongoing staff education
- Pre-treating patients with antihistamines who have known acetylcysteine reactions
- Pre-treating patients with a history of asthma


LNCs need to identify and weigh the benefits and risks for each patient requiring Acetylcysteine therapy. They should then determine if the appropriate route and precautions were identified and managed prior to and during acetylcysteine dosing, compounding, and administration. These precautions are in place to decrease the adverse effects from iatrogenic Acetylcysteine therapy and to provide the patient with the optimum therapeutic benefit in an effort to decrease the potential for acetaminophen-induced hepatotoxicity.

References


M. Thomas Quail, MS Ed, R.N., LNC, EMT-B has a background in Emergency Medicine that spans more than 30 years. He has been an EMT for 39 years, an RN for 31 years, and an LNC for 12 years. From 2000-2009, Quail was employed as the clinical coordinator for the Commonwealth of Massachusetts Department of Public Health (DPH), Office of Emergency Medical Services investigating complaints of patient care issues. Quail is currently employed at the DPHs’ Bureau of Environmental Health, where he is conducting research to answer public health concerns to see if environmental factors are connected to specific health issues and disease. He conducts medical records reviews with regard to amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig’s disease, and has assisted in the first ALS Registry named after former Governor Argeo Paul Cellucci. Quail provides continuing education lectures for Nurses and EMTs in pre-hospital emergency medicine, forensics, and toxicology. He has articles published in the field of Emergency Medicine, Forensic Science, Hematology, Law Enforcement, Legal Nursing, Nursing, Pre-Hospital Emergency Care, and Toxicology.

Edward W. Boyer MD, PhD, is Chief of the Division of Medical Toxicology at the University of Massachusetts. He received his doctorate in chemistry from Columbia University and was a NIH postdoctoral fellow at The Rockefeller University. He earned his MD degree from the Columbia College of Physicians and Surgeons before completing residency in emergency medicine at the Hospital of the University of Pennsylvania. After fellowship training at Boston Children’s Hospital, he joined the faculty of the University of Massachusetts, where he is Professor of Emergency Medicine.
<table>
<thead>
<tr>
<th>Case #</th>
<th>Authors (Yr. Pub.)</th>
<th>Patient Info.</th>
<th>Acetaminophen Quantity (Level/Time)</th>
<th>Therapy Route (Dose)</th>
<th>Adverse Event</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bailey, et al (1987)</td>
<td>3- yo M</td>
<td>NA</td>
<td>PO/PR (Therapeutic)</td>
<td>Liver function abnormalities</td>
<td>Two admissions with same diagnosis. Drug induced hepatic injury</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hx: cystic fibrosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dx: meconiumileus obstruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>70-80 grams</td>
<td>(346 mcg/mL @ 11 hrs)</td>
<td></td>
<td>Liver function abnormalities</td>
<td>Delayed effects. Recovered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PO/PR (Therapeutic)</td>
<td>Angioedema</td>
<td>No airway compromise</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cassidy et al (2008)</td>
<td>20–24 grams 75 minutes prior</td>
<td>(362 mcg/mL @ 2 hrs No true 4-hr level drawn)</td>
<td>IV (Therapeutic)</td>
<td>Flushing, Urticaria, Hypotension, Respiratory, Depression, Bradycardia, Asystole</td>
<td>Recovered</td>
</tr>
<tr>
<td>5</td>
<td>Little et al (2005)</td>
<td>Unk Qty.</td>
<td>(410 mcg/mL @6hrs)</td>
<td>IV (10-fold Under dose)</td>
<td>Liver function abnormalities</td>
<td>Recovered</td>
</tr>
<tr>
<td>6</td>
<td>Little et al (2005)</td>
<td>35 grams</td>
<td>(362 mcg/mL @4hrs)</td>
<td>IV (10-fold Under dose)</td>
<td>Liver function abnormalities</td>
<td>Recovered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Heard et al (2011)</td>
<td>7.5-10 grams</td>
<td>(128 mcg/mL @ 6-hrs)</td>
<td>IV (Massive Overdose)</td>
<td>Seizures</td>
<td>Profound neurological injury. In persistent vegetative state.</td>
</tr>
<tr>
<td></td>
<td>Selbst et al (2012)</td>
<td>Unk Qty.</td>
<td>(200 mcg/mL @4hrs)</td>
<td>IV (5-fold Overdose)</td>
<td>Cerebral edema</td>
<td>$15.5 Million Settlement</td>
</tr>
<tr>
<td>8</td>
<td>Mullins et al (2011)</td>
<td>Unk Qty.</td>
<td>(49 mcg/mL @ Unk Time)</td>
<td>IV (Massive Overdose)</td>
<td>Hematocrit</td>
<td>Required dialysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rise creatinine levels</td>
<td>Dx; Atypical Hemolytic-Uremic syndrome</td>
</tr>
<tr>
<td>9</td>
<td>Elms et al (2011)</td>
<td>Unk Qty.</td>
<td>(200 mcg/mL @4-hr)</td>
<td>IV (Massive Overdose)</td>
<td>Seizures</td>
<td>Death</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 grams</td>
<td>(44 mcg/mL @Unk time)</td>
<td>IV (5-fold Overdose)</td>
<td>Facial flushing</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Lorentzen et al (2002)</td>
<td></td>
<td></td>
<td></td>
<td>Vomiting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unk Qty.</td>
<td>(45 mcg/mL @5hr non-toxic level)</td>
<td>IV (2-fold Overdose)</td>
<td>Cyanotic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1800 mg</td>
<td>(45 mcg/mL @6hr non-toxic level)</td>
<td></td>
<td>Myoclonus</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mant et al (1984)</td>
<td>Unk Qty.</td>
<td>(145mcg/mL @12hrs)</td>
<td>IV (10-fold Overdose)</td>
<td>Flushing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hypotension</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Kao et al (2003)</td>
<td>Unk Qty.</td>
<td>(80 mcg/mL @unk)</td>
<td>PO Administered IV (Therapeutic)</td>
<td>Hypoxia Apnea Bradycardia Atrial fibrillation Ventricular fibrillation Asystole</td>
<td>Recovered</td>
</tr>
</tbody>
</table>
The National Practitioner Data Board (NPDB) classifies "professional nurses" into five licensure categories: non-specialized registered nurse, nurse practitioner, nurse anesthetist, nurse midwife, and clinical nurse specialist. According to the NPDB Report (2012), between 1990 and 2011 all types of professional nurses had a total of 9,278 monetary malpractice payments, with an approximate mean of $282,297 per claim. Nurses must be concerned about malpractice litigation because each nurse is accountable for his or her own acts of negligence. To help decrease the risk of a malpractice claim, every nurse should know his or her nurse practice act, relevant laws and legal doctrines, agency policies and procedures, and applicable standards of care that impact daily clinical practice.

Despite continuous efforts to educate nurses on the law and their professional responsibilities through nursing programs and continuing education courses, the number of nurses named as defendants in malpractice actions continues to increase. Various reasons identified in the medical and nursing literature for this continuous trend have included shortage of qualified nurses, healthcare provider fatigue, improper supervision/delegation, miscommunication, early patient discharge, hospital downsizing, increased autonomy, advanced technology, inadequate training, high-level clients, short-staffing, failure to follow standard clinical nursing practice, and better-informed consumers. Various reasons identified in the medical and nursing literature for this continuous trend have included shortage of qualified nurses, healthcare provider fatigue, improper supervision/delegation, miscommunication, early patient discharge, hospital downsizing, increased autonomy, advanced technology, inadequate training, high-level clients, short-staffing, failure to follow standard clinical nursing practice, and better-informed consumers.

Nolo (2012a) cites the national average payout for medical (doctor) malpractice negligence is approximately $285,000. Malpractice is the legal term for an act of negligence by any licensed professional (Stein, 2000). The Joint Commission (nd) defines negligence as a "failure to use such care as a reasonably prudent and careful person would under similar circumstances" and malpractice as "improper or unethical conduct or unreasonable lack of skill by a holder of a professional or official position; often applied to physicians, dentists, lawyers, and public officers to denote negligent or unskilled performance of duties when professional skills are obligatory. Malpractice is a cause of action for which damages are allowed" (Croke, 2003, p.54-55).

For a nurse to become liable in a malpractice action, certain legal elements must be proven by the plaintiff before a successful case can be brought against the defendant nurse. Except as noted under the doctrine res ipsa loquitur, these liability elements include the following:

- **Duty**—nurse-patient relationship; employment relationship
- **Breach of Duty**—act of omission or commission in standard of care (SOC)
- **Foreseeability**—foresee a certain result based on actions or lack of actions at the time of occurrence
- **Causation**—breach in standard of care caused injury (cause-effect)
- **Injury**—physical, financial, emotional
- **Damages**—monetary awards

Each nurse is responsible for his or her own acts of negligence, but hospitals and doctors can also be held accountable. Under the doctrine of respondeat superior, the employer is responsible and accountable for an employee's negligent acts. Because most nurses are employees of hospitals, hospitals are common defendants in nursing malpractice litigation (Nolo, 2012b). Common reasons for hospital liability for negligence of employees are:

- Negligent hiring or firing of employees
- Failure to ensure competency and continuing competency of employees
- Understaffing of healthcare providers
- Mislabeling medication
• Health Insurance Portability and Accountability Act violations
• Failure to provide a safe environment

Research has shown that hospitals with high nurse-patient ratios experience higher patient mortality rates, decreased quality patient care, increased complaints of nurse burnout, and job dissatisfaction (Aiken et al., 2002; Aiken et al., 2010; Stanton, 2004).

Jenkins & Lemak (2009) reported “research on jury verdicts indicates that the median plaintiff award against hospitals and their employed health care providers is about $500,000”… and the average 250 bed hospital spends between $300,000 and $1 million dollars annually defending medical malpractice lawsuits, not including settlements and judgments (p. 52). Specialized nurses, known as legal nurse consultants (LNC), often work with attorneys on medical-legal related cases. The LNC helps the attorney “understand and analyze complex medical data” encountered in the client’s medical records. Duties of the LNC may include:
  • Screening cases for merit
  • Locating and interviewing witnesses and preparing witness reports for trial
  • Formulating medical-legal theories
  • Handling plaintiff’s medical records
  • Analyzing and interpreting information for defense attorneys
  • Serving as an expert witness (“What does a legal nurse consultant,” 2013,p.1)

Nurses must be concerned about malpractice litigation because each nurse is accountable for his or her own acts of negligence. To help decrease the risk of a malpractice claim, every nurse should know his or her nurse practice act, relevant laws and legal doctrines, agency policies and procedures, and applicable standards of care impacting daily clinical practice. The following website provides a state-by-state summary of medical malpractice laws.


CLAIMS and COSTS

Nurses and nursing students can be held liable for their actions or non-actions, and thus can be sued (Learning Express Editor, 2011). “Once money is exchanged through an out-of-court settlement or jury award, the nurse’s name is automatically reported to the state board of nurse examiners, to insurers, and to the federal government’s National Practitioner Data Bank” (NPDB) (Stein, 2000,p.1).

Types of Malpractice Claims Against Nurses

The most common malpractice claims against nurses identified in the medical and nursing literature between 2000 and 2012 include:
  • Failure to get informed consent from the patient
  • Failure to use a medical device properly
  • Failure to follow the standard of care
  • Failure to communicate
  • Failure to assess and monitor
  • Failure to act as a patient advocate
  • Failure to update a physician on a patient’s condition
  • Failure to document
  • Failure to properly supervise a patient resulting in harm
  • Negligent delegation and supervision
  • Medication errors
  • Working while impaired: controlled substances, alcohol or fatigue

The NPDB collects information on health care practitioners who, as a result of judgments in malpractice suits, have entered into settlements, had disciplinary action taken against them that resulted in their licenses being revoked or suspended, had their privileges to practice limited, or had to pay monetary awards (Croke, 2003; Croke, 2006).

According to the NPDB Report (2012) (Table 1) between 1990 and 2011 all types of professional nurses had a total of 9,278 monetary malpractice payments with an approximate mean of $282,297 per claim. The majority of payments made were less than or equal to $50,000, with the smallest number of payments made for amounts greater than $2,000,000. Similarly, as shown in Table 2, CNAHealth Pro and Nurse Service Organization (NSO) examined professional nurse liability payments made on behalf of CNA insured professional nurses. Table 2 reports professional nurse indemnity payments for closed claims for four separate CNAHealth Pro and NSO claims analysis periods. The highest and lowest amounts of closed claims awarded with an indemnity payment greater than $10,000 were made on behalf of registered nurses (RNs) and licensed vocational nurses (LVN/LPN), respectively. CNAHealth Pro and NSO (2011) reported RNs had an average paid indemnity of $168,438 while LVNs average paid indemnity was $83,213. Nurse practitioner indemnity payments increased overtime from $16 million to more than $44 million. CNAHealth Pro and NSO reported that in 2009, the average paid indemnity for a nurse practitioner closed claim greater than $10,000 was $186,282, and increased to an average indemnity payment of $221,852 in 2012 – a 19% increase (CNAHealth Pro and NSO, 2012). As members of the profession of nursing seek greater autonomy in their clinical practice arenas, outcomes of increased responsibility, accountability, and potential liability arise (DiCicco-Bloom, 2009).

Table 3 shows the top three closed claim clinical practice areas reported by CNAHealth Pro and NSO Reports. The top two clinical practice areas for nurse practitioners’ liability have remained consistent through all CNAHealth Pro and NSO Reports – physicians offices and outpatient clinics. For RNs and LVNs the hospital environment has remained the highest area of liability. Painter, Dudjak, and Kidwell (2011) reported a literature review revealed that most
Table 1: NPDB Nursing Malpractice Payment Range by Numbers of Professional Nurse Payments (1990-2011)

<table>
<thead>
<tr>
<th>Malpractice Payment Range</th>
<th>Number of Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$50,000</td>
<td>3,185</td>
</tr>
<tr>
<td>$50,000-$99,999</td>
<td>1,368</td>
</tr>
<tr>
<td>$100,000-$249,999</td>
<td>2,019</td>
</tr>
<tr>
<td>$250,000-$499,999</td>
<td>1,239</td>
</tr>
<tr>
<td>$500,000-$999,999</td>
<td>838</td>
</tr>
<tr>
<td>$1,000,000-$1,999,999</td>
<td>434</td>
</tr>
<tr>
<td>&gt;=$2,000,000</td>
<td>195</td>
</tr>
<tr>
<td>Total Number of Payments</td>
<td>9,278</td>
</tr>
</tbody>
</table>


Table 2: CNAHealth Pro and Nurse Service Organization (NSO) Closed Claims for Professional Nurse Liability

<table>
<thead>
<tr>
<th>Claim Study Years</th>
<th>Professional Licensure</th>
<th>Number of Closed Claims Examined With Paid Indemnity Greater than $10,000</th>
<th>Total Paid Indemnity Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994-2004</td>
<td>Nurse Practitioner</td>
<td>107</td>
<td>$16,453,890</td>
</tr>
<tr>
<td>1998-2008</td>
<td>Nurse Practitioner</td>
<td>96</td>
<td>$39,067,185</td>
</tr>
<tr>
<td>2006-2010</td>
<td>Registered Nurse Licensed Vocational Nurse</td>
<td>474</td>
<td>$79,839,387</td>
</tr>
<tr>
<td></td>
<td></td>
<td>42</td>
<td>$3,494,965</td>
</tr>
<tr>
<td>2007-2011</td>
<td>Nurse Practitioner</td>
<td>200</td>
<td>$44,370,490</td>
</tr>
</tbody>
</table>

### Table 3: Top Three Closed Claim Clinical Practice Areas/Settings Reported by CNAHealth Pro and NSO Reports

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians’ Office</td>
<td>Medical Care Office</td>
<td>Hospital PACU</td>
<td>Hospital-Inpatient Surgical Service</td>
<td>Physicians’ Office</td>
</tr>
<tr>
<td>Non-Hospital Based Clinics</td>
<td>Clinic-Non-Hospital Based</td>
<td>OB Outpatient Services</td>
<td>Patient’s Home</td>
<td>Community-Based Outpatient Clinics</td>
</tr>
<tr>
<td>Hospital Inpatient</td>
<td>Nursing Home</td>
<td>Clinic-Hospital Outpatient</td>
<td>Hospital-Inpatient Medical Service</td>
<td>Skilled Nursing Facilities</td>
</tr>
</tbody>
</table>

**Note.** Adapted from:

### Table 4: Top Three Closed Claim Clinical Specialties Reported by CNAHealth Pro and NSO Reports

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Practice*</td>
<td>Adult/Geriatric</td>
<td>Neurology/</td>
<td>Hospital-Inpatient Surgical Service</td>
<td>Physicians’ Office</td>
</tr>
<tr>
<td>Adult/Geriatrics*</td>
<td>Family Medicine</td>
<td>Obstetrics</td>
<td>Home Health</td>
<td>Family Practice</td>
</tr>
<tr>
<td>Obstetrics/Gynecology</td>
<td>Pediatric/Neonatal</td>
<td>Plastic/Reconstructive</td>
<td>Hospice</td>
<td>Behavioral Health</td>
</tr>
</tbody>
</table>

**Note.** Adapted from:
malpractice cases involving a nurse occurred in the acute care hospital and involved non-specialized RNs. Similarly, the Joint Commission (2012, Dec.31) reported the hospital environment has remained the top area for sentinel events from 2004-2012. The Joint Commission defines a sentinel event “as any unanticipated event in a healthcare setting resulting in death or serious physical or psychological injury to a patient or patients, not related to the natural course of the patient’s illness. Sentinel events specifically include loss of a limb or gross motor function, and any event for which a recurrence would carry a risk of a serious adverse outcome” (Wikipedia, 2013, p.1).

Table 4 shows the top three closed claim clinical specialties reported by the CNAHealth Pro and NSO Reports. Family practice and adult/geriatrics have consistently remained the highest clinical practice specialties for liability claims for nurse practitioners. For RNs and LVNs, the only common clinical practice specialty involved the surgical environment.

Reducing Potential Liability

Malpractice litigation is both professionally and emotionally devastating to a nurse. “Each nurse can take steps to help reduce potential liability by using caution and common sense and by maintaining a heightened awareness of his or her legal responsibilities” (Croke, 2003, p.62).

The following are ways nurses can help reduce potential liability:

- Using nursing judgment on a case-by-case basis. Utilizing each step of the nursing process and critical thinking may reduce the likelihood of “bad outcomes” that commonly lead to nursing malpractice (Giordano, 2003).
- Maintain open, honest, respectful relationships and communication with patient's family members, and physicians. Poor communication may exist amongst nurse physician, nurse and other healthcare providers, and nurse-patient/family. Timely reporting changes in the patient condition to the physician is the most common communication basis for nursing malpractice. Research has shown patients are less likely to initiate a lawsuit if they believe the nurse has been caring and professional (Croke, 2003; Reising & Allen, 2007).
- Maintain competence in your specialty area of practice. Each nurse needs to attend relevant continuing education programs, remain up-to-date on professional certification requirements and continue to expand professional knowledge, skills and experience (McCarthy, 2013).
- Each nurse needs to document all pertinent data, and do it contemporaneously—not after the fact. Documentation must reflect the nursing process. Documenting in the medical record after a lawsuit has been threatened by a patient or member of a patient's family—from the chart—Factually, Accurately, Completely and Timely (Guido, 2014, Stein, 2000).
- Follow chain of command. A nurse’s belief on a patient care issue may require action beyond a discussion of the nurse’s concerns with the physician. If the nurse’s concern is not resolved—the facility’s nursing hierarchy chain of command should be activated (Reising & Allen, 2007).
- Obtain informed consent. Obtaining a patient’s informed consent is needed to prevent charges of battery against a healthcare provider.
- Practice within the bounds of professional licensure. Each nurse must perform only the nursing skills allowed by the state nurse practice act, and state and federal laws (Croke, 2006; Guido, 2014; McCarthy, 2013; Reising, & Allen, 2007).
- Know your strengths and weaknesses—each nurse must examine if he or she has the skill, knowledge, and experience to carry out the assignment. If the nurse does not believe he or she has the competency—this lack of skill must be reported prior to accepting the assignment (Croke, 2003, Reising, & Allen, 2007).

Hospitals can reduce risk of malpractice claims by increasing RN staffing. Research has shown that limiting nurse workloads has a positive impact on quality and safely of patient care, fewer medical errors, increased nurse satisfaction and nurse retention, decreased adverse patient outcomes, and lowered patient mortality rates (Aiken et al., 2002; Aiken et al., 2010; Stanton, 2004). A facility’s communication policy that is known to both physicians and nursing staff can help reduce risk of liability.

Due to an ever-changing practice care environment, nurses are facing a plethora of ethical and legal dilemmas that increase their risk of becoming named in a malpractice litigation process. Nurses are being held accountable to the public for their professional judgment, actions, and outcomes. To help decrease liability, nurses must render safe and competent nursing care, recognize potential problems, identify potential risks in their practice care arena, and remain competent in technology and evidence-based practices (Guido, 2014).

References


Nolo (2012b). If you are injured by a nurse's negligence, you may have a claim for medical malpractice. Retrieved from: http://www.nolo.com/legal-encyclopedia/nursing-malpractice-300076.html


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Introduction

Sexual assault victims are frequently referred to emergency departments (EDs). Emergency departments are often victims’ first contact for assistance with medical, legal, and forensic treatment (Fehler-Cabral, Campbell, & Patterson, 2011; Henderson, Harada, & Amar, 2012). Since most sexual assault victims’ injuries are not life threatening (including many who do not have physical injuries) and the diverse needs of sexual assault victims are not understood by many emergency physicians and nurses, the victims of sexual assault are frequently not recognized as requiring priority care in emergency departments (Fehler-Cabral et al., 2011; Ledray, 1999). For these reasons, programs for the care of sexual assault victims should be developed in emergency departments so that compassionate and quality care is able to be provided to these victims.

Rape, Sexual Assault, and Sexual Violence

Rape is a crime that is motivated by power and control and not through sexual desires. The perpetrator’s sexual gratification is satisfied by dominating and humiliating the victim (Pennsylvania Coalition Against Rape, n.d.). Greater than 345,000 rapes and sexual assaults occur each year in the US to individuals age 12 and older, or to view this from an alternate perspective, a sexual assault occurs less than every two minutes in the United States (Truman, Langton, & Planty, 2012). One in six women and one in 33 men in the United States have been raped at some time in their lives (Tjaden & Thoennes, 2006). A woman is more likely to be sexually assaulted in her lifetime than to take up smoking (Lee, 2012). Even with such overwhelming statistics, only 3% of rapists will ever spend one or more days in jail (Rape, Abuse & Incest National Network, n.d.).

The U.S. Department of Justice (DOJ) and the CDC define sexual assault and sexual violence as completed or attempted sexual acts that occur without the consent of an individual (CDC, 2009; The Federal Bureau of Investigation, 2012). In January 2012, the Federal Bureau of Investigation (FBI) announced the revision of the 1927 Uniform Crime Report definition of rape. The current definition of rape is “the penetration, no matter how slight, of the vagina or anus with any body part or object, or oral penetration by a sex organ of another person, without the consent of the victim” (The FBI, 2012, para. 1). The definition now includes male and female victims, victims who are unable to consent to sexual intercourse due to age (according to state statute), and incapacitation related to an individual’s mental and physical abilities. The definition also takes into account female perpetrators, oral and anal penetration, and penetration of the vagina and anus with foreign objects thus allowing for more accurate statistics of rape to be reported and accounted for in the national crime data base (The FBI, 2012).

Sexual Assault Nurse Examiners

Sexual Assault Nurse Examiners are registered nurses who receive specialized training in the medical, forensic, and legal treatment of sexual assault victims (U.S. DOJ, 2013). Sexual Assault Nurse Examiners play a vital role in impacting the medical and legal outcomes of victims of sexual assault, sexual violence, and rape (Taylor, 2002). Sexual Assault Nurse Examiners are supported and considered the professionals of choice to conduct sexual assault exams by the American College of Emergency Physicians and the FBI (Houmes, Fagan, & Quintana, 2003).

Sexual Assault Nurse Examiner training initially involves at least a 40-hour didactic component and a clinical preceptorship with an experienced SANE (International Association of Forensic Nurses, n.d.). Complete SANE training is based on the current standards of care established by the International Association of Forensic Nurses (IAFN),
the guidelines of each state’s nurse practice act, each healthcare organization’s policies and procedures, and the forensic nursing scope and standards of practice (ANA and IAFN, 2009; U.S. DOJ, 2013).

Sexual Assault Nurse Examiners are essential to address the immediate and culturally diverse needs of victims of sexual assault in a caring and compassionate manner. Sexual Assault Nurse Examiners provide victims of sexual assault access to high quality, comprehensive medical and forensic evidence based standards of care. The SANE comprehensively documents victims’ history of the assault and the forensic exam findings, properly collects and maintains chain of custody of forensic evidence, accurately interprets findings, and provides fact or expert witness testimonies to the judicial system. Treatment for physical injuries, sexually transmitted infection (STI), and pregnancy prophylaxis are based on victims’ needs and beliefs (Taylor, 2002; U.S. DOJ, 2013). Sexual Assault Nurse Examiners refer victims to community agencies to provide a multidisciplinary community approach to help lessen the immediate and long-term physical and mental suffering and adverse health conditions that many victims experience (U.S. DOJ, 2013).

SANE Programs

The first three non-collaborating SANE programs originated in the US in the mid to late 1970s. Almost two decades later, the IAFN was established in 1992 and the ANA acknowledged forensic nursing as a specialty in 1995 (IAFN, n.d.). As a result, there are currently 600 SANE programs in the US (National Institute of Justice, 2012). Even though 90% of SANE programs are operated in emergency departments, when the number of SANE programs is compared to the number of emergency departments in the US, less than 15% of emergency departments have a SANE program (Hsia, Kellermann, & Shen, 2011; National Institute of Justice, 2012).

Sexual Assault Nurse Examiner programs are beneficial because they provide high quality standards of care and evidence collection to victims of sexual assault (National Institute of Justice, 2012). Sexual assault victims cared for at facilities with a SANE program were found to have been offered and have accepted more medical services, such as pregnancy prophylaxis and STI prophylaxis. Victims spend significantly less time in emergency departments with SANE programs and receive more community referrals for follow-up care. Rape kit collection techniques are completed properly and more rape kits are collected in emergency departments with SANE programs (Crandall & Helitzer, 2003; Littel, 2001). Sexual Assault Nurse Examiner programs assist law enforcement as evidenced by higher rates of victim cooperation with police. Victims have a better understanding of and trust in the judicial process, leading to more charges filed, higher arrest rates, higher rates of prosecution, and longer average sentences for perpetrators (Attorney General of Texas, 2011; Campbell, Patterson, & Fehler-Cabral; Crandall & Helitzer, 2003; Markowitz, 2010; National Institute of Justice, 2012).

Sexual assault victims presenting to emergency departments without a SANE program receive lower standards of care than other victims of trauma. This is evidenced by waits up to 10 to 12 hours for treatment because their complaints and injuries are often viewed as less critical than other types of trauma victims. Physicians or nurses in emergency departments without SANE programs are often not adequately trained or prepared to care for the medical, forensic, and legal needs of victims of sexual assault which often results in poorer documentation of the victims’ history and forensic examination, treatment regimes that do not meet the current recommended standards of care, and less time spent by emergency physicians and nurses in performing more thorough forensic exams creates little to no psychological support to these victims. Health care workers may blame these victims for their presenting complaints, causing them to refrain from seeking follow-up care. (Fehler-Cabral, Campbell, & Patterson, 2011; Ledray, 1999; Littel, 2001)

Sexual Assault Nurse Examiner programs should be located at sites that are victim-centered and meet the needs of the victim and the community. Emergency departments offer many advantages of having a developed SANE program over other community based locations. One of the primary advantages is an emergency department’s hours of operation. Emergency departments are a protected environment open 24 hours a day, 7 days a week with numerous resources. Emergency departments’ physicians are readily available on site for consultation about medications and injuries as needed. Most medications that are ordered can be administered to the victim prior to discharge, ensuring the victim receives the recommended treatment. Laboratory services are readily available to complete tests, such as pregnancy or toxicology screens, and to assist with blood draws if needed. Depending on the severity of the injuries, SANE programs located in emergency departments help to prevent the victim from being sent to another facility for treatment of injuries, which could potentially result in the loss of valuable forensic evidence (Littel, 2001).

Additionally, developing SANE programs in emergency departments would satisfy regulatory compliance. In 1992, The Joint Commission established requirements that each emergency and ambulatory care facility develop policies and practices to care for victims of sexual assault, and ED staff would be trained according to each institution’s policy (Ledray, 2001; U.S. DOJ, 2013). The Joint Commission also requires each of these facilities to specify their roles and responsibilities for the forensic evidence collection and preservation (U.S. DOJ, 2013).
Cost Benefit of SANE Programs

In emergency departments without SANE programs, there are unrecognized and overlooked costs that are being absorbed into ED budgets associated with the examination and treatment of victims of sexual assault. The increased time victims spend in emergency departments, consuming more physicians and nursing resources is one of the associated unrecognized costs. The Urban Institute found that costs for forensic sexual assault exam conducted in hospitals are much higher if a physician performs the examinations as opposed to a SANE (Burt, Newmark, Olson, Aron & Harrell, 1997). Factoring costs from 1996 to 2013, a physician conducting an exam in 2013 would cost approximately $1,200 whereas the cost of a SANE conducting the exam would be approximately $300 to $450. Sexual Assault Nurse Examiners completing exams results in a projected savings of up to 75% per exam. Emergency departments completing 25 forensic sexual assault exams per year would recognize an average annual savings of $19,000 to $23,000. Estimated startup costs for SANE programs can range up to $30,000 to $40,000, depending on equipment and training costs (Houmes et al., 2003). Initial SANE program costs would be easily offset within one to two years by the financial savings gained through SANEs completing sexual assault exams.

Savings to community agencies and the community as a whole occurs through SANE programs’ collaboration with community resources. In 2008, each rape in the US was predicted to cost its victim over $150,000 (Delisi et al., 2010). Not accounting for child sexual abuse cost, the annual bill for rape victims totaled over $127 billion, making rape the most expensive crime for its victims (Miller, Cohen, & Wiersema, 1996). Victims who receive early intervention services have better medical and legal experiences with less overall public-associated costs (Campbell, 2006; National Alliance to End Sexual Violence, n.d.). Communities further benefit from SANE programs because more perpetrators are incarcerated for longer periods of time, preventing these perpetrators from reoffending in the community (Attorney General of Texas, 2011).

Conclusion

Victims of sexual assault are entitled to high quality medical and forensic care. The evidence illustrates that SANE programs are a necessary part of emergency departments to provide high quality healthcare standards. Sexual Assault Nurse Examiner programs in emergency departments have many advantages over community-based programs. Collaboration of community resources through SANE programs improves the health and legal outcomes for victims while reducing overall expenses. Education should be provided to hospital administration, hospital board of directors, emergency nurses, emergency physicians, and community agencies on SANE programs to ensure success in providing care to victims of sexual assault. Sexual Assault Nurse Examiner programs can be developed in any emergency department with thoughtful preparation and planning. Understanding the medical, legal, and forensic advantages, as well as the financial savings of SANE programs, are the first steps towards successful implementation of SANE programs in emergency departments.

References


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Since 2010, Bimber has continued to provide educational in-services on topics related to forensic nursing, and she participates in various county and state committees related to improving the care for sexual assault victims, including the Pennsylvania Sexual Assault Evidence Collection Committee.

Bimber is a member of the Emergency Nurses Association, International Association of Forensic Nurses, and Sigma Theta Tau International Pi Rho Chapter.
Online References and Resources

Palliative Wound Care and End of Life Wounds
Diane L. Krasner, PhD, RN, CWS, CWCN, MAPWCA, FAAN

The following sites provide online resources for clinical practice, education, and research and for legal nurse consultant reference. This listing is not intended to be all inclusive of resources available. No endorsement is made of any listed sites or services. Online sources change and should be confirmed prior to using as a reference.

Glossary
The National Pressure Ulcer Advisory Panel (NPUAP)
NPUAP Terms and Definitions of Stages Related to Pressure Ulcers
http://www.npuap.org/resources

World Wide Wounds
The premier online resource for dressing materials and practical wound management information, including palliative and end of life wound care.
http://www.worldwidewounds.com

WoundSource
Features numerous blogs defining and discussing palliative and end of life wound care.
http://www.woundsource.com/palliativewounds

Kennedy Terminal Ulcer
http://www.kennedyterminalulcer.com

European Pressure Ulcer Advisory Panel
Skin Changes At Life’s End (SCALE)
http://www.epuap.org/scale-skin-changes-at-lifes-end

Annals of Long-Term Care: Clinical Care and Aging
Skin Failure: Identifying and Managing an Underrecognized Condition

Governmental Resources
Agency for Healthcare Research and Quality (AHRQ)
Palliative Wound Care at End of Life
http://www.ahrq.gov/about/nursing/palliative.htm

Downloadable Fact Sheets
F.R.A.I.L. For Recognition of the Adult Immobilized Life
Palliative Wound Care and Healing Probability Assessment Tool
http://www.frailcare.org/projects.htm

The National Pressure Ulcer Advisory Panel (NPUAP)
Fact Sheets on pressure-ulcer related terms, stages/categories, prevention and treatment strategies, education
http://www.npuap.org/resources

Continuing Education, Conferences, and Educational Opportunities
Palliative Care Institute, Center for Curative & Palliative Wound Care, Calvary Hospital, Bronx, New York
http://www.calvaryhospital.org

Palliative Wound Care Conference, Hope of Healing Foundation
Biannual conference, next conference May 2015 in Orlando, Florida
http://www.HopeOfHealing.org

http://ce.nurse.com/ce152-60/latex-allergy-alert/

The National Pressure Ulcer Advisory Panel (NPUAP)
White Paper: Pressure Ulcers in Individuals Receiving Palliative Care 2010
http://www.npuap.org/NPUAPwhitpapers

Protocols, Position Statements, and White Papers
F.R.A.I.L. For Recognition of the Adult Immobilized Life 2002
http://www.frailcare.org

The National Pressure Ulcer Advisory Panel (NPUAP)
White Paper: Pressure Ulcers in Individuals Receiving Palliative Care 2010
http://www.npuap.org/NPUAPwhitpapers

European Pressure Ulcer Advisory Panel
Skin Changes At Life’s End (SCALE) Consensus Document 2009
http://www.epuap.org/scale-skin-changes-at-lifes-end

WoundSource
http://www.woundsource.com/whitepapers

Scholarly Articles, Books, and Chapters
http://www.jblearning.com/catalog/9781449600112/

http://www.amazon.com/Wound-Care-End-Life-Professionals/dp/0988955822

http://journals.lww.com/jwocnonline/Pages/default.aspx

http://www.liebertpub.com/JPM

Kennedy, KL. (1989). The prevalence of pressure ulcers in an intermediate care facility. Decubitus, 2(2), pp. 44-5. [Decubitus is now Advances in Skin & Wound Care]
http://journals.lww.com/aswcjournal/pages/default.aspx

http://www.chronicwoundcarebook.com

http://journals.lww.com/aswcjournal/pages/default.aspx

http://www.epuap.orgSCALE-skin-changes-at-lifes-end

http://www.woundsresearch.com/store/10209

http://www.woundsresearch.com/


American Professional Associations

- American Professional Wound Care Association  
  http://www.apwca.org

- Association for the Advancement of Wound Care  
  http://www.awcc.org

- National Pressure Ulcer Advisory Panel  
  http://www.npuap.org

- The Hope of Healing Foundation  
  http://www.HopeOfHealing.org

- Wound Healing Society  
  http://www.woundheal.org

- Wound Ostomy Continence Nurses Society  
  http://www.wocn.org

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- WOUNDS  
  http://www.woundsresearch.com

- WoundSource  
  http://www.woundsresearch.com

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In any discussion about coordination of care, understanding the critical importance of the PCP and hospitalist role in integrating healthcare is paramount in preventing patient harm or death. Ideally, the PCP and hospitalist have the most knowledge about their patients and can orchestrate the involvement and communication among other physicians and healthcare settings so patients do not fall through the safety net of consistent care coordination. However, Health Affairs indicates that, “…one of the biggest barriers to smoother care transitions is the fact that primary care physicians often have little or no information about their patients’ hospitalizations.” (2012, p. 2)

Hospitalists oversee the PCP’s patients in the hospital and may be unlikely to keep the PCP informed about the status of their patients’ medical condition because of heavy workloads. As Rabin points out, “Hospitalists routinely work seven to 15 days in a row on shifts that each last 10 to 12 hours to provide continuity.” (2013, p. 2)

Health Affairs identifies “…several root causes of poor care coordination. First, differences in computer systems often make it difficult to transmit medical records between hospitals and physician practices. In addition, hospitals face few consequences for failing to send medical records to patients’ outpatient physicians upon discharge. As a result, physicians often do not know when their patients have been released and need follow-up care. Finally, current payment policies create disincentives for hospitals to invest in smoother care transitions.” (2012, p. 2)

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References


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Malnutrition can be defined as an excess or a deficiency of protein, fat, carbohydrate, vitamins, minerals, or fluid intake. Malnutrition is of epidemic proportions in the United States. Who in the patient population is malnourished? Consider the diabetic patient with poor immune response, the cardiac patient with three plus pitting edema, and the dialysis patient with calcium deposits in soft tissues. Identify the female with a history of premature births or spontaneous abortions. Evaluate the child in school who lacks motivation or the obese five year old child. Take a closer look at the teenager with a BMI < 17.5. Consider the nutritional needs of the severely burned patient with sepsis or the post-operative patient whose wound dehisces? Re-evaluate the geriatric patient with a history of frequent falls and the chronic wound patient whose wound remains recalcitrant despite numerous changes in treatments.

Despite the plethora of information about nutrition, it remains one of the most under-addressed areas in health care today. Nutrition is the basis for health and wellness. Nurses are in key positions in the health care delivery system to identify patients with nutritional risk; to educate patients, families, and other caregivers about nutrition; and to make appropriate referrals within the health care delivery system to provide ongoing evaluation and support for nutritional needs. The Nurse Practitioner’s Guide to Nutrition, second edition, is the comprehensive resource for nurses, nurse practitioners, and legal nurse consultants, providing standards of care, authoritative references, and guidelines for clinical practice. Lisa Hark, Kathleen Ashton, and Darwin Deen are thorough in their coverage of nutritional assessment, nutritional counseling, and practical application across the lifespan. This book enables the nurse and the nurse practitioner to easily identify the “at risk” patients and to develop plans of care to meet the nutritional requirements to maximize health and wellness.

The book is delivered in three sections. Section One discusses nutritional concepts and how they are important to nursing practice. Section Two goes into detail about nutrition as it relates to the journey throughout the lifespan. Section Three discusses nutrition for clinical issues and in clinical settings. Several appendices are provided about food sources related to vitamins and minerals and also nutritional resources.

Chapters one through three provide the basis for the role of nursing related to nutrition, as well counseling for behavioral changes. Chapter four addresses nutrition from pre-conception through lactation. It discusses the importance of the pre-natal evaluation to address nutritional needs to minimize risk and complications for both the mother and fetus. It includes the nutritional needs of the lactating female and management of breastfeeding complications.

Chapter five addresses the nutritional needs from infancy through adolescence, including prevention and treatment of the overweight and obese child. It also includes guidelines to manage the “picky eater,” the vegetarian, the athlete, and the child with eating disorders. Chapter six addresses the nutritional needs of the older adult, including identification of the “at risk group” for malnutrition. This chapter includes nutritional assessment tools for the older adult, including the Determine Your Nutritional Health Nutrition Screening Initiative, the Mini Nutritional Assessment, and the Kayser-Jones Brief Oral Health Status Examination. It defines nutritional frailty and discusses the etiology of malnutrition in the geriatric population, providing interventions to stimulate the appetite and supplement the diet for the geriatric cohort.

Chapters seven through twelve discuss disease-specific nutrition as it relates to the obese patient, the cardiac patient, the renal patient, and the diabetic patient. Special attention is also given to the patient with digestive disorders as well as the patient with cancer.


Susan Mikulak Cacciola, RN, BSN, WCC
Chapter thirteen provides guidelines for enteral and parenteral nutrition. It includes information regarding formula selection and administration, determining parenteral nutritional requirements, and managing complications of parenteral therapy including refeeding syndrome, glycemic control, and fluid/electrolyte balance.

The handbook concludes with dietary sources for key vitamins and minerals; the Therapeutic Lifestyle Changes Diet and the Dash diet; and recommended Dietary Reference Intake Tables to guide clinical practice.

Legal nurse consultants will find this an authoritative text as they measure nursing care against the standards of practice for patients with nutritional needs. This book will assist the legal nurse consultant to determine deviations from the standards of care, including failure to assess, identify, and develop individualized plans of care to meet nutritional needs; failure to choose the appropriate nutritional support; failure to maximize nutritional support; failure to employ strategies to promote health and a safe environment; failure to coordinate care delivery; failure to provide consultation to influence the identified plan, enhance the abilities of others, and effect change; failure to use prescriptive authority, procedures, referrals, treatments, and therapies in accordance with state and federal laws and regulations; and failure to communicate and collaborate with the health care team for continuity of care and to effect change and positive outcomes.

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Manuscripts should be sent to the JLNC Editor via e-mail at JLNC@aalnc.org, as a Microsoft Word attachment. Use a minimum of formatting: do not use unusual fonts or a variety of type, and do not insert page headers or footers except for page numbers. Create a separate file attachment for tables and figures—do not insert them into the text file. Clearly label your e-mail with the submission title, and word processing program name and version.

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