

# THE LNC NEWSLETTER

PRESENTED BY:  
**Medical-Legal Interface**

## Intradiscal Electrothermal Annuloplasty (IDET) New Treatment Option for Chronic Lumbar Pain

Marguerite Barbacci, RNC, MPH, BSN, LNCC

May 2004  
Volume 3, Issue 8

Inside this issue:

To Manage or Not To Manage (Care That Is)	2
Understanding the Emergency Medical Chart	4
When reviewing a Premature Labor and Delivery Medical Record, Don't Forget to Look at the Risk Factors	5
More on TBIs-Assessing TBIs in the Elderly	5
Misdiagnosis of Subarachnoid Hemorrhage	6

The treatment of chronic lumbar pain presents an arduous challenge to the spine specialist. Patients with chronic lumbar pain fall into two clinical categories: chronic recurrent and chronic persistent. Chronic recurrent patients have multiple pain flares with varying durations of 2 weeks to 3 months. Chronic persistent patients have symptoms that do not abate and last longer than 3 months. Reports in the scientific literature note that patients who do not experience a resolution of their back pain within 3 months of onset have a poor prognosis for further recovery.<sup>1</sup> In one study, patients 22 months out from initial occurrence of back pain continued to have symptoms and were dissatisfied with their outcomes.<sup>2</sup> Other studies reported that although 80% of patients had resolution of their acute low back pain within 12 weeks, 60% of the patients experienced recurrent symptoms.<sup>3</sup> These studies underline the fact that "chronic low back pain does not necessarily have a favorable prognosis and that the long-held belief that 90% of patients will experience resolution of their back pain within

6 to 12 weeks is incorrect and misleading."<sup>1</sup>

In the vast majority of patients with chronic symptoms, the disc has been implicated as the source of continued pain.<sup>1,4</sup> Discs are cushioning tissues located between each vertebra of the spine. The disc has a soft center (nucleus) surrounded by tougher ligament tissue (annulus). With aging, the outer ligament tissue begins to fray and tear from use or injury. This allows nerves and small blood vessels from the soft center to seep into the injury site, triggering pain receptors in the ligament tissue. The result is discogenic back pain.

Discogenic pain differs from a ruptured or herniated disc because the pain originates within the disc and does not come from nerves or other structures. Discogenic pain is confined to the back and does not radiate down the legs.<sup>1,4</sup>

Nonoperative measures are frequently unable to reduce pain and improve function in patients with discogenic lumbar pain. Surgical treatment of these patients, Cont on p 2

## Osteoporosis

Jeannine Lurie RN, BSN, CLNC

**Background Information:** Osteoporosis is a disease characterized by low bone mass and loss of bone tissue that leads to weak and fragile bones. In osteoporosis, there is an increased risk for bone fractures (broken bones), particularly in the hip, spine, and wrist. Osteoporosis was often thought to be a condition that "frail old ladies" develop. In actuality, the damage from osteoporosis begins much younger in life. Women especially reach peak bone density in their 30s and must take in enough calcium to build bones that will remain strong later in life.

**Incidence:** In the United States, nearly 10 million people already have the disease, and 18 million more have low bone mass, which places them at an increased risk for osteoporosis. Women make up 80% of those people. It is predicted that 1 in 2 women and 1 in 8 men older than 50 years will have an osteoporosis-related fracture in their lifetime. According to the World Health Organization, the prevalence of osteoporosis among US Caucasian women past menopause is estimated to be 14% aged 50-59 years, 22% aged 60-69, 39% aged 70-79, and 70% aged 80 and older. Significant risk has been reported in people of all ethnic backgrounds. Caucasian and Asian racial groups, however, are at a greater risk.

### Causes

- Osteoporosis occurs when the body fails to form enough

new bone, when too much of the old bone is reabsorbed by the body, or both. The 2 essential minerals for normal bone formation are calcium and phosphate. Throughout youth, the body uses these minerals to produce bones. If calcium intake is not sufficient or if the body does not absorb enough calcium from the diet, bone production and bone tissues may suffer. Calcium and phosphate may be reabsorbed back into the body from the bones, making the bones weaker. Both situations can result in brittle and fragile bones that can break easily.

- Usually, the loss of bone happens over an extended period of years. Most often, a person will sustain a fracture before becoming aware that the disease is present. By then, the disease is in its advanced stages and damage is serious. The leading cause of osteoporosis is a lack of certain hormones, particularly estrogen in women and androgen in men. Women, especially those older than 60 years, are most frequently diagnosed with the disease. Menopause brings lower estrogen levels and increases a woman's risk for osteoporosis. Other factors that contribute to bone loss in this age group include inadequate intake of calcium and vitamin D, lack of weight-bearing exercise, and possibly other age-related changes in endocrine functions (in addition to lack of estrogen).
- Certain other conditions may lead to osteoporosis. These include overuse of corticosteroids (Cushing Syndrome), cont on p 3

## Intradiscal Electrothermal Annuloplasty (IDET) New Treatment Option for Chronic Lumbar Pain

Continued from page 1

including interbody fusion techniques, has yielded mixed results.<sup>1-4</sup>

Introduced in 1997, intradiscal electrothermal annuloplasty (IDET) is a new treatment for back pain. IDET was developed to address treatment of patients with chronic discogenic pain. This outpatient procedure applies high heat directly to the inside of the disc. It is a less expensive and less invasive procedure than spinal surgery, but it is not appropriate for everyone with low back pain.<sup>1-6</sup>

The IDET procedure is typically performed under local anesthesia. Conscious monitored sedation is applied to the patient in an outpatient surgical or radiologic setting. A 17-gauge procedure needle is introduced into the symptomatic disc under multiplane fluoroscopic guidance. The SpineCATH™ is introduced through the procedure needle and navigated to the offending portion of the annulus. Care must be undertaken to avoid kinking the catheter because this may lead to catheter breakage. Treatment may be achieved with unilateral catheter deployment, but about 40% of the time bilateral deployment is necessary to cover the entire posterior annular wall. An auto-temperature heat generator controls the catheter heat delivery system. The patient must be alert enough during the procedure to be observed for the development of radicular pain. If this occurs, the catheter is repositioned or removed. Most patients will experience their typical back pain and referral leg pain during the procedure.<sup>1</sup> IDET is usually reserved only for patients who have tried aggressive, non-operative techniques to relieve their pain without success. IDET is not recommended for patients with severe disc degeneration, nerve compression, spinal instability and/or narrowing of the spinal canal (spinal stenosis).<sup>1-6</sup> Indications for the IDET procedure include:<sup>1</sup>

- ❑ function-limiting low back pain of at least 6 months duration;
- ❑ lack of improvement from conservative treatment, including exercise, epidural steroid injections, manual therapy, oral anti-inflammatory medication, and activity modification;

- ❑ normal neurologic examination;
- ❑ Negative straight leg raise (SLR);
- ❑ Lack of neural compressive lesion on MRI scan;
- ❑ Reproduction of symptoms with provocative discography at low pressurization at 1 or more levels with demonstration of a control painless level.

Patients excluded from consideration of IDET include those with inflammatory arthritides, non-spinal conditions that mimic lumbar pain and those persons with medical or metabolic disorder that would preclude appropriate follow-up and participation.<sup>1-6</sup>

The long-term results of this procedure are still unknown. Since 1997, case series without controls have reported encouraging results. However, these results need to be confirmed in prospective, randomized trials to determine the efficacy of the procedure compared to surgical intervention. Not every patient will benefit from IDET treatment. Some patients continue to experience back pain and eventually may require other surgical procedures.<sup>1-6</sup>

One study followed active duty soldiers undergoing IDET for a two year period post-procedure. Long-term follow up noted that while initial results of the procedure were favorable, up to 20% of patients reported worsening of baseline symptoms at final follow-up. The authors concluded, "IDET will prove its role in the treatment of chronic discogenic low back pain as more outcome data are obtained, but for now, at best, IDET should be considered an antecedent rather than alternative to spinal fusion."<sup>5</sup>

### Bibliography:

1. Saal JA, Saal JS. "Intradiscal Electrothermal Therapy For The Treatment of Chronic Discogenic Low Back Pain." *Clinics in Sports Medicine*. 2002; 21(1):167-187.
2. Cohen SP. "Risk Factors for Failure and Complications of Intradiscal Electrothermal Therapy: a Pilot Study." *Spine*. 2003; 28(11): 1142-7.
3. Davis TT. "Lumbar Intervertebral Thermal Therapies." *Orthopedic Clinics of North America*. 2003; 34(2):255-262.
4. Coppes MH, et al. "Innervation of 'Painful' Lumbar Discs." *Spine*. 1997;22:2342-2350.
5. Freedman BA. "Intradiscal Electrothermal Therapy (IDET) for Chronic Low Back Pain in Active-Duty Soldiers: 2-year Follow-up." *Spine Journal*. 2003; 3(6): 502-9.

6. Saal JA. "Intradiscal Electrothermal Treatment for Chronic Discogenic Low Back Pain: Prospective Outcome Study with a Minimum 2-year follow-up." *Spine*. 2002; 27(9): 966-73.

## To Manage Or Not To Manage (Care, that Is)

Robert Morrison, RN BSN

Managed care. In some circles this has become an obscene expression. It has certainly sparked a few, mostly by those denied care, forced to change providers or otherwise left feeling like they have been run over by it. One of my favorite descriptions comes from Helen Hunt's character in the movie "As Good As It Gets." Frustrated by her HMO's refusal to allow diagnostic testing for her son, she blurts out a rather colorful description of them.

While managed care is a favorite scapegoat, it is also a fact of modern medicine. The reason why is simple- it works. It is a very time-intensive process and can be expensive for the insurer. However, in a large, questionable, or complicated claim it saves money for the insurer in the end- not just through denied tests and procedures but by forcing the providers to explain their rationale, coordinate with each other, and take into account the different options that may exist. It is by utilizing the synergy of multiple people that you decrease recovery time and minimize permanent impairments. And that is what is so expensive for the responsible party.

Managed care is normally accomplished by teaming together a claims adjuster, whose expertise is billing and applicable fee schedules, and a Registered Nurse, preferably with experience in the specific area of the current claim, and in-house medical officers or consulting experts. It is usually the adjuster that has the final say in accepting or denying claims and requests. While every claim will have an adjuster to handle the billing, only those that need the specialized medical knowledge will have a nurse assigned. In this instance the adjuster is depending

Cont on p 3

## Osteoporosis

Continued from page 1

thyroid problems, lack of use of muscles, bone cancer, certain genetic disorders, and other problems such as low calcium in the diet.

### Risk factors:

- Women are at a greater risk than men, especially women who are thin or have a small frame and those of advanced age.
- Women who are white or Asian, especially those with a family member with osteoporosis, have a greater risk of developing osteoporosis than other women.
- Women who are postmenopausal, including those who have had early or surgically induced menopause or abnormal absence of menstrual periods are at greater risk.
- Cigarette smoking, eating disorders, a low amount of calcium in the diet, heavy alcohol consumption, inactive lifestyle, and use of certain medications such as corticosteroids and anticonvulsants are also risk factors.

### Signs and Symptoms:

- Early in the course of the disease, there may be no symptoms. May have dull pain in the bones or muscles, particularly low back pain or neck pain.
- Later in the course of the disease, patients may feel sharp pain that comes on suddenly. It may not radiate, is made worse by activity that puts weight on the area, may be tender, and generally begins to subside in 1 week. But lingering pain may last greater than a month.
- Patients may have a broken bone, particularly in the spine, and not recall a fall or other trauma that might have caused it. Many spinal compression fractures may result in stooped posture. This is commonly called a dowager's hump. Patients may lose height over time.
- Fractures at other sites, commonly the hip or bones of the wrist, usually result from a fall. The literature states most spontaneous fractures from osteoporosis occur more often in the spine.

Prognosis: With adequate treatment, the progression of osteoporosis can be slowed or stopped. But some people become severely disabled as a result of weakened bones. Hip fractures are the most frequent fracture and leave about half of those who break a hip unable to walk independently. This fracture is one of the major reasons people are admitted to nursing homes. Although osteoporosis is a debilitating disease, it does not affect the length of life.

## To Manage Or Not To Manage (Care, that Is)

Continued from page 2

on the nurse to explain the process and help analyze the different requests and plans made by the providers.

While doctors and patients may curse them and accuse them of trying to undermine the attending provider, their most pressing concern is the patient's situation and finding the best way to complete the healing process and maximize recovery. Many of the most expensive cases for the insurer are not the short, intense, expensive procedures, but are the low-intensity therapy and rehab claims that go on for years without improving function. With each passing week the odds of fully recovering from the injury decrease and the patient is more likely to experience a permanent limitation of their function. That costs the insurer money and the patient quality of life (which is even more expensive than money).

When we perform chart audits or analyses, that final point is the measuring stick we use to analyze the providers' or insurer's performance. I abhor the expression "return to work," when dealing with occupational injury claims. I am not interested in getting the claimant "back to work," I am interested in seeing them regain functional abilities as they were before the injury. That means utilizing all of the treatment and rehab options available, and doing it with as little delay as possible. You may have to swallow your impatience and let the doctors and therapists work through the steps over time, but you want to make sure the case is always moving forward, not getting left in the corner and ignored. Were they doing what they should, focusing on function and ability?

We also look for the specific action taken by the Case Manager and the rationale for it. Did the Case Manager make sure the adjuster was getting all the information he or she needed to make a decision? Did they work with the doctor regarding the types of diagnostic procedures ordered, making sure that the patient was made aware of the options and alternatives? I have had times as the Case Manager when I have objected to the ordered test or treatment, not because I didn't want to authorize the money but because I felt that it would not be beneficial and would possibly cause complications greater than its expected benefit.

Another thing we watch for is that all of the players are notified of the case and given a chance to participate. The Case Manager cannot help the process if they are never brought into the picture by the adjuster. It is a lot easier to make this judgment after the fact than to be the adjuster on the scene. Hindsight is 20/20 after all. However, the adjuster should be explaining their reasons for denial of care or of a claim. Just like the nurse or doctor, the adjuster should be basing their decisions on hard, measurable standards, not by their own personal feelings or opinions.

This type of review is becoming more common for us, both from attorneys and insurers. Insurers are looking to review their methods and procedures, evaluate how well they are working by documenting the final outcomes, and decide how they need to change them in order to improve claimants' status at discharge. The attorney is trying to make sure the providers and/or the insurer did all they could have or should have done to maximize the patient's success. Also, as attorneys are being retained more often by claimants still in active treatment, they need to have a way to monitor the progress of the case and watch it as it unfolds. Managed care isn't just an insurance company's scapegoat any more. It has become what it was meant to be in the first place- a way to monitor and evaluate the care being given, and help it improve.

I would like to take this opportunity to welcome our newest member to the newsletter team, **Marguerite Barbacci** who brings with her, lots of writing experience, having been published in numerous journals books and other publications. I am sure she will be yet another great asset to this very talented writing staff.

## Understanding The Emergency Medical Chart

Gail Hendrickson, RN, CEN

To the health care provider, the medical chart is primarily a place to record information related by the patient, their assessment, and plan of care. To the lawyer, the medical chart is one of the primary pieces of evidence in a medical malpractice case against a hospital or physician. Many hospitals spend a lot of time and money on educating doctors and nurses on the correct way to document to help in the defense, if a suit should be brought against them.

The emergency room physician has the challenge of learning as much as they can about a patient that they don't know in a very short period of time. They don't have the luxury of knowing the patient like their primary care physician does.

Usually the physician record is one page. Many hospitals use "T" sheets, or templates. They are complaint specific i.e. chest pain, abdominal pain, and motor vehicle accident. The sheet directs the physician with questions that pertain to the complaint. It is mostly a check off. There is room for lab and x-ray results, a small area for assessment, and plan. Sometimes a physician will write more on a separate sheet, if it is a complex case. It is always important to look for this, which may end up being filed with the progress notes of the main hospital record.

The triage nurse is usually the first person to see the patient. Look closely at the triage level that she/he has assigned the patient. Did they appreciate the emergent nature of the patient's complaint? Look to see what the nurse has written for chief complaint. Sometimes the nurse's assessment and what the physician says are different. However, if they are different, the doctor should address it in his notes. An example would be when the triage nurse documents that the patient is short of breath. The physician would need to address this, and if he doesn't agree with it, he should document, "no dyspnea". You may find that the complaint documented by the registrar may not agree with the triage note. Registration personnel are usually lay people, and also have to pick from complaints in their computer.

The emergency department medical chart must meet standards established by JCAHO (Joint

Commission on Accreditation of Healthcare Organization). The following information must be on the patient's medical record:

- Patient identification
- Time and means of arrival
- Pertinent history of the illness or complaint
- Physical findings including the patient's vital signs
- Emergency care given to the patient prior to arrival
- Diagnostic and therapeutic orders
- Clinical observation including the results of the treatment
- Reports of procedures, tests, and results.
- Diagnostic impression
- Final disposition of the patient
- Patient's condition on discharge or transfer
- Discharge instructions
- Any documentation that the patient left against medical advice

There should be a signed consent form, which is usually obtained upon registration. This is giving permission to do an examination and treat. Further consents are needed for invasive procedures such as a lumbar puncture.

Careful documentation of times of arrival, triage, physician examination, medical orders, treatments and discharge create the kind of medical record that is very helpful in court. However, you may find that this information is commonly lacking. The time of arrival is usually the time the patient was registered, so this may be different than the time you see on the triage record. It is important to see what time the physician saw the patient, although they don't always document it. Look in the nurses notes, and sometimes the nurse has written what time the physician goes in to see the patient. You can't always go by the time orders are written, because many times, the nurses order tests before the physician has seen the patient, per standing orders. An example would be when a patient comes in with chest pain. Many times the nurse will have the EKG done, and labs drawn before the physician gets into see the patient. Standing orders for aspirin and nitroglycerin may have already been done.

You may notice a discrepancy in

the history that the triage nurse takes, and what history the physician gets. There are many reasons for this. The patient or their family may think of other medical conditions they have when they are questioned again. Also, the patient's old medical chart is requested, if needed, by the triage nurse and the physician may have it prior to seeing the patient, and can ask further questions to clarify their medical history.

Look closely to see if the physician consulted with another physician, i.e. the patients' own physician, or a specialist such as an Orthopaedic doctor. They usually document that they have spoken with a consult, and the results of the conversation.

The JCAHO requires that patient be given written discharge instructions. These instructions should include the illness or diagnosis, any medications or equipment such as crutches, and a follow up plan. Many times there is a generic statement saying "Return if worse or any new symptoms appear."

So in conclusion, when reviewing a chart, be sure to closely look at the emergency record. It has a great deal of important information if you know how to read it.

### More on TBIs-Assessing TBIs in the Elderly

Pattie Patterson RN, LNCC

Falls are the leading cause of TBI in the elderly. While this is no big surprise, the fact that men sustain more fall related TBIs than women was a surprise to me. Hospital related TBIs from falls are greater in men than women as well. In hospital related falls, often times the patient's confusion is associated to other factors, such as medications, "hospitalitis", sundowners or just plain dementia as opposed to the head trauma they suffered, as most elderly persons do not exhibit confused behavior immediately after the trauma, but is usually several hours to several days later when the effects of the trauma surface. This is not to say that these factors are not relevant, but one must not just assume simply by the virtue of ones advanced years that the trauma could not be the culprit, especially if the

Cont on p 5

## When reviewing a Premature Labor and Delivery Medical Record, Don't Forget to Look at the Risk Factors.

Jan Aken RN IBCLC, LNC

In the April LNC Newsletter I discussed the premature labor and delivery assessment guidelines. I am going to focus on some risk factors associated with premature labor in this article. Premature labor is defined as contractions with cervical change occurring at less than 37 gestational weeks. Preterm delivery is defined as a delivery that occurs at more than 20 weeks and less than 37 weeks gestation.

In spite of all the technical advances over the last 20 years the numbers of premature births has not decreased but in fact have edged slightly higher. The United States has a prematurity rate of 8%-10%.—Surprisingly, Europe who we think is a step or two behind us in the advent of technology and medicine has a premature birth rate between 5%-7%.

The neonatal morbidity associated with premature births is a significant problem for clinicians. It is not surprising to note that morbidity risks are directly related to the gestational age of the premature infant at birth. Premies that have weights of less than 1500 grams would be expected to have a higher incidence of respiratory distress syndrome (RDS), intraventricular hemorrhage, and necrotizing enterocolitis. The long term problems include neurological handicaps such, cerebral palsy, and mental retardation.

### Etiology

The genesis of preterm labor and delivery is not well understood but we do know risk factors that increase the numbers of premature deliveries. We have scientific evidence supporting an interaction process that does involve hormones, enzymes and cells, all between the mother and the fetus. There are 3 main biologic events that occur before or during the labor and they are as follows: (1) cervical ripening, (2) formation and expression of myometrial oxytocin receptors, and (3) myometrial gap junction formation. The ripening process of the cervix involves a breakdown of collagen by an enzyme and this changes the connective tissue in the cervix by softening the cervix. Increased fibroblast activity similar to anti inflammatory tissue response also occurs during this ripening process. The

formation and expression of myometrial oxytocin receptors takes place in the uterine muscle. These receptors increase the cells that allow the instantaneous communication necessary for the rhythmic and coordinated uterine contractions.

### Risk Factors

But the question remains what sets all this in motion before the time is "right"? The pregnancy associated risk factors would include previous preterm delivery, poor weight gain after 20 weeks gestation, poor prenatal care, uterine /cervical anomalies, multiple gestation, placenta previa, abruptio placenta, polyhydramnios, cervical incompetence, maternal infection and cervical effacement and dilatation.

Clinicians have been investigating the hypothesis that an infection in the mother's vaginal vault is the causation factor. The hypothesis tends to point towards infections involving the upper genital tract. Numerous investigations point to bacterial vaginosis (BV) as a possible culprit. What we do know is an upper genital infection will cause a disruption of the choriodecidual interface. The disruption is associated premature rupture of membranes. This disruptive action causes a cascade of events that ultimately result in spontaneous labor. Aggressive therapy in treating upper genital tract infections maybe having some effect on changing the rate of premature labor but at this time it is too early to tell.

Race is a significant risk factor when looking at the rate of premature births. The African American women have a premature rate of 16%-18%. Caucasian women have a premature rate of 7%-9%. The over all demographic risks include: adolescence, advanced maternal age, low socioeconomic status, non Caucasian, smoker, substance abuser, pre-pregnant weight of less than 100 lbs, and psychological stress.

When reviewing an obstetrical case the legal nurse consultant should look carefully at the risk factors. I reviewed an obstetrical case involving a premature labor and delivery of a 31 week gestation fetus several years ago. The mother presented at an attorney's office

wishing to file a lawsuit against her health care provider after she delivered a baby who now had numerous medical problems. It was my opinion the health care provider provided adequate care. You see the patient was an adolescent, had a low socioeconomic status, was a smoker, a substance abuser and had a pre-pregnant weight of less than 100lbs and last but certainly not the least of risks she only had appeared for 2 prenatal visits. This young adolescent also worked at McDonalds and she was on her feet standing for several hours. This is another risk for preterm labor too. When I pointed out the client's risk factors along with the client's general disregard for her own body by abusing it with drugs, the attorney did not take the case. Perhaps this adolescent mother was just looking for some easy money. So when one is reviewing the obstetrical records of a preterm delivery be familiar with the risk factors of preterm labor and delivery. The possible answers to the early preterm labor and delivery may well be in the patients medical history and not in the labor and delivery part of the record.

In the June issue of *The LNC Newsletter* I will be discussing treatment, Betamimetics, along with the nursing care and intervention for premature labor, premature rupture of membranes and delivery.

## More on TBIs- Assessing TBIs in the Elderly

Continued from page 4

person was mentally and cognitively intact prior to the head trauma, or if the symptomology has become more pronounced since the trauma.

It is also interesting to note that dementia and/or senility is not the "price we pay" for getting older. In other words, this is not a normal and expected outcome just by virtue of getting older. And, if you think about it, this does make sense, as there are many persons who are in their 70s, 80s and even older that are as mentally

Cont on p 7

## Misdiagnosis of Subarachnoid Hemorrhage

Maggie Driscoll RN, BSN, CCRN, CLNC

### Close Call

Laura was a 43 year-old married hardworking mother of two with a fantastic sense of humor. Her usual jovial demeanor disappeared the day she presented to the local Emergency Department with a "horrible" headache. Laura had been sleeping almost continuously for the last 24 hours. Her husband Jake told the ED physician that she headaches in the past, but never this severe and would always go away with over the counter pain relievers. The physician noted a completely "normal" neurological exam, although Jake looks back now and realizes that Laura was not at all like herself. Laura was discharged with a diagnosis of "migraine" headache and told to "go home and take a warm bath". Later that night, Jake, concerned that Laura's headache was no better, drove her to a different ED. This time the diagnosis was different. A CT of the head revealed a subarachnoid hemorrhage (SAH). Laura eventually underwent surgery to clip the aneurysm that caused bleeding into her brain. After weeks of hospitalization and rehabilitation Laura was able to come home to her family. She had no permanent neurological or cognitive impairment. Laura was very lucky.

### SAH

Subarachnoid hemorrhage, or bleeding between the middle membrane covering of the brain and the brain itself, within the CSF (cerebrospinal fluid) filled spaces surrounding the brain (also known as the subarachnoid space), results in serious impairment and death in 40-60% of cases. Risk factors associated with developing a SAH include: disorders associated with aneurysm or weakened blood vessels, including a history of polycystic kidney disease, fibromuscular dysplasia (FMD), other connective tissue disorders, aneurysms in other blood vessels, female gender, increased age, high blood pressure, smoking, alcohol and use of oral contraceptives. Ruptured aneurysms account for 95% of nontraumatic SAH's.

*Outcome is heavily dependent on early diagnosis and aggressive intervention.* According to Mayer (1996), "The condition of the patient at the time of treatment is the most important predictor of outcome. An untreated ruptured aneurysm is predisposed to recurrent hemorrhage, often within hours or days of initial SAH." If the aneurysm is left untreated,

re-bleeding is reported in 26% to 73% of patients within days or weeks after the initial rupture. Permanent brain damage may result from ischemia (loss of blood flow) or from the presence of blood in and around the tissues of the brain.

### Symptoms

- Headache
  - Sudden onset
  - Described as the "worst ever experience"
  - Can be preceded by a popping or snapping sensation in the head
  - Pain described as a new type (different pattern of headache)
  - Generalized pain, often worse near the back of the head
- Nausea and vomiting may accompany the headache
- Decreased consciousness and alertness
  - Temporary or progressively worsens to coma and death
- Difficulty seeing or changes in vision
  - Double vision
  - Blind spots
  - Temporary loss of vision in one eye
- Stiff neck
- Photophobia (light bothering or hurting the eyes)
- Muscle aches (especially neck pain and shoulder pain)
- Seizure
- Difficulty or loss of movement or sensation of a part of the body
- Changes in mood and personality
  - Confusion
  - Irritability

### Diagnostic Testing

A noncontrast CT is the most sensitive imaging study in SAH, however, the longer the interval between the onset of symptoms and the scan, the less likely the CT will show the bleed. If the CT scan is negative, but the findings are consistent with SAH a lumbar puncture (LP) is normally performed to evaluate the cerebrospinal fluid (CSF) for the presence of red blood cells and xanthochromia. The LP is most sensitive 12 hours after onset of symptoms. Cerebral angiography can be used to assess the site of aneurismal bleeding, to detect the presence of other aneurysms and to assist in determining the appropriate treatment.

According to clinical guidelines set forth by the American College of Emergency Physicians (level B recommendation), "Patients presenting to

the ED with headache and abnormal findings in a neurologic examination (i.e., focal deficit, altered mental status, altered cognitive function) should undergo emergent (*emergent studies* are those essential for a timely decision regarding potentially life-threatening or severely disabling entities) noncontrast head CT scan. Patients presenting with acute sudden-onset headache should be considered for an emergent head CT scan."

### Characteristics of Misdiagnosis:

Two commonly reported reasons for misdiagnosis include:

- Failure to obtain a CT of the head related to incorrect working diagnosis (based on failure to entertain diagnosis of SAH or appropriately interpret history and physical exams)
- Failure to interpret CT or LP findings correctly

Rates of reported misdiagnosis vary within the literature from 12-51%. Headache, a key symptom of SAH, is one of the most common presenting symptoms in the emergency department and is associated with a wide variety of non life-threatening disorders. Erroneous diagnoses include: viral meningitis, migraine, headache of uncertain etiology, stroke, sinus headache, hypertensive headache, and tension headache.

Misdiagnosed patients were more likely to report "warning or sentinel" headaches (thought to be caused by the leaking of blood from an aneurysm before it ruptures) than those who were correctly diagnosed. Kowalski et al (2004) theorized that practitioners misinterpreted these headaches for recurrent headaches associated with migraines or tension headaches.

Kowalski also identified patients with smaller bleeds and right-sided aneurysms as associated with initial misdiagnosis.

Younger patients and nonsmokers typically have better outcomes after SAH. The location and severity of bleeding also influence prognosis. The Hunt and Hess Scale designed for grading SAH can be correlated to prognosis. *The lower the grade, the better the prognosis.* Grades 1-3 generally are associated with favorable outcome; these patients are candidates for early surgery.

Cont on p 7

## Misdiagnosis of Subarachnoid Hemorrhage

Continued from page 6

Grades 4 and 5 carry poor prognosis; these patients need stabilization and improvement to grade 3 before surgery is undertaken. Some recommend more aggressive management for patients with poor clinical grade.

Studies have concluded that patients with the highest rate of misdiagnosis initially have the best neurological grade and are most likely to benefit from timely aneurysm repair. Kowalski reports in their study that "misdiagnosis (in patients that presented with Hunt-Hess Grade I or II) was associated with a nearly 4-fold increase in likelihood of death at 12 months and with worse functional recovery and quality of life among survivors".

Laura was very fortunate. It's been nearly 16 years since her aneurysm repair. Had Laura's husband not taken her to another ED for another exam, the outcome may have likely been very different. Careful attention to the signs and symptoms that accompany SAH, consideration of risk factors, and proper diagnostic testing and interpretation may help in reducing the chance of misdiagnosis.

### References:

- Kowalski RG, Claassen J, Kreiter KT, et al. Initial misdiagnosis and outcome after subarachnoid hemorrhage. *JAMA*. 2004;291:866-869.
- Mayer PL, Awad IA, Todor R, et al. Misdiagnosis of symptomatic cerebral aneurysm. Prevalence and correlation with outcome at four institutions. *Stroke*;27:1558-1563.
- American College of Emergency Physicians. Clinical policy: Critical issues in the evaluation and management of patients presenting to the emergency department with acute headache. *Annals of Emergency Medicine* Volume 39 • Number 1 • January 2002.
- Kazzi AA, Ellis K. Subarachnoid Hemorrhage. *Emedicine* Last updated August 28, 2003. Available online: <http://www.emedicine.com/EMERG/topic559.htm>
- Medline Plus: Service of the National Library of Medicine and the National Institutes of Health: Subarachnoid hemorrhage. Updated by: Victoria Kennedy, RN, A.D.A.M. editorial. (2/18/2002). Previous review: Charles Prestigiacomo, M.D., Department of Neurological Surgery, Beth Israel Medical Center, New York, NY. Review provided by VeriMed Healthcare Network. (6/19/2001). Available online: <http://www.nlm.nih.gov/medlineplus/ency/article/000701.htm>

### Additional Resources:

- The US Headache Consortium: <http://www.ahsnet.org/guidelines.php>
- National Guideline Clearinghouse: <http://www.guideline.gov/summary/summary.aspx?docid=2820&nbr=2046&string=headache+AND+disorders>
- The Hunt and Hess Scale: [http://www.strokecenter.org/trials/scales/hunt\\_hess.html](http://www.strokecenter.org/trials/scales/hunt_hess.html)

## More on TBIs-Assessing TBIs in the Elderly

Continued from page 5

intact as they were when they were much younger. In the hospital setting many healthcare providers make the assumption that just because one has reached their "golden years" any confusion or behavioral changes are simply the normal aging process, and often do not look past that assumption to ascertain if there may be an actual problem causing this.

Another thing worth noting is the fact that as we age, our brain does shrink to a certain degree, so depending on the amount of shrinkage, this too can affect the amount of injury sustained to the brain.

When looking at a TBI case in the elderly, one must look at all of the elements in play such as;

- Preinjury condition.
- Medications
- Disease process(es) going on with patient and/or diagnoses.
- Labs
- Familiarity of surroundings-confusion and/or disorientation.

One must also look at when changes are first noted, and any and all testing done after noting the changes, including but not limited to:

- Neurological checks
- Vital signs
- Any type of brain imaging
- Labs
- Radiological studies

Also, there are disease processes that can be exacerbated or can cause an early onset by a head trauma such as:

- Alzheimer's
- Parkinson's
- Organic brain syndrome.

Medications that one should be especially aware of are any type of sedative, tranquilizer, psychotropics and also anything that is utilized to thin the blood, as these can cause and/or exacerbate a bleed after the head trauma.

When looking at a TBI in an elderly person, these are just some of the issues that must be examined to determine the true damages in the case.

## Medical-Legal Interface

**Pattie Patterson RN, LNCC**  
**Legal Nurse Consultant-Certified**  
**Life Care Planner**  
**6501 Galaxie Road**  
**Richmond, Va. 23228**

Phone: 804-262-2991

Fax: 804-266-5701

Email: [leglnurs@bellatlantic.net](mailto:leglnurs@bellatlantic.net)

*"We get to the heart of your case."*

