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ROBERT BREVING, MD

The Newest AMS Trustee Shares a Remarkable Story of Giving
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In one month, the 90th General Assembly of the State of Arkansas will convene into regular session. The elections are over, and thankfully so are the nasty campaign ads that dominated our airwaves for most of the past six months. I’m reminded of the words we look forward to hearing each time our television watching is interrupted by breaking news, “we now return to our regularly scheduled programming.” Thank goodness.

Your physician and staff leadership in the AMS are hard at work preparing for the legislative session. There are priorities to set and bills to draft. While I cannot tell you today what those priorities are, I can tell you some of the issues we already know will be on the table for consideration. The session is setting up to be very difficult as you will see from the issues that follow.

Certified Registered Nurse Anesthetists (CRNA) will once again seek to remove the requirement that they practice “under the supervision of” a physician or dentist.

Advanced Practice Registered Nurses are again seeking to require Medicaid and other payers to recognize them as qualified to be the head of patient centered medical homes. We expect another attempt to require payers to reimburse them at rates equal to that of physicians despite their lack of equal education and training.

Naturopaths are asking to be officially recognized by creating a state licensure system.

A group representing “certified” surgical technologists and surgical assistants are seeking to require that anyone performing those duties must attend a formal educational program, pass a national certification exam and obtain a license from a state licensing body such as the Arkansas State Medical Board.

The “Private Option” alternative to Medicaid expansion will undoubtedly take up a tremendous amount of time and political capital in order to continue its course. Currently over 210,000 previously uninsured Arkansans, mostly employed and earning less than 138% of the federal poverty level are now covered by private health insurance. It takes a difficult 75% vote in both the house and senate to obtain the appropriation to fund the program. It will take exceptional leadership from the “new” governor and the leaders of both political parties to continue this program.

Telemedicine continues to grow both in Arkansas and nationally. However, there are licensure issues and reimbursement issues that must be addressed. Expect AMS to lead the charge to get this done.

Physician Orders for Life Sustaining Treatment, or “POLST,” is an effort to address the current shortcomings in our current system of end of life planning. Currently, patient wishes cannot always be honored even with an advance directive due to the lack of a physician’s order. The use of a POLST form, which focuses on conversations between the patient their family and their physician, allows the patient to document their wishes in the POLST form, which translates the shared decisions into actionable medical orders.

Continuation of the ACA primary care enhanced payment for Medicaid services. The Affordable Care Act increased Medicaid reimbursement for primary care up to Medicare amounts (about a 25% increase) for 2013 and 2014, fully funded by federal dollars. Primary care groups are asking the state to continue this enhanced reimbursement under the normal 70/30 match, meaning the state puts up 30% of the funds, which translates into about $12 million per year. The reason is justifiable, currently Medicaid pays primary care services at about 55% of private insurance. The hurdle is finding the dollars to fund this program.

There…that is just a handful of what we are going to be dealing with. Buckle up and let the countdown begin.
Free your mind to think about something other than med-mal.

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With the improvement of our cancer diagnostic and therapeutic tools the number of cancer survivors is expected to reach 18 million by the year 2022 while the existing structures of our health care system are not well adapted to address their multifaceted needs. Screening for recurrence and new cancers, identifying and caring for late and long-term side effects of the cancer or its treatment and managing the psychological and spiritual needs of survivors are the mainstay of health care after acute cancer treatment has ended. Patients are seen by many specialists and tests are ordered, and yet many of their essential needs are not met. What is missing is the focus on these new needs and communication and coordination between their doctors and, most importantly, with the patients and their families.

Stress, missed work days and financial burden imposed by a cancer diagnosis are going to be experienced by family members too. Weak family relationships may lead to failure of treatment and strong family ties may be the bridge to the cure. When the patients are overwhelmed by a diagnosis, terrorized by the prospect of failure to cure it and tired from the numerous tests and different treatments, a strong family structure will help them pick up the pieces and move forward. The state of shock, typical for this diagnosis phase, explains the “selective hearing” that many cancer patients experience. Once the word “cancer” is uttered they are no longer connected and do not hear the rest of the discussion. It is not uncommon for me to answer the same questions several times in the immediate period after a diagnosis is given. The presence of a family member makes this task easier by providing someone who is able to comprehend and remember important details that the patients do not even hear. The role of the family only expands from this point forward with all the logistics required for the treatment phase – i.e. transportation, house chores, employment changes, etc.

But most importantly, family members offer the emotional and spiritual support that only a family can provide. Past the acute phase of treatment, patients struggle to return to “normal life” before cancer became a part of their daily existence. While this is possible for most patients from a physical standpoint, many patients cannot achieve this goal. Their lives have changed forever due to the loss of a limb, a colostomy or the inability to speak or to walk. Many patients fall into depression. Others have protracted pain and fatigue or lose their ability to concentrate and remember, a condition called by the patients “chemo brain.” Interestingly, patients who had only surgery and never received chemotherapy suffer from the same condition, which underlines the impact of this traumatic experience on brain functioning. But invariably they all suffer from a smoldering anxiety and fear of the return of cancer, some sense of loss of control and lack of trust in the future that becomes visible at transition times such as scans or office visits or with any new symptoms, no matter how trivial they are. Sometimes, the family is ready to move on but the patients are not. Here again, an active intervention by the care team and engagement of the family to address these issues are paramount.

“I want to become myself again,” one patient said “I am not only a successful cancer case.” Many patients express the feeling that they are not understood or that nobody listens to them. Unfortunately, it is not uncommon that the system ignores their voices because “they have survived” and that should be enough. It has become clear from our experience with cancer survivors that this phase will last for a long time; it carries its own specific problems and solutions, but it receives the least focus and attention from care providers. Hence the need for a specific “cancer survivorship program” that looks at patients as whole persons and not a disease or affected organ. This is a program that provides a navigation system, helping patients in their journey by addressing their general and specific survivorship needs, being sure the latest screening guidelines are met, and improving communication and coordination between their providers, all while keeping the overall well-being of the survivor in sharp focus. This program will help our patients retrieve their “new norm” by providing them with appropriate rehab support and reeducating them about healthy living. Electronic medical records offer the promise of improving communication between providers and with patients but without a well-designed, patient and family centered program geared toward addressing the unique needs of cancer survivors we will not make substantial progress. Our ultimate goal should be to allow them to overcome the constant reminders of cancer and regain their place in their social network to become again themselves not the face of a disease. AMS
Why would my practice need cyber/privacy insurance?
A large majority of doctors and dentists are not aware that their standard insurance coverages (Malpractice, GL, Property) typically don’t provide proper coverage for cyber and privacy liability. Most also don’t know that they (along with their practice) have an exposure to cyber and privacy risk, especially given the presence of personal health information that they and their vendors have access to and the laws that exist to protect this.

Any medical practice that...
- Obtains social security numbers, personal health information, drivers license numbers, bank account numbers of patients
- Is in the process of going paperless or stores paper files
- Provides online access for payment
- Has a website
- Relies on their computer network on a daily basis
...carries a significant exposure to cyber risk.

Financial Threats to Your Practice:
- Costs to comply with federal and/or state required notification.
- Data breaches in 2010 cost their companies an average of $214/record. *Ponemon Institute Study
- Various regulatory proceedings (including fines and penalties) as a result of a privacy breach, including alleged HIPAA violations.
- Patients/affected individuals suing your organizations for damages as a result of a privacy breach or network intrusion
- Liability for the transmission of malicious code to an outside party
- Business interruption expenses as a result of your network or server going down due to a denial of service attack or similar action
- Intellectual property/privacy lawsuits. These include libel/slander arising out of content that is on your internet or intranet sites
- Destruction to your ‘brand’ as a result of a privacy breach (lost patients)

Claim Scenarios for physicians/dentists:
- A physician’s assistant brings a laptop home to update patient records. While on her way home, she stops at the grocery store and her car is broken into and the laptop is stolen. Files on the laptop contained patient names, social security numbers, dates of birth, addresses, phone numbers, and medical condition information
- In an effort to go paperless, employees organized medical information (to be shredded) and non-medical information (to be thrown out.) The person responsible for discarding the information inadvertently switched the two types of information and the medical information was thrown into an unsecured dumpster without being shredded. Personal information and personal health information of patients is compromised and those affected join a class action suit against the practice
- A hacker gained unauthorized access to a surgery center’s computer system. The practice’s failed to timely notify its patients whose personal health information was contained on the computer system. The practice suffered fines and penalties for not adhering to HIPAA laws and regulations
- A practice’s computer network is down for 4 days as a result of a Trojan horse attack and are unable to access billing software, appointment scheduler or patient files, resulting in the need to hire experts to come in and correct the system and get it back to where it was functioning
- A practice has a website and posts testimonials from patients. As a result of the practice not obtaining proper authorization to use one of the patient’s comments, they are sued for invasion of privacy

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A good story tends to travel. When Robert (“Bert”) Breving, MD, spoke of his association with the late S. Truett Cathy, founder and CEO of Chick-fil-A, friends listened intently. Soon, one felt moved to deliver the story to the local paper, The Sentinel-Record, which covered it in its September 14, 2014 edition. When The Journal caught wind of the story, it seemed appropriate to share it with you, his physician colleagues in Arkansas.

Upon Cathy’s recent passing, Dr. Breving could not help but reflect and speak of the philanthropist’s important role in his life – as a mentor, friend, father figure and sometimes benefactor.

This isn’t a story he shares to puff himself up, he stressed. However, it’s a story he cannot forget – one for the books, as they say, especially in a world where bad news abounds. “Seems like today when you open the paper or turn on the TV, it’s [bad news],” he said. “To see an exceptional story about a complete stranger, who helped another person and changed the course of their life, is uplifting and rare.”

Dr. Breving, a board-certified general surgeon and chief of staff at National Park Medical Center, is a prominent member of the medical profession in Arkansas. Since moving to the state in 2004, he has practiced in Hot Springs. He has also been a member of the Arkansas Medical Society and just this month, became the newest member of the AMS Board of Trustees. Dr. Breving is excited about the opportunity to serve, and he says he would not be the man he is today without the generosity Cathy extended to him in the early part of his life.

A Modest Start

Dr. Breving’s life began modestly, in Cincinnati, Ohio, where, from a young age, he and his younger sister lived with a mother who suffered from mental illness. His father was not around much. “My mother and father were divorced,” said Dr. Breving. “I can’t blame him for that. Living with a person with untreated schizophrenia will drive you crazy if you don’t separate yourself from the situation.”

Prior to her schizophrenic break, the late Mrs. Breving was regimented, smart and devoted. “My mom was incredible … completely devoted. She didn’t work outside the home, but she was interested in our education. We went to school and did a lot of home schooling as well.

“When I was 10, everything changed,” said Dr. Breving, recalling how the disease firmly took hold of his mother. “Because of her disease process, she couldn’t hold down a job, nor would she accept financial assistance.”

In response, 16-year-old Breving went to work. That sounds brave and mature for a very young man, but he indicates another motivation. “There was no other choice,” he said, simply. “My sister, Becky, was too young to work. Child support wasn’t what it is now. Frequently, there was no money coming in. Everything I made went to keep the family fed and alive. We rarely had more than one of our utilities on. I’ll tell you, taking baths in zero degree weather, in the Cincinnati winter, without hot water, is a chilly experience.”
Enter Truett Cathy

Without considering the fairness of it, young Breving forged ahead. The year was 1980, and he was growing up fast. He kept up his schoolwork and worked two jobs, the main one being at the new Chick-fil-A restaurant that opened up just outside walking distance. “It sounds trite, but it’s true,” smiled Dr. Breving. “I literally walked to work … uphill … sometimes even in the snow. Luckily, it was often only one way. There was usually someone to give me a ride home at closing time.”

He had worked at Chick-fil-A for a couple of months by the time the establishment held its Grand Opening. CEO S. Truett Cathy was among the executives who attended the festive occasion, which represent a new beginning not only for Chick-fil-A in the community, but for Breving as well.

The store operator, knowing of Breving’s difficult circumstance, made a point to tell Cathy about the hard-working young employee. In turn, Truett took a personal interest in him. “He invited me to his farm in Atlanta,” said Dr. Breving, who was not used to such attention. “We spent the weekend, rode motorcycles, walked the farm and talked about life. He was an energetic, vibrant, genuine person.”

The man must also have been quite determined by trait, judging by one of Dr. Breving’s favorite memories. Cathy truly wanted to fill a need for young Breving – one way or another. “First, he offered to adopt me,” recalled the doctor, who Politely declined out of loyalty to his own family, whom he wanted to provide for.

That settled, Cathy pressed onward, analyzing the situation and quickly arriving upon a need he could fill.

Decision made, Cathy picked up the phone. “He called his son – also an executive for Chick-fil-A,” recalled Dr. Breving. “And he says ‘Son, I got Bert here, and he needs a car. Will you give him your car?’”

Within minutes, son Dan Cathy had pulled up outside in one of the first popular minivans of the time. “It was a Voyager I think,” said Dr. Breving, who, still stunned by this act of generosity, managed to help remove car seats and toys before taking over the vehicle. “They gave me the keys, and I drove away. It was surreal. I drove that thing until the tires just about came off of it.”

For many years to come, Cathy’s generosity continued. “There were times when he helped with utilities – that was an issue for a number of years,” said Dr. Breving. “And through Chick-fil-A, he helped me get a scholarship that helped me attend undergraduate school at Ohio State.” (At that time, employees who worked for Chick-fil-A for a certain period of time, could earn partial scholarships to help with school.)

“My grades were good,” said Dr. Breving, who procured a number of scholarships and school loans that allowed him to work toward an undergraduate degree and, later, attend...
medical school. Even so, Cathy’s financial assistance was what set him solidly on his future course. “If not for his help, I would not have been a doctor. [It] wasn’t even on my radar screen before I met Cathy. My goals were short-term at that time – ‘how are we going to survive the next two months? ‘How will we keep the water on?’

“Now I’m a surgeon.”

Forging His Own Trail

While attending Ohio State, Dr. Breving worked as a ward clerk and OR scheduler in the operating room. He was touched by the excitement of the environment, the strive for excellence he witnessed there, and the need he saw in the surgeons to “fix” things. In the years since, he has put himself in that same environment, giving his all day after day for the betterment of his own patients. “I have to be at the top of my game,” he said. “With every operation, I have someone’s life in my hands.”

Dr. Breving graduated from medical school in 1993 and practiced in Birmingham, Alabama, until moving to Arkansas in 2004. He is married to Internist Nannette Vowell, and the two have three children.

As the newest trustee for the Arkansas Medical Society, Dr. Breving looks forward to House of Delegates meetings and other opportunities to learn more and contribute more to the legislative process. During medical school, he was involved in the American Medical Society as a student, and he looks forward to working with AMS on issues of medical politics and decision-making.

“The next few years are going to be challenging – with the proliferation of electronic medical records, the shrinking health care dollar, increased stress placed upon health care providers and with people’s increasing expectations of quality related to their medical care,” said Dr. Breving. “When you put stress on the system, sometimes it will break. Physicians will still need to provide medical care if it does. We’re going to encounter challenges that will require due diligence by the AMS as well as the state medical board more and the physicians of our state.”
**Time to Pay it Forward**

Cathy gave Dr. Brevign much that was vital to his early life. High on a list of gifts that included financial support, a car, and even Brevign’s first tailored suit, was time. “It’s easy for people to write a check when there’s a cause that they want to support,” said Dr. Brevign. “Sometimes, the most valuable thing is time. We spent time together. There was some mentoring that went along with that — he would talk to me, educate me about life, about the way people should act.”

Cathy made a habit of helping others. The restaurateur and philanthropist was also an author, educator, Sunday School teacher, scholar, mentor and supporter of those around him. “Hundreds — literally thousands — of people were affected by his generosity,” reflected Dr. Brevign. “His family is like this too ... genuine and interested in providing a wholesome, quality product and creating wholesome, quality people.”

Dr. Brevign hopes someday to affect another person through the type of kindness and generosity Cathy showed to him. In preparation, he believes he must focus first on himself. “I think you’ve got to get your own life straight before you can help somebody else’s life,” he said. “Truett picked me, a complete stranger to him. He found me at a pivotal point in my life. The assistance that he provided changed the course of my life.

“I was thinking of that when he died. What have I done? Sure, I’m trying to provide the best patient care, and be nice to people, but I can’t say I’m mentoring someone right now. It’s something I owe it to him to try to do, and I’d like to do that for somebody else.”

Perhaps he has been more of a mentor already than he gives himself credit for. Sister Rebecca Rogers called her brother Bert her “role model” growing up. A realtor in the luxury residential market of Saddle River, New Jersey, Rogers recalls the sacrifices her brother made for her, and the help he received from Truett Cathy. “I told myself, ‘if Bert can get into college by working hard and making smart decisions, I can, too,’” she said. “Bert was clever and funny, and he kept my spirits up with laughter. He did the responsible thing: he stayed with me to provide for me. I’m eternally grateful to Mr. Cathy for recognizing Bert’s character and intelligence and giving him a helping hand. Mr. Cathy’s generosity had a profound effect; he steered Bert onto a course of success.”

The Journal appreciates Robert Brevign, MD, for sharing his inspirational story of courage, commitment and a generous “hand up.” Learn more about Truett Cathy at truettcathy.com. Among other things, you will find Cathy’s “Eleven Dos and Don’ts of Proven Entrepreneurial Success,” as well as information about WinShape Foundation, which he bore out of his desire to “shape winners” by “helping young people succeed in life through scholarships and other youth-support programs.”

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Engage patients for better health care, lower costs

It seems like everyone is talking about patient and family engagement. But providing effective patient engagement that achieves better, more cost-effective outcomes can be a challenge.

Patient engagement — ongoing and constructive dialog between the patient, patient’s family and provider with the aim of improving overall health — is a cornerstone of several of the Centers for Medicare and Medicaid Services’ (CMS) current initiatives, including patient-centered medical homes (PCMH) and Stage 2 of Meaningful Use (MU).

WHY ENGAGEMENT MATTERS

As the PCMH model becomes more widely used, it is increasingly important to include the patient’s voice. Patients who are engaged with a health care provider and can communicate easily regarding their care can be expected to achieve better outcomes and have higher levels of satisfaction with their providers. A National Research Corporation study shows a direct correlation between patient experience and an organization’s reputation.1 According to the study, “hospitals with low patient experience scores are four times more likely to have poor reputation scores.”

There is solid data that demonstrate that more actively engaged patients incur lower costs. One study found patients with lower “patient activation scores” had a 21 percent higher health care cost the following year, when compared with patients with higher patient activation scores.2

Improving patient engagement provides an opportunity to access bonus Medicare payments. The CMS requires providers to meet several patient engagement benchmarks to improve quality. Stage 2 of MU requires that, for providers to earn bonus Medicare payments, 5 percent of patients must log onto and upload data via a patient portal; more than 50 percent of a clinician’s patients must receive timely online access to health information, including diagnostic test results and medication lists; and more than half of patients receive a clinical summary of his or her office visit within one business day.

ENGAGING EFFECTIVELY

Providers who want to increase patient engagement must first assess the practice’s current level of engagement as well as the range and type of patients’ engagement habits. Starting with a comprehensive plan for the practice will save time and resources in the long term.

While no provider could operate without the telephone, patient communication has expanded with email and other electronic formats. A patient portal — an online web-based connection that facilitates information sharing and two-way communication in a secure format — is the next step.

About 40 percent of office-based physicians currently have a portal through their EHR system. Cleveland Clinic says its portal is crucial in coaching patients and eliminating unnecessary office visits.3

A patient portal allows a patient to access his or her personal health information securely and reliably from a personal computer, cell phone or tablet. Be certain your EHR system is optimized for mobile devices, because usage is increasing. Overcoming patient resistance to using your patient portal, especially among older, less tech-savvy patients, will be crucial to its success. Research published in the Annals of Family Medicine4 reports that a practice must both actively promote and integrate portals into routine patient
engagement. Patient education should ensure patient satisfaction and ongoing care. Small- to medium-size practices are unlikely to engage in large-scale promotion; however, success has been reported with low-cost methods.

Eight small practices that used an interactive preventive health record (IPHR) were studied for over two years. The IPHR provided patients with personally tailored recommendations and resources for chronic conditions and preventive services. More than 25 percent of patients created an IPHR account. The high utilization rate was credited to using these methods:
- Use a team approach to notify and encourage patients about the benefits of the IPHR, not just the physician
- Provide the ability to view lab results
- Stress the importance of the IPHR for patients with chronic conditions
- Customize treatment plans
- Include the imprimatur of the patient’s personal clinician. Online personal health records offered by Internet companies or health plans did not provide this important element of gravitas.

Cleveland Clinic says that allowing patients to log on through the patient portal, view their provider’s schedule and make their own appointments was one of the Clinic’s earliest and most successful changes.3

Ongoing patient education ensures patient satisfaction and ongoing engagement. Patient education should actively involve family members and caregivers. Providing clear and concise written instructions after each visit will ensure the best outcome. Cleveland Clinic found that patients want to know two things: what’s going on with them and what’s going to happen next.

Cleveland Clinic is experimenting with a series of pilot projects that allow patients to enter data into their own health records via the portal. The data become part of the clinical workflow, and let physicians track patient progress and potentially modify care between visits.3

Look for other opportunities to engage patients outside of usual business hours. Modern technology makes this relatively simple and inexpensive for most providers. Social media options such as Facebook, Twitter, YouTube and Instagram are popular and successful ways to educate and message patients.

Providers can use these channels to address general health issues and topics without increasing overhead. The Center for Social Media at the Mayo Clinic reports zero cost for the Mayo Clinic’s social media (Facebook, YouTube and Twitter) and $75 annually for a customized blog.

Mobile device “apps” are increasingly popular with younger, more highly educated urban/suburbanites. An app is software designed for mobile devices such as cellphones and tablets that extends the device’s capabilities. Apps are increasingly the standard pathway to connect to the Internet for mobile computing.

A November 2011 Pew Research Center study reported that 34 percent of adults with a cell phone or tablet computer had downloaded an app. However, only two-thirds reported actually using apps; about half on a weekly basis.5

Apps that are currently being used successfully in clinics include:
- Dietary apps for food education, calorie tracking and weight management
- Exercise apps to track walking, exercise and activity levels
- Health management apps that provide more comprehensive information such as WebMD
- Chronic disease management apps to help manage the treatment of a specific condition such as asthma or hypertension

As technology advances and more information becomes available, it will be increasingly important to simplify data so a patient can understand and easily apply it to his daily life. Most patients want to know what to do to help themselves. Patients are more likely to make positive health changes if they take responsibility for their health and feel invested in health care treatment and services. The more patients understand, the more likely they are to ask questions, learn, and obtain the care that meets their specific needs.

Providers can encourage this by teaming up with patients, encouraging and enabling them to take responsibility for their health and quality of life. ▲

Dr. Milligan is vice president, corporate medical director with the Arkansas Foundation for Medical Care.

REFERENCES
5. Purcell K. Pew Research Center Half of adult cell phone owners have apps on their phones. Pewinternet.org Nov.2, 2011
A 50-year-old, right-handed Caucasian man with a history of diabetes mellitus, hypertension, liver cirrhosis and hepatitis C presented to an outside hospital with bilateral lower extremity weakness. One week prior to presentation he stepped off a porch stair which resulted in sudden onset left hip pain. He had a dull continuous pain in his left hip that worsened the following day with radiation from the mid back down the posterior aspect of his left knee. Over the upcoming three days his symptoms progressed to significant weakness with involvement of the right lower extremity. He reported taking large quantities of non-steroidal anti-inflammatory drugs as well as smoking both marijuana and methamphetamines for alleviation of pain during this time. He denied intravenous drug abuse, fevers, night sweats, chest pain, recent upper respiratory infection, or bowel or bladder incontinence. Upon presentation to the outside hospital, basic laboratory investigations were normal. He underwent CT imaging of the cervical, thoracic and lumbar spine without contrast that was negative for any acute process and was subsequently transferred to our tertiary care center for further management.

At the time of admission he was hemodynamically stable and in no acute distress but appeared anxious. The initial general physical and systemic examinations were unremarkable; however, his neurological examination was significant for flaccid paralysis of both lower extremities. He had normal vibration and proprioception with a sensory level up to T12 to pinprick testing. Ankle reflexes and sphincter tone were absent with mute plantar reflexes. Emergent magnetic resonance image (MRI) of the spine with and without contrast demonstrated intramedullary T2 hyper-intensity in the spinal cord at T10-11 level. For further delineation, T2-diffusion weighted images were obtained which showed restricted diffusion in the central portion of the spinal cord consistent with spinal cord infarction (SCI) (Figure 1A-E). Additional laboratory investigations were negative for autoimmune, infectious, inflammatory or neoplastic causes. Subsequent computed tomography angiogram of the chest, abdomen, and pelvis was negative for aortic dissection. He was started on low dose aspirin and aggressive physical therapy with only minimal improvement and eventually discharged two weeks later to a rehabilitation facility with persistence of incontinence and neurologic deficits.

**Figure 1 A-B:** Sagittal T2 images of thoracic and lumbar spine showing T2 hyper-intense single in lower thoracic spinal cord through conus.
DISCUSSION:

Back pain is a frequent reason for outpatient primary care visits. Although most cases are due to musculoskeletal injury, the clinician should be alerted to symptoms of life threatening conditions particularly back pain associated with either weakness or paralysis. The causes of bilateral lower extremity weakness can be divided into the following classifications: spinal cord disease, peripheral nerve disease, brainstem stroke, neuromuscular disorders, and muscular disease. As with all neurologic conditions, a thorough history and physical examination are crucial to accurate diagnosis and should be supported by laboratory data and imaging. Important clues in the medical history include initial presenting symptoms (pain vs. weakness and numbness), chronicity (acute vs. chronic), and progression of symptoms (step-wise vs. progressive). A systematic physical examination can often provide clues for the underlying etiology of back pain. Severe neurologic compromise indicated by a loss of sphincter tone, acute urinary retention or saddle anesthesia warrants emergent intervention. Furthermore, arthralgias may suggest a rheumatologic origin while cutaneous findings such as livedo reticularis and purpura may suggest systemic disease such as vasculitides.

Despite being less common than cerebral strokes, spinal cord infarction (SCI) accounts for approximately 1.2% of all strokes. These infarctions frequently occur in the distribution of the anterior spinal artery - the primary vascular supply for the anterior two thirds of the spinal cord. Vascular compromise anywhere along the anterior spinal artery distribution clinically presents as acute paraparesis, loss of pain and temperature below the level of infarction with concurrent preservation of vibration and proprioception, and impairment of bowel and bladder function. Once the suspicion for SCI arises, MRI is the initial diagnostic modality of choice. Abnormalities on T2 weighted sequences are seen in more than 90% of SCI cases but these are not specific. Sagittal MRI of anterior spinal artery infarction demonstrates isolated “pencil-like” area of T2 hyper-intensity involving the central medullary region often encompassing more than 2 vertebral segments. Axial T2 sequences may show bilateral hyper-intensities most confined to anterior horns giving the “owl eye” appearance. Etiologies of SCI may include trauma, hypotension, atherosclerosis, fibrocartilaginous embolization, vasculitides and prothrombin mutations; however, the true etiology in most cases remains unclear. Our patient had multiple vascular risk factors including poorly controlled diabetes, hypertension, and polysubstance abuse — all of which we hypothesize contributed to his stroke. Furthermore, his clinical presentation of weakness and numbness with preservation of the posterior column function, in addition to T2 hyper-intensity on MRI was highly suggestive of spinal cord infarction. While only a small fraction of patients show clinical improvement, treatment is primarily aimed at supportive care and prevention of complications associated with immobility such as decubitus ulcers, recurrent urinary tract infections and venous thromboembolism. The psychological impact of spinal cord infarction should also be addressed, as up to 25% of patients will have some heightened level of anxiety or depression.

In conclusion, SCI should be considered in the differential diagnosis of any patient presenting with back pain and acute paraplegia. Early recognition and risk factor modification is essential to slowing the progression of the disease.

ACKNOWLEDGEMENTS:
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REFERENCES:
Falls and Comorbid Conditions among Community Dwelling Arkansas Older Adults from a Population-based Survey

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2Research Triangle Institute, Atlanta, GA, 3Arkansas Department of Health, Little Rock, AR,
4Department of Family and Preventive Medicine, University of Arkansas for Medical Sciences College of Medicine, Little Rock, AR

ABSTRACT
The prevalence of self-reported falls and associated comorbid conditions among community dwelling Arkansas older adults (ages 65 years and older) was estimated using data from the 2010 Behavioral Risk Factor Surveillance System survey. 1,653 Arkansas older adults were surveyed. Eighteen percent of them had sustained a fall at least once in the past three months prior to the survey period. After adjusting for age, general health, coronary heart disease, diabetes status and quality rest or sleep in a multinomial logistic regression, we found that older adults with visual impairment (OR=1.47; 95% CI: 1.02, 2.12), and those who use special equipment (OR=2.85; 95% CI: 1.94, 4.19) were more likely to have sustained a fall. An integrated multidisciplinary approach in caring for older adults is imperative for preventing falls and fall-related injuries. This can also reduce fall-related hospitalizations and potentially result in substantial cost savings as well as improve the quality of life of older Arkansans.

INTRODUCTION
Falls are the leading cause of injury related deaths among older adults. According to the Centers for Disease Control and Prevention, 15.9% of all US adults 65 years and older (older adults) fell at least once during the preceding three months and approximately 31.3% of those who fell sustained an injury that resulted in a doctor visit or restricted their activity for at least one day.1 Falls among older adults can lead to death, disability, and admission to a long-term care facility and substantial medical costs.2, 3 In 2010, there were 10,407 hospitalizations among Arkansas older adults with an average length of stay of about 5 days. The average charge for falls-associated hospitalization was $22,412.4 Several risk factors for falls among older adults have been studied, including older age, white race, history of falling, use of special equipment such as cane or walker, abnormalities in gait or balance, muscle weakness, visual impairment, use of psychotropic drugs and sleep disorders.5, 6 Currently, there is no clinical consensus on a standardized screening instrument to assess the risk of falls among older adults.7 Multiple strategies or guidelines for the prevention of falls among older adults have been recommended, including exercise (tai chi, flexibility and strength training exercise), vitamin D supplementation, and multifactorial interventions.8-10

Although, many risk factors for falls among older adults have been studied, only a few studies have evaluated the association of falls and the co-morbid conditions such as presence of coronary heart disease, stroke, diabetes, quality rest or sleep, and overall general health.11-13 Using the population-based behavioral risk factor surveillance system (BRFSS) survey, we assessed the association between the falls among older Arkansans and some selected co-morbid conditions that can predispose to falls. We also set the stage for a discussion of some of the prevention strategies to combat this frequently devastating condition among our older adults.

METHODS
Data Sources
The Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is the world’s largest telephone survey used to track health risks of Americans aged 18 years and older. Since 1984, it has been administered by the 50 states in the US through funding from the Centers for Disease Control and Prevention (CDC) to a random sample of non-institutionalized community dwelling adults. The survey uses the disproportionate stratified random digit dialing methodology; additional information on survey design and methodology can be found in BRFSS Users Guide (Chapter Seven).14

The BRFSS survey collects information on survey respondents’ demographic and behavioral characteristics, and co-morbid conditions (presence of coronary heart disease, stroke, diabetes), overall general health, visual impairment (difficulty seeing or recognizing a friend across the street), use of special equipment (i.e. cane, wheel chair, special bed or a special telephone), quality rest or sleep, hours of sleep, and daytime sleepiness. The survey has been continuously administered in Arkansas since 1993. In the years 2003, 2008 and 2010, a falls core section which consists of two questions was asked among adults age 40 years and older in Arkansas. The questions specific to core section on falls are: “In the past three months, how many times have you fallen?,” and “How many of these falls caused an injury? By an injury, we mean the fall caused you to limit your regular activities for at least a day or to go see a doctor?”
Statistical Analysis

Statistical analysis was carried out with SAS version 9.3 (SAS Institute, Cary, NC) and SUDAAN version 11.0 was used specifically to account for variable weights and stratified design. We restricted our analysis to the 2010 BRFSS survey data on falls among older adults (65 years of age or higher). A chi-square ($\chi^2$) test was used to test the differences in the demographic characteristics and co-morbid conditions among older adults with falls. A multivariate binomial logistic regression method was used to assess the epidemiological determinants of falls among older adults and to assess its relationship with co-morbid conditions, after adjusting for other variables. Education was used as a proxy measure for socioeconomic status. Annual household income was not included in the model for two reasons: 1) to avoid co-linearity with education, and; 2) to avoid excluding respondents who did not wish to disclose or did not know their household income. Several variables of interest in this study are logically correlated with each other. For example, older adults with co-morbid conditions were more likely to have fair/poor general health. Therefore, not all variables that were significantly associated with falls were significant predictors in the final multivariate model. All 2-way interactions were tested for significance in the model. We also conducted a sensitivity analysis by stratifying older adults who used special equipment and who did not use special equipment to assess the predictors for falls. The final model includes only variables and interactions that made a significant contribution (P < .05). The Hosmer-Lemeshow test was used to assess goodness of fit while the Wald F test was used to assess statistical significance of odds ratios.

RESULTS

A total of 1,653 older adults 65 years and older were surveyed. Higher proportion of those surveyed were 65-74 years of age (53.8%), females (57.2%), whites (93.1%), those who had an annual household income less than twenty five thousand dollars (41.7%), and those who were high school graduates (37.2%).

## Table 1. Demographic characteristics of older adults with falls, Arkansas, 2010 (N=1653).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>With Falls (% (SE*))</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>18.0 (1.1)</td>
<td></td>
</tr>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-74</td>
<td>16.7 (1.5)</td>
<td>0.0835</td>
</tr>
<tr>
<td>75-84</td>
<td>17.7 (1.9)</td>
<td></td>
</tr>
<tr>
<td>85+</td>
<td>26.6 (4.2)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td>0.5114</td>
</tr>
<tr>
<td>Male</td>
<td>18.9 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17.4 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td>0.8433</td>
</tr>
<tr>
<td>White</td>
<td>17.9 (1.2)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>17.0 (4.7)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>23.5 (10.1)</td>
<td></td>
</tr>
<tr>
<td>Body Mass Index</td>
<td></td>
<td>0.1873</td>
</tr>
<tr>
<td>≤ 24.9</td>
<td>18.5 (1.9)</td>
<td></td>
</tr>
<tr>
<td>25.0 – 29.9</td>
<td>15.7 (1.8)</td>
<td></td>
</tr>
<tr>
<td>≥ 30.0</td>
<td>21.2 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td>0.0576</td>
</tr>
<tr>
<td>≤ 24.9 K</td>
<td>21.8 (2.1)</td>
<td></td>
</tr>
<tr>
<td>25-49.9K</td>
<td>16.2 (2.0)</td>
<td></td>
</tr>
<tr>
<td>≥ 50K</td>
<td>14.9 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>0.9786</td>
</tr>
<tr>
<td>Some high school or less</td>
<td>17.2 (2.7)</td>
<td></td>
</tr>
<tr>
<td>High school graduate</td>
<td>17.9 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>18.4 (2.4)</td>
<td></td>
</tr>
<tr>
<td>College graduate</td>
<td>18.6 (2.3)</td>
<td></td>
</tr>
<tr>
<td>Current Smoker</td>
<td></td>
<td>0.1529</td>
</tr>
<tr>
<td>Yes</td>
<td>14.1 (2.9)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>18.6 (1.2)</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td></td>
<td>0.0936</td>
</tr>
<tr>
<td>Yes</td>
<td>16.5 (1.4)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>20.5 (2.0)</td>
<td></td>
</tr>
</tbody>
</table>

* - Standard error

Approximately 18.0% of the older adults 65 years and older had fallen at least once in the past 3 months. When demographic characteristics of older adults who had fallen in the past 3 months were assessed (Table 1), a higher proportion of those between 85 years of age or older had fallen in the past 3 months (26.6%) compared to those 75-84 years of age (17.7%) or those over 65-74 years of age (16.7%), though this was not statistically significant (P=0.0835). When co-morbid conditions among older adults were compared (Table 2), a significantly higher proportion of those who reported fair/poor health had fallen in the past month compared to those who reported excellent/good health (23.4% vs. 15.5%, p<0.0023). Similarly, older adults who reported no quality rest or sleep (21.2%, p=0.0239), had history of coronary heart disease (25.0%, p=0.0163), diabetes (24.3%, p=0.0106), had difficulty seeing a friend across the street due to visual impairment (24.9%, p=0.0010), and those who used a special equipment (34.8%, p<0.0001) were significantly more likely to have fallen in the past 3 months compared to respective referent groups.

After adjusting for the demographic characteristics and co-morbid conditions in the multivariate logistic regression model (Table 3), older adults who used special equipment (OR=2.85; CI: 1.94, 4.19), and those who had visual impairment (difficulty seeing) (OR=1.47; CI: 1.02, 2.12) were more likely to have had fallen in the past 3 months. Older adults who did not have a quality rest or sleep (OR=1.35; 0.97, 1.89) were more likely to have fallen in the past 3 months, though this was not statistically significant. We tested the association between quality rest or sleep and falls among older adults after stratifying by those who used special equipment (OR=1.31; 0.90, 1.89) and those who did not use special equipment (OR=1.58; 0.88, 2.85). However, the association between quality rest or sleep and falls among older adults was not significant.

DISCUSSION

To our knowledge, this is the first study to use the population-based survey data from the BRFSS to assess the association between falls and comorbid conditions among Arkansas older adults.

Our study reaffirmed some of the findings from previous studies. Older adults who used special equipment (OR=2.85; CI: 1.94, 4.19) had nearly three times higher odds of sustaining a fall compared to those who did not use special equipment. Use of special equipment such as cane or wheelchair for mobility may indicate some degree of physical impairment or disability among older adults and puts them at an increased risk of falls. Also, older adults who had visual impairment (OR=1.47; CI: 1.02, 2.12) had fifty percent higher odds of sustaining a fall than those who did not have a visual
impairment. Evaluating older adults for visual impairment should be part of routine clinical visits to prevent debilitating effects of falls.

The observations from our study emphasize the need for an integrated approach to prevent falls among older adults. Currently, there is no clinical consensus on a standardized screening instrument to assess the risk of falls among older adults. Screening for physical functioning/impairment, visual impairment and quality rest or sleep should be an essential part of falls assessment. This can assist in formulating strategies to prevent falls among older adults. Multiple guidelines for the prevention of falls among older adults have been recommended, including exercise (tai chi, flexibility and strength training exercise), vitamin D supplementation, and multifactorial interventions.16-18

The findings in this report are subject to a few limitations. First, BRFSS is a telephone survey and does not include persons without landline telephones, or those residing in nursing homes, long term care facilities or other institutions. Second, the self report design of the BRFSS could have affected our results because socially desirable responses tend to be over reported and, therefore, less accurate. Third, because of the cross-sectional nature of the survey, one must use caution in making inferences suggestive of causality based on the results. Fourth, our study and its findings are limited to community dwelling Arkansas older adults. It does not apply to Arkansas older adults residing in hospitals, nursing homes, long term care institutions or any other facilities. Finally, survey respondents could be subject to recall bias and possibly could have misinterpreted the wording of the question used to identify falls or insufficient rest or sleep.

In conclusion, our study demonstrates an association between falls and co-morbid conditions (use of special equipment, and visual impairment) in a random, population-based study. Our findings also suggest that assessment of sleep quality may be a useful aspect of fall prevention strategies, although this requires further evaluation. For every older adult who falls and sustains injuries, a caregiver is also impacted in some way, often increasing the overall stress. Because of the tremendous physical, emotional and economic burden of falls and fall-related injuries, strategies to streamline assessment of fall risk and fall prevention is a priority and an integrated multidisciplinary approach in caring for older adults is therefore essential. This can also reduce fall-related hospitalizations and potentially result in substantial cost savings as well as improve the quality of life of older Arkansans.

ACKNOWLEDGMENT:
The authors would like to acknowledge the funding support from Claude Pepper grant (OAIC grant number AG028718) for this research.

REFERENCES


Table 3. Adjusted odds ratios* of older adults with falls, Arkansas, 2010

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>OR † (95% CI)</th>
<th>95% Confidence limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality rest or sleep</td>
<td></td>
<td>0.0762</td>
</tr>
<tr>
<td>Yes</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.35 (0.97, 1.89)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>0.2858</td>
</tr>
<tr>
<td>65-74</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>75-84</td>
<td>0.90 (0.62, 1.30)</td>
<td></td>
</tr>
<tr>
<td>85+</td>
<td>1.38 (0.83, 2.31)</td>
<td></td>
</tr>
<tr>
<td>Use special equipment</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.85 (1.94, 4.19)</td>
<td></td>
</tr>
<tr>
<td>Difficulty seeing</td>
<td></td>
<td>0.0392</td>
</tr>
<tr>
<td>No</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.47 (1.02, 2.12)</td>
<td></td>
</tr>
<tr>
<td>Coronary heart disease</td>
<td></td>
<td>0.2233</td>
</tr>
<tr>
<td>No</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.30 (0.85, 1.98)</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td>0.2209</td>
</tr>
<tr>
<td>No</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.29 (0.86, 1.92)</td>
<td></td>
</tr>
<tr>
<td>General Health</td>
<td></td>
<td>0.6092</td>
</tr>
<tr>
<td>Excellent/Good</td>
<td>1.0 (ref.)</td>
<td></td>
</tr>
<tr>
<td>Fair/Poor</td>
<td>0.91 (0.63, 1.31)</td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted for age, use of special equipment, difficulty seeing, coronary heart disease, diabetes, and general health  †OR = Odds ratio   ‡CI = 95% confidence interval

Polymethylmethacrylate Pulmonary Embolism as a Complication of Percutaneous Vertebroplasty in Cancer Patients

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1University of Arkansas for Medical Sciences, Department of Internal Medicine, Division of Hematology and Oncology
2Little Rock Diagnostic Clinic and Baptist Health Medical Center, Department of Internal Medicine

INTRODUCTION:
Percutaneous vertebroplasty is frequently used in the treatment of vertebral body fractures due to osteoporosis, vertebral body metastasis, or myeloma. Acrylic cement of polymethylmethacrylate injected into the vertebral body can leak into the paravertebral venous system and reach the pulmonary artery via the azygos vein leading to a cement pulmonary embolism. We are presenting a case of a 78 year old woman who was found to have polymethylmethacrylate pulmonary embolism as a result of vertebroplasty used for vertebral collapse from metastatic breast cancer. The appearance of new intrapulmonary artery tubular opaque density on CXR performed post procedure is highly suggestive of the diagnosis. In this case, we are exploring the importance of clinical and radiographic correlations, as well as evaluation of the hemodynamic and perfusion effects of the cement pulmonary embolism as essential steps in the management of this condition.

CASE DESCRIPTION:
The case is a 78-year-old woman with morbid obesity and past medical history of metastatic breast cancer, systemic hypertension, gastrointestinal reflux, and childhood asthma. Her breast cancer was diagnosed when she presented with back pain and was found to have diffuse bone metastasis. A biopsy was obtained from one of the thoracic vertebral body and was consistent with metastatic breast adenocarcinoma, ER positive, PR positive, and HER 2 negative. She received palliative radiation to her spine and was started on Anastrazole, remaining on it for two years with improved and stable disease. About two years into this treatment, she presented with a significant worsening of her back pain. At this time she was found to have new onset thoracic spine compression fracture. There was no neurologic compromise observed. Percutaneous vertebroplasty was done using polymethylmethacrylate cement. This is resulted in immediate relief of the pain. There were no complications with shortness of breath, chest pain or palpitation or oxygen desaturation during or immediately after the procedure.

Three months later she presented with a chief complaint of shortness of breath. The shortness of breath was episodic in nature. Each episode was associated with chest tightness, wheezing and dry cough. She was evaluated by a cardiologist and there was no evidence of CAD. Her past medical history is significant for childhood asthma. She is an ex-smoker of 15 pack/year of smoking. She has no history of organic or inorganic dust exposure. No TB exposure. Pulmonary function tests showed severe obstructive disorder with FEV1 47% of predicted value, with severe air trapping and normal diffusing capacity. Her IGE level was normal. An echocardiogram showed diastolic dysfunction, but no pulmonary HTN and normal right ventricular function. Chest X-ray indicated an intravascular tubular radiodense lesion within the right pulmonary artery (Figure 1). A CT chest without contrast showed a radiodense lesion within right pulmonary tree (Figure 2), primarily at the distal aspect of the right main pulmonary artery with a linear portion extending to the right lower lobe medially. There were smaller radiodensities in the upper lobe. The findings were consistent with polymethylmethacrylate pulmonary embolisms as result of her prior vertebroplasty. A CT with contrast showed the lesions were not occlusive (Figure 3). The patient improved with maximizing bronchodilator therapy for her obstructive disorder. Since the cement pulmonary embolism was non-occlusive with no hemodynamic effect on the right ventricle and the symptoms could be explained with her obstructive disorder, the decision was not to treat with anticoagulation. The patient was observed clinically and radiographically, and stayed clinically stable without progression in her cement embolisms.

DISCUSSION:
Percutaneous vertebroplasty is frequently used in the treatment of vertebral collapse from...
cases. The cement leakage is venous plexus in up to 24% of the patients with a leak to the paravertebral in 70% of vertebroplasty interventions with a leak to the paravertebral in 70% of vertebroplasty interventions with a leak to the paravertebral. If the cement leaks through the basivertebral zygos vein. If the cement leaks toward the internal vertebral venous plexuses, this may lead to cord and nerve root compression. If the cement leaks through the basivertebral vein and anterior external vertebral venous plexus, it will reach the pulmonary artery via segmental spinal veins, vena radicularis magna, the azygos vein, and accessory hemiazygos vein.

It is reported that the cement can escape from the vertebral body in 70% of vertebroplasty interventions with a leak to the paravertebral venous plexus in up to 24% of the cases. The cement leakage is higher in vertebral collapse as result of metastatic malignancy comparing to the collapse from osteoporotic vertebrae. This is due to the higher vascularity of the malignant tumors and the higher cortical destruction by the malignant tumor. For example: high vascularity lesions such as metastatic renal cell carcinoma, metastatic thyroid cancer, and vertebral angiomas will have a higher rate of leaking compared to other lesions.

Most of the cases of cement pulmonary embolisms are asymptomatic, or present with mild chest or back pain that could be difficult to distinguish from the original pain related to the vertebral fracture, or could be interpreted as a local pain from the procedure itself. Also mild symptoms in patients with multiple myeloma can be masked by other comorbid or disease-related symptoms in the patients. Therefore, most of the cases can remain undiagnosed. Chest X-ray will show the cement as a high density material compared to the lung parenchyma. It will appear in a tubular distribution that follows the pulmonary artery branching. Detecting an intrapulmonary artery opaque lesion is a rarely encountered problem in clinical practice. The differential diagnosis of intrapulmonary artery opaque lesions will include: retained catheter tip or a wire; cement pulmonary embolus; calcified pulmonary embolus; and, in rare cases, calcified parasites. The appearance of a new intrapulmonary tubular opaque density on CXR performed post percutaneous vertebroplasty is highly suggestive of the diagnosis. On the other hand, performing CXR immediately post procedure is not routinely done. This will make it difficult to determine the actual rate of cement pulmonary embolism. In a retrospective study performed at the MD Anderson Cancer Center, the cement pulmonary embolism was seen in 4.6% of the patients after percutaneous vertebroplasty or kyphoplasty. In a recent study, Chest CT scans were performed during follow-up in a large proportion of patients who were enrolled in a clinical trial to compare percutaneous vertebroplasty to conservative therapy. Small and clinically silent PCE occurred in 24% of patients treated with percutaneous vertebroplasty. Cement leakage into the azygos vein was the only risk factor. In asymptomatic cases, the cement embolism does not usually cause a significant perfusion defect on the ventilation-perfusion scan, suggesting that cement emboli are not occlusive in asymptomatic cases, and are not leading to thrombus formation around the cement. Theoretically, the cement may increase the risk of thrombus formation around the cement. One study looked at the thrombogenic properties of the bone cement surface or cement liquid component in vitro. It was found that the bone cement surface or cement liquid component do not induce platelet aggregation or plasma coagulation in vitro, and therefore, the surface of fresh or aged bone cement was not thrombogenic in vitro. In most reported cases of asymptomatic cement pulmonary embolisms, no anticoagulation was given and the patients did well without anticoagulation. However, in symptomatic cases the rule of anticoagulation is still debatable. Whether the improvement in treated cases was due to anticoagulation or supportive care is unclear. Emergency embolectomy by intravascular intervention was performed in massive cement embolism resulting in hemodynamic instability and shock status. If anticoagulation was chosen to treat symptomatic cases, the duration of anticoagulation was reported up to 6 months. In our case, the patient improved with maximizing bronchodilator therapy for her obstructive disorder. The cement pulmonary embolisms were non-occlusive and there was no evi-
dence of hemodynamic effect on the right ventricle. Therefore, we decided that anticoagulation would not be helpful in her case, and probably would carry more risk than benefit given her risk of fall. Close clinical and radiographic follow up showed no progression of the embolus into occlusive embolisms and no worsening in the symptoms.

We suggest the following approach when approaching the case of cement pulmonary embolism: 1- Careful evaluation of the patient symptoms. 2- Assessing if the symptoms can be explained by other etiology. 3- Correlation between the symptoms and radiographic features. 4- Assessing if the cement embolism is causing significant perfusion defect. 5- Evaluation of the hemodynamic effects of the cement pulmonary embolism. 6- Evaluation of the risks of anticoagulation.

CONCLUSIONS:
Clinicians should become more aware of the risk of cement pulmonary embolism after vertebroplasty, as the procedure is becoming the standard of care for vertebral fractures from osteoporosis or metastasis in cancer. Clinical and radiographic correlations as well as evaluation of the hemodynamic and perfusion effect of the cement pulmonary embolisms are essential steps in the management of these cases.

REFERENCES:

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