

CONTENTS

2 & 3

Sports Concussions and
Return To Plays

4 & 5

Of Rationing and Waste

6 & 7

The Key to Treating
End-of-Life Ulcers

8 & 9

Don't Lose Sight of Glaucoma

10 & 11

Molecular Diagnostic Techniques
in Infectious Diseases

12 & 13

Red Flags for Pediatric
Headaches

14 & 15

The Latest on Lead
Management and Extraction

16

The Results Are In:
Physician Engagement Survey



Every Day Is a Gift

Dr. Kristin M. Nelsen, Covenant Chief of Staff

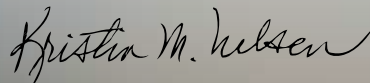
Physicians are famous for their hectic schedules. We are so busy at work, at home and planning for the future that we often don't stop to appreciate what we have. Once in a while, though, we get a wake-up call. Something happens that makes us take notice. That happened to me recently. One of our nurses in Interventional Radiology died unexpectedly; she was only 43 and a wonderful single mom. How could she be here one day, and gone the next?

Medically, of course, we can usually answer that question. Emotionally, though, it forces us to realize two things:

- 1 First, we are human too, and the unexpected could happen to us. We all expect to see our families, friends and coworkers tomorrow, but in reality, maybe we won't. So every so often, slow down and remember to take a step back and reassess what is important in your life. Life is a precious, fragile gift. Live it to the fullest and live in the moment. Enjoy the little things. Choose to be happy. And don't sweat the small stuff.
- 2 Second, death is extremely difficult on those left behind. That might sound a little trite, but as physicians dealing with serious illnesses and death on a regular basis, we tend to build a shell over time and get a little callous when sharing bad news. So remember to have empathy and put yourself in the shoes of those who are grieving. It is hard to lose someone, especially when you don't get to say good bye. Your attitude and approach can make an important difference.

We like to think we are infallible and maybe that's a mindset that comes with saving lives. But the fact is, we are as vulnerable as everyone else. According to Mahatma Gandhi, "Live as if you were to die tomorrow; learn as if you want to live forever."

I think these are excellent words of wisdom to live by; I hope you do too.



Dr. Kristin M. Nelsen, Chief of Staff

Live as if you were to
die tomorrow; learn as if
you want to live forever.

– Gandhi





Sports Concussions and Return To Play

GUEST AUTHOR

Dr. Frank Schinco, Chief of Neurosurgery, Covenant Neurosurgery

Many concussions occur in sports and since a new season of football, soccer, cheerleading and ice hockey is upon us, this is a good time to review the basics. Dangers can be minimized through education, early diagnosis and swift treatment.

How Many Fingers?

A concussion is a form of traumatic brain injury (TBI) that usually occurs without loss of consciousness. A seemingly mild bump can cause permanent damage if the brain is not allowed to heal. This is why the National Football League (NFL) and other sports organizations have adopted more stringent “return to play” guidelines that err on the side of safety.

The more stringent NFL policy states, in part: “Once removed for the duration of a practice or game, the player should not be considered for return-to-football activities until he is fully


asymptotic, both at rest and after exertion, has a normal neurological examination, normal neuropsychological testing, and has been cleared to return by both his team physician(s) and the independent neurological consultant.”

Fortunately, the old “how many fingers can you see” test is becoming a thing of the past and NFL players with concussion symptoms are not returning to play on the same day. Not only are coaches held more accountable, but so are the players in terms of being honest about their symptoms.

The problem is that this approach hasn’t always trickled down to high school sports. In fact, return-to-play guidelines for young athletes are vague, which is unfortunate because the developing adolescent brain is more subject to injury than the adult brain. This coupled with the fact that kids try to act tough and invulnerable, is primarily why young athletes are more prone to injury and concussion issues.

Diagnosis & Treatment

Patients who present with a possible concussion should be asked detailed questions about their injury followed by a neurological exam. This would include checking the patient’s memory, reflexes, vision, hearing, strength, coordination and balance.



Return-to-play guidelines for young athletes are vague, which is unfortunate because the developing adolescent brain is more subject to injury than the adult brain.

If the patient is experiencing continued symptoms such as seizures and problems with recall, a CT scan followed by an MRI may be indicated to reveal problems such as bleeding. Overnight stays in the hospital for observation may also be called for.

If there is bleeding, patients should be hospitalized immediately for the appropriate care. Otherwise, evidence supports a treatment plan in which patients stay away from contact sports for up to six months, get lots of rest, avoid alcohol, noise, commotion and high-stimuli activities like video games. TBI occurs at a microscopic level in which tau proteins accumulate around the nerve cells, causing damage over time that is similar to late-stage Alzheimer's. Allowing the brain to rest and heal is the only way to stop the damage from progressing.

Playing It Safe

With TBI, it's always best to play it safe, even if it means telling the young athlete to stop playing sports for a period of time. This is never an easy message to deliver or receive, but it might end up saving their life.

Such a judgment call can prevent further neurological issues (see case study) and second-impact syndrome – a condition in which a second concussion occurs before the first is fully healed. This can cause serious issues and even death due to complications from brain swelling. Every year, six to nine kids die from this condition nationally in football. Now, there

is a growing concern that it will escalate among soccer players too, due to the repeated “headers” that kids are required to make during practices and games.

Education & Awareness

As physicians, we should make every effort to educate coaches, parents and players about the dangers of concussions. Covenant HealthCare, for example, offers concussion education through the Covenant Injury Prevention Program to promote safety and understanding.

Together, we can help people understand that:

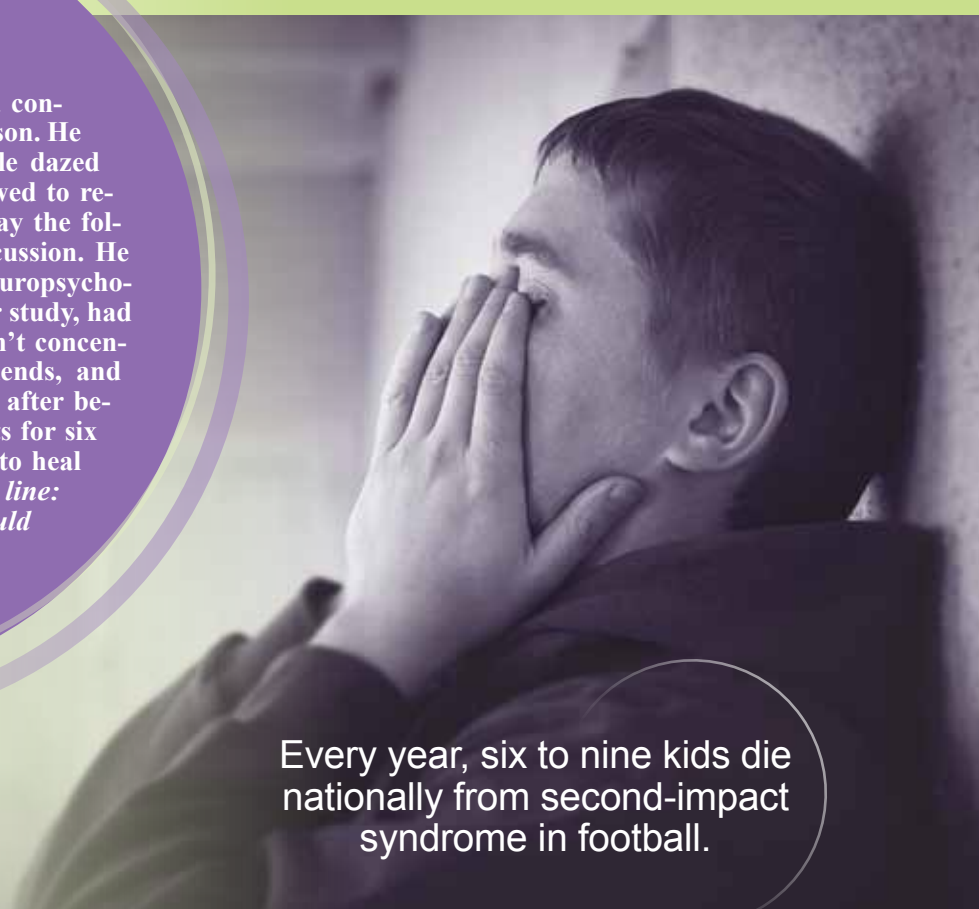
- The symptoms of dizziness, amnesia, nausea and/or vomiting are not a laughing matter.
- Players with these symptoms likely have a mild to moderate TBI.
- Such players should not be returned to play for the rest of the game.
- They should be assessed by a qualified physician for further treatment decisions.

If we don't let kids play with a broken ankle, they shouldn't be allowed to play with a broken brain either. The injury needs time to heal. It's that simple.

For more information, contact Dr. Schinco's office at 989.752.1177 or fschinco@chs-mi.com. For questions about the Injury Prevention Program at Covenant HealthCare, contact Christine Knieper at 989.583.7451.

Could This Be Your Patient?

A popular football quarterback has a concussion during the third game of the season. He didn't lose consciousness, but was a little dazed with some amnesia. While he wasn't allowed to return to that game, he was permitted to play the following week and experienced another concussion. He developed a more serious headache and neuropsychological symptoms. He couldn't think right or study, had problems with attention and grades, couldn't concentrate, was frustrated with family and friends, and developed personality issues. Fortunately, after being ordered to stop playing contact sports for six months and to rest, his brain was able to heal and he made a full recovery. *Bottom line: don't be afraid to sideline kids; it could make a difference between quality of life and death.*



Every year, six to nine kids die nationally from second-impact syndrome in football.



Of Rationing and Waste

Dr. Michael Schultz, Chief Medical Quality and Informatics Officer

The debate about health care reform in the United States is multifaceted, ranging from reducing costs and improving quality to enhancing access to affordable care. One key discussion centers around rationing of healthcare services and waste reduction. Consider the following points made in a recent *New England Journal of Medicine* perspective (Howard Brody).

- One way of thinking about the vexing issue of rationing in healthcare is that spending on interventions without patient benefit constitutes waste.
- A case is being made by bioethicists that rationing and waste avoidance are complementary.
- Avoidance of waste in healthcare can make available limited resources to those who otherwise would not have been able to receive care due to occult (unintended and unrecognized) rationing.
- Occult rationing occurs when waste (as previously defined) makes needed but limited resources (beneficial interventions) unavailable to those that may benefit.
- As medical technology advances, especially with personalized genomic medicine, we will almost certainly arrive at the day when we cannot afford all potentially beneficial therapies for everyone.

The Moral Conundrum

Upon graduating from medical school, as new physicians we all took a time-honored oath placing our own individual interests below that of our patients. These oaths were generally some derivation of the Hippocratic Oath, if not The Oath itself. According to Wikipedia, one contemporary interpretation of the Hippocratic Oath includes the notion that while all required measures should be employed in the care of the patient, *overtreatment and futile measure should certainly be avoided*. This perspective includes responsibility for economic stability as it relates to patient care.

So how does a physician's moral conduct relate to healthcare reform? While the information system technology revolution is exciting due to potential improvements in patient care and efficiency, it is also worrisome due to the potential for negative unintended consequences such as constraints that restrict care. In addition, keeping pace with change is becoming increasingly onerous. As noted in her recent book, Grace Terrell observes "Physicians must both adapt and continue to provide the leadership and social authority to make these changes patient-centric, or our special position in American health care will erode and become increasingly irrelevant" (Grace E. Terrell and J.M. Bohn).

Our oath to care for our patients seemed to suggest we exclude all considerations other than what is the best for the patient from a purely medical perspective. But consider this perspective: "Put simply, helping a patient become well

enough to climb the stairs to his apartment is meaningless if our care leaves him unable to afford that apartment. Protecting our patients from financial ruin is fundamental to doing no harm" (Lisa Rosenbaum and Daniela Lamas).

Path Forward

So how do we proceed, balancing patient needs with affordability and quality of life? It is becoming more and more clear that in order to:

- Be successful with fundamental reform in healthcare,
- And achieve financial sustainability,
- While maintaining effective, high quality, efficient and accessible care ...
- *Business as usual* is not a tenable position.

Unfortunately, what has not become any clearer is the best course forward. That said, one promising component of new healthcare roadmaps involve the concept of reducing "variation." Statistics teaches us that variation is the enemy of quality. If variation in the use of diagnostic tests was reduced by adopting best practices:

- **Close to one third** of our current healthcare costs could be eliminated.
- This reduction could occur **without** depriving any patients of beneficial care (Howard Brody).

Earlier this year, a program was launched to get us off the starting block with reducing waste in healthcare while avoiding rationing. Brody, one of the preeminent medical ethicists of our time, feels that the approach suggested by such an initiative can truly protect a patient's interests without rationing if done properly. A recent article in the *New England Journal of Medicine* suggested that overuse of ineffective measures amounts to approximately \$800 billion a year (Gregg Bloche) – or the "one-third" of healthcare costs mentioned above.

The name of this program is Choosing Wisely, an initiative of the American Board of Internal Medicine Foundation to reduce waste without rationing. It began as a concept that was originally conceived and introduced by the National Physicians Alliance and is now comprised of numerous medical professional societies as well as Consumer Reports.

"Physicians must both adapt and continue to provide the leadership and social authority to make these changes patient-centric, or our special position in American health care will erode and become increasingly irrelevant"

– Grace E. Terrell and J.M. Bohn

About Choosing Wisely®

The stated aim of this program is:

To promote conversations between physicians and patients by helping patients choose care that is:

- Supported by evidence.
- Not duplicative of other tests or procedures already received.
- Free from harm.
- Truly necessary (Choosing Wisely).

Nine specialty societies in the United States have developed lists of evidence-based recommendations that should be considered between physicians and patients regarding appropriate care. Each list contains five clinical activities that are felt to be overused and should be questioned routinely so as to hopefully reduce the wide variation in use. Shown below are each of the nine participating societies with one example of waste reduction from its list of Top Five recommendations for that specialty.

The complete lists can be downloaded from the website, www.choosingwisely.org, along with other useful information.

In aggregate, there are currently 45 such recommendations that our medical societies have agreed we should all follow, and for which there is significant overutilization. For the next several issues of *The Chart*, we will be identifying medical staff for each of the nine medical societies involved in Choosing Wisely to provide commentary on the Top Five from their respective specialty.

For more information, refer to the www.choosingwisely.org website, review the suggested resources, or contact Dr. Schultz at 989.583.4103 (mschultz@chs-mi.com).



PARTICIPATING SOCIETIES	EXAMPLE OF WASTE REDUCTION
American Academy of Allergy, Asthma & Immunology	Don't diagnose or manage asthma without spirometry.
American Academy of Family Physicians	Don't perform Pap smears on women younger than 21 or who have had a hysterectomy for non-cancer disease.
American College of Cardiology	Don't perform stress cardiac imaging or advanced non-invasive imaging as a pre-operative assessment in patients scheduled to undergo low-risk non-cardiac surgery.
American College of Physicians	Don't obtain imaging studies in patients with nonspecific low back pain.
American College of Radiology	Don't do imaging for uncomplicated headaches.
American Gastroenterological Association	Do not repeat colorectal cancer screening (by any method) for 10 years after a high-quality colonoscopy is negative in average risk individuals.
American Society of Clinical Oncology	Don't perform PET, CT and radionuclide bone scans in the staging of early breast cancer at low risk for metastasis.
American Society of Nephrology	Avoid nonsteroidal anti-inflammatory drugs (NSAIDs) in individuals with hypertension or heart failure or CKD of all causes, including diabetes.
American Society of Nuclear Cardiology	Use methods to reduce radiation exposure in cardiac imaging whenever possible, including not performing such tests when limited benefits are likely.

Resources: Works Cited

- Amireh Ghorob, M.P.H. and M.D. Thomas Bodenheimer. "Sharing the Care to Improve Access to Primary Care." *New England Journal of Medicine* (2012): 1955 - 1957.
- *Choosing Wisely*. 2012. 11 August 2012 <www.choosingwisely.org/?page_id=8>.
- David Blumenthal, M.D., M.P.P. "Performance Improvement in Health Care -- Seizing the Moment." *New England Journal of Medicine* (2012): 1953 - 1955.
- Grace E. Terrell, M.D. and M.B.A. J.M. Bohn. *MD 2.0: Physician Leadership for the Information Age*. Tampa: American College of Physician Executives, 2012.
- Howard Brody, M.D., Ph.D. "From an Ethics of Rationing to an Ethics of Waste Avoidance." *New England Journal of Medicine* (2012): 1949 - 1951.
- Howard Brody, M.D., Ph.D. "Medicine's Ethical Responsibility for Health Care Reform -- The Top Five List." *New England Journal of Medicine* (2010): 283 - 285.
- Lisa Rosenbaum, M.D. and M.D. Daniela Lamas. "Cents and Sensitivity -- Teaching Physicians to Think about Costs." *New England Journal of Medicine* (2012): 99 - 101.
- M. Gregg Bloche, M.D., J.D. "Beyond the "R Word"?: Medicine's New Frugality." *New England Journal of Medicine* (2012): 1951 - 1953.



The Key to Treating End-of-Life Ulcers: Education and Documentation

GUEST AUTHOR

Dr. Dennis Boysen, Medical Director, Covenant Regional Wound Healing and Hyperbaric Medicine Center

The medical community is starting to see a growing number of end-of-life ulcers due to an aging population in which ulcers develop quickly despite best efforts to prevent them.

The problem is that patients and families often don't understand the nature of ulcers and may think that ulcers are avoidable or result from improper care. Even best practices advocated by CMS insinuate that ulcers are avoidable. This is a misconception and simply not true. In fact, a National Pressure Ulcer Advisory Panel (NPUAP) unanimously agreed that, **“Not all pressure ulcers are avoidable and it is likely impossible to eradicate pressure ulcers in end-of-life patients owing to their many co-morbid conditions and risk factors.”**

Consequently, it is particularly important to not only focus on prevention, but to also educate patients about ulcers and complications. With end-of-life ulcers (Kennedy), it is especially critical to document the slim chance of healing and get agreements for palliative care. Below are some useful guidelines that can promote understanding, prevent finger-pointing and improve patient outcomes. These guidelines will also help you recognize and treat these wounds.

Common Risk Factors Among the Elderly

- More skin injuries and slower healing due to drier, fragile skin
- Impaired oxygenation, impaired gas exchange and lower blood pressure
- Tissue ischemia from prolonged pressure and lack of mobility
- Tissue breakdown due to moisture from perspiration, wounds and other body exudates
- Decreased perception of pain and fear of movement
- A myriad of other factors related to the dying process

Note: The sacrum, elbows and heels are particularly vulnerable to pressure, friction and shear.

Patient Education

Patients and their circle of care (family and caregivers) should be educated about ulcers early in the process and given the time and opportunity to ask questions. Such a discussion can occur even if ulcers are not present as a proactive way to prepare more susceptible patients for the possible occurrence of ulcers.

Interestingly, patients are often not aware that skin is the largest organ of the body and can fail along with other organs even with treatment. Nor do they realize how quickly ulcers can develop – within hours or from minor friction from turning, or that death can actually result.

Such knowledge can often make a world of difference to patients in understanding their condition and accepting it as part of the illness or dying process, rather than assigning blame.

Patients should also be involved in decisions regarding an aggressive curative wound treatment strategy or if the wound is non-healing, a palliative strategy. They should know that supportive, comfort-enhancing interventions are always part of any treatment plan.

General Treatment

When pressure ulcers occur, it is important to determine if they are 1) healable within an individual's life expectancy, 2) can be maintained or 3) are not healable and qualify as palliative.

Healthcare practitioners should be aware of Skin Changes At Life's End (SCALE), and related etiologic and pathophysiological factors. The plan of care should be carefully documented and reflected in the medical record along with comorbidities and consensus on treatments (see SCALE algorithm). Together, the patient's healthcare team should address the medical, social, legal and financial ramifications of SCALE. Patient concerns should be addressed first and foremost, including pain management, to enhance the patient's dignity and quality of daily life.

What About Kennedy Ulcers?

Kennedy ulcers, which are the most severe form of ulcer, tend to occur in the geriatric population and frequently in hospice patients; they are often called “acute bed sores.” These can result from blood perfusion problems exacerbated by the dying process in which internal organs – including skin – begin to fail. Pressure effects from lack of mobility and friction occur more quickly which is how the “3:30 Syndrome” phrase was coined – patients often present normal in the morning but develop a Kennedy ulcer by 3:30 in the afternoon.

While recovery is possible it is very unlikely, and death usually occurs in a short timeframe – a fact confirmed by the NPUAP (see the *Kennedy Ulcer visual for more details*).

Kennedy ulcers are sudden-onset wounds, usually starting out as an abrasion or blister, or at Stage II. They typically present on the sacrum; can be shaped like a pear, butterfly or horseshoe; can be red, yellow, black or purple; and usually have irregular borders. Most people say: "Oh my gosh, it wasn't there yesterday!" The patient in this particular photo presented with a significant Stage III ulcer, and shows the progression over three months. The patient agreed to hospice care where she died soon after.



A few treatment considerations (see www.npuap.org for details):

- Treat the same as other pressure ulcers; treat what you see.
- If it becomes a Stage II ulcer with minimal drainage, use hydrocolloid, hydrocolloid gel and a pressure reduction mattress.
- If the ulcer is full-thickness – Stage III or IV, add a calcium alginate treatment to avoid moisture buildup/soiling and consider vacuum assisted closure (VAC) therapy. Note also that VAC can decrease ulcer size by 48% if applied within less than 30 days.
- For necrotic, slough, or eschar tissue, use an enzymatic debriding agent.
- If infection occurs, consider a silver impregnated dressing and always debride at bedside or in the OR.

(medical therapy and environmental techniques), appropriate cleansing and dressings, infection and odor management, and periwound protection.

Agreement to palliative care should be documented in the records and reflect a contract with the patient. Moving a patient from curative to palliative status requires patient approval and should be communicated to the patient's circle of care and other members of the medical team.

Choosing Palliative Care

Palliative care should be the prescribed treatment if the wound is considered nonhealing and not merely undertreated. Key considerations include:

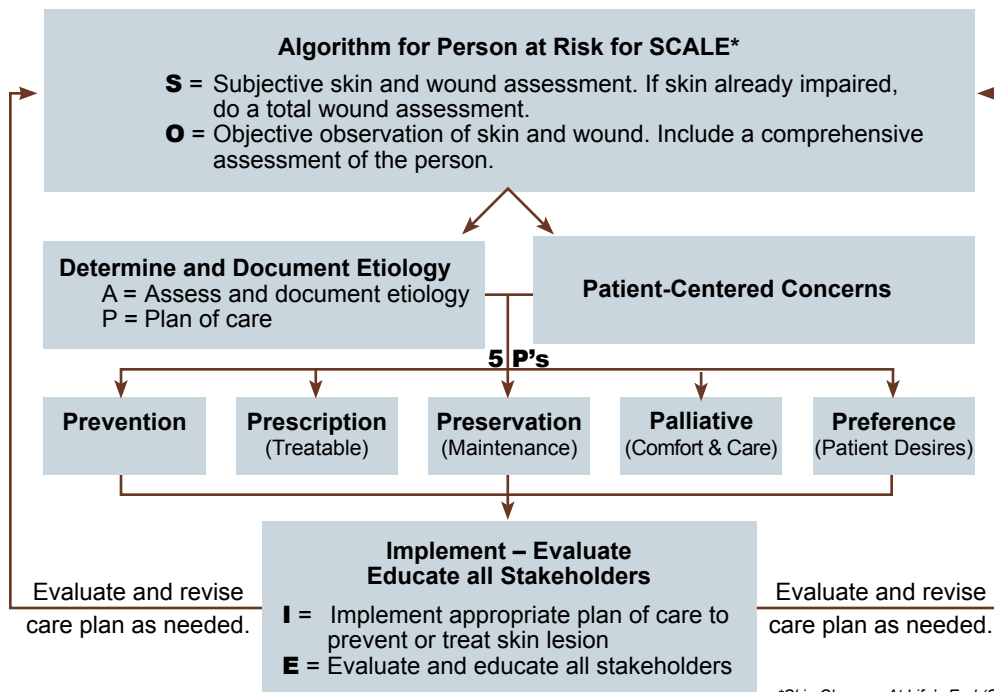
- The wound fails to progress and deteriorates.
- New wounds form.
- The patient's clinical condition deteriorates.
- Quality of life can no longer be enhanced.

Numerous studies suggest that appropriate care of pressure ulcers at the end of life, based on the goals of the patient and family, can be achieved and improve outcomes in at least 50% of the cases, even in a hospice unit (with the exception of Kennedy ulcers where, as mentioned, recovery is slim).

It should be mentioned here that the government often isn't "in tune" with the reality of ulcers either, making it difficult for physicians to meet government expectations relative to healing. This is yet another reason why documentation and education are critical.

The goal of palliative wound care may be healing, but often consists of maintenance and comfort. The challenge is to balance the best wound prevention and management practices while promoting patient dignity, self-esteem and quality of life. Palliation should include wound pain management

For more information about proper wound care practices, please contact Dr. Boysen at 989.583.4401 or dboysen@chs-mi.com. Also visit www.npuap.org.



Useful Resources

- Wound Care Guidelines and other reference tools from the National Pressure Ulcer Advisory Panel (NPUAP) – see www.npuap.org.
- Langemo, Diane "General Principles and Approaches to Wound Prevention and Care at End of Life: An Overview", *Ostomy Wound Management* 2012; 58 (5): 24-34.
- Sibbald, Gary R., Krasner, Diane L., Lutz, James "SCALE: Skin Changes at Life's End: Final Consensus Statement" *Adv. Skin Wound Care* May 2010; 23:225-36.

*Skin Changes At Life's End (SCALE)



Don't Lose Sight of Glaucoma

GUEST AUTHOR

Dr. Usha Bulusu, Ophthalmologist, Eye Care Specialists of Michigan

Glaucoma is a leading cause of blindness in the U.S., second only to cataracts. It's a condition that affects 3 million Americans. Half of these people don't know they have glaucoma, however, because it tragically presents with no pain and in most cases, initially affects peripheral vision. Left untreated, these patients will experience tunnel vision and a growing loss of vision until they go blind. Therefore, when talking to patients about their general health, don't lose sight of glaucoma – especially for patients in higher risk categories. Early diagnosis and proper treatment are critical to saving their vision.

Risk Factors

Several factors put patients at an elevated risk for glaucoma. These include:

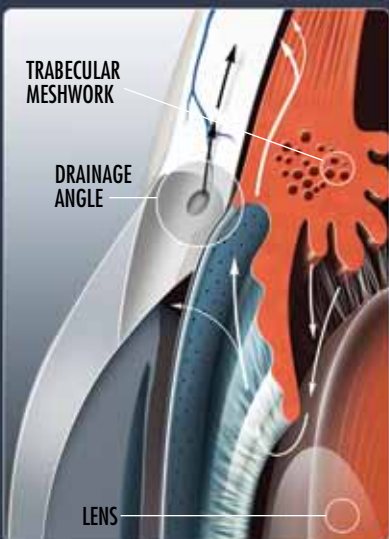
- **Ethnicity** – African-Americans are five times more likely to develop glaucoma than Caucasians and about 1 million are afflicted. The reason for the high incidence rate is unknown, but could be due to a greater likelihood of optic nerve damage due to elevated pressure in the eyeball occurring at a younger age, and less resources to detect the problem. Hispanics are also considered a higher risk group.
- **Age** – patients 60 and older are six times more likely to develop glaucoma and should have an annual dilated eye exam. Checking intraocular pressure (IOP) alone does not rule out glaucoma; the optic nerve must be evaluated.
- **Family history** – having a first-generation relative with glaucoma makes a patient nine times more likely to develop glaucoma.
- **Pre-existing eye conditions** – past eye injuries such as detached retina, eye inflammation and eye tumors.

- Prolonged corticosteroid use
- Diabetes and hypothyroidism
- Nearsightedness

Types of Glaucoma

Glaucoma presents in the following forms:

- **Open Angle Glaucoma** is the most common form of the disease in the U.S.. With this type of glaucoma, there are no visible abnormalities to the trabecular meshwork, but it functions poorly resulting in decreased intraocular fluid outflow. This creates a gradual pressure buildup over months and years. Open angle glaucoma is an extremely slow progressing degenerative eye disease. Most patients don't notice a decrease in their vision until they have already suffered significant vision loss peripherally, and it is affecting their central vision too. People of African and Latino ancestry are more prone to this form.
- **Closed Angle Glaucoma** makes up approximately 10% of glaucoma cases in the U.S. This form of glaucoma is caused by an anatomical variation in which the iris bulges forward to block the aqueous humor from reaching the drainage channel between the cornea and iris. It usually results in a rapid increase of IOP. Symptoms include severe eye pain, blurred vision, rainbow-colored halos around lights, reddening of the eye and sudden onset of vision disturbance in low light. Women, people with hyperopia (farsightedness), and people of Asian descent are more prone to develop this form.
- **Congenital Glaucoma** is a rare form of glaucoma which presents in infants when their ocular drainage channels



Glaucoma causes blindness in over 120,000 people in the U.S. annually. It encompasses a group of eye conditions generally caused by high intraocular pressure (IOP) that damages the optic nerve. The increased pressure is caused by a buildup of aqueous humor. This fluid normally flows through the filtering trabecular meshwork and then enters the bloodstream through Schlemm's Canal near the base of the cornea. This exit point can narrow and restrict fluid flow, and in some cases it can be completely closed off. Impediment to proper flow will result in the buildup of pressure, damage to the optic nerve and glaucoma. Treatment with medication or surgery is necessary to reduce pressure build-up.

have not properly developed. Symptoms include excessive tearing, sensitivity to light, and spasms or squeezing of the eyelids.

- **Pigmentary Glaucoma** generally affects young to middle-age adults and is caused by the dispersion of pigment particles in the eye. Physical activities can jar the particles loose from the iris surface and allow them to be deposited in the trabecular meshwork, obstructing fluid flow and resulting in IOP elevation.
- **Low Tension (or Normal Tension) Glaucoma** is different from other types of glaucoma in the sense that it is not caused by increased IOP. Optic nerve damage occurs while eye pressure is within the normal pressure range. The cause of low tension glaucoma is unknown, but is theorized to be due to especially sensitive optic nerves or in patients who have a reduced blood supply to the optic nerve. People of Asian descent are more prone to develop this form.

Diagnosis

Specialists use a variety of tests and procedures to diagnose glaucoma, including:

- Tonometry and tonography testing to measure and track IOP.
- Optic nerve inspections performed by pupil dilation to inspect for nerve damage.
- Vision field testing to determine range of peripheral vision.
- Gonioscopy to examine the angle which is formed between the cornea and iris. This testing can differentiate open angle versus closed angle glaucoma and show evidence of trauma, pigment deposition and other anomalies.
- Pachymetry testing to determine the thickness of the patient's cornea as cornea thickness can affect homeostatic eye pressure.

According to the Glaucoma Foundation, eye exams should be prescribed as follows:

- Everyone under 40 should have a comprehensive eye examination *every three to four years*.
- Individuals under 40 with risk factors should get tested *every one and a half to two years*.
- Everyone 40 years or older should have a comprehensive eye examination *every one and a half to two years*.
- Individuals who are 40 years old and have an additional risk factor should get tested *annually*.
- Anyone with high risk factors should be tested *every year or two* after age 35.

Treatments

There is no way to reverse the damage caused by glaucoma but once detected, proper treatment can slow and prevent further damage from occurring. The goal is to reduce IOP, thereby stopping the downward spiral of decreased peripheral vision, tunnel vision and total blindness. This is achieved by decreasing aqueous humor production, improving the fluid outflow or both.

Treatment plans are tailored to meet specific patient needs and will depend on factors such as their stage of disease (mild, moderate or advanced), age and comorbid conditions. In general, treatments include:

Medicated Eye Drops

Depending on the patient's needs, eye drops are prescribed to:

- Increase the outflow of aqueous humor. They feature prostaglandin-like compounds, epinephrine compounds and miotic/cholinergic agents.
- Reduce the production of aqueous humor. These eye drops include use of beta blockers and carbonic anhydrase inhibitors.
- Reduce the production of aqueous humor and increase drainage, such as alpha-agonists.

Oral Medication

Oral medications are used in conjunction with eye drops if necessary, although this is less common.

Surgical Options

For patients who don't respond well to eye drops or medication, a variety of surgical and laser procedures exist including:

- Trabeculectomy surgery: a small opening is made in the sclera to remove a small portion of the trabecular meshwork to bypass the native, poorly functioning drainage system to create a new channel for outflow. While this penetration surgery has the best rates of significant IOP reduction and has been considered a gold standard, it is not recommended as an early intervention strategy.
- Tube shunts or drainage implants: silicon tubes are inserted into the eye to help shunt and drain aqueous humor fluid. This is considered a penetrating surgery for diseased eyes.
- Trabeculoplasty laser treatment: a laser is used to modify the drainage canal to improve outflow facility and reduce eye pressure.

Summary

A great deal of research is underway to surgically treat glaucoma safely and successfully for long-term results. Advanced surgical options are opening the door to new protocols and approaches. Meanwhile, early detection and prevention are essential to stop the progression of glaucoma. This should begin with a dialogue with patients to understand their risk factors and educate them about the disease. Annual eye exams are highly recommended for all patients at high risk, including those over age 60.

For more information, contact Dr. Usha Bulusu at 989.791.2020 or bulusueyecare@gmail.com.



Molecular Diagnostic Techniques for Infectious Diseases: A Practical Primer

GUEST AUTHOR

Dr. Del DeHart, Internal Medicine and Infectious Disease

The ability to amplify and identify specific DNA or RNA sequences in clinical samples of material has revolutionized several areas of diagnosis and treatment for infectious diseases in the last decade. Perhaps the most transformational advance in this field is the ability to qualitatively and quantitatively identify and stage the human immunodeficiency virus (HIV) infection and viral load, respectively. Similar advances have been made in the hepatitis C virus (HCV) infection. More recently still, molecular amplification has greatly enhanced our diagnostic ability around an emerging infection we see every day in clinical practice, *Clostridium difficile*-associated colitis.

Available Assays

Below is an overview of several readily available assays which can be useful in your clinical practice.

Aseptic Meningitis and Encephalitis: PCR (polymerase chain reaction) testing in clinical specimens expected to be sterile. Although HSV and enteroviruses are common, they are not expected in the protected cerebrospinal fluid (CSF) compartment. Finding any evidence of a viral genome in this clinical specimen is highly sensitive for true infection.

- **HSV I:** The herpes simplex virus is responsible for a significant percentage of true encephalitis syndromes, with seasonal variation. Arboviruses make up a greater

percentage in the warmer months, but HSV I is a major factor in any season. CSF obtained for PCR analysis has extremely high sensitivity (98 percent) and specificity (94-100 percent) and is positive early in the course of illness.

- **HSV II:** This virus is responsible for the majority of cases of recurrent aseptic meningitis syndromes, a phenomenon formerly known as Mollaret's meningitis. HSV II should be suspected in any case of aseptic meningitis, and strongly suspected in recurrent episodes. Confirming HSV II by PCR from CSF in such cases can lead to chronic suppression of the virus, and a significant decrease in relapses.
- **Enteroviruses:** Fondly remembered from our student days for the bewildering number of serotypes (by the time you get into your 70s, you know you are in trouble), these viruses can cause a significant percentage of aseptic meningitis and encephalitis syndromes, often peaking in the late summer and early fall. PCR, using a reverse transcriptase step and primers derived from the highly conserved 5'-non-coding region of the genome, has superior sensitivity compared with cell culture for the identification of enteroviruses in the CSF (up to 86 percent versus 30 percent). Although current PCR techniques don't allow for specific viral typing, they allow you to be relatively certain that you are dealing with an enteroviral process, and may greatly lessen the need for further diagnostic testing in otherwise perplexing cases.



Molecular diagnostic techniques in infectious diseases are revolutionizing testing and treatment for many conditions.

Colitis: PCR testing in clinical specimens with expected microbial colonization or contamination. Positive testing of stool for the presence of *C. difficile* bacteria does not directly imply causation of colitis. Finding evidence of significant toxin production, however, is much stronger evidence.

- ***C. difficile* toxin (CD toxin) by molecular assay:** Various techniques are now available to test for and amplify the presence of CD toxin in clinical specimens, and are currently in use in the Covenant HealthCare laboratory. These tests are so good that they have changed the way we think about diagnosis for this disease. Whereas previous assays were moderately sensitive at best, these tests have a high positive and negative predictive value. Given an appropriate (true diarrheal) specimen, we can reach actionable certainty with one test in most cases.

When positive in symptomatic individuals, treatment is indicated. When negative, strong consideration should be given to alternative problems (ischemic colitis and other infectious syndromes). Testing for cure also becomes moot: if the colitis resolves, then it doesn't matter if you can amplify a stray toxin molecule. This is a case where technology has evolved to the point where we really need to treat the patient and not the laboratory test.

HIV and HCV: Testing for viruses that should never be encountered, and quantifying for prognostic and therapeutic purposes.

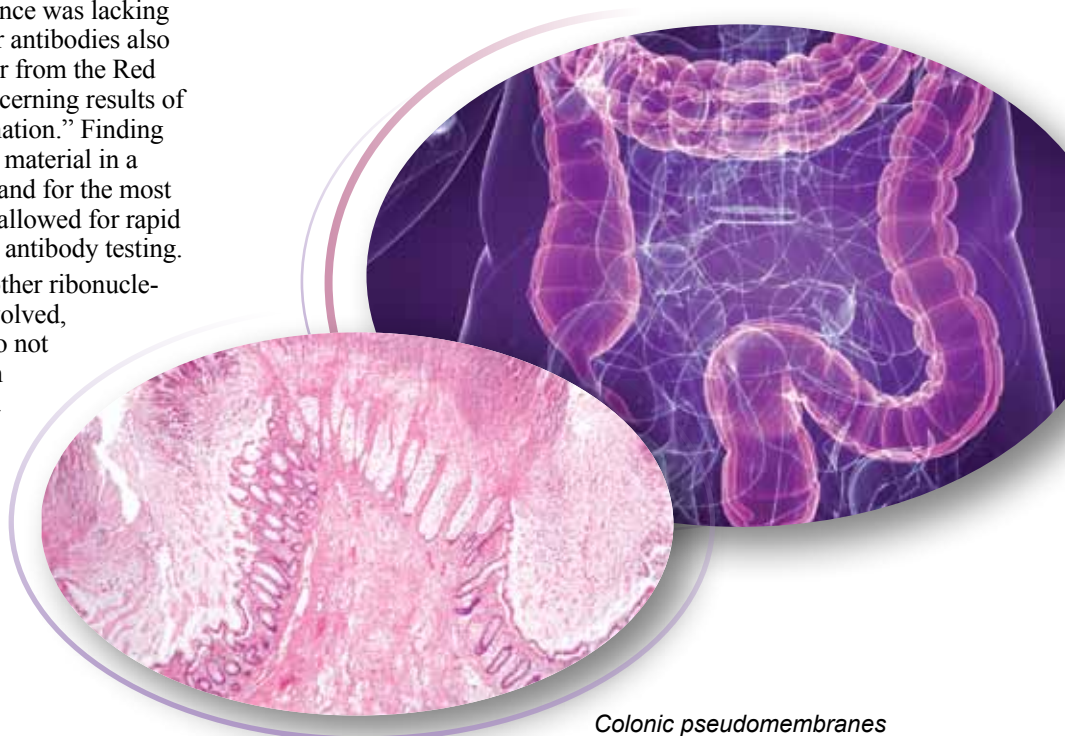
- **HIV qualitative assay:** Early in the HIV epidemic there was a troubling window of time when infection might be clinically present, but antibody evidence was lacking or equivocal. Cross-reactivity with other antibodies also frequently resulted in the notorious letter from the Red Cross – “Please contact your doctor concerning results of testing of your recent blood product donation.” Finding qualitative evidence of any HIV genetic material in a clinical specimen is not to be expected, and for the most part closed the window period and also allowed for rapid confirmation of suspected false-positive antibody testing.
- **HIV quantitative assay:** As PCR and other ribonucleic acid (RNA) amplification methods evolved, we were given tools which allowed us to not only detect the presence of viral RNA in samples, but to quantify the amount in a given sample. Studies quickly demonstrated that modifying the viral level of HIV in the bloodstream strongly predicted the arc of the infection in a given individual, and also the efficacy of viral drug treatment and its durability.

- **HCV typing and treatment:** PCR typing and viral load studies have significant prognostic implications in HCV infection, and with treatments improving drastically in the last few years, will play a significant role in testing and treatment decisions.

Rethinking Our Strategies

Molecular diagnostic techniques in infectious diseases are revolutionizing testing and treatment for many conditions. The sensitivity of the tests often requires us to rethink our strategies of testing, but when used with sound clinical judgment, they are near-miraculous innovations in both diagnostic and therapeutic medicine. Many more techniques are in clinical development, such as meta-genomic assays which are implicating entirely new microbial species in various infectious syndromes like brain abscesses and endocarditis. It's exciting and the wave of the future, so when advising young medical professionals, we may want to strongly emphasize genetics even if we are engaged in other fields of practice.

For more information, contact Dr. DeHart at 989.798.5971 or dehartid@gmail.com.



Colonic pseudomembranes



Red Flags for Pediatric Headaches

GUEST AUTHOR

Dr. Marianne Majkowski, Pediatric Neurologist, Covenant Pediatric Neurology

Everyone gets headaches, even children. Occasionally, however, headaches might be a symptom of something more serious than eyestrain, sinus problems or migraines.

The time to get concerned is when children age 18 and under are having chronic headaches. This would equate to major headaches three to four days per week or 15 days per month. A few key questions to ask parents and patients (depending on their age) include:

- What is the family history of migraines?
- For toddlers, have they been carsick?
- Where is the location of the pain?
- How long have the headaches been occurring?

These questions will help you diagnose the conditions below.

Migraines

When children have migraines, there is usually a relative on either side of their family with this condition. Ask about the entire family tree – the link could be a distant relative such as a great aunt or uncle. Also, for children under age 5, repeated episodes of carsickness usually precede the first full-blown migraine.

If a migraine diagnosis is made, a combination of medications and patient education typically resolve the issue (see sidebar on far right). Note that many parents worry that a diagnosis of “migraines” means that the child will be dealing with this condition for the rest of their life. That is not the case. For most people, migraines taper off in their late 30s or early 40s and eventually stop.

Meningitis

Intracranial infections such as viral and bacterial meningitis can also be the source of headaches. Usually, however, these headaches appear suddenly with other symptoms and are not chronic. To be safe, children under age 5 should be given a spinal tap (along with other tests) to rule out viral meningitis since most cases occur in this age group and usually due to enteroviruses. Older pediatric patients should also be tested if meningitis is strongly suspected. Viral meningitis infections usually get better without treatment, but bacterial infections are extremely serious requiring prompt medical attention that follows established protocols.

Pseudotumor Cerebri

All children presenting with headaches should be given a fundus eye exam to determine the presence of pseudotumor cerebri, or swelling of the optic discs that causes increased intracranial pressure. If you see this, then an MRI of the brain should be ordered to rule out tumors. If you don't see this, then a cause should be determined with the appropriate treatment. Some causes for pseudotumor cerebri are related to medications, various diseases, obesity, menarche and pregnancy.

Tumors

Knowing the location of the pain is critical, because if it is concentrated in the posterior occipital region, the child could have a posterior fossa tumor. These tumors block the flow of spinal fluid causing increased pressure on the brain and spinal cord. Other common symptoms of this condition include waking up in the middle of the night, uncoordinated walking, nausea and early morning vomiting.

Two common forms of posterior fossa tumors are cerebellar astrocytoma and medulloblastoma, both of which are malignant but operable if caught early and prior to metastasis. Diagnosis typically involves an MRI scan and biopsy to confirm the presence and extent of a tumor. Recovery depends on the type and size of the tumor, its location within the brain, and the age and health of the child.

Only 1-2 percent of all pediatric headache cases are tumor-related, which is why it doesn't make sense to order an MRI scan with every patient that presents with a headache. The vast majority of cases are migraine-related and readily treatable.

Referrals

Many physicians are comfortable with treating pediatric headaches. The first step is to understand the patient history and discern the difference between a migraine, infection or potential tumor. If the diagnosis is a migraine and it continues to persist, or if you are perplexed and suspect a potential tumor or other condition, you should refer your patient to a pediatric specialist for a consult.

For more information, contact Dr. Majkowski at 989.671.5757 or mmajkowski@chs-mi.com.

When children have migraines, there is usually a relative on either side of their family with this condition.

General Treatment Guidelines

After taking the patient history and ruling out severe conditions such as tumors, the following treatment guidelines for recurring headaches can help treat the symptoms and relieve pain.

Migraine Headaches

- Symptoms include nausea, vomiting, sensitivity to light, throbbing pain on one side of head, chills and language problems.
- For prevention, counsel the patient to document and avoid triggers (e.g. certain foods, missed meals, lack of sleep) and to look for warning signs (e.g. visual aura, blurred vision, eye pain).
- Treatment:
 - Over-the-counter medications include Ibuprofen or Acetaminophen; preparations such as Excedrin Migraine contain caffeine which may help relieve a migraine.
 - Prescription medications include prophylaxis with cyproheptadine for a younger child or anticonvulsants (Topamax or Depakote) for older children. Also consider abortive treatment with triptans such as Imitrex, Relpax and Maxalt, which come in nasal spray or melt tablets for children experiencing nausea and vomiting.

Tension Headaches

- Symptoms include pain or discomfort in the head, scalp, or neck, usually associated with related muscle tightness.
- Treatments include muscle relaxants and anti-inflammatories.





The Latest on Lead Management and Extraction

GUEST AUTHOR

Dr. Asim Yunus, Electrophysiologist, Michigan CardioVascular Institute (MCVI)

In today's high-tech world, the number of people with cardiac rhythm management (CRM) devices like pacemakers and ICDs is growing. In fact, about 4 million people worldwide have CRMs and 700,000 more CRMs are implanted each year. While such interventions save and prolong lives, complications with the leads are relatively frequent.

Over time, these leads grow into the walls of the heart and can cause infections. Complications that can occur with the leads usually fall in one of three areas:

- 1 Infection resulting from the leads.
- 2 Sending unnecessary shocks which can lead to significant psychological stress.
- 3 Not sending necessary shocks to the heart when one is required to save a life.

Lead Management Approaches

Depending on the problem, cardiologists usually take one of three lead management approaches:

- Prescribe lifelong antibiotics to prevent infections, and/or
- “Cap” the old leads and implant a new device with new leads, or
- Extract the old leads before implanting a new device if the patient's condition allows it.

Each option holds certain benefits and risk. Capping is often a sensible choice, but it leaves the patient with redundant leads, increasing the burden on the venous system and heart, and increasing the potential for infection and other complications such as endocarditis. Research shows that removing old leads versus capping them can significantly reduce future risks, and removing them sooner rather than later increases the chance for successful removal. Consequently, lead extraction is becoming the proactive approach of choice, especially with the advent of new and safer technologies.



Lead Extraction Technologies

The growing demand for safe lead extraction has accelerated advances in technology and specialized training. Several approaches (such as mechanical sheaths and traction devices) are designed to snare and pull the leads out, however, the procedure is difficult often requiring brute force to tear the lead from the tissue. In some cases the leads are 20 years old, so one can imagine the difficulty in separating the lead from the heart tissue without causing damage or further breakage of the leads.

Such approaches are being replaced by laser extraction tools such as the next-generation GlideLight Laser Sheath, an innovative technology that uses laser light to disrupt the fibrotic attachments to the lead. Instead of brute force, the laser dissolves the fibrous bonds, making it twice as easy to remove the leads in one piece. The procedure requires significantly less force than other extraction methods, markedly improving control, safety and efficiency.

Weighing the Risk

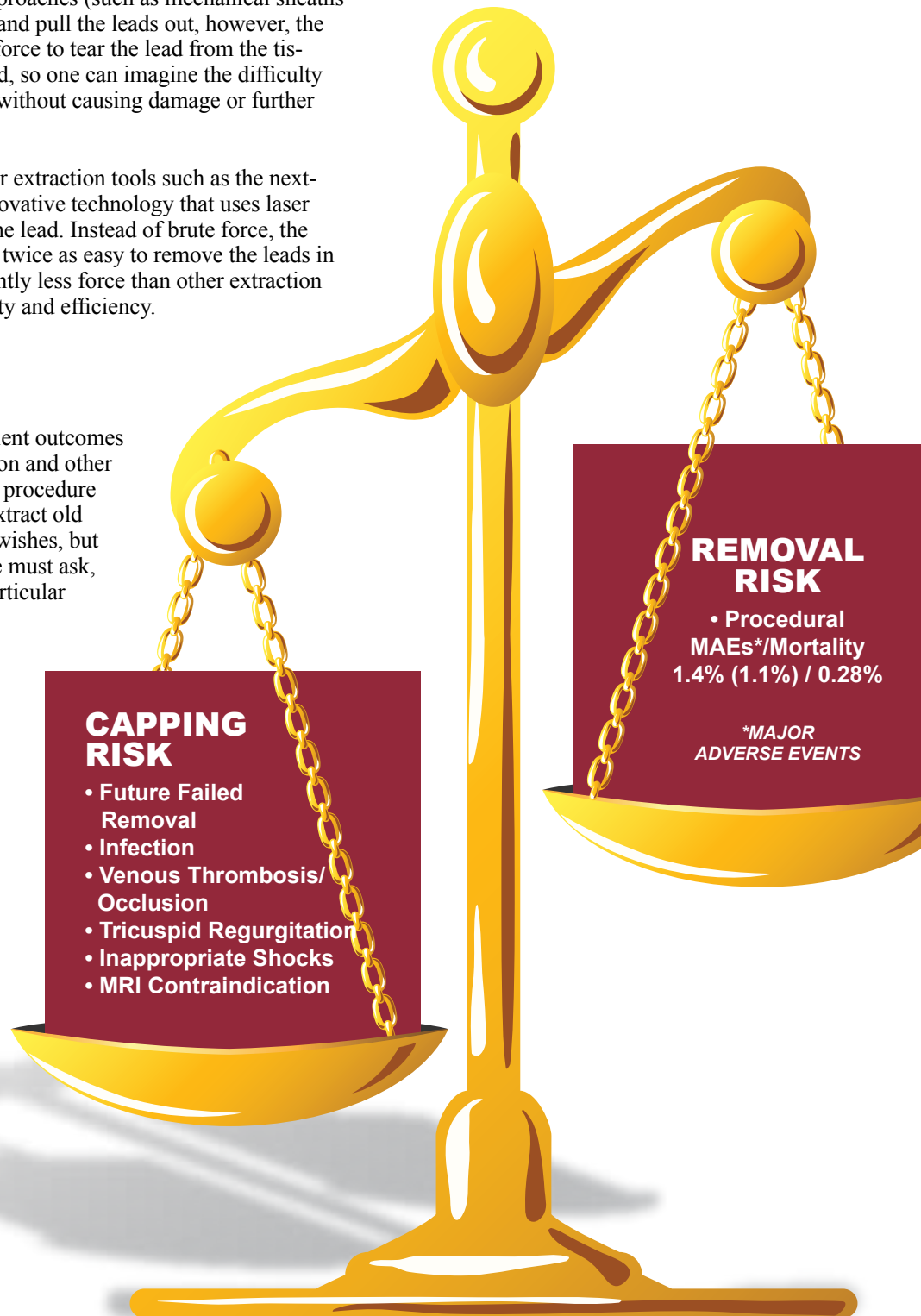
While safe lead extraction can improve patient outcomes by lowering the risk of infection, malfunction and other complications, the risks and benefits of this procedure must always be weighed. The decision to extract old leads will not only depend on the patient's wishes, but also on the patient's age and condition. One must ask, what is the quality-of-life choice for this particular patient? In some cases, the answer might not be lead extraction. Antibiotics or capping the old leads could be the best path to follow.

*For more information, contact
Dr. Asim Yunus at 989.754.3000
or ayunus@mcvi.com.*

Lead extraction is becoming the proactive approach of choice.

Research shows that the risk of capping old leads outweighs the risk of removing them, and that the sooner the removal, the greater the chances of successful patient outcomes.

Risk of Lead Capping Versus Lead Removal



GlideLight was recently piloted by Dr. Yunus at Covenant HealthCare, the first facility in Michigan fully trained to use this technology. To date, Yunus has used GlideLight to perform more than a dozen lead extraction procedures.



The Results Are In: Physician Engagement Survey

Dr. John Kosanovich, Vice President of Medical Affairs and Network Development

Out of a pool of 452 physicians, the physician engagement survey team received a 45% response rate, a significant improvement over previous years due to enhancements to the overall survey process. Thank you to everyone who took the time to participate, despite occasional glitches.

RESPONSE RATES

Group	Response Rate
Covenant Employed	74%
Covenant PHO	43%
Independent	29%
St. Mary's Employed or PHO	18%

Participants completed a set of questions based on their professional relationship to Covenant HealthCare. This led to one of two survey paths:

- **“Employed/Closely Affiliated”** for those physicians who are Covenant HealthCare-employed or independent but who practice mainly at Covenant HealthCare (PHO members), or
- **“Independent Medical Staff”** for those physicians who do not practice primarily at Covenant.

Results

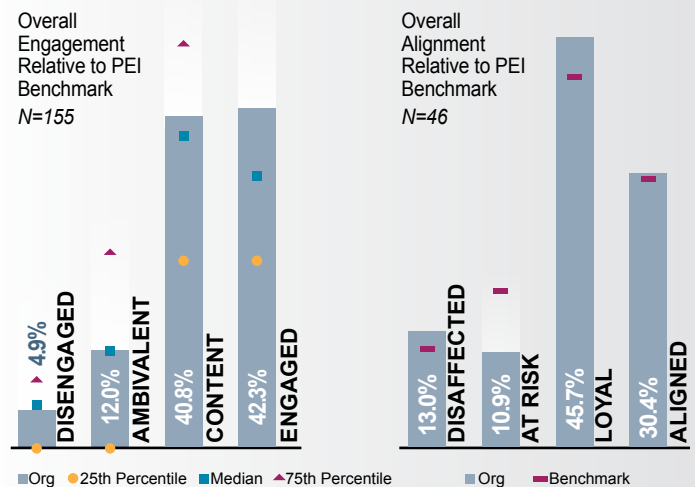
Results were calculated according to the two survey paths above. Level of “engagement” was measured for those physicians who fall in the first survey path, and level of “alignment” was measured for those physicians who followed the second survey path.

Engagement is defined as having a high level of loyalty and commitment to the organization, where the individual is willing to go above and beyond for the organization. At the other end of the spectrum is disengagement, which is defined as actively unhappy with one’s role or the organization.

Alignment is defined as having a high level of strategic and financial alignment with the organization, where the individual is willing to serve in non-clinical roles and likely to admit and/or refer a majority of patients to the organization. At the

other end of the spectrum is “disaffected,” which is defined as actively unhappy with the organization, where the individual is highly unlikely to refer and/or admit patients.

Engagement/Alignment Results Covenant HealthCare



Results and Next Steps

Most physicians fall in the categories of “content and engaged” or “loyal and aligned.” Our goal is to further increase that level of engagement and alignment.

Results have been shared at September’s Medical Executive Committee and Active Medical Staff meetings in greater detail, including breakouts by specialty, top strengths and improvement opportunities. These results will also be shared among smaller physician groups going forward. Further analysis of all findings, along with physician input from the results-sharing meetings, will lead to specific action plans. Please stay tuned for more information.

For more information contact Dr. Kosanovich at 989.583.6047 or jkosanovich@chs-mi.com.