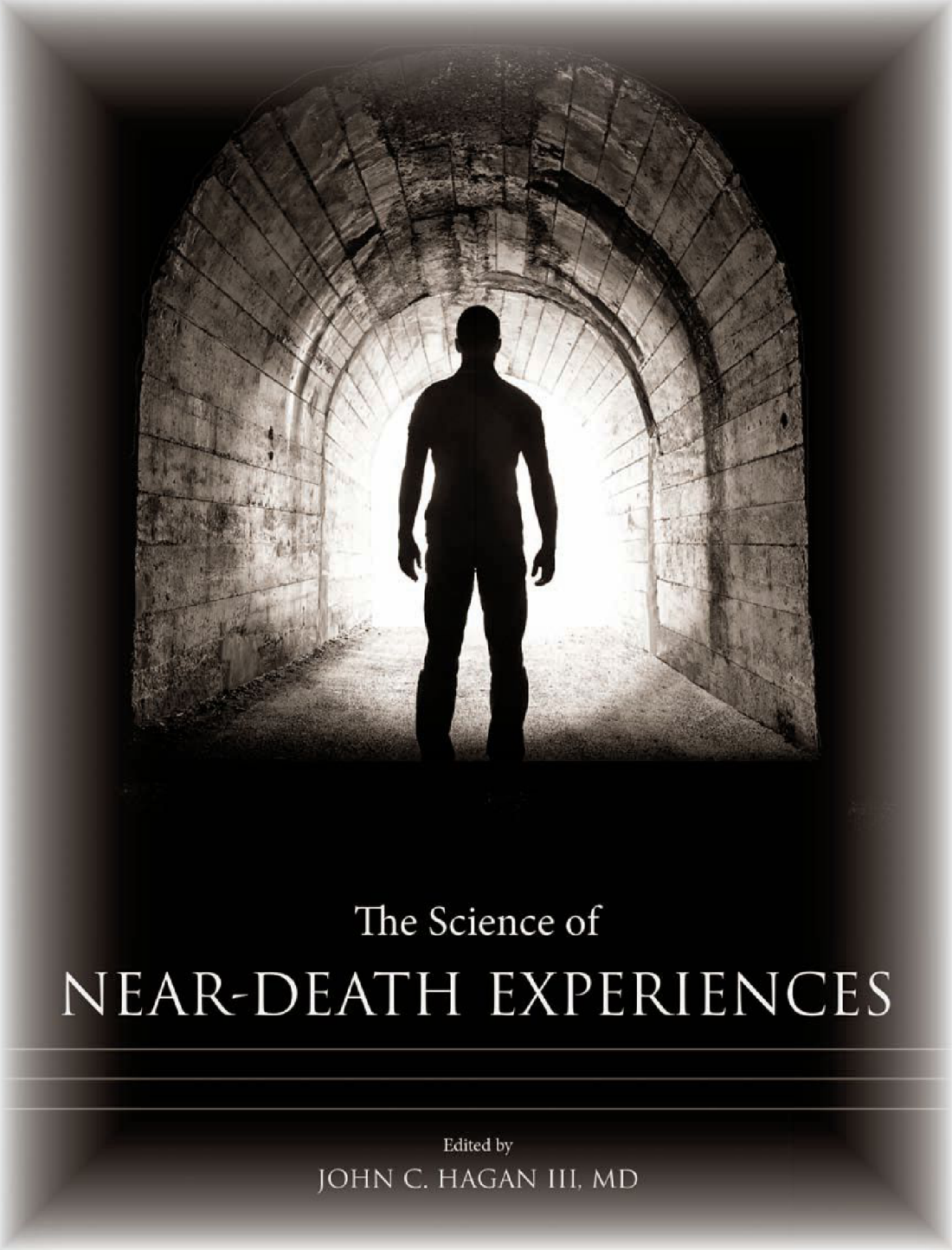
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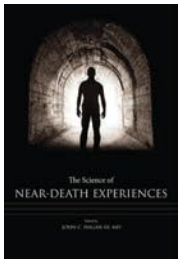
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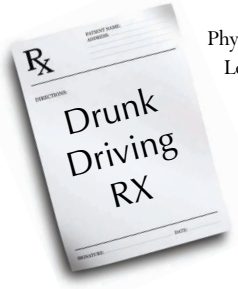
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The Science of Near-Death Experiences A Book by *Missouri Medicine* Authors Is Now in Print and World-Standard

by John C. Hagan, III, MD

Our book deals with the essential aspect of physicians and health care workers recognizing and treating a real, well-described and frequent medical syndrome.

Our *Missouri Medicine* book, *The Science of Near-Death Experiences* (University of Missouri Press, 2017, edited by John C. Hagan, III, MD) is now in print. If you are involved in patient care or medical education, especially in those fields that deal with the critically ill that are hovering at the nexus of the barely alive and the newly dead, our book and the knowledge it imparts is essential.

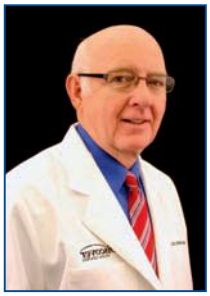
As many as 9 million to 20 million Americans are estimated to have near-death experiences (NDEs); perhaps 10% of successfully resuscitated cardiac arrest patients have a NDE. Physicians and health care professionals need to know how to recognize NDEs and how patients, especially children, should be treated after this frequently life altering event occurs. (See Raymond Moody, MD, PhD, Foreword, next page.)

The highly acclaimed and "world's first" peer-reviewed series on the science and medical aspects of NDEs appeared in this Journal from September/October 2013 to July/August 2015. Because of the opportunity to get NDE research and experience into the peer-reviewed, indexed medical literature we had access to the foremost world experts. Each of these renowned authors updated their manuscripts prior to printing. Our book is worldwide acknowledged as the newest and most evidenced-based study of NDEs.

Our book deals with the essential aspect of physicians and health care workers recognizing and treating a real, well-described and frequent medical syndrome. For the philosophic and introspective among you it may provide: an insight as to the cause of NDEs, their interpretation, the veracity-reality of content, alternative explanations of sentience-consciousness plus intimations of their persistence after lasting death.

The Science of Near-Death Experiences book is available on MSMA's website, www.msma.org, and Amazon.com. The Kindle eBook version is also available. All profits from the book are returned to Missouri State Medical Association, owner and publisher of *Missouri Medicine*. When you purchase your copy directly through MSMA, 50% of the purchase price benefits the Health Education Fund.

Please read the thoughtful Foreword by Raymond Moody, MD, PhD, who first coined the term near-death experience (the description and depiction of NDEs date to antiquity) and whose books have sold over 20 million copies.

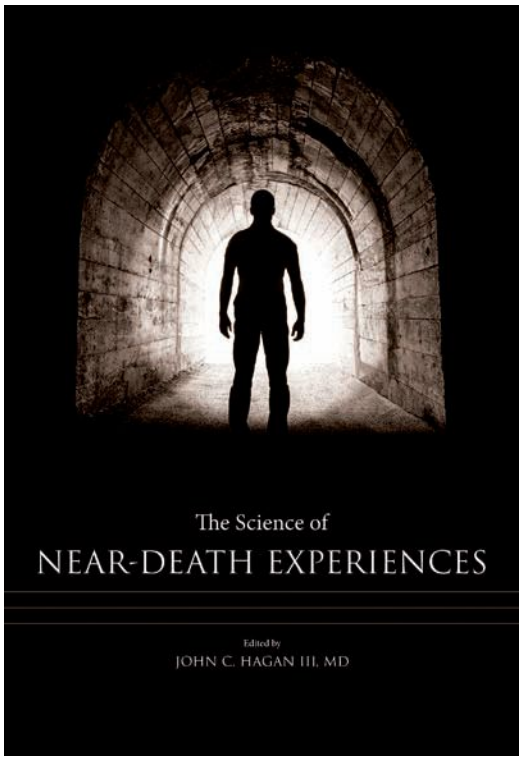


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The Science of Near-Death Experiences

Foreword by Raymond Moody Jr., MD, PhD

"Physicians who treat terminally ill patients sometimes hear the poignant and heart-wrenching question: "What is it like to die?" Yet the answer always seemed beyond the scope of the medical profession and perhaps even beyond the reach of human knowledge. This trailblazing book about near-death experiences provides a partial answer that informs clinicians and comforts dying patients.



Near-death experiences are fairly common among survivors of cardiac arrest and other severe medical conditions. They captured worldwide attention in 1976, and they have held the public's imagination continually since then. These experiences are bound to become more common with the steady advance of techniques of cardiopulmonary resuscitation. Hence, this book is appearing at a particularly opportune time. Near-death experiences present truly interdisciplinary problems that concern clinical medicine, philosophy, religious studies and the neurosciences in equal measure. Professionals in those fields will find plenty of clinically useful and thought-provoking information in this book.

The fascinating papers that this book brings together represent a variety of different perspectives. And the medical doctors whose papers describe their personal near-death experiences deserve our particular gratitude and respect. For their clear conviction that they experienced a transcendent state of conscious existence beyond the physical world awakens questions about an afterlife in clinical medicine. How should we respond to bright, articulate patients who report that they visited a light-filled after-death realm when they almost died? Clinical and philosophical issues are inextricably intertwined in this question.

Clinically, the situation is usually straightforward. Physicians should listen thoughtfully to what their revived patients report. Then, physicians should assure the patients that they are not alone in that such experiences occur frequently among individuals who recover after almost dying. Physicians should also acknowledge that such experiences often profoundly affect patients' subsequent spiritual lives. Interpreting such an experience should be left to the patient. In particular, attempting to explain near-death experiences neurophysiologically as hallucinations induced by oxygen deprivation to the brain typically alienates patients.

Besides, life after death is not yet a scientifically answerable, testable question. Rather, it is an important, traditional philosophical problem. And the old philosophical problem of an afterlife has intrusively manifested itself at the heart of clinical practice. Hence, it is not intellectually honest to avoid the question in one's personal reflections. After all, many brilliant, perceptive people of good judgement concluded from their personal near-death experiences that there is a life after death. How can the rational mind make sense of such an extraordinary state of affairs?

Modern medicine and the ancient discipline of philosophy may seem far apart. However, philosophical reasoning is exactly what is needed to grapple with the question of life after death. The greatest philosophical minds pointed out that questions about an afterlife are incommensurable with the Aristotelian logic that underlies ordinary reasoning. Therefore, the emergence of the afterlife question within clinical practice of medicine presents exciting challenges, calling for new methods of conceptual analysis. The time is right for innovative rational inquiry into the biggest question of human existence. This volume is a step in that direction."

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Should Physicians Ever Retire?

by Charles W. Van Way, III, MD

With a growing physician shortage, it will be very tempting to keep these old warhorses in harness. And really, we need them. Every time a physician retires, we lose 30, 40, or 50 years of experience.

There has been interest, of late, on just what to do with old docs. A resolution at the AMA annual meeting in 2015 suggested that standards should be relaxed, to allow retaining older physicians.[1] This was defeated. That's probably for the best. Lowering standards past some age, say 60, would send a very bad message.

On the other side of the question, there continue to be advocates for stricter treatment of older physicians. The reasoning is that since physicians may lose some faculties with age, all physicians should be tested for loss of mental faculties. Perhaps there should be a mandatory retirement age. It works for pilots, doesn't it? Checklists can be helpful in both practicing medicine and flying airplanes, right? But the similarities pretty much start and end with checklists.

Nonetheless, the argument for mandatory retirement has a certain amount of appeal. There are institutions, both academic and non-academic, that require retirement at a certain age, usually 65. But… do they, really? Such requirements are often highly selective. If the administration of a university decides you're making sufficient money, or prestige, or grant income, you may find yourself at the grindstone well after you begin drawing Medicare.



Charles W. Van Way, III, MD FACS, FCCP, FCCM, MSMA member since 1989, Missouri/AMA Delegate, and *Missouri Medicine* Contributing Editor, is Director of the UMKC Shock Trauma Research Center.
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Whatever their stated principles, most institutions are coldly pragmatic. The whole idea of mandatory retirement is simply a way of easing some older physicians out while retaining others who still have value to the institution. Why retire the aged goose who is still laying golden eggs? Assessment of competence is flexible, after all.

A few statistics might be in order. There are, at last count, about 900,000 licensed active physicians in the U.S.[2] The physician supply is growing at about 2-3% per year. So, how many practicing physicians are elderly? (Who you calling elderly, sonny boy? Ahem.) Some 30% have passed their 60th birthdays, and 10% are 70 or older. We have a physician shortage which is estimated from 46,000 to 90,000 by 2025, most of which will be in primary care specialties.[3] Mandatory retirement even at 70 would drop the numbers of practicing docs by 90,000. That would seem to be a poor policy choice. But just because it's dumb doesn't rule it out. Consider the number of good policy choices that have been made in health care over the last ten years or so. Good choices are pretty thin on the ground, and are clearly outnumbered by the rest.

The AMA has adopted a middle position on the issue of older physicians. A 2015 report by the Council on Education concluded that physicians should meet the same standards of competence, whatever their age.[4] Seems fair enough. Does this resolve the issue? Well… not really.

Consider surgeons. Dr. Mike DeBakey operated into his 90s. Most of us are not so skilled. Or so valuable to our institutions. All of us lose some of our stamina as we age, even though we may still be skilled. Staying up all night to operate, for example, becomes more difficult to endure.

So… should a 70-year-old continue to take trauma call? A 65-year-old? Granted, it depends on the individual. But how do we know? How does the surgeon himself or herself know? We all keep track of outcomes, now, especially in trauma. But it may take several years for enough poor outcomes to accumulate to mandate a decision.

Such things as peer review, maintenance of certification, keeping up on CME activities, and attending conferences are probably helpful. But we all know older physicians. Some of us ARE older physicians. Do we follow them around, looking for mistakes? I can testify that as you get older, you do ask yourself if you should be continuing in practice. Speaking personally, I stopped operating a year or two ago, but I still see patients on a part-time basis. This was, of course, with the advice of my colleagues. But it was basically a personal decision, made on my best judgement. Judgement, of course, is the very thing that might be failing. I like to think my judgement is pretty good. Or I wouldn't still be writing editorials. But then, so does everyone, even politicians. Especially politicians. Some, obviously, are wrong.

The truth is that we depend largely on the judgement and the conscience of the individual physician in these matters. Most of us, and I say this on the basis of long observation, do a pretty good job at making the call about when to slow down and when to stop entirely. Inevitably, a few of us do not. Figuring out who those few are, and easing them into retirement, will remain difficult.

Maintaining uniform standards for all ages, as the AMA advocates, is certainly a good thing to do, and is necessary. But is it sufficient? In that 2014 survey, 54% of practicing physicians were over 50. They will be entering their 60s and 70s over the next ten years. With a growing physician shortage, it will be very tempting to keep these old warhorses in harness. And really, we need them. Every time a physician retires, we lose 30, 40, or 50 years of experience.

Finally, there is a legitimate fear that too many older physicians will respond to the current trends in health care by simply quitting. Last issue, we published an editorial on physician burnout. The number of doctors who have talked, written, or e-mailed me about this issue is sobering. To reprise the conclusion of that piece, we must strive to make working conditions better for physicians. Otherwise, a lot of us are going to retire, or at best go into non-practice jobs. But health care reform will require increasing numbers of practicing physicians. The manpower loss could be crippling. In short, we need older docs. And we need to keep them happy. Or the rest of us will be even more stressed in 10 years than we are now.

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Adam Hammer, MD: The St. Louis Physician Who Made the First Ever Diagnosis of Coronary Thrombosis and Acute Myocardial Infarction in a Living Patient



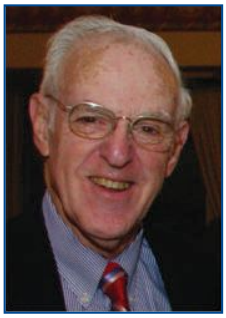
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by Arthur H. Gale, MD

Hammer was a practicing physician and well respected general surgeon and ophthalmologist in St. Louis during the mid- and late-nineteenth century.

Adam Hammer, a St. Louis physician, was the first doctor to consider that a blocked coronary artery could cause an acute myocardial infarction in a living patient. He confirmed his diagnosis with an autopsy. His originality and his enormous achievement in the understanding of the pathology and physiology of heart attacks is largely unknown.[1]

During a visit to Vienna in 1876 Hammer made his landmark diagnosis. His patient was a 34-year-old man who collapsed and died 19 hours later. The patient's symptoms were atypical. He did not have angina pectoris. He developed a very slow heart rate which probably represented complete heart block.



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Hammer suggested to a colleague that a completely occluded coronary artery might have caused death of heart muscle and the death of the patient. Although angina pectoris had been previously described the diagnosis of infarction had never previously been made or even thought of.

Hammer's diagnosis was confirmed at autopsy. A coronary artery was completely occluded by a thrombus caused by a vegetative aortic endocarditis. Atherosclerosis of the coronary arteries was not mentioned. The area of the heart that the artery supplied was a pale yellow-brown signifying infarction.[2]

Hammer published his case in a German medical journal. Prominent physicians in both the U.S. and in Germany had never heard of the disease and were unaware of any similar cases. Considering the prevalence of myocardial infarction it is astonishing that no one before Hammer ever thought that an occluded coronary artery could be the cause of this serious common disease. Hammer hoped his case "would stimulate interest among clinicians who might also recognize the condition before the death of the patient." He also hoped that experimental pathologists would study the case and conduct further research.

Hammer was born in Germany in 1818. The profession of medicine was in its infancy. He received an excellent medical education in Germany where medical training was far more advanced that it was in the United States. He took part in the revolution of 1848 which aimed to bring democracy and a republican form of government to Germany. The revolution failed and many participants including Hammer were wanted by the authorities. Like many Germans who sympathized with this democratic uprising Hammer immigrated to the United States. They were known as the "48ers."

Hammer settled in St. Louis. He was anti-slavery. He was an admirer of Abraham Lincoln and joined the Republican Party. During the Civil War he joined the Union Army as a medical officer and rose to the rank of lieutenant colonel.

Hammer was a practicing physician and well respected general surgeon and ophthalmologist in St. Louis during the mid- and late-nineteenth century. He was an astute clinician a tireless reformer of medical education founding two medical schools in St. Louis both of which eventually failed. Hammer believed that the medical curriculum should last 16 months not the 4½ months that the existing two St. Louis medical schools, as well as Harvard, required. He lost that battle.

He was a pioneer in the study of surgical pathology. He served as a professor at the Missouri School of Medicine. He founded a hospital for poor people in St. Louis, where eye operations and other types of surgeries were carried out free of charge. He was altruistic and promoted many philanthropic causes. He was a member of the St. Louis Medical Society ultimately serving as its president.

Hammer had a prickly personality which caused him to come into conflict with physicians both at the medical educational facilities that he was affiliated with and also at the St. Louis Medical Society. He filed a civil suit against his foes which he won. Eventually, he resigned from the St. Louis Medical Society.

The renowned nineteenth century St. Louis physician William Beaumont, who with the aid of his famous patient Alexis St. Martin, was the first to document and describe the process of gastric digestion had a similar independent prickly personality. He, too, was president of the St. Louis Medical Society, and because of conflicts other members he too subsequently resigned from the society.[3]

Hammer died in 1879 one year after he permanently moved back to Germany. At the time of his death the St. Louis Medical Society issued the following ambivalent obituary:

"Dr. Hammer had his friends and his enemies; but what man of talent has not? Now that he is dead, let us forget his faults and cherish his memory as that of one whose first and last love was for his profession; one whose great mind and good deeds entitle him to be enrolled among the benefactors of mankind; one whom the members of the medical profession of St. Louis will ever be proud to acknowledge as their companion and compeer."

It would be fitting for the St. Louis Metropolitan Medical Society, the Missouri State Medical Association, and the Missouri History Museum or the City of St. Louis to find a way to honor Hammer as well as that other great nineteenth century physician William Beaumont for their original and landmark contributions to medicine.

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The Opioid Epidemic: It's Time to Place Blame Where It Belongs

by Ronald Hirsch, MD

Blame must be placed; it is the American way. The co-conspirators noted here have created the current crisis and should be required to enter into an Opioid Master Settlement Agreement to pay for treatment and prevention efforts for all those affected by their nefarious activities.

When the media runs short of stories about the upcoming presidential election and need filler, they have recently been turning to the ongoing saga in Flint, Michigan, where the drinking water source was switched from Detroit water to improperly treated water from the Flint River, resulting in widespread lead contamination and possibly an outbreak of Legionnaire's disease. What is notable is that very little of the media coverage focuses on the remediation plans and instead covers the efforts to place blame for the crisis. Congressional hearings were held, lawsuits were filed and apologies issued. This is the American way and the bedrock of our legal system; first place blame then seek solutions.

But the opposite is happening with the opioid abuse crisis in this country. Several weeks ago, the Centers for Disease Control and Prevention issued guidelines for prescribing opioids in chronic pain, Congress passed the Comprehensive Addiction and Recovery Act of 2016, providing millions of dollars for prevention and treatment efforts, and the U.S. Department of Health and Human Services released a "National Pain Strategy." But unless you read Twitter or dig deep with a Google search or read the article about the California physician who was recently convicted of murder for overprescribing opioids, the media attention has been focused on the solutions instead of attempting to place blame.



Ronald Hirsch, MD, is vice president, regulations and education group, R1 Physician Advisory Services. Reprinted with permission from the *Observer*.
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So to fulfill my duty as an American and a physician who practiced internal medicine for over 20 years and was faced with many patients with real pain and many drug-seeking patients, allow me to place blame for our current opioid crisis and provide a roadmap for further investigation.

First, in all fairness, I will start with physicians. We overprescribe opioids, just as we overprescribe antibiotics. But it is generally well meaning; we don't want our patients to experience pain. But then we prescribe 30 or 60 pills when 5 or 20 would have been adequate. We do that because we are used to prescribing in multiples of 30; 30 days for a month supply of a once a day medication, 90 days for a mail-order prescription. Prescribing 6 or 10 pills will undoubtedly result in a phone call from a pharmacist asking for a round number of pills, taking up time better spent entering meaningless information into our electronic health record systems. It is the leftover pills that sit forgotten in the medicine cabinet which often lead to trouble, stolen by a relative or visitor and abused. But sometimes it is that prescription that was provided for true pain that leads rapidly to tolerance and addiction. *Healthy Living* magazine recently published a heart wrenching story of a woman whose life was nearly destroyed by two weeks of oxycodone prescribed by a well-meaning physician for arthritis.

The role of these physicians can best be described as innocent bystander. We were truly trying to help the patient. But there are also what are known as "pill mill" doctors who set up shop, accept cash as the only payment and are willing to prescribe to anyone for any ailment, real or feigned. One physician in my area was so bold as to meet his "patients" in a local coffee shop to exchange prescriptions for cash. Needless to say he is no longer licensed to practice medicine. Doctors such as these are criminals and need to be stopped. They cast a long shadow on the work of every other physician trying to help patients.

After the minor role of physicians comes the real co-conspirators. First up is Purdue Pharmaceuticals, the manufacturer of Oxycontin. Oxycontin was approved by the Food and Drug Administration (FDA) in December, 1995. Despite a lack of increased efficacy in treating pain compared to older medications, Purdue mounted an aggressive marketing campaign that included a warning from the FDA in 2003 over misleading advertisements. Physicians, including myself, believed Purdue and started using Oxycontin, thinking we were helping patients.

At around the same time as Oxycontin's approval, the American Pain Society, our third guilty party, introduced the "pain as the 5th vital sign" campaign, followed soon thereafter by the Veterans Health Administration adopting that campaign as part of their national pain management strategy. This declaration was not accompanied by the release of any device which could objectively measure pain, as was done with all previous vital signs, blood pressure, pulse, respiratory rate and temperature, making it the first and only subjective vital sign.

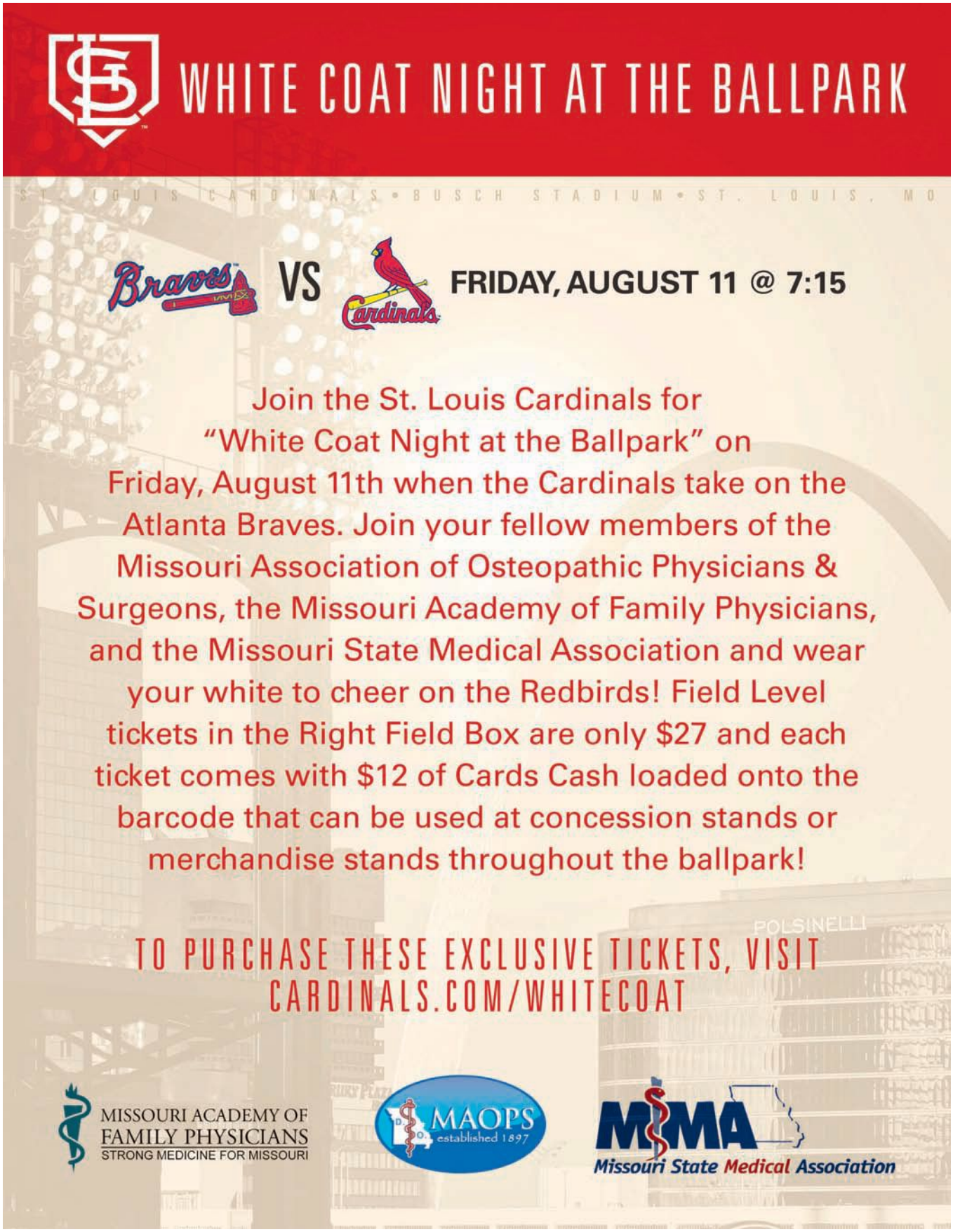
The Joint Commission also bought into this, earning a place on the list. In 2001 they issued standards requiring the use of a pain scale and stressing the safety of opioids. According to an article in the *Wall Street Journal*, The Joint Commission went so far as to publish a guide sponsored by Purdue Pharma on pain management. This guide reportedly stated, "Some clinicians have inaccurate and exaggerated concerns about addiction, tolerance and risk of death. This attitude prevails despite the fact there is no evidence that addiction is a significant issue when persons are given opioids for pain control."

The Joint Commission also framed pain management as a patient's rights issue, inferring that inadequate control of a subjective symptom would lead to sanctions. Attempting to deflect blame, the chief medical office of the Joint Commission, Anna McKee, stated that the Joint Commission said its standards didn't encourage physicians and hospitals to increase prescriptions. "I think that's a very distorted and not helpful explanation of what's going on." They also released a statement on April 18, 2016, listing the five misconceptions about the Joint Commission standards on pain management, which reads as a preemptive defense from a guilty party.

Press Ganey, the next on the list, began in 1985 with the noble concept of surveying patients in an attempt to improve the patient experience. As is often said, without data you cannot improve, so collecting patient satisfaction data has value. But it is important to separate excellent patient satisfaction from excellent quality of care. Of course Press Ganey monetized their concept, selling not only patient satisfaction surveys but also consulting services to help hospitals improve their patient satisfaction. Unfortunately, the correlation between patient satisfaction and quality has not been definitively established, with Press Ganey of course equating high patient satisfaction with high quality, but academic literature, such as the study from UC Davis, suggesting that striving for high satisfaction is actually bad for a patient, correlating it to higher expenditures, higher rates of hospitalization and a higher risk of death. But acknowledging such literature would affect Press Ganey's lucrative survey sales, so such studies are ignored.

Then comes the Centers for Medicare and Medicaid Services (CMS). CMS determined that pay for volume was leading the Medicare Trust Fund into bankruptcy and that they needed to shift to pay for performance. And to that end, CMS developed the value-based purchasing program. As currently structured, hospitals are scored based on their performance on measures of processes of care, outcomes of care, efficiency and the patient experience. The patient experience is based on scoring on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) surveys that are sent to patients, which includes patient scoring of their satisfaction with their pain control. And buying into Press Ganey's propaganda, they decided that a patient's satisfaction was as important as whether a patient develops a hospital-acquired condition or even survives their hospitalization, and weighted satisfaction at 30% of the overall score when the program began.

Because CMS was now attaching significant reimbursement to patient satisfaction, hospital administrators, the next on the list, were forced to develop initiatives to improve their scores and avoid a penalty. If the results of a quarter of patient satisfaction survey results are reviewed, it can be seen that the difference between being in the 50th percentile and 90th percentile can often be an absolute difference of 1-2%. Because only approximately 25% of patients actually return patient satisfaction surveys and CMS only requires 300 surveys returned in a 12-month period for a hospital, a single poor survey can have devastating effects. This means that administrators are


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Physician-Driven Innovation and Determination Leads the War on Drunk Driving in One Missouri Community

by Jim Blaine, MD

Mission Statement of the Springfield DWI Task Force

"To prevent driving under the influence of alcohol and other drugs by working with the community to increase public awareness of the severity of the problem and to support and develop legal and legislative action."

Some 27 years ago, concerned physicians in the Springfield, Missouri, area convened a task force of like-minded citizens dedicated to ridding their local roads and highways of drunken drivers. Their resolve and commitment led to several innovative and successful initiatives that have lowered the incidence of impaired driving both locally and statewide. Following is a look back – and forward – at their laudable efforts to protect the public from the scourge of drunk driving.

The Springfield DWI Task Force met for the first time May 4, 1990, in the Greene County Medical Society's (GCMS) Conference Room. The membership included GCMS physicians, area legislators, law enforcement officials, prosecutors, and other local leaders. Our simple goal at the time was "to remove drunk drivers from the road." We wrote in the *GCMS Bulletin* at the time, "We understand that our goal will not be realized in the short term, but will most likely require several years to complete. Here is a brief overview of our efforts over the years.



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The Task Force has held 90 minute meetings every month for the past 26 years. It met for the first few years at the GCMS office, and moved the meetings to the Springfield City Council Office when Councilman Conrad Griggs joined the Task Force. Conrad became co-chair during his time on the Council, and was a great supporter.

It's first major success was a local vehicle confiscation and forfeiture ordinance for multiple DWI offenders. Although the program was very successful in prevention of DWI recidivism, it was eventually struck down by the Missouri Supreme Court. You can read more on that in the accompanying article on page 87.

The Task Force also worked for statewide legislation that included reducing the legal limit for intoxication from 0.1% to 0.08% blood alcohol content. This legislation was facilitated by federal legislation sponsored by Missouri's U.S. Senator John C. Danforth. The Task Force also played a leadership role in state legislation that resulted in "Zero Tolerance" blood alcohol content for minors. The legislative champions for DWI control legislation came from the Springfield area, and included Senator Roseann Bentley, Senator Morris Westfall, and Representative Craig Hosmer. The Missouri State Medical Association and its lobbyists played a significant role, too. None of this would have happened without the team effort.

The Task Force successfully supported two local DWI control measures that required an initiative petition to become law. That process requires the laborious task of drafting a proposed ordinance, gathering adequate registered voter signatures, and visiting with media and other groups to support the ballot issue. Both initiative petition efforts were successful and created laws that:

1. Prohibit minors from entering bars (defined as an establishment that derives 60% or greater revenue from sale of alcohol products), and

2. Prohibit the sale of alcohol in family-oriented movie theaters. (The Task Force did not oppose the sale of alcohol in theaters where it is confined to the food area. But a local theater allowed wine and beer to be taken into a darkened theater where it easily could be shared with minors, which, according to the Greene County Sheriff, would have created "a law enforcement nightmare.")

Public outrage, better roads, better enforcement efforts, and effective legislation (statewide and local) have contributed to a reduction in the nationwide DWI-related fatality rate from 15,827 in 1991, to 10,076 in 2013 (a 36% drop) according to the CDC. Under age 21 DWI deaths have dropped even more; from 2,905 in 1991, to 1,174 in 2013 (a 60% drop).

Missouri statistics are similar. DWI-related fatalities have dropped 37% in the past ten years, and under age 21 DWI fatalities have dropped 51.2%.

A primary effort for law enforcement remains deterrence, and this is the strategy behind sobriety checkpoints. Law enforcement "Wolfpack" operations – special police details that search specifically for DWI offenders – arrest more drunk drivers than the checkpoints, but the latter are intended to deter motorists from driving drunk in the first place.

Increasingly over the years, DWI offenders have learned to refuse breathalyzer analysis. According to Chief Assistant Greene County Prosecutor, Todd Myers, there were 137 DWI arrests by the Greene County Sheriff's Office during the period of November 2013 through February 2014. Fifty-seven of those refused to submit to breathalyzer testing. Last year the Greene County Prosecutor, the Springfield Police Department, the Greene County Sheriff's Office, and the Missouri State Highway Patrol implemented a "No Refusal" policy. When a suspected intoxicated driver refuses to take a breath test, law enforcement and the prosecutor request the "on call Greene County Judge" to issue a search warrant. If the search warrant is authorized by the judge, a nurse at the Greene County Jail will take a blood sample from the intoxicated driver for testing.

After implementation, there were 148 DWI arrests by the Greene County Sheriff's Office from November 2014 through February 2015, but, not surprisingly, only 16 refusals (we do not have statistics for the Springfield Police Department or the Highway Patrol). This is a great example of innovation that benefits the safety of the citizens without violating constitutional rights.

Perhaps the most significant current challenge is impairment by non-alcohol ingestion, including marijuana, cocaine, heroin, methamphetamine, and prescription opiates. Springfield area trauma centers are providing statistics regarding the drugs of abuse they see on a weekly basis (without patient names, of course). This knowledge will assist in developing strategies to prevent impaired driving from particular drugs. The Task Force joins GCMS and MSMA in strong support of Prescription Drug Monitoring Program legislation to reduce abuse of prescription narcotics.



Clearly the Task Force has been beneficial for our community. However, the favorite benefit has been the collaboration of its members. It has been a labor of love, with the added – and priceless – dividend of lives saved. It would be great to see physicians in other communities across the state take a leadership role in keeping impaired drivers off of their local streets and roadways as well. **MM**

Drunk Driving and Vehicle Forfeiture: A Good Effort Cut Short

by Tom Holloway

With vehicle forfeiture seemingly out of reach following the Springfield court ruling, other success was won in the state Capitol with passage of a good ignition interlock law that went into effect in 2008.

In 1986, the Missouri General Assembly enacted the Criminal Activity Forfeiture Act (CAFA), which provided that "all property of every kind used or intended for use in the course of, derived from, or realized through criminal activity is subject to civil forfeiture" to the state. That law sets forth a specific legal process by which a forfeiture can be pursued and defines criminal activity to encompass almost every conceivable offense, including drugs, alcohol, stealing, gambling, arson, prostitution, weapons, pornography, and even "offenses against public order."[1]

Under CAFA, any sort of derivative contraband – lawful property that becomes unlawful because it was used in an unlawful act – is subject to civil forfeiture. Cars, boats, airplanes, weapons, tools, dwellings, land, and even cash are eligible if they are used in or to facilitate a crime. But under the law a forfeiture action can only be filed by the Missouri attorney general or the prosecuting attorney in the county in which the property was seized.



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In 1993, the General Assembly revisited CAFA and acted "to restrain what it perceived to be overzealous use of federal and state forfeiture statutes"[2] with a spate of significant reforms. Central among them, for the purposes of this discussion, was language providing that "no property shall be forfeited unless the person charged is found guilty of or pleads guilty to a felony offense substantially related to the forfeiture."[3]

That same year, the legislature also acted separately to adopt a new statute authorizing the city of Springfield to enact an ordinance to "subject to forfeiture any motor vehicle operated by a person with one or more prior convictions for an intoxication-related traffic offense."[4] The law specifically allowed the Springfield city attorney to bring a civil vehicle forfeiture action under any of three conditions: (1) When a person operates a motor vehicle while his or her license is under suspension or revocation for an intoxication-related traffic offense; (2) When a conviction of an intoxication-related offense causes the vehicle owner to be classified as a prior or persistent offender; or (3) When a person with two or more intoxication-related offenses refuses to submit to or fails a blood alcohol content test.

Even though this was a new and separate state statute, the procedures governing its forfeitures were tied specifically to the legal process set forth in CAFA.[5] But the Springfield bill, as introduced, was intended to be bound by the 1986 version of CAFA – the one that was in effect while the Springfield bill was winding its way through the legislative process – without the aforementioned CAFA reforms that were under consideration at the same time. And that would come into play later.

The new statute authorizing the local initiative was based on the successes of similar laws in other parts of the country. It was pursued here by Springfield's city elders and road safety advocates (including MSMA), and was seen by the legislature as a demonstration project to gauge the merit of subsequently extending similar authority to other political jurisdictions. Not long after the new law went into effect, Springfield adopted its enabling ordinance.[6]

Like the original CAFA, it did not specifically require a felony conviction as a condition precedent to forfeiture. But it did specifically provide that forfeitures were to be done in accordance with CAFA. And, as was noted above, by then the "reformed" CAFA clearly required a felony conviction before a forfeiture action could be filed.

Most observers felt the new Springfield ordinance worked as designed and worked very well, particularly with repeat offenders. It also demonstrated to drunken driving victims and their families that their city was committed to keeping the worst offenders off the roads. In 2003, however, the new ordinance was challenged in the Circuit Court of Greene County. Two different defendants, in two different forfeiture proceedings, asserted that the city violated CAFA when it initiated those proceedings before they had been convicted. The city argued that the enabling statute and its own ordinance made no mention of that prerequisite, and so no conviction was necessary. The trial court, citing provisions in both the Springfield-specific statute and the city ordinance that require the local proceedings to be done in accordance with CAFA (which clearly requires a felony conviction before a forfeiture action can be filed), disagreed. The city appealed that decision to the Missouri Court of Appeals, which, in November of 2004, unanimously upheld the lower court finding and ruled against the city.[7]

That decision had a profound impact on the Springfield project. Under Missouri's DUI laws, first offenders and prior offenders (two convictions) are charged with misdemeanors. Not until a person becomes a persistent offender (three offenses) is he or she subject to a felony charge.[8] So the reach of Springfield's forfeiture authority was significantly abridged, as were any discussions about extending that new authority to other cities and political jurisdictions.

In the wake of the court ruling, road safety advocates convened in the Missouri Capitol to find some way to work around the decision. Loosening the 1993 CAFA "reforms" was not particularly palatable to a conservative legislature leery of governmental overreach. Another idea was to allow a court – not a local government – to impound or immobilize the vehicle of any person convicted of a DUI offense, if circumstances warranted. But that, too, lacked the requisite traction to advance. Clearly, granting the government the authority to seize personal property is a political mountain to climb in Missouri.

The memories are tattered, but some arguments voiced against vehicle forfeiture remain fresh. What about the 8th Amendment to the U.S. Constitution, which protects people from excessive punishment? (Numerous courts have ruled that forfeiture – done right – does not in and of itself constitute governmental malfeasance.) What happens when a family relies on that vehicle to go to work, or take the children to school, or take someone for important medical care? What if a business or a bank or another creditor owns the vehicle's title? Are there improper incentives when a city's police can seize assets for the city's economic gain? And where is due process when police impound a vehicle for months and months on end while the alleged offender seeks his or her day in court?

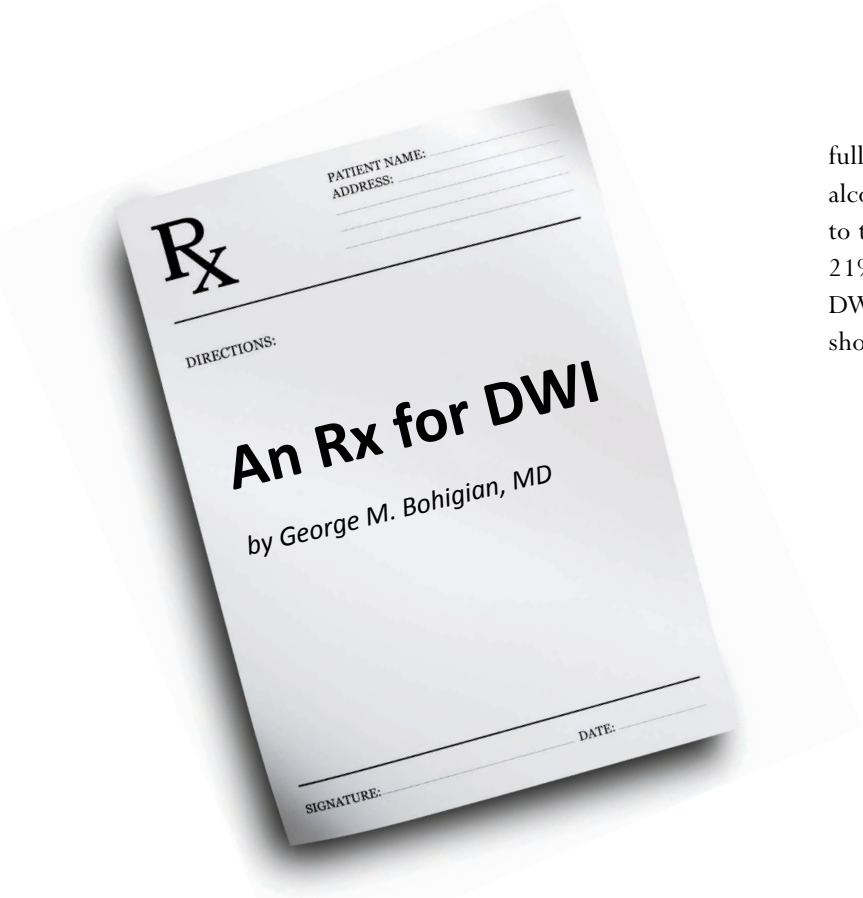
There are better arguments in support of life and limb on our roads and highways. But sadly, that debate will likely wage for years to come. MSMA and its highway safety allies will carry on, winning whatever changes the political environments will allow. With vehicle forfeiture seemingly out of reach following the Springfield court ruling, other success was won in the state Capitol with passage of a good ignition interlock law that went into effect in 2008.[9] Under that law, a judge may order a device for any individual with any first-time "alcohol-related offense." However, for any second or subsequent offenses, the device is mandatory and must be installed on any and all vehicles operated by the offender. Initially there were some design weaknesses in both the law and the devices themselves that allowed determined impaired drivers to cheat the system. But technological advances and tighter state regulations have made it all but impossible to circumvent them now. Other enhancements followed, too, such as tighter limited driving privileges for offenders, Abuse and Lose for minors, and special DWI courts.

Some local governments are not waiting for the Missouri General Assembly to act. As is discussed on page 85, safety advocates in Greene County are actively pursuing some very innovative measures to rid their roads of impaired drivers. Maybe that worthy fever will prove infectious in other jurisdictions as well.

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MM



Driving to the Lake of the Ozarks, or just about anywhere else on a late Friday afternoon, can be dangerous! There are drunks on the road! And they can kill you!

The driver in that slow vehicle pulling a boat is an "idiot," and that speeding pick-up truck whizzing by has a "maniac" behind the wheel. But that's not the worst of it. "Joe Six-Pack" had two beers while hitching up the boat in his driveway, and that iced cooler loaded with his favorite brew will provide him another one before he even gets out of his subdivision. Woe to you and me – and our family and friends as well! Watch out!

According to CDC statistics, 28 people are killed every day in alcohol-impaired driving crashes in the United States – more than one every hour. In Missouri, fully 26% of fatal automobile accidents are related to alcohol. That's more than one in four! And according to the National Highway Traffic Safety Administration, 21% of Missouri drivers convicted of DWI had prior DWI convictions. These are staggering numbers, and should not be tolerated.

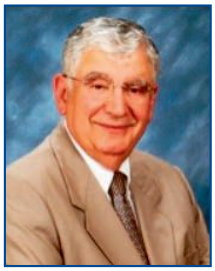
My Rx is necessarily harsh:

1. The first DUI violation should require a mandatory ignition interlock device on any vehicle the perpetrator will drive. These devices analyze breath for the presence of alcohol, and will disable the vehicle of any is detected. They also include a camera to capture the person who engages the device, so that a sober buddy cannot start a vehicle for an impaired driver.
2. A second violation would result in impoundment and forfeiture of the drunk driver's vehicle. A court would be authorized to modify the circumstances to allow home to work and medical emergency use only.
3. A third DUI violation would carry a penalty of mandatory jail time and evidence of successful completion of an approve rehabilitation program for alcoholism.

The Missouri State Medical Association has stridently supported stronger DUI laws in Missouri, and has worked successfully to pass several good DUI statutes. But more needs to be done to rid our roads of drunken drivers (and eventually we will need more comprehensive laws to cover driving under the influence of drugs). As you will see in an article on page 85 of this journal, physicians, law enforcement, and other community leaders have done some innovative things in the Springfield, Missouri area. Perhaps lawmakers in the state Capitol will follow suit.

We currently have legislators who are willing to sponsor legislation to strengthen current DWI laws, but I doubt anything will be done until a legislator's family member is involved in a fatal vehicle accident caused by an intoxicated driver. So watch out!

You can help. Contact your state legislators if you want to save lives, including your own! Most physicians do not know who represents them! You can find your state Senator and Representative on MSMA's website: www.msma.org. Click on the "Contact Lawmakers" button and let your lawmakers hear from you. **MM**



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holding departments and physicians responsible for ensuring that every single patient is completely satisfied in every way. And in the case of physicians, as described by numerous physicians in the comments section of a 2013 *Forbes* article entitled "Why Rating Your Doctor is Bad for Your Health," that means withholding pay or bonuses. Physicians therefore feel pressured to prescribe opioids when patients request/demand them, despite their reservations about the need for opioid medications. And despite the proclamation by Thomas Lee, MD, from Press Ganey in a *JAMA* editorial that "these (drug-seeking) patients do not respond often to surveys and thus have little influence on physicians' overall ratings," there is no data to support that claim and depriving a potential drug-seeking patient who threatens to "give bad satisfaction scores" is a sure route to either that bad score or a phone call from an administrator asking for an explanation about the upset patient who did not get the prescription they felt they required. It is clearly a no-win situation.

As with Dr. Lee, the administrators at CMS also tried to deflect blame in their own *JAMA* editorial, noting "Because some hospitals have identified patient experience as a potential source of competitive advantage, these actions can create perverse and harmful incentives to elicit positive survey responses. For example, there are reports that some hospitals link individual physician or physician group financial incentives to performance on disaggregated HCAHPS responses. This is contrary to the survey's design and policy aim; HCAHPS is not suitable for evaluating or incentivizing individuals or groups within a hospital." Well, if this was the case, why did CMS not address this in 2013, when the Forbes article provided ample evidence that hospitals were using the surveys in such a way, or even earlier? A notice to hospitals forbidding the use of HCAHPS scores as a punitive measure would have gone a long way to empowering doctors to say "no" to patients demanding opioids.

Of course placing blame will not fix the current problem but neither will asking for the resignation of the governor of Michigan nor will any malpractice suit for negligence ever bring back a loved one, but those responsible for this crisis need to be held accountable. I call on Congress to hold hearings and compel the top executives from Purdue Pharmaceutical, the Joint Commission, Press-Ganey, and CMS and hospital administrators to appear and testify as to their role in this national epidemic. Blame must be placed; it is the American way. In 1998, the Tobacco Master Settlement Agreement was signed between the four largest tobacco companies and the attorneys general of 46 states. This agreement set limits on advertising and provided payments to states to cover the cost of tobacco-related illnesses. Could there be any better parallel? The co-conspirators noted above have created the current crisis and should be required to enter into an Opioid Master Settlement Agreement to pay for treatment and prevention efforts for all those affected by their nefarious activities.

MM



Barriers to Mental Illness and Substance Abuse Treatment Among Physicians and the Impact on Patient Care

by Julianne Story, JD & David Solberg, JD

Balancing the interests of physician privacy and patient safety is a challenge facing the medical profession. Physicians are at a higher risk for suicide compared to the general population. According to the American Foundation for Suicide Prevention, approximately 300 to 400 U.S. physicians commit suicide each year.[2] Although lack of treatment for depression is a predominant factor in suicide, the majority of physicians who commit suicide were not undergoing psychiatric treatment at their time of death.[3] In fact, many deliberately choose not to seek treatment due to concerns regarding a perceived lack of confidentiality and the potentially adverse effects that a diagnosis of mental illness or substance abuse may have on their medical license or medical staff privileges.

State medical boards, the licensing bodies for physicians in each state, maintain an overriding mission to protect patient safety by ensuring, among other factors, that practicing physicians possess the mental and physical health required to provide competent professional services. Hospitals and other health care organizations uphold a similar duty in reference to the physicians to whom they grant medical staff privileges.





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Accordingly, as part of the process for determining whether a physician demonstrates the requisite fitness to practice medicine, state medical boards and health care organizations consider the practitioner's mental health status and any current or past substance abuse. Given that mental illness and substance abuse may inhibit a physician's ability to provide quality care, licensing boards and health care organizations must consider these factors for purposes of protecting patient safety. However, the professional risk perceived by physicians of a diagnosis of mental illness or substance abuse, which influences them not to seek treatment, disadvantages both physicians and patient safety. Specifically, lack of treatment not only endangers the health and well-being of individual physicians, it also jeopardizes the safety of patients receiving treatment from those physicians, as unresolved mental health or substance abuse issues may lead to negligent care.

This article first provides a general overview of requirements by state medical boards for disclosing mental health and substance abuse issues, identifies relevant federal and state laws governing the confidentiality of such information and its use, and offers one potential solution to assist in striking a balance between encouraging treatment for physician mental health and substance abuse while also protecting patient safety.

Disclosure of Mental Health and Substance Abuse Treatment to State Medical Boards

Requirements for the disclosure of mental health and substance abuse issues as well as treatment for such conditions to state medical boards differ from state to state. Regardless of the specific mandate, any simple disclosure can have an impact on the physician. A 2007 study by the Journal of Medical Licensure and Discipline sought to identify such requirements within all state medical board license applications and any resulting ramifications.[4] Out of the 35 state medical boards that responded, 37% indicated that diagnosis of mental illness by itself was sufficient to merit sanctioning a physician.[5] The study also found that 40% of the responding state medical boards considered a diagnosis of substance abuse as sufficient for sanctioning a physician.[6] Potential sanctions include the revocation or

restriction of a physician's license, probation, or satisfactory completion of a treatment program.

As illustrated by these findings, a substantial number of state medical boards continue to possess the authority to discipline physicians for diagnoses of mental illness or substance abuse, irrespective of whether such conditions impair the physician's ability to practice medicine competently. While these state medical boards likely rationalize such sanctions as preemptive action seeking to protect patients from substandard care by a physician potentially impaired due to mental illness or substance abuse, many argue that professional licensing and credentials should instead be based on performance (i.e., evidence of impaired ability) as opposed to a diagnosis or treatment. As one example, the American Medical Association House of Delegates proposes that, "physicians who have major depression and seek treatment not have their medical licenses and credentials routinely challenged but instead have decisions about their licensing and credentialing and re-credentialing based on professional performance."[7]

Missouri's state medical board, the Board of Registration for the Healing Arts (the "Board"), may sanction a physician for "habitual intoxication or dependence on alcohol," even if such dependence does not cause adverse professional performance.[8] Grounds for sanctioning by the Board also include failure by a physician to comply with a treatment program entered as part of a Board order, settlement agreement or licensee's professional health program.[9] The Board's regulations do not address diagnosis of mental illness as a reason for sanctioning medical licenses, but some state medical boards maintain such regulatory authority. The Oregon Medical Board, for one, mandates automatic suspension of a physician's license if the physician is determined by a court to have a mental illness.[10]

Hospitals and other health care facilities may also consider a physician's mental health or substance abuse issues when determining whether the practitioner possesses the professional competence necessary to be granted privileges. Hospitals typically include such requirements in the organization's medical staff bylaws, which may also enable them to request treatment records of practitioners who have previously demonstrated behavioral or substance abuse issues.

Applicable Federal and State Laws

While state medical boards, hospitals, and other health care organizations may consider issues regarding a physician's mental health or substance abuse as part of determining the physician's fitness to practice medicine, compliance with multiple federal and state laws must be assured.

HIPAA

The most commonly cited federal law governing the confidentiality of health information, the Health insurance Portability and Accountability Act ("HIPAA"), protects most individually identifiable health information held or transmitted by a "covered entity" or its "business associate," in any form or medium.[11] However, while records for mental health or substance abuse treatment implicate HIPAA safeguards, physicians are required pursuant to state licensing board regulations, medical staff bylaws and other health care organizational procedures to grant the release of such information to licensing boards or hospitals, thus eliminating the applicability of HIPAA's privacy protections.

Federal Regulation Governing Confidentiality of Alcohol and Drug Abuse Patient Records

In addition to HIPAA, special privacy protections are afforded to alcohol and drug abuse patient records under federal regulations. Specifically, federally-assisted substance abuse treatment programs that provide alcohol or drug abuse diagnosis, treatment or referral are prohibited from disclosing patient records in connection with such treatment.[12] These federal regulations "were written out of great concern for the potential use of substance abuse information against individuals, causing individuals with substance abuse disorders to not seek needed treatment."[13]

In February 2016, the U.S. Department of Health and Human Services finalized vrevisions to these regulations, seeking to clarify that the records of general medical practices and individual practitioners within them could also be covered by 42 C.F.R. Part 2 if they are federally assisted and are identified or hold themselves out as primarily performing substance abuse treatment.[14] While 42 C.F.R. Part 2 generally requires substance abuse treatment programs to obtain written patient consent before sharing treatment records, the finalized rule would allow a patient to permit through written consent the disclosure of treatment records to an integrated care network. This finalized change seeks to "facilitate information exchange within new health care models while addressing the legitimate privacy concerns of patients seeking treatment for a substance use disorder."[15] Although the purpose behind this finalized rule is well-intentioned, it could cause individuals granting general consent to have their treatment records reach providers they did not want to access their personal information. In particular, physicians obtaining substance abuse treatment who provide general consent may have their treatment records disclosed to providers with whom they work or otherwise risk adverse impact on their careers.

State Confidentiality Laws

States also have laws and regulations that protect the confidentiality of patient medical information. For example, Missouri safeguards the confidentiality of information and records compiled by a mental health program.[16]

Rehabilitation Act and Americans with Disabilities Act

The Federal Rehabilitation Act and The Americans With Disabilities Act (as amended) ("the ADA") provide physicians with protections in certain instances in which their medical staff privileges might be jeopardized by mental health or substance abuse issues. Section 504 of the Rehabilitation Act ("Section 504") provides that an otherwise qualified individual with a disability shall not, solely by reason of that individual's disability, be excluded from or subjected to discrimination under any program or activity receiving Federal financial assistance.[17] A plaintiff making a claim under Section 504 must show that a reasonable accommodation is possible.

The ADA prohibits a covered employer from discriminating against an otherwise qualified individual with a disability because of the disability in regard to job application procedures, among other conditions.[18] The ADA also requires a place of public accommodation to make reasonable modifications to its policies, practices and procedures where necessary to ensure full and equal access to its services by disabled individuals. However, accommodations under Section 504 as well as the ADA are not required if doing so would pose a "direct threat" to the health and safety of others.[19] Thus, if a physician poses a "direct threat" to patient safety, the physician is not entitled to protection of Section 504 or the ADA in reference to his or her medical staff privileges.

A Compromise Solution

The regulatory and workplace barriers to physicians seeking treatment for mental illness or substance abuse, whether perceived or real, must be addressed by state medical boards. While protecting patients from impaired physicians should be a primary mission of state boards overseeing medical licensure, that goal would be enhanced by taking affirmative steps to prevent physician impairment. As articulated by the Federation of State Medical Boards ("FSMB"), "the diagnosis of an illness does not equate with impairment."[20] Unfortunately, some state medical boards seemingly do not recognize this distinction, as evidenced by sanctioning of physicians based on diagnosis without regard for whether the diagnosis causes impairment. While mental illness and substance abuse often lead to impairment over a period of time, the threat of such diagnosis by itself inevitably leads many practitioners to avoid treatment altogether. In this way, practices designed to protect patient safety may actually create a risk of harm.

As an alternative, FSMB proposes that state medical boards offer a voluntary track for participation in a physician health program,[21] enabling physicians to obtain treatment confidentially.[22] FSMB goes on to recommend that, "as long as the physician is willing to abide by contracted agreements struck by the physician health program and the physician does not pose a risk of harm to the public, the physician participant can maintain confidentiality."[23] Such a proposal would incentivize physicians to seek treatment early rather than wait for impairment. Rather than viewing physician privacy and patient safety as competing interests, protecting physician privacy may actually support patient safety by promoting treatment before the onset of impairment. State medical boards and health care organizations should consider the aforementioned FSMB recommendation and other potential solutions to improve physician health and patient safety as a whole.

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1. This article was written by Julianne Story and David Solberg. Julianne is a partner and David is a former associate in the Kansas City Office of Husch Blackwell LLP. The information contained in this article should not be construed as legal advice or a legal opinion on any specific facts or circumstances. The contents are intended for general information purposes only, and readers are urged to consult their own attorney concerning their own specific situation and any specific legal questions.
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17. 34 C.F.R. Part 104.4.
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21. 48 states have "physician health programs", which are state-funded programs that provide assistance to physicians with physical or mental illness. The Missouri Physicians Health Program provides physicians and medical students in the state with treatment for mental and physical illness, substance abuse, and stress management.
22. Policy on Physician Impairment at 6.
23. Id.

MM

The Privilege to Meet MSMA Members

by Ravi Johar, MD

I will be forever grateful for the privilege I have been given to interact with the incredible physicians of Missouri. To be allowed into their communities and lives is a gift that I will always treasure.

As my term as MSMA President closes, this is a great time for me to reflect on some of what I have had the privilege to see and participate in this year. I had the honor of meeting with physicians all over the State of Missouri and representing Missouri to many of our neighboring states. I got the gift of being able to travel to all corners of our state and see just how beautiful our state is. I had no idea just how large Missouri is.

I had the chance to meet an 82-year-old Internal Medicine physician who, along with his nurse practitioner, sees over 50 patients a day, five days a week, with the sixth day making rounds at several nursing homes. I met Family Practice physicians that deliver babies in western Missouri because they are the only physicians around. I met Cardiologists that are doing valve replacements through incredibly small catheters. I met Neonatologists pushing the envelope on keeping premature babies alive. I met physicians in solo practice, physicians in small groups, and physicians that were in large groups of hundreds of physicians. I met physicians in research, physicians in management, physicians in politics, and physicians in insurance.



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There were physicians that were volunteering their time and talents both in Missouri and in other countries.

I met hundreds of physicians that truly wanted to practice medicine. They found contentment and joy in being able to take care of people and make a difference in their lives and in their communities.

I also met physicians that were that were disillusioned with medicine. There were physicians that were overwhelmed or simply tired.

I met physicians that were just burned out.

This is not surprising as about 42% of Missouri physicians exhibit symptoms of burnout. Almost half of our doctors in Missouri cannot find the joy in practicing that attracted them to medicine to begin with.

However, when talking with these physicians, it became evident that they loved practicing medicine. They still found happiness in taking care of patients. It was the non-medical parts of the job that was robbing them of their joy. They felt that fixing some of the issues like EMR, precertification, formularies, etc., would help them want to practice medicine again.

What was common in all these different groups of physicians was the Missouri State Medical Association. It was quite obvious that there is a wide array of issues faced by all physicians in the state. While some of those issues are ones that can be resolved by individual physicians, the large issues are ones that can only be dealt with by physicians coming together and with a collective voice working to resolve the problems. MSMA is the big tent that these different groups of physicians can gather in. What makes MSMA special is that it is the only organization that can voice the concerns of different specialties, private practice or integrated physicians, physicians in management, physicians in research, and all the other myriad physician groups across the state.

MSMA has a long history of strong leadership and some outstanding presidents. Dating back to 1850 we have had 166 presidents, and happily, 24 of them are still with us today. This collective group has a wealth of experience and knowledge and a true love and passion for organized medicine.

What makes MSMA special is that it is the only organization that can voice the concerns of different specialties, private practice or integrated physicians, physicians in management, physicians in research, and all the other myriad physician groups across the state.

One of my goals during my year as president of MSMA has been to look at the role of the past presidents and how they may be able to contribute to the MSMA. As I have traveled around the country to other state medical societies, I have found that this is a common concern that most states are dealing with. Many thoughts and ideas have been tossed out as the search for a solution continues.

An emphasis of organized medicine has been to get younger physicians involved as members and leaders. Medical society presidents have been getting younger and have many years that they are able and willing to contribute to organized medicine. Some are still very active in their practices and others have a little more "free time" that they can devote to helping their colleagues. Some have moved on to using their skills and talents in other ways, and others are just waiting to be asked to help in meaningful ways. Many past presidents I have spoken with are ready and willing to pitch in any way that they can benefit the society.

I feel that we need to find a way to harness their energy and knowledge. Having them directly involved with the current issues and problems facing physicians and being able to call on each other for guidance as well as their connections to other states, could prove to be a valuable asset to council deliberations. It would also give a built-in kitchen cabinet for the current president and executive council to call on when needed. I would envision it as evolving as the different members move through the section and its purpose and usefulness evolves.

There are many other areas that past presidents may be able to help. Serving as hosts for other state leaders, "informally" reaching out to state and national leaders for information that would be helpful to the council, representing Missouri at functions that conflict with the current president's schedule or needs, working on recruitment of new members, mentoring medical students, etc. Many past presidents already play some of these roles. Creation of this "club" might help formalize these roles and take some of the burden off the MSMA staff and leadership.

I am excited to be able to announce that the House of Delegates adopted Resolution #14:

Resolved, that the MSMA Bylaws be amended to create a new standing committee composed of MSMA's Past Presidents by adding the following new provision to Chapter VII, Section 1. of said Bylaws:

"The Committee of Past Presidents shall consist of the MSMA Past Presidents who are members of the Association and who volunteer to serve on the Committee. The Committee shall provide the MSMA Council and House of Delegates with advice on such matters as may be necessary to advance the Association's mission and causes."

I was proud to be able to show the physicians of Missouri what MSMA has done to help them practice medicine, excited to show them what we are fighting for now, and grateful to hear from them about what other issues and problems they are facing in the future.

As I said in my inauguration speech, MSMA is there to deal with the big issues so that physicians can be free to deal with providing the best possible care to the people of Missouri.

I will be forever grateful for the privilege I have been given to interact with the incredible physicians of Missouri. To be allowed into their communities and lives is a gift that I will always treasure. While my year as President has ended, my involvement with organized Medicine will continue, and I hope to continue using what I have seen and learned this year to continue working for physicians and patients in our great state.

Thank you. **MM**

Correspondence

Praise for "I Stuffed Their Mouths with Gold"

I read with great interest Arthur Gale's article, "I Stuffed Their Mouths with Gold - How Hospitals Destroyed the Private Practice of Internal Medicine," in the January/February 2017 issue of *Missouri Medicine*.

This was written with clarity and is a "must read" article. I have met many doctors in private practice who have sold their practices to the hospital in hope of reducing their work load of hiring, coding, administrative duties, etc., only to find out when their contracts are renewed the hospitals have increased their work load of seeing more patients per day and reducing they salaries.

Remember the old adage "He who has the gold makes the rules." This is happening not only to internal medicine but to other specialties.

It will be a rough sea in the next few years for all. Remember "the only thing that is constant is change," from Heraclitus, Greek philosopher, 535-475 BC.

One thing we can do as physicians is to keep organized. We can do more as a group than as individuals by supporting our local and state medical societies

George Bohigian, MD
Professor of Clinical Ophthalmology
Department of Ophthalmology and Visual Sciences
Washington University School of Medicine
St. Louis
MSMA member since 1977

Congratulations on your [Dr. Gale's] recently published in *Missouri Medicine*. As usual, well written and to the point. As a partner in an independent oncology group in St. Louis, I appreciate and share your point of view. To answer your question about which medical specialty is next? It was oncology. The majority of oncologists in St. Louis are owned by a health system except for six to eight independent physicians (three of whom are my partners!). As you pointed out in your article the cost of medical care and specifically oncology care has increased dramatically. Thank you for bringing this information to the public and to the medical community.

J. Daniel Cuevas, MD
St. Louis Cancer Care, LLP
St. Louis
MSMA member since 2008

I want to compliment you on Arthur Gale's article. I am entering my fortieth year of internal medicine practice. I don't have the words to describe the changes that I am witnessing. I am still able to find that ever decreasing nugget of enjoyment that keeps me in the profession. I have no answers but just wish to applaud Dr. Gale for his succinct presentation.

David Pfefferkorn, MD
Internal Medicine
Sikeston
MSMA member since 1977

Excellent article from Arthur Gale, MD. It should be sent to all members of Congress in the Missouri Delegation.

Bill Reynolds, MD
Plastic Surgery
Springfield
MSMA member since 1996

Put Me Back In Coach! Concussion and Return to Play

As a Primary Care Sports Medicine specialist, who cares for many athletes with acute and prolonged effects from concussions, this topic has daily application to my practice. This article in the January/February 2017 issue of *Missouri Medicine* was an excellent review of the pathophysiology, diagnostic testing, and return to play progression that form the foundation of care today. Appropriately, they stressed that concussion testing (SCAT3, ImPACT, others) cannot replace a thorough neurological exam and the review of a health care profession experienced in concussion care. They also reviewed prolonged issues and the risks if concussions are not treated correctly.

Two points I would stress that are integral for concussion care are early intervention with a multidisciplinary care team and education. A care team that includes athletic trainers at every treatment step is vital for improved outcomes. They are well trained in prevention, early symptom recognition, follow-up, and progression through an athlete's return to play. Education has been integral to the improvement with concussion outcomes. Athletes, parents, coaches, and administrators should be included. Outreach athletic trainers in school settings should be involved in educating these groups regularly.

Health care professionals can be detrimental to concussion care if they do not stay up to date with

MSMA Members in the News

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Missouri Medicine announces a new member of its Editorial Board. Board members are selected on the basis of exceptional professional accomplishment and expertise in their specialty.



Susan Berdy, MD, MSMA member since 1982, is the new Allergy and Immunology board member. Dr. Berdy is Assistant Professor of Clinical Medicine at Washington University in St. Louis. She is an Allergist at Allergy Consultants in St. Louis.

Dr. Berdy replaces Chitra Dinakar, MD, who has accepted a position as Professor Asthma, Allergy & Immunology at Stanford University and will head a new food allergy institute.



Philip O. Alderson, MD, Retiring Dean of the Saint Louis University School of Medicine, was named the 2016 recipient of the St. Louis Metropolitan Medical Society Award of Merit. He's been an MSMA member since 2009. Pictured above is Samer Cabbabe, MD, Immediate Past President of SLMMS and MSMA member since 2010 (l to r). Photo credit: Jim Braibish, SLMMS.





Drs. Edward Barns and Philip Mataverde have expanded their services with Lake Regional Health System to the Prairie Hills Clinic in Versailles. MSMA appreciates your memberships since 2012.





Congratulations to Michael Deiparine, MD, member since 2000, and James Foster, MD, member since 2010, for merging the services they provide at Midwest Aortic & Vascular Institute with Cameron Regional Medical Center.



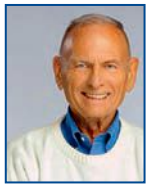
Scott Luallin, MD, a top doctor in the field of sports medicine and doctor for Sporting KC, has been an MSMA member since 1999. MSMA wishes to recognize him and his orthopedic team for joining the Belton Regional Medical Center.



MSMA commends N. Scott Litofsky, MD, member since 2006, for the work he is doing in targeted radiosurgery at the University of Missouri, featured recently in the Hannibal Courier Post.



Beth Rosemergey, DO, has been named UMKC Family Medicine Residency Program Director. She has been an MSMA member since 2015.



Once again, MSMA member since 1982 C. Norman Shealy, MD, PhD, of Fair Grove, has been named Professional of the Year (for two consecutive years) by Strathmore's Who's Who Worldwide Edition.

Correspondence, continued

care standards. In October 2016, the 5th International Conference of Concussion in Sport was held in Berlin; the release of their consensus statement will be soon. I would strongly recommend reviewing this paper when it is released. It will form the basis of concussion care in this population for the near future.

In closing, this article is helpful for the practicing physician as a great resource for help in the care of sport-related concussions.

Brian L. Mahaffey, MD, MSPH, CAQ, FAAFP
Director, Mercy Sports Medicine
Team Physician, St. Louis Cardinals
MSMA member since 1999

Kudos to Editor John Hagan, III, MD

I want to congratulate you on all the hard work you have put into your editorship for so many years. I am proud to serve on the Editorial Board as a section editor and to have you as my colleague.

Thanks again for all you do to make the publication a success.

David Cort, MD
Gastroenterology
St. Louis
MSMA member since 1997

Keeping the **game fair...**



...so you're not **fair game.**

Your Missouri medicine
is getting hit from all angles.

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confident in your coverage.

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with resources that make important
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The Importance of Geriatric Syndromes

by John E. Morley, MD

With advancing age persons tend to accumulate multiple medical conditions. This multimorbidity tends to accelerate the chances of the person developing disability and of dying, as shown by the Frailty Index of Rockwood.[1] Multimorbidity tends to lead to polypharmacy, which has been shown to cause poor outcomes in older persons.[2,3] Unfortunately, the recognition of multimorbidity while connoting poor outcomes in older persons, does not help to provide a guidance plan to enhance management.

In contradistinction to multimorbidity, a focus on geriatric syndromes and away from a disease focus has been shown by the Geriatric Evaluation and Management studies to improve outcomes in the older person.[4,5] The modern geriatric syndromes consist of frailty, sarcopenia, anorexia and weight loss, depression, delirium, falls, cognitive dysfunction, and caregiver stress. While successful management approaches exist for each of these conditions, physicans often fail to recognize these syndromes or to employ the available therapeutic strategies.

The physical frailty phenotype originally described by Fried et al[6] has been shown to respond to treatment responses involving physical exercise nutrition, behavioral therapy and treatment of specific medical conditions.[7,8] It can be rapidly identified in a busy medical practice using the FRAIL questionnaire, which has been validated in 5 continents.[9]

Sarcopenia is defined as functional impairment due to a loss of muscle mass.[10] Like frailty, it can be identified by a short questionnaire – SARC-F – which has been validated.[11] The treatment of sarcopenia involves long-term resistance exercise, a leucine enriched essential amino acid supplement and 1000 IU of vitamin D daily.[12]



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The anorexia of aging and weight loss can be identified by the Simplified Nutritional Assessment Questionnaire (SNAQ) and monitoring of the patient's weight.[13] A number of reversible causes of weight loss have been identified.[14] In addition, a caloric supplement may slow the rate of weight loss and improve outcomes.[15]

Depression can be recognized by the Patient Health Questionnaire-2. Treatment of depression involves not only medications but supportive therapy which should include exercise.[16]

Falls are a common problem in older persons. Importantly, they lead to hip fracture.[17] Approximately a third of older persons who fall have the fall precipitated by a syncopal episode.[18] Common causes of syncope are postural hypotension, postprandial hypotension (treatable with acarbose premeals) and arrhythmias. If the cause is not apparent, an implantable loop recorder should be considered. Arrythmias are very common in persons with diabetes mellitus. For persons who do not have syncope, the Toulouse – Saint Louis University Falls Assessment can be used to identify treatable causes of falls.[19] All persons with recurrent falls should be screened for sarcopenia and treated when it is present. A home environmental assessment is often useful in frail older persons. Specific exercise programs for older persons with recurrent falls, e.g., the OTAGO program,[20] are available. All persons with falls should be taught balance exercises.

When an older person has new onset of falls, they should be checked for delirium. Delirium is defined as fluctuating confusion or lack of attention due to an acute problem. Common causes of delirium are anticholinergic drugs, hypoxia (stroke, myocardial infarction, pulmonary embolism and anemia), infections, epilepsy, dehydration, metabolic conditions (hypothyroid, vitamin B_{12} deficiency) and retention of urine or feces.[21] Often 2 or more of these causes are found to be the reason for a single delirious episode.

Cognitive dysfunction [mild cognitive impairment (MCI) and dementia] is increasingly common as a person ages. These can be screened for using either the St. Louis University Mental Status (SLUMS) or the

Montreal Cognitive (MOCA) assessment.[22] We have recently developed the Rapid Cognitive Scale (RCS) which identified both MCI and dementia in under 2½ minutes.[23] Early identification of MCI is important as the FINGER study showed that a Mediterranean diet with extra virgin olive oil, exercise, socialization, brain games and control of cardiovascular risk factors can slow cognitive deterioration in older persons.[24] In addition, the St. Louis University geriatric group showed that careful evaluation of people with MCI can result in reversal in about half of individuals.[25] Common reversible causes of cognitive dysfunction include wax in the ears and other hearing deficits, sleep apnea, atrial fibrillation, depression, normal pressure hydrocephalus and metabolic disorders.

Caregiver stress is poorly recognized by physicians. It is an important cause of institutionalization of older persons being cared for by a stressed caregiver. Brief screens for caregiver stress are available. Caregivers who are stressed should be referred to programs that exist to help alleviate their stress.

This issue of *Missouri Medicine* will discuss in more detail specific approaches to older persons with geriatric syndromes. The screening tools for these syndromes are available at www.aging.slu.edu as well as videos on how to administer them. For health care professionals who are interested in using these screening tests in their practice, we have a Geriatric Workforce Enhancement Program that gives us the opportunity to provide you with assistance in inserting these screens into your computer programs. If you wish help, please contact us through the website.

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MM

The Rapid Geriatric Assessment: A Quick Screen for Geriatric Syndromes

by Milta O. Little, DO

The components of the Rapid Geriatric Assessment should be viewed as routine tests given to all older adults, just like checking blood pressure.



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The comprehensive geriatric assessment (CGA) has been well-established as the geriatrician's procedure. The CGA is a systematic, multimodal, interprofessional approach to a complicated older patient with the intent to diagnose geriatric syndromes, develop targeted treatment plans, and improve patient outcomes with a focus on function and quality of life.[5, 19] Key elements are the assessment of medical status, functional capabilities, cognitive status, and psychosocial structure and support. The best time for a CGA is while the person is still functional in order to identify risk factors for decline and disability that can be ameliorated with appropriate interventions. Parts of the CGA should be repeated over time and over several patient care visits in order to continually monitor for new geriatrics syndromes.

While the CGA is the "toolbox" of the geriatrician, the various evaluation components can be completed by any member of the interprofessional team and the care plan that is derived from the assessment results is best prepared as team. While the CGA has been shown in various settings to improve outcomes,[1, 3, 5, 6, 13, 15, 17, 18, 20] it is also time-consuming, requiring two to three hours in some cases to complete. Since there are not enough geriatric providers to assess and manage all geriatric patients, it is imperative that primary care physicians and advanced practitioners, along with all members of the health care team, are equipped with tools that can quickly evaluate an older adult for geriatric syndromes.

At Saint Louis University, our team created the Rapid Geriatric Assessment (RGA), which consists of four screening tools and an inquiry into the presence of advanced directives (See Figure 1). Positive responses to the RGA should trigger further assessments and management by members of the interprofessional team. Electronic versions of the RGA, training materials on its proper administration, and patient information sheets on common geriatric syndromes are available at aging.slu.edu

The RGA consists of four short screening questionnaires: The FRAIL scale, the SARC-F scale for sarcopenia, the Simplified Nutritional Appetite Questionnaire (SNAQ), and the Rapid Cognitive Screen (RCS). These four were chosen because they can help any health care provider to quickly identify most geriatrics syndromes and none are copy written. This means that the RGA is free to use or distribute and its dissemination is encouraged. This article will briefly discuss each screening tool in turn.

Frailty

Frailty is the diminished ability to carry out important activities of daily living under stress.[12] The presence of frailty predicts dementia, hospitalizations, institutionalization,

Figure 1
Rapid Geriatric Assessment

Saint Louis University
Rapid Geriatric Assessment*

*There is no copyright on these screening tools and they may be incorporated into the Electronic Health Record without permission and at no cost.

ID#:_____ Sex:_____ Age:_____ Primary Care Provider Y / N
Ethnicity (circle): African/Am Asian Caucasian Hispanic Non-Hispanic

The Simple "FRAIL" Questionnaire Screening Tool

Fatigue: Are you fatigued?
Resistance: Cannot walk up one flight of stairs?
Aerobic: Cannot walk one block?
Illnesses: Do you have more than 5 illnesses?
Loss of weight: Have you lost more than 5% of your weight in the last 6 months?

Scoring: 3 or greater = frailty; 1 or 2 = prefrail

From Morley JE, Vellas B, Abellan van Kan G, et al. J Am Med Dir Assoc 2013;14:392-397.

SARC-F Screen for Sarcopenia (Loss of Muscle)

Component	Question
Strength	How much difficulty do you have in lifting and carrying 10 pounds? Scoring: None = 0 Some = 1 A lot or unable = 2
Assistance in Walking	How much difficulty do you have walking across a room? Scoring: None = 0 Some = 1 A lot , use aids or unable = 2
Rise from a Chair	How much difficulty do you have transferring from a chair or bed? Scoring: None = 0 Some = 1 A lot or unable without help = 2
Climb stairs	How much difficulty do you have climbing a flight of ten stairs? Scoring: None = 0 Some = 1 A lot or unable = 2
Falls	How many times have you fallen in the last year? Scoring: None = 0 1-3 Falls = 1 4 or more falls = 2

Total score of 4 or more indicates Sarcopenia

From Malmstrom TK, Morley JE. J Frailty and Aging 2013;2:55-6.

SNAQ (Simplified Nutritional Assessment Questionnaire)

My appetite is
a. very poor
b. poor
c. average
d. good
e. very good

Food tastes
a. very bad
b. bad
c. average
d. good
e. very good

When I eat	**Normally I eat**
a. I feel full after eating only a few mouthfuls	a. Less than one meal a day
b. I feel full after eating about a third of a meal	b. One meal a day
c. I feel full after eating over half a meal	c. Two meals a day
d. I feel full after eating most of the meal	d. Three meals a day
e. I hardly ever feel full	e. More than three meals a day

Scoring: a=1, b=2, c=3, d=4, e=5.
A score ≤14 indicates significant risk of at least 5% weight loss within 6 months.

From Wilson et al. Am J Clin Nutr 2005;82:1074-81.

Rapid Cognitive Screen (RCS)

1. **Please remember these five objects. I will ask you what they are later.**
[Read each object to patient using approx. 1 second intervals.]
Apple Pen Tie House Car

2. [Give patient pencil and the blank sheet with clock face.] **This is a clock face. Please put in the hour markers and the time at ten minutes to eleven o'clock**
. [2 pts/hr markers ok; 2 pts/time correct]

3. **What were the five objects I asked you to remember?**
[1 pt/ea]

4. **I'm going to tell you a story. Please listen carefully because afterwards, I'm going to ask you about it.**

Jill was a very successful stockbroker. She made a lot of money on the stock market. She then met Jack, a devastatingly handsome man. She married him and had three children. They lived in Chicago. She then stopped work and stayed at home to bring up her children. When they were teenagers, she went back to work. She and Jack lived happily ever after.
What state did she live in? [1 pt]

SCORING
8-10…….. Normal
6-7……. Mild Cognitive Impairment
0-5……. Dementia

From Malmstrom TK, Voss VB, Cruz-Oliver DM et al J Nutr Health Aging 2015;19:741-744.

Advanced Directive
Do you have an advanced directive? Y/N

falls, and fractures in community dwelling individuals.[7-10] It is important to note that for many people, frailty is a pre-disabled state, and identifying frailty early helps to establish care goals and more successful interventions. If one considers the bio-psycho-social model of health care, a frail elder has limitations in these domains.

For example, the presence of multimorbid disease, bereavement, social isolation, and financial distress puts the person at risk of a significant functional decline or disability given an additional stressor, such as a new medication or illness. If one can identify and address frailty, one may delay the onset of disability, slow the progression of dependency, and improve outcomes. When an additional stressor is added, the person will not experience a permanent decompensation if the appropriate interventions are in place at the time frailty is discovered.

The ICD-10 diagnosis code for frailty is R54. The FRAIL scale is a five-item yes/no questionnaire that has been validated is several different populations around the world. Scores range from 0 to 5, with a higher score indicating more frailty. A score of zero indicates a healthy older adult, a score of 1-2 indicates pre-frail or early decline, and a score of 3 or more indicates decline and frailty. It is important that people answer the questions based on how they usually feel most of the time, not just the day of the office visit or screening tests. This applies to the following tools as well.

Sarcopenia

Sarcopenia is literally translated from the Greek as "the poverty of flesh" and is the decrease in both muscle mass and function that occurs with aging. Similarly to frailty, sarcopenia in the absence of functional limitations is considered a pre-disabled state, and is best assessed and treated in those who are functionally independent. While there is certainly overlap between frailty and sarcopenia, studies have determined that these are two separate clinical

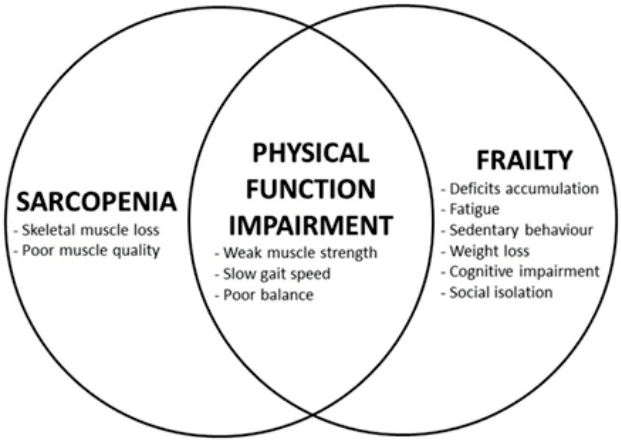


Figure 2
Relationship among sarcopenia, frailty, and physical function impairment[4].
Copyright © 2014 Cesari, Landi, Vellas, Bernabei and Marzetti. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

entities, both which can lead to poor functional outcomes[4, 16] (See Figure 2). For this reason, it is important to look for both frailty and sarcopenia when assessing an older adult. The SARC-F scale has been validated in several continents and found to have good predictive ability for future dependency.[2, 22] Scores range from 0 to 10 with a score of 4 or more indicating sarcopenia. Sarcopenia as a diagnosis is now billable with the new ICD-10 code M6284.

Simplified Nutritional Appetite Questionnaire

Significant weight loss is defined as a decrease in more than 5% of usual body weight over the last six to twelve months. Whether or not the weight loss is intentional, it may be a cause for concern in those over 65 as it contributes to memory loss, decreased immune function (predisposing to infections), decreased muscle mass and weakness, loss of function, and poor wound healing. Weight loss and cachexia are also associated with an increase in mortality in older adults. Anorexia is the main contributor to malnutrition so questionnaires that assess appetite can be useful to assess risk of weight loss and malnutrition. The Simplified Nutritional Appetite Questionnaire (SNAQ) has been validated in community-dwelling older adults, hospitalized patients, and nursing home residents and a score of 14 or less is predictive of weight loss over the following six months.[14, 21] These studies also show improved functional capacity when nutritional interventions are put into place. Abnormal weight loss is billable under the ICD-10 diagnosis code R634.

Rapid Cognitive Screen

Major neurocognitive impairment (also known colloquially as dementia) is defined as memory impairment plus aphasia, apraxia, agnosia, and/or a disturbance in executive functioning. People with major neurocognitive impairment have a noticeable (although possibly subtle) decline from a previously higher level of functioning, including significant impairments in occupational or social function. Memory loss is NOT normal in older adults. It is important to distinguish dementia from mild cognitive impairment (MCI), which is memory impairment in the presence of intact activities of daily living, because early identification of a cognitive disorder allows for improved care and planning. In addition, it may be possible to reverse, prevent, or slow decline in cognition if MCI is found and treated early. It is not enough just to diagnose the presence of major neurocognitive impairment. It is also important to distinguish the various dementia syndromes (not all dementias are Alzheimer's disease), rule out reversible causes, and provide complete bio-psycho-social care to patients and family members.

Most office-based screening instruments take 8-10 minutes to complete. For the standard primary care office visit, the length of time required to complete a short screening test is still too long. The Rapid Cognitive Screen (RCS) is the shortened version of the well-validated Saint Louis University Mental Status Examination, and is useful in a busy clinical setting. It takes roughly two minutes to complete and has been validated to pick up both major neurocognitive disorder and MCI in several languages.[11] Scoring of the RCS is from 0-10. A score of 0-5 indicated dementia, 6-7 is MCI, and 8-10 is normal.

The final part of the RGA is the question, "Do you have an advanced directive?" This question is important because advanced directives are how a person communicates his desired care goals to ensure

these goals are met when he is not able to express his wishes. It also gives the person administering the RGA a chance to discuss the importance of having a primary care doctor to coordinate care goals. Some web resources that may be useful for people as they document their advanced directives are:

- Advance Care Planning - National Institute of Health https://www.nia.nih.gov/health/publication/advance-care-planning
- Missouri Form for Durable Power of Attorney for Health Care:
- http://missourilawyershelp.org/legal-topics/durable-power-of-attorney-for-health

Goals of care discussions are also now billable under Medicare using the time-based CPT codes 99497 and 99498.

In conclusion, the components of the RGA should be viewed as routine tests given to all older adults, just like checking blood pressure. For a successful assessment, the set-up is key. Be positive as they answer and allow time if they are struggling. For any RGA done at a community screening event, provide resources and encourage them to talk to their doctors.

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Physical Activity in Older Persons

by Julie K. Gammack, MD

Physical activity in older adults has been shown to improve physical, cognitive and functional status and to reduce risk of frailty.



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Abstract

Physical activity in older adults has been shown to improve physical, cognitive and functional status and to reduce risk of frailty. Guidelines recommend at least 150 minutes of moderate-intensity aerobic physical activity each week as well as strength activities. There is little evidence of adverse events or harm with regular physical activity in older adults. Group-based and center-based models may help maximize short-term benefits, but creating home-based activities can improve the long-term compliance of a physical activity program.

Background

Successful aging is as much about maintaining function as it is about successful disease management. Retaining cognitive, physical and psychosocial function is critical for avoiding frailty and for maintaining an independent lifestyle. Being physically active is inherent in maintaining the functions of everyday life and in reducing the risk for chronic diseases.

Physical inactivity has been identified by the World Health Organization (WHO) as the fourth leading behavioral risk factor for development of noncommunicable diseases and global mortality.[1] The WHO is focused on reducing insufficient physical activity by 10% over the next 10 years. Older adults are the least physically active of any age group with less than one quarter engaging in regular physical activity.[2] Inadequate physical activity in younger years is a risk factor for the development of frailty later in life. In a longitudinal study of 513 men, those in the lowest tertile of physical activity (less than 120 minutes per week) at age 50 compared to the highest tertile, (> 360 minutes per week) were over three times more likely to be frail at age 75 (16.1% versus 4.7%).[3]

Physical Activity Recommendations for Older Adults

The U.S. Department of Health and Human Services (DHHS) established Physical Activity Guidelines for Americans in 2008.[4] The guidelines included standards for older adults that were the same in intensity and duration as those of younger adults and offered guidance for those limited by chronic conditions (See Table 1). DHHS guidelines recommend at least 150 minutes of moderate intensity aerobic physical activity per week and strengthening activities at least twice per week. The American College of Sports Medicine updated their physical activity guidelines for older adults in 2009. These recommendations are generally consistent with the DHHS guidelines but place greater emphasis on the specific forms of exercise including endurance, resistance, flexibility, and balance.[5]

For those unaccustomed to a regularly structured activity regimen, 150 minutes each week of moderate-intensity physical activity may seem quite intimidating. Splitting the activity into 10-15 minute increments several times daily on five days of the week is an accepted approach that may be better received in sedentary individuals. As any level of physical activity is preferable to no activity, those with chronic conditions are encouraged to be as physically active as possible.

Table 1
Physical Activity Guidelines for Older Adults

For Young and Older Adults
- Avoid Inactivity: Some physical activity is better than none and any amount has health benefits.
- Do Aerobic Activity
  - 150 minutes of moderate-intensity aerobic physical activity each week
  - Do aerobic physical activity in episodes of at least 10 minutes
  - Increase duration of activity each week for greater health benefits
- Strengthen Muscles: Do resistance activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week.

For Older Adults
- If unable to do 150 minutes of moderate-intensity aerobic activity a week, be as physically active as chronic conditions allow.
- Do exercises to maintain or improve balance if at risk of falling.
- Target level of effort for physical activity relative to level of fitness.
- Understand how chronic conditions affect ability to safely do regular physical activity.

It may be difficult for some older adults to gauge the intensity of physical activity. Moderate intensity is generally defined as 3-6 metabolic equivalents (METs) and causes a noticeable increase in heart rate and breathing effort. As maximal heart rate decreases with age and is affected by many cardiac medications, using heart rate as a measure of intensity in older adults can be problematic. Using a scale or descriptors can be useful in assigning meaning to physical effort. Moderate intensity is often designated as a 5-6 on a ten point scale where 10 is maximal physical exertion and 0 is no physical movement. Activities of moderate intensity can include brisk walking, dancing, gardening, raking, stair climbing, performing vigorous household chores (vacuuming, scrubbing, sweeping) and carrying moderately heavy (< 40 lb) items.

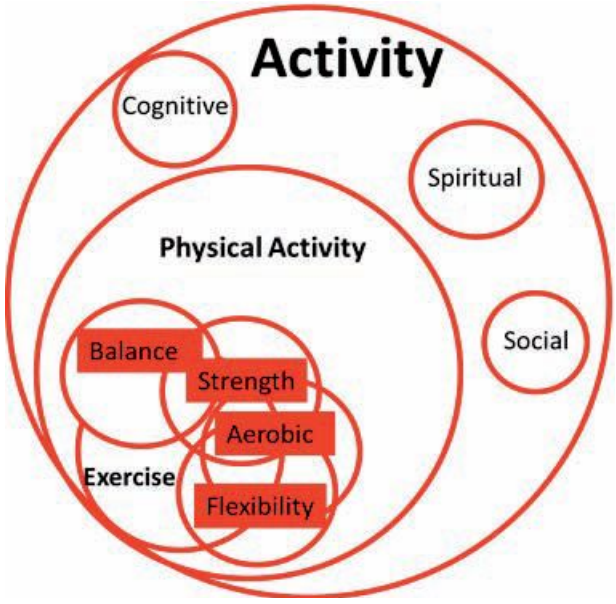
Physical activity is any physical movement carried out by the skeletal muscles that requires energy. There are many forms of activity and physical activity, but exercise is the most commonly recognized and studied subcategory of physical activity (See Figure 1). Exercise is planned, structured, repetitive, and intended to improve or maintain physical fitness. It can be achieved through strength, balance, flexibility, and aerobic movements. The health benefits of specific forms of exercise such as jogging, yoga, and Tai Chi are well known and are beyond the scope of this review.

Although weight loss, reduction in falls and increased strength can be achieved with greater intensity exercise, the health benefits of less intense physical activity have not been as well-established for older adults. Several studies are underway to assess the physical and functional benefits of physical activity and there are growing data to support the psychological benefits of physical activity in older adults. Improving sleep, depression and cognitive function are of great interest in promoting quality of life and successful aging.

Physical Activity and Mobility

Most studies of physical activity employ exercise, mobility, fine motor, cognitive-based or social-behavioral interventions. These interventions are usually delivered in

Figure 1
Forms of Activity and Physical Activity



20-60 minute session one to three times weekly for three to six month duration. Compliance is generally measured by the frequency or duration of participation rather than the intensity of the effort. Outcomes of many studies include balance, gait speed and falls.

The LIFE Study (Lifestyle Interventions and Independence for Elders), conducted from 2004 – 2006, was a landmark multicenter randomized controlled study assessing a physical activity intervention to reduce major mobility disability in sedentary elders. The pilot phase enrolled 424 elders age 70-90 years with < 20 minutes of weekly structured physical activity. The intervention included a structured triweekly 45 minute multimodal exercise program (aerobic, strength, balance, flexibility) with behavioral counselling. The control group received educational sessions about health and physical activity. Outcomes were measured over one year and demonstrated improved physical performance on the Short Physical Performance Battery, faster walking speed, and a lower but not statistically significant rate of mobility disability (15.6% versus 12.2%) in the treatment group.[6] A significant ($p = .01$) reduction in frailty prevalence was observed at one year in the treatment group (10% versus 19%, $P=0.01$).[7]

In 2013, an expanded follow-up to the pilot was conducted at eight sites and included 1,600 participants. Subjects engaged in a progressively intense, center and home-based physical activity program for at least 30 minutes daily (150 minutes weekly) and were followed for up to three years. Study subjects averaged 218 min/wk of physical activity compared with 115 min/wk in the health education group. Major mobility disability occurred in 246 study

subjects (30.1%) and 290 participants (35.5%) in the health education group (HR, 0.82 [95% CI, 0.69-0.98]); P = .03.[8] Cardiovascular disease outcomes such as myocardial infarction, stroke, and cardiac-related death were not different between the two groups.[9] Sub-analysis of these data did not show that the intervention reduce hospitalizations or falls.

A meta-analysis of physical activity studies in older adults was recently published.[10] The results show that physical activity has a significantly positive effect on mobility and physical functioning when compared to a non-activity control group. When compared to low-intensity activities, high-intensity interventions were somewhat more effective in improving physical functioning.

Physical Activity and Sleep Quality

Several studies have demonstrated that both moderate intensity and low intensity physical activity can significantly improve sleep quality in older adults. In a recent study, sleep quality was studied in a combined 12-week physical-cognitive activity training program.[11] In a four-block randomization, subjects were assigned to either low or high intensity physical and cognitive training. It was interesting that the greatest improvement in sleep quality (5.1 points on a 28 point scale) was seen in the lower intensity stretching and lower intensity educational program rather than the higher intensity groups (P<0.001).

Researchers from two Missouri universities have studied the use of a therapeutic dance activity to improve sleep in frail older adults. In a community care setting, participants were provided 45 minutes of a dance activity three times weekly for six weeks. Sleep restlessness was measured using a bed monitoring system. A reduced level of nighttime restlessness (midnight to 6:00 a.m.) was noted in the dance group versus control. The treatment group showed greatest benefit in the participants with the highest baseline level of nocturnal restlessness.[12]

Physical Activity and Cognitive Function

A recent systematic review of aerobic activity on cognitive functioning in older adults included 12 trials with 754 subjects. The analyses failed to show a cognitive benefit from aerobic exercise even when the intervention demonstrated cardiorespiratory fitness. The longest of these trials was 26 weeks.[13] A subsequent study (a sub-analysis of the LIFE Study) had a 24-month intervention period. Incident mild cognitive impairment or dementia were the primary outcomes and were not different between groups at the end of this intervention.[14]

A second recent trial of adults with mild cognitive impairment showed some positive results. One hundred subjects were randomized to a four-block activity protocol: active or sham physical training plus active or sham cognitive training. The intervention was two to three days per week of 60-100 minute activity for 18 months. Cognitive performance was measured as executive functioning and score on the ADAS-Cog assessment scale. Physical activity, with or without cognitive training, significantly improved ADAS-Cog scores at 6 months compared with sham exercise (P < .05) but effects were not sustained at 18 months. Executive functioning improved significantly from baseline in the physical activity group compared to the cognitive groups.[15]

Physical Activity and Depression

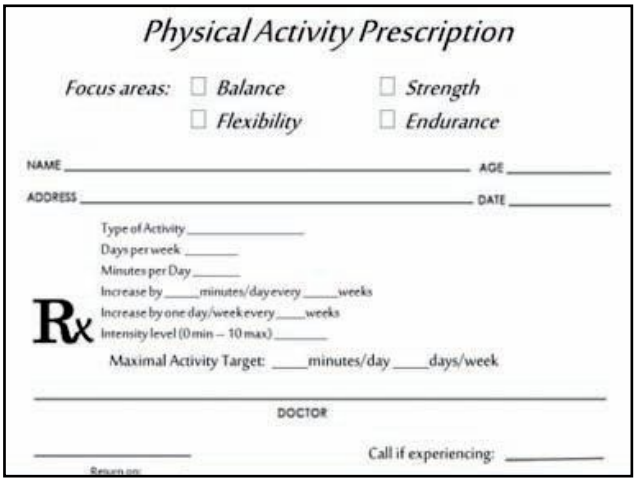
The most recent meta-analysis identified six trials (464 participants) with adequate study design for analysis. Reduction in depression symptoms with physical activity was not statistically significant when compared to no treatment or control. Pooled data from eight trials (377 participants) with long-term follow-up found a small effect in favor of exercise (SMD -0.33, 95% CI -0.63 to -0.03). Seven trials compared exercise with psychological therapy and found no significant difference. The authors conclude that best evidence shows only a small benefit with exercise for reducing symptoms of depression, and exercise is no more effective than pharmacotherapy.[16]

A subsequent small, but positive study from Taiwan did show reduction in depression, as measured by the Geriatric Depression Scale score, with a physical activity program. In this study of 57 older adults with depressive symptoms, both a cognitive behavioral therapy and a physical activity program (150 minutes weekly for 12 weeks) improved mood symptoms compared with the control group. The physical activity arm also improved six-minute walking distance.[17] Additional studies are needed to substantial these findings.

Organized Models for Therapeutic Activity

Guided physical activity or group activity sessions may be improve participation and promote greater social interactions. Group-based activities in a gym or therapy center provide opportunities for supervision and assistance and may be more motivating than solo activity programs. Disadvantages may include cost, need for transportation, and limited availability or flexibility of session times and structure. There is some evidence that the short-term impact of center-based group activities may be greater than home-based individualized programs, however sustained effects are greater in home-based programs.[18] This would support a dual approach to physical activity programs in which a group leader can maximize activity intensity and participation, while a home-based component can promote sustainability when center-based activity is no longer available or practical.

Figure 2
A Physical Activity Prescription



In the IMPACT study, community-dwelling older adults with osteoarthritis were randomized to a traditional individualized physical activity model or a group-based physical activity program.[19] The group-based program showed greater increases in total weekly minutes of physical activity at three months (83 minutes per week versus 44 minutes per week) and 12 months (81 minutes per week versus 33 minutes per week) relative to the traditional approach.

Team-based, guided activity is also shown to improve engagement and socialization in frail populations. The Lifestyle Engagement Activity Program used individualized but team-delivered guidance to improve physical activity and social behaviors in cognitively impaired homebound elders.[20] After 12 months, the treatment group showed significantly lower apathy, dysphoria, and agitation, and showed greater engagement in recreational activities and care provider visits.

Based on the scientific evidence and public policy initiatives promoting physical activity, several group-based activity models have developed to deliver physical activity programs to frail and cognitively impaired populations. The most widely studied model with worldwide disseminated is a rhythmic dance program focusing on lymphedema management, breathing control, and improving circulation. Previously called the Lebed Method,™ this approach is now known as Healthy-Steps™.[21] Therapeutic movements are designed for specific body areas and choreographed to music selected for the target audience. Sessions are led by certified instructors who are rigorously trained in the proper technique. The sessions are intended to improve balance, range of motion, and strength. Although established as a therapeutic activity, the focus is on participant engagement, enjoyment, and a positive activity experience. Large studies of the Healthy-Steps™ method have not been published but small pilot data suggests some functional benefits with this approach.[22] Fifteen certified instructors and many community programs exist to delivery Healthy-Steps™ in the state of Missouri.

Another model of therapeutic activity for older adults is the Sonas© program developed out of the United Kingdom. The target population is the cognitively impaired elder. This model uses stimulation of all five senses, communication, and structured, repetitive movements within a "failure-free environment".[23] Formal training sessions are available to learn the components of this approach. Cognitive stimulation therapy is key element of this model which has been demonstrated to improve cognitive function in demented individuals.

Another European-based physical activity model is Long-term Care in Motion (LTCMo). LTCMo was developed through the INNOVAGE consortium that was tasked to promote social models to raise healthy life expectancy and quality of life of older adults. LTCMo focuses on strength and mobility in the nursing home population using a multi-component group-based physical exercise program delivered by trained staff. Two 45-minute sessions are offered weekly with increasing intensity over time. To further engage participants a "serious games" evidence-based cognitive task is incorporated into the sessions.[24] Final results from this program have not yet been published.

A Physical Activity Prescription for Older Adults

There may be concern when starting a new or more intensive physical activity program for those with serious chronic illnesses or who have limited functional ability. Most studies on physical activity in older adults report few, if any, adverse events in study participants. A series of review articles on "evidence-based risk assessment and recommendations for physical activity clearance" was published in 2011 (Issue 36, Supplement 1) of the journal *Applied Physiology, Nutrition, and Metabolism*. These articles reviewed chronic conditions such as cardiovascular disease, COPD, cognitive impairment, and stroke. Most of these studies excluded the most frail and chronically ill subjects and were not limited to the older population. Despite these limitations, the authors conclude that for most conditions, is there is no direct evidence regarding the risk of exercise and that the risk-to-benefit ratio in most patients favors the recommendation of exercise. Use of routine cardiovascular exercise testing prior to engagement in a moderate intensity physical activity program is not suggested in these reviews.

To ensure maximal safety and benefit for older adults initiating a physical activity program, a health review

should be performed by a medical provider to address the following questions specific to the participant:

1. Are there any exercises, intensity level, or activities to be avoided?
2. Is medical care optimized for greater physical activity?
3. How do the health conditions affect the ability to exercise?
4. What symptoms should prompt further medical evaluation or reduction in activity level?

To address these questions, the medical provider should inquire about the form, duration, frequency, and intensity of physical activity that will be taking place. Are there functional limitations that should be addressed or require accommodations to allow increased physical activity? Is adaptive equipment necessary to ensure safety? Is supervision required to oversee and reinforce appropriate activity? The responses can help in the development of a "physical activity prescription" (See Figure 2).

Like a medication prescription, a physical activity prescription can define the goals and parameters of the therapy. It can also serve as an educational and motivational tool to reinforce the importance and health benefits of increased activity. The prescription can be used at follow-up visits to monitor progress and refine future recommendations. Care should be taken to define the expected health benefits of physical activity for the individual and that time frame expected to appreciate these benefits. For greatest success, the physical activities selected should be enjoyable, feasible and sustainable and should be matched to the functional capabilities of the participant.

Conclusion

Physical activity in older adults has been shown to improve physical, cognitive and functional status and to reduce risk of frailty. Guidelines recommend at least 150 minutes of moderate-intensity aerobic physical activity each week as well as strength activities. There is little evidence of adverse events or harm with regular physical activity in older adults. Group-based and center-based models may help maximize short-term benefits, but creating home-based activities can improve the long-term compliance of a physical activity program.

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Disclosure

None reported. **MM**

Palliative Care: An Update

by Dulce M. Cruz-Oliver, MD

Palliative care is a growing specialization that has proven to meet the needs of patient with serious illness with dignity.



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Abstract

Population across the globe is not only aging but also suffering from serious illness. This is critically important in providing patient–centered end of life (EOL) care. The following article intends to describe what are the principles of palliative care (PC), how PC assists in the care of patients with cancer and serious illness across settings, current delivery of EOL care, and the future of PC with novel models of delivery.

Introduction

Why is Palliative Care Important?

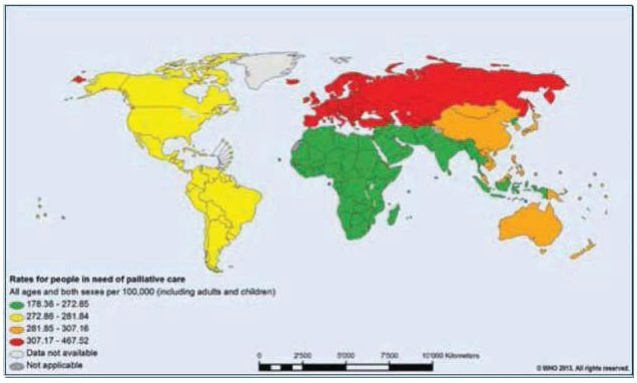
About 2.6 million North Americans died in 2013[1], but the demographics of those who have died has changed dramatically since the early 1900s. Death in childhood was more common at that time, but with the introduction of antibiotics, immunizations and sanitation practices, morbidity and mortality began to drop and a longer life expectancy was realized. Increased life expectancy has brought with it much higher rates of chronic disease. Chronic conditions don't threaten life expectancy, but significantly affect a person's wellbeing and health care needs. More serious life limiting chronic conditions such as dementia, cardiovascular and respiratory disease, and cancers are also increasing and have changed the pattern of death[2]. Today older adults typically die from chronic illnesses with a gradual period of deterioration and disability[3]. Most healthy people, when asked where they would prefer to die, nominate their home as their preference. However, the statistics on place of death indicate that this is uncommon. For example, in Australia and United Kingdom (UK) only 18% of people die at home, 13% die in the nursing home, 13% die in hospice, 56% die in hospitals[2, 4]. This results in a high cost burden for the health system and potentially a poorer quality of death[2].

Palliative care (PC) is a new field in medicine that has proven to be essential for patients with chronic advanced illness. According to the Worldwide Palliative Care Alliance (WPCA) and the World Health Organization (WHO) global atlas[5], only three out of five continents have quality palliative care. The document states that PC should be based not on prognosis or diagnosis but on needs wherever the persons' care take place and at the primary and secondary levels of care. Palliative care is a human right because the lack of PC is a problem that leads to unnecessary suffering for the people who are among the most vulnerable in society.

Worldwide 20 million people are estimated to require PC at the end of life (EOL) every year, of which 69% are adults over 60 years old and 6% are children. Figure 1 shows an estimated number of people in need for PC. The places colored in orange and red have the highest number of patients in need of this service[5].

Nationwide the Institute of Medicine (IOM) has released multiple reports stating that PC is essential for quality, and stopping suffering across the continuum is their common

Figure 1
Rate for people in need of palliative care.
From Connor SR, Sepulveda-Bermedo MC (Eds). Global Atlas of Palliative Care at the End of Life. World Health Organization (2014). Worldwide Palliative Care Alliance:Hospice House, London (Chapter 2: pp.17).



denominator. For example, the Dying in America document reports that there is evidence for improving the quality and availability of medical and social services for patients with advance illness and their families[6]. Moreover, cancer care delivery system is in crisis because care often is not patient-centered and many patients do not receive PC to manage their symptoms and side effects from treatment[7].

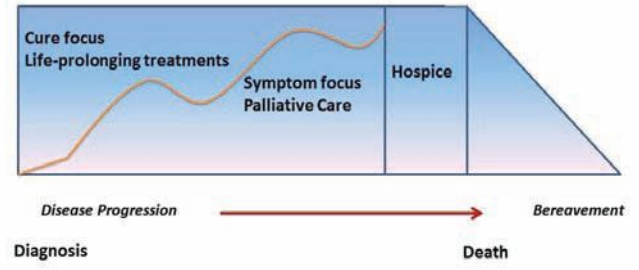
What are the Main Barriers for Palliative Care Development?

There are many barriers to PC development[5] This includes but is not limited to lack of clear policy establishing PC, lack of educational programs to teach PC and lack of essential medications to deliver PC (e.g. opioids, which has low to non-existent access in 83% of the world's countries). All these barriers can be overcome. A public health approach that emphasizes policy, education, medication availability, and implementation is needed to foster the development of PC services[5].

A report by Casarett and Teno[8] states that population health and PC need each other because of the potential synergies between these two disciplines. For instance, PC focuses on patient-centered outcomes such as quality of life, symptom burden, emotional and spiritual well-being, caregiver burden and bereavement. This more inclusive approach complements the traditional emphasis of population health on reducing morbidity and avoiding mortality. On the other hand, population health models could help PC move beyond the current model of inpatient and outpatient consultations. Specialized PC clinicians are in short supply, and a population health-based approach may offer novel strategies to meet patients' and families' needs without relying on specialists. Similar to the suggestions proposed in the global atlas report[5],authors propose that population-based PC should include access, primary PC, structures that support PC, innovative ways to change the culture of EOL care and data that provides a picture of a population's well-being in the face of serious illness[8]. This approach is particularly relevant for low income countries where access to secondary care in hospitals may be limited.

In the next section we will discuss the principles of EOL care and the evolution of PC services in the United States as a way to look at how such barriers are being addressed.

FIGURE 2. Continuum of EOL care.
Adapted from Ferris F, Balfour H, Bowen K, Farley J, Hardwick M, Lamontagne C, Lundy M, Syme A, West P. A model to guide patient and family care. Based on nationally accepted principles and norms of practice. J Pain Symptom Manage. 2002;24(2):106-23.

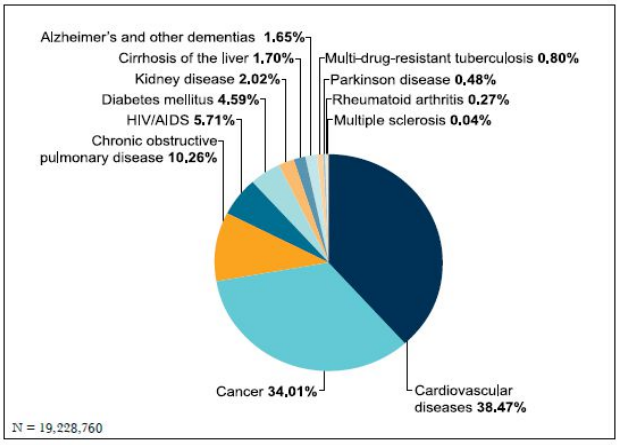


Principals of End-Of-Life Care

End of life (EOL) care is defined as care that helps those with advanced, progressive, incurable, and serious illness to live as well as possible until they die[9]. EOL care in the U.S. is provided through palliative and hospice medicine. Both hospice care and palliative care focus on ensuring the best possible quality of life for individuals with serious illness and their families by providing support, symptom management and comfort care. Palliative care begins at the start of a serious illness and is given alongside treatments designed to combat the disease. Hospice care is a type of palliative care program for people in the final months of life and is considered when the person's condition deteriorates and active treatment does not control disease. Since progressive deterioration and death is anticipated, the emphasis of care moves from active treatment of disease to treatment to give comfort and control symptoms[10]. People who receive palliative and hospice care may live longer and have a better quality of life than people with similar illness who don't receive it[11]. Figure 2 shows the model of EOL care continuum[12].

Hospice and palliative care were introduced to the United States over 40 years ago. The movement began to replicate the services provided at the EOL in the United Kingdom. In 1963, Dr. Cicely Saunders, a world renowned

Figure 3
Distribution of adults in need of palliative care at the end of life by disease groups.
From Connor SR, Sepulveda-Bermedo MC (Eds). Global Atlas of Palliative Care at the End of Life. World Health Organization (2014). Worldwide Palliative Care Alliance:Hospice House, London (Chapter 2: pp.17).



hospice leader, was invited to the Yale School of Nursing to provide a lecture series on hospice care. These lectures led to the formation of the first hospice in the U.S. ten years later. Early hospices were developed by professionals who felt that caring was lacking in the provision of health care for the dying and used the services of volunteers, both professionals and lay persons. In 1982, the Medicare Hospice Benefit (MHB) was established as a three-year provision with a required review prior to approval. Conditions were established so that hospice providers had to adhere to standards and regulations in order to receive reimbursement. The MHB provides 87% coverage of hospice patient days; the remaining 13% is covered by a variety of other payers including Medicaid, private insurers, self-pay, and charity care[13]. A key element to the provision was that participants had to have a terminal illness with a life expectancy of 6 months or less certified by two clinicians[13, 10].

Over time in the U.S. the specialization of palliative care has advanced considerably. It is an established field with formal accreditation processes (for hospitals by Joint Commission, for universities by ACGME and for comprehensive cancer centers by NCCN), has an increasing public and professional awareness, increasing training options, and better supportive policy. Palliative care is provided most of all in health care settings including acute hospitals, community services (either as consult or hospice service), nursing home and pediatric services.

According to data from CAPC (Center for Advance Palliative Care) registry, in 2015, PC prevalence and number of patients served had more than tripled since 2000. This is more evident in hospitals where in the past five years, the number of academic, community and faith-based hospitals offering palliative care services has soared. As of 2012, some 1,734, or 61 percent, of U.S. hospitals with more than 50 beds had a palliative care team—an increase of 164 percent since 2000[14]. On the other hand, the community setting needs further development, but home-based PC pilot models are promising in reducing Medicare cost and hospitalizations[15, 16]. Further development is needed in the nursing home setting as well as in the pediatric population.

Current changes in the health care system have led to policy supportive of PC services. For instance, moving reimbursement from fee for service toward paying for quality through the Affordable Care Act (ACA), increased financial and quality incentives to keep people safely at home and avoid unnecessary hospitalizations, and the new reimbursement for advance care planning conversations in January 2016. These changes have led to marked increase in payer and health system interest in palliative care models. However, the challenge is to determine what type of patient really needs palliative care.

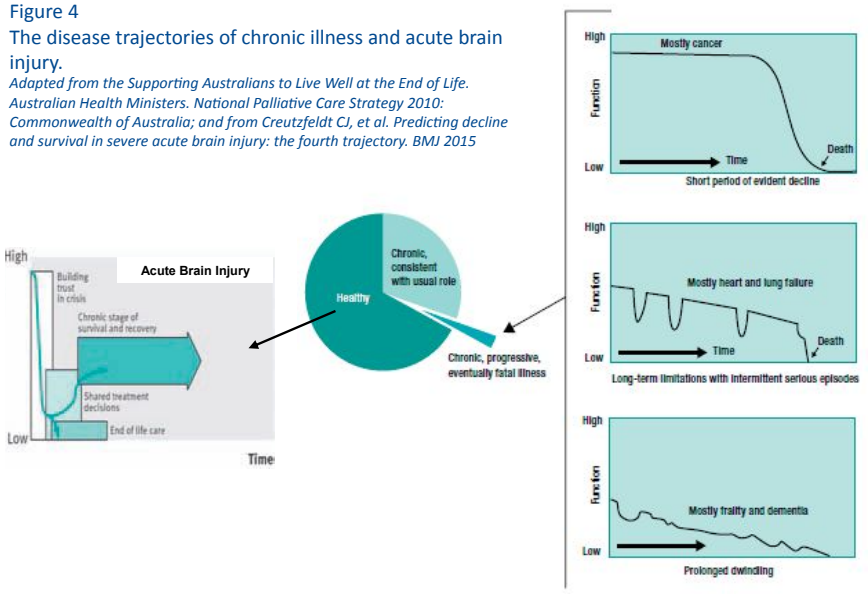
Who Needs Palliative Care?

The need for palliative care may not be as obvious and it depends on the psychosocial, spiritual and physical necessities of each patient rather than on diagnosis. However, there are several diagnoses that due to its known course have been identified as in need for PC (See Figure 3). Caution is needed when using only diagnoses for the assessment, because not all patients with a certain diagnosis are in need of palliative care. There are generally three groups of patients: those who have a palliative period of advancing progressive disease; those who have a stable or no disease, relatively few symptoms but then deteriorate or die suddenly; and those who suffer from chronic disease, where the disease is not clearly progressing, but who might have periods of progression and symptoms where they would benefit from palliative care and then periods of remission. Because it is not precisely known what the proportions are of those three groups of patients requiring palliative care, symptoms experienced in the last year of life can be used as indicator of palliative care needs[5]. The best tool providers have is their clinical judgment by answering the following question: would you be surprise if this patient dies within the next year? Providers should base their answers on three elements: nutritional decline, disease progression and functional decline[17].

The prognostic indicator par excellence is function. The trajectory of various disease types is depicted in Figure

4 and it shows how function plays out in the dying process. Unlike cancer patients who experience considerable decline in a shorter period of time prior to death and where the need for palliative care services may be more obvious, patients with chronic conditions have a much longer disease trajectory with difficult prognostication. Additionally, a larger number of patients exist with more complex chronic conditions involving multiple co-morbidities[2]. On the other hand acute illness among healthy individuals can lead death and adult disability. Therefore, a study by Creutzfeldt CJ, et al.[18] proposed a fourth trajectory to help prepare providers, patients and families to make more informed and critical decisions about care. The suddenness of the injury and the "time is brain" imperative create a fast paced, often chaotic environment characterized by uncertainty, fear and stress for patient, families and providers. Decisions must be made rapidly, unlike the case for patients with cancer and other chronic diseases, when goals can be clarified in the context of relentlessly progressive symptoms and disability. Patients who survive the acute stage enter a chronic stage of recovery, when the chaos gives way to an agonizing watchful waiting period. The potentially long disease course and changing function demand vigilance for emerging symptoms. Understanding this pattern and providing clear communication may help improve clinical care by considering the steps set out in the trajectory. The added dimensions to this trajectory, namely, building trust and shared decision making, are pivotal in all PC conversations[18].

Figure 4
The disease trajectories of chronic illness and acute brain injury.
Adapted from the Supporting Australians to Live Well at the End of Life. Australian Health Ministers. National Palliative Care Strategy 2010: Commonwealth of Australia; and from Creutzfeldt CJ, et al. Predicting decline and survival in severe acute brain injury: the fourth trajectory. BMJ 2015



As stated in section I, there is a need for population based planning of PC service provision. A population health approach is about focusing the planning on population rather than individuals and addressing disparities between different groups through a priorities method. These groups can be categorized according to socio-demographic or diseases such as dementia and cancer. Based on diagnosis of cancer and non-cancer serious illness we will look into the evidence of needs met by PC services. Seriously ill patients have high symptom burden depending on their diagnosis, namely nausea, pain, fatigue, anorexia and breathlessness among others. Routine comprehensive symptom assessment with the use of validated instruments is indicated in the context of advanced disease.[19] Also data suggest that spiritual concerns are common and that the majority want to discuss their spirituality with providers. All of which can be address by PC approach. In cancer care there is a tendency toward personalized cancer treatment because it is associated with lower treatment related death rate (1.5 vs. 2.3%, p=.001)[20]. Various different randomized controlled trials (RCT) in advanced cancer patients demonstrated benefit of early PC in survival, quality of life and mood outcomes but no change in symptom intensity[11, 20, 21]. Certainly, providing PC based on patient needs is the goal but, depending on the setting, PC delivery may be different.

Current and Future Models of Delivery

Current Models

A model of service delivery is about the framework for the delivery of care and a model of care broadly defines the way health services are delivered. Delivery of PC service is influenced by the nature of the health system and the country in which the PC service are embedded. Palliative care is provided by many different health professionals and it occurs across three health settings: community, hospice and acute hospitals[22].

Community settings include the patient's own home, nursing home facilities or other locations. Community PC can reduce general healthcare use and increase family and patient satisfaction with care, which supports families to sustain patient care at home[22]. Nursing home PC delivery occurs in one of three modes: contracted hospices, PC

consultation and internal PC team. However, nursing home PC delivery has limited evidence about an effective integrated model. This is an area of great need given that 28% of older Americans die in nursing homes, as well as nearly 70% of people with advanced dementia. Moreover, end-of-life (EOL) care for nursing home residents has been associated with poor symptom control, burdensome transitions, and low family satisfaction with care [23]. Hospice use in the nursing home is associated with lower rates of invasive therapies, hospitalizations, higher satisfaction and pain management[19]. A more recent retrospective study by Miller and colleagues revealed that PC consults in nursing homes was associated with less hospitalization and intensive treatment[24]. Future trials should compare the relative efficacy of different models and intensities of PC community services. Models need to include integration between the different setting and services, in particular for PC delivery at the NH.

Hospice or inpatient designated palliative care beds can include beds in hospitals or a purpose-built hospice. In the U.S. & the U.K. hospice is provided at home through an interdisciplinary team. Hospice has been demonstrated to enhance symptoms, improve satisfaction, prolong survival and reduce admissions[19]. However, hospice care needs to be viewed as less of an escape from traditional medicine and traditional care at the EOL and more as a component of high quality care[25]. For this reason, with the ACA there is incentive in developing PC programs by managed Medicare and Medicaid.

Acute hospital is the place where patients receive active but short term treatment for a severe injury or episode of illness, an urgent medical condition or during recovery from surgery. PC is usually provided by a consultative service. Inpatient consultation team reduces symptom distress, enhances quality and decreases spiritual distress[19]. Along with various prospective studies, one RCT demonstrated better quality of life and longer survival in the PC consultation group as compared to usual emergency department (ED) care. There is evidence that using either consultative or integrative PC interventions in the ICU results in the decrease of ICU and hospital length of stay[26]. ICU interventions also improved the quality, quantity and content of communication and decreased symptoms of distress and anxiety in family members. However, the field could benefit from a definitive well-powered, well-designed, multicenter controlled trial evaluating proactive PC in the ICU/ ED as compared to usual ICU/ED care.

Palliative care teams in hospitals are now the rule, not the exception, because evidence shows its benefits in quality of service and less expenditure. The sickest 10% of the U.S. population accounts for 64% of health care expenditures. On average, palliative care consultation is associated with reductions of $1,700 per admission for live discharges and reductions of $4,900 per admission for patients who died in the hospital. This means savings of more than $1.3 million for a 300-bed community hospital and more than $2.5 million for the average academic medical center[27]. This is evidence of cost reduction seen in the inpatient setting however this is inconclusive in the community setting2[8]. There is also need of further studies to evaluate the cost of different population and disease groups (such as cancer or renal care) served in these settings.

One aspect that has been introduced by PC is dignity[29]. While the separation of humanity and compassion from healthcare delivery has been an issue, healthcare providers have a profound influence on how patients experience illness and on their sense of dignity. That is why a dignity conserving care framework has been proposed to remind providers about the importance of caring for as well as caring about their patients. This consists of the "ABCD" mnemonic, including attitudes- to examine their own attitudes and assumptions toward patients, behaviors-awareness of attitudes can set stage for modified behavior, compassion-awakening of the providers' feelings (empathy) about patients' suffering, and dialogue-exchange of information within a partnership. The addition of dignity conserving care in health education provides a framework to guide providers towards maintaining patients' dignity[30].

Future Models

There are two models worth exploring as they may be exemplary for future PC models. Of note, case management is a recurring feature of many successful models. First, is integrated PC in cancer and chronic disease. A systematic review[31] on integrated PC in Europe revealed that agreement in the benefit of involvement of a PC multidisciplinary team: better symptom control, less caregiver burden, improvement in continuity and coordination of care, fewer admissions, cost effectiveness and patients dying in their preferred place. This model has a threefold focus: treatment for alleviation of symptoms, consulting for discussion of options and training for education of providers involved in the interventions. A cultural shift that is needed is that of reframing the conversation about wellness and living with quality for as long as possible no matter your health condition[25]. Second, is the example of Florida Hope Hospice[5]. This hospice agency realized there was an increasing need for a special kind of care by those who were not eligible for hospice benefit. They were one of many hospices that pioneered the

concept of access for all and set a goal to expand the scope of our care to reach more people in need. Through an interdisciplinary team approach they provide pain control, symptom management and bereavement counseling. This lead to care coordinated programs, each with its own staff, that focus on quality of life through palliative care. This enabled adults to remain in the place they call home, providing daily living assistance, proactive medical care and innovative disease management. This resulted in additional cost-saving efficiencies, increased levels of service, and a more robust referral network. Through collaboration with other healthcare centers and the open access, Hope cares for 73% of all people at the end of life in their service area; the national average is 41.6%. Revenue sources included Medicare, Medicaid, insurance, private pay, grants and community support. Only limited expansion was required for their administrative services and infrastructure[5].

Conclusion

Palliative care is a growing specialization that has proven to meet the needs of patient with serious illness with dignity. The story of U.S. PC development has demonstrated how such service can be expanded not only through policy but also through education of providers, including nurses, social workers, and physicians, among others. Functional decline and patient needs are the best determinants of who would benefit from PC. This service is available in the hospital and community settings with good evidence of its benefits. However, further studies are needed to provide appropriate modes of delivery as well as to fortify the evidence of its benefits across all settings.

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Disclosure

None reported.

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Non-Pharmacologic Interventions for Persons with Dementia

by Marla Berg-Weger, PhD & Daniel B. Stewart, MSG

While further study is needed to determine best practices in delivering non-pharmacologic interventions, such findings suggest that these strategies are providing a response to a growing need for quality of life interventions.



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Abstract

Affecting over 100,000 older Missourians, cognitive impairment is of concern for all health care providers. With no available pharmacologic treatments to eradicate/diminish symptoms, professionals and families need non-pharmacologic behavioral interventions to enhance individuals' quality-of-life and decrease the number and intensity of dementia-related behavioral symptoms. This paper provides an overview of available evidence-based non-pharmacologic interventions and strategies that can be delivered in both the community and facility setting, including reminiscence, validation, and cognitive stimulation therapies.

Introduction

As all health care providers who provide care for older adults know, two trends are challenging our capacity to meet the needs of this patient population: 1) the growing number of older adults and 2) the increased prevalence of cognitive impairment. When providing health care for an increasing number of older adults with cognitive impairment, health care providers, physicians in particular, can find treatment options and resources to be lacking. This paper will address the impact of these two issues on older adults living in Missouri and provide an overview of non-pharmacologic and behavioral interventions for persons with dementia. This emerging area can now provide options for older adults experiencing cognitive impairment and their families and care partners.

Profile of Aging and Cognitive Impairment in Missouri

To better understand the realities of caring for older adults living in Missouri, we must consider demographic changes occurring in the state. Older adults (65 years and older) currently comprise 15.7% of the population in Missouri, an increase of 4.7% since 2010[1]. This places Missouri as one of eleven states in which the older adult population comprises greater than 14% of the total state population[1]. With an estimated annual increase of approximately 3%, the total population of older adults in Missouri is expected to increase 41% by 2030[2].

Compounding the complexities of providing health and social services to our older adult population is the fact that Missouri falls short in multiple areas of health status and health care for older adults. Overall, Missouri's older adults are ranked 40th in senior health, having fallen four spots in the past two years[2]. Moreover, the number of older adults who self-report their health as "good" or "excellent" is only 48% and has remained unchanged since 1999[2]. When coupled with the fact that we are ranked 25th in terms of a "geriatrician shortfall," 38th in preventable hospitalization, and 35th

in unnecessary hospital re-admissions, Missouri health care providers have area for improvement in providing care for older adults[2], particularly for those Missourians who are experiencing cognitive impairment.

With improved methods of assessment and early diagnosis, the number of persons diagnosed with cognitive impairment is on the rise as well. Ranging from Mild Cognitive Impairment (MCI) to more severe forms of dementia (e.g., Alzheimer's disease, Lewy Body Dementia, etc.), 5.3 million[3] Americans experience cognitive impairment, two-thirds of whom are women. This number is expected to increase to 16 million[3] by mid-century. In Missouri, there are currently 110,000 older adults (9.1% of the older adult population) who have been diagnosed with cognitive impairment and that number is expected to rise to 120,000 by 2020 and 130,000 by 2030 resulting in Missouri having the 9th highest death rate due to Alzheimer's disease and other dementias[3]. Not only are dementias the 6th leading cause of death in Missouri, they are costing the state over $800 million in annual Medicaid payments[3].

Treatment Options for Cognitive Impairment

For those persons experiencing cognitive impairment, the stark reality is that there is presently no pharmacologic treatment available to "cure" the disease or even significantly slow the progression of memory and functional deficits. There are currently six U.S. Food and Drug Administration prescription drugs approved for use in symptom-improvement, but the outcomes differ dramatically by individual and all have been shown to have limited benefit over the long term[3]. While hundreds of drugs are being tested, the process for approval is long and costly with no one drug at present showing promise. The most common pharmacologic intervention is the cholinesterase inhibitor, but there is little evidence to support its efficacy[4].

With no viable long term pharmacologic treatment available, professionals and individuals diagnosed with cognitive impairment, their families, and their caregivers are seeking help and support in living with this disease. In particular, professionals and caregivers are searching for strategies to address the behavioral and psychological symptoms of dementia (BPSD). The overwhelming majority (approximately 80%) of persons with cognitive impairment will experience BPSD at some stage of the progressive illness[5]. As a result, non-pharmacologic interventions are beginning to emerge as an alternative strategy for not only addressing BPSD, but to enhance the quality of life for the person with dementia and care partners.

The aim of a non-pharmacological or behavioral intervention is to improve or at least maintain the individual's cognitive function, enable the person to continue to perform usual activities of daily living, and/or address behavioral symptoms that often accompany memory impairment[3] (e.g., depression, wandering, sleep, agitation, or aggression). Research findings support[6] the belief that intellectual engagement and physical activity improve one's cognitive functioning; thereby providing support for interventions that are non-pharmacologic and are focused on the individual's capabilities. As the evidence-based non-pharmacologic psychosocial interventions are proving to be more cost-effective than pharmaceutical treatments and, because they do not involve the prescribing of medication are free of side effects[7,8], they are an emerging treatment option to consider.

A number of national and international bodies are calling for the development of evidence-based non-pharmacologic interventions for persons with dementia for the purposes of addressing BPSD, stimulating cognitive function, and improving the lives of the individuals with dementia and their caregivers. Led by the World Health Organization (WHO), dementia experts from around the globe convened in 2015 for the first Ministerial Conference on Global Action Against Dementia. Out of this gathering came a Call to Action[9] that identified the need for "diversification of therapeutic approaches including non-pharmacological as well as pharmacological agents" (p. 33). The WHO Mental Health Gap Action Programme (mhGAP) further calls for the development of cognitive stimulation interventions in which caregivers can be trained to deliver programs at home and in the community and for the creation of non-pharmacologic interventions to address issue of BPSD and depression[10]. Despite the need for further widespread and methodologically sound, experimental, and longitudinal research to support the efficacy of non-pharmacological interventions, there is data to suggest that these interventions can improve cognitive status, social engagement, and quality of life, while decreasing depressive symptoms. Within the U.S., the American Geriatrics Society (AGS) endorses the delivery of non-pharmacologic interventions as a primary practice to address BPSD[11]. The following discussion will highlight available non-pharmacologic interventions, including reminiscence therapy, reality orientation, validation therapy, and cognitive stimulation therapy.

Non-Pharmacological Interventions

Believed to be a safe treatment option with fewer side effects[12], non-pharmacologic interventions stem from a variety of disciplines each attempting to positively influence cognition, mood, and other behavioral and psychological symptoms of dementia. These interventions can be divided into four categories outlined by Cammusuli et al.[8]: holistic techniques, brief psychotherapy, cognitive methods, and

alternative methods. For sake of brevity, the authors have focused on holistic interventions that have shown promise and are well documented within the literature. These holistic interventions included reality orientation, reminiscence therapy, validation therapy, and cognitive stimulation therapy.

Reminiscence Therapy

Reminiscence therapy elicits recall of past events, activities, and memories through the use of tangible aids such as photographs, familiar items from the past, music and movies. While remembering recent memories (e.g. what one had for lunch) may prove difficult for individuals with dementia, long held memories of personal importance can remain easily accessible. Reminiscence therapy encourages participants to speak about past experiences therefore decreasing the demand on impaired cognitive abilities while encouraging those preserved abilities. Evidence[13-20] suggests reminiscence is an effective means of improving mood in persons with dementia but results are mixed regarding a definite cognitive benefit. The intervention is administered in either a group setting, typically once/week focusing on free recall of memories or on an individual basis within the context of a focused life review. Overall, reminiscence therapy shows a small-size effect on cognitive function (g= 0.18, 95% confidence interval 0.05-0.30) and a moderate-size effect on depressive symptoms (g= -0.59 vs. -0.16, p= 0.003)[13]. In St. Louis, the Alzheimer's Association and Saint Louis University have developed a very popular reminiscence group based on the Major League Baseball team, the St. Louis Cardinals[21].

Validation Therapy

Validation therapy is a form of "therapy for communicating with persons diagnosed as having Alzheimer's disease and related dementia"[21]. Focused on validating the personhood and emotions of a person with dementia, validation therapy posits that individuals with dementia present with confusion as a means to avoid stress, boredom, loneliness, and often as an escape from a reality[22,23]. It is then the responsibility of the facilitator (e.g. caregiver, clinician) to validate the feelings of the person with dementia rather than focus on the confusion as a means of comfort[22]. Validation therapy is found to alleviate stress[24], promote contentment[25], and decrease behavioral disturbances[25]. Note that the benefit of validation therapy may be limited to those with mild-moderate form of the disease[26]. This therapy focuses less on what is factually correct and more so on validating the person's feelings and emotions in their moment of confusion.

Reality Orientation

First described by Taulbee and Folsom in 1966, reality orientation aims to decrease confusion and behavioral symptoms in people with dementia by orienting the individual to time and place. Widely used, reality orientation includes classroom-like group sessions held daily for 30 minutes[27]. These sessions involve facilitators presenting personal and current information to participants through the use of games, puzzles, calendars, and reality orientation boards. In a systematic review of 43 studies yielding six randomized control trials (RCT) testing the efficacy of reality orientation, reality orientation is correlated with cognitive and behavioral benefits in participants with dementia[28].

Cognitive Stimulation Therapy

Like reality orientation, cognitive stimulation is typically delivered in a social setting in small groups involving cognitive based tasks and activities, including word games and puzzles[29-31]. In multiple efforts to determine the effectiveness of cognitive stimulation, review studies found cognitive stimulation to be one of the most effective non-pharmacologic interventions[8,31-33]. Participants exhibited improvement in cognitive function, quality of life, and well-being immediately when compared to those receiving usual care (anti-dementia medication) [31-33]. Cognitive stimulation provides the basis (with influences from the aforementioned therapies) for a holistic intervention: Cognitive Stimulation Therapy

Cognitive Stimulation Therapy (CST) is a non-pharmacologic, psychosocial group intervention for individuals with mild to moderate dementia. Based on cognitive stimulation, reality orientation, reminiscence therapy, and validation therapy, CST incorporates key features of other holistic therapies within a guided curriculum. CST is delivered twice a week for 45 minutes over seven weeks. The 14-themed sessions are outlined in the manual Making a Difference: An Evidenced-based Group Programme to Offer Cognitive Stimulation Therapy for People with Dementia[34]. Studies[35-39] show CST to improve processing and recall for individuals with dementia and a reduction in behavioral issues[35]. Derived from the UK, CST is currently the only non-pharmacologic intervention for dementia recommended by the UK government guidelines[41]. Findings[35-43] from the literature suggest CST to be a viable, cost-effective non-pharmacological intervention for dementia both in the community and in the nursing home.

Conclusion

While development of pharmacologic treatments to slow or end the progression of cognitive deficits for persons with dementia is an ongoing process that is likely years (maybe decades) from realization, effective evidence-based non-pharmacologic interventions are available now for enhancing the quality of lives of persons with dementia and

their care partners. Such interventions are low cost, without physical side effects, and can be delivered by trained lay, paraprofessional, and/or professional facilitators. Of the non-pharmacologic interventions highlighted here, Cognitive Stimulation Therapy is the newest and potentially most impactful strategy for enhancing cognition, quality of life, and depressive symptoms. Recently introduced into the U.S. by Saint Louis University, CST is gaining acceptance, particularly in Missouri. Information on both the group and individual formats is available in an on-line format through the Gateway Geriatric Education Center (GEC) or in-person training sessions. To obtain more information on the availability of CST, visit the GEC website at aging.slu.edu or contact aging@slu.edu. CST can and is being delivered in both the individual and group formats in residential and long term care settings, community and out-patient hospital-based settings, and in the individual's home. Recent and current research is being conducted at Saint Louis University in both group-based and individual (iCST) formats. A 2015 study of a group-based CST that included somatic movement (i.e., chair yoga) yielded results that suggest improvement for all participants in the areas of cognitive function, depression, quality of life, and mobility[42]. While further study is needed to determine best practices in delivering non-pharmacologic interventions, such findings suggest that these strategies are providing a response to a growing need for quality of life interventions.

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Disclosure

None reported.

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Obstructive Sleep Apnea Diagnosis and Management

by Munish Goyal, MD & Jeremy Johnson, DO

Obstructive Sleep Apnea is a serious illness affecting about 12% of adults in the United States. The majority of patients are undiagnosed posing serious health care and economic burden.





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Abstract

The diagnosis and treatment of obstructive sleep apnea is discussed in the context of recent diagnostic and therapeutic advances.

Introduction

Obstructive sleep apnea (OSA) is characterized by episodes of breathing cessation or shallow breathing in sleep. These episodes are due to complete or partial collapse of upper airway. Most of the time, the respiratory events are associated with snoring, oxygen desaturations and brief arousal from sleep.

Sleep apnea is usually worse during supine and Rapid Eye Movement (REM) sleep. There could be exacerbation of snoring and OSA with alcohol consumption or ingestion of sedative medications.

Epidemiology

According to the Wisconsin Sleep Cohort Study preformed on random middle aged state employees of Wisconsin in 1993, Young et al. reported an estimated prevalence of OSA (AHI ≥5) in 9% of women and 24% of men. However, the prevalence of symptomatic OSA or OSA syndrome was only 2% in women versus 4% in men.[1] Due to increasing prevalence of obesity, the current estimated prevalence in North America is close to 20-30% in men and 10-15% in women.[2] According to a recent report by American Academy of Sleep Medicine (AASM), OSA affects 12% of US adult population totaling 29.4 million individuals and 80% of these are undiagnosed. The annual economic burden due to the undiagnosed sleep apnea is estimated around $150 billion in year 2015.[3]

Obesity is a major risk factor for OSA. OSA is seen in up to 70% of morbidly obese individuals.[4] Other risk factors include advancing age and craniofacial deformities. OSA is also common in smokers, individuals with family history of OSA and in postmenopausal females. Prevalence of OSA increases with coexisting medical conditions like – pregnancy, atrial fibrillation, stroke, congestive heart failure (CHF), Chronic Obstructive Pulmonary Disease (COPD), hypothyroidism, and Polycystic Ovary Syndrome (PCOS).

Diagnostic Criteria

Modified from International Classification of Sleep Disorders – Third edition (ICSD-3)[5] (A and B) or C satisfies the criteria:

A. The presence of one or more of the following:

1. The patient complains of sleepiness, nonrestorative sleep, fatigue, or insomnia.
2. The patient wakes with breath holding, gasping, or choking.
3. The bed partner or an observer reports habitual snoring or breathing interruptions in sleep.
4. The patient has hypertension, a mood disorder, cognitive dysfunction, coronary artery disease, stroke, congestive heart failure, atrial fibrillation, or type 2 diabetes mellitus.

B. Polysomnography (PSG) or out-of-center sleep testing (OCST) demonstrates:

Five or more predominantly obstructive respiratory events (obstructive apneas, hypopneas, or respiratory effort related arousals [RERAs]) per hour of sleep during a PSG or per hour of monitoring (OCST).

C. PSG or OCST demonstrates:

Fifteen or more predominantly obstructive respiratory events (apneas, hypopneas, or RERAs) per hour of sleep during a PSG or per hour of monitoring (OCST).

Definition or Scoring of Respiratory Events During PSG

In adults, various respiratory events are defined and scored per the criteria laid out by the AASM Manual for the Scoring of Sleep and Associated Events.[6]

An obstructive apnea is scored if there is a drop in the respiratory effort signal by ≥90% of pre-event baseline, for ≥10 seconds and continued or increased inspiratory effort from chest and/or abdomen.

A hypopnea is defined when there is drop in the respiratory effort by ≥30% of pre-event baseline for ≥10 seconds, associated with oxygen desaturation by ≥3% (AASM criteria) or by ≥4% (CMS criteria).

A Respiratory Effort-Related Arousal (RERA) is scored if there is flattening of the inspiratory nasal pressure for ≥10 seconds causing an arousal from sleep, but not meeting criteria for an apnea or hypopnea.

The severity of OSA is determined by an index – Apnea Hypopnea Index (AHI) or Respiratory Disturbance Index (RDI), if PSG is preformed, or Respiratory Event Index (REI) if OCST is performed.

- AHI = number of Apneas+Hypopneas/total sleep time
- RDI = number of Apneas+Hypopneas +RERAs/ total sleep time
- REI = number of Apneas+Hypopneas/ monitoring time
- AHI or REI <5/hour = normal (for adults); 5-14.9/hour = mild OSA; 15-29.9/hour = moderate OSA; and ≥30/hour = severe OSA.

Signs and Symptoms

Snoring and daytime sleepiness are the most common symptoms in patients with OSA. Other nighttime symptoms include witnessed apneas by the bedpartner, waking up choking or gasping, restless sleep, frequent arousals, nocturia, and erectile dysfunction. Patients with OSA may experience non refreshing sleep, early morning headaches, lack of energy, poor concentration, fatigue or bad mood.

OSA can be associated with lack of attention, loss of productivity, and accidents at work or on the road. OSA increases the risk of a motor vehicle crash by two to three times. Significant reduction in this risk can be achieved with treatment of OSA such as Continuous positive airway pressure (CPAP) therapy.[7]

Examination

As obesity is a major risk factor for OSA, measurement of Body Mass Index (BMI) should be performed. Neck circumference of ≥17 inches in men and ≥16 inches in women is associated with higher risk of OSA. Upper airway abnormalities such as macroglossia, enlarged tonsils, large uvula, retrognathia, nasal septal deviation, turbinate hypertrophy; predispose one for OSA. Airway narrowing can be clinically quantified by Mallampati score.

Screening Tools

To identify the patients at risk, there are several screening tools such as Berlin questionnaire, STOP-BANG questionnaire, and Preoperative questionnaire. Epworth Sleepiness Scale (ESS) is a subjective measure of sleepiness, and is commonly used to screen for OSA. STOP-BANG is an easily administrable tool with high sensitivity. (See Table 1.) Patients with a score of 0 to 2 have low risk of OSA whereas those with score of 5 to 8 have high risk of moderate – severe OSA (AHI >15).[8]

Diagnostic Tests

The sleep tests are classified depending on the number of channels being monitored during the test. Type 1 test is the in-lab attended sleep study or polysomnography (PSG), which is the gold standard test to diagnose OSA. Out-of-center sleep testing (OCST) or Home Sleep Apnea Test (HSAT), a type 3 test, is an acceptable alternative, when PSG is not feasible. The HSAT does not measure sleep as there is no EEG recording. AASM recommends HSAT in patients with high pretest probability after comprehensive sleep evaluation. HSAT should not be used as a screening tool and is not appropriate in patients with comorbid severe pulmonary disease, congestive heart failure, neuromuscular disease or other sleep disorders like periodic limb movement disorder (PLMD), narcolepsy, or parasomnias. A negative or technically inadequate HSAT should be followed by an in-lab PSG in a symptomatic patient with high index of suspicion for OSA.[9]

Table 1
STOP BANG score

	Question	Yes or No
S	Do you **Snore** loudly?	
T	Do you feel **Tired** or sleepy during the day?	
O	Has anyone **Observed** apneas or choking during sleep?	
P	Do you have high Blood **Pressure**	
B	**BMI** > 35	
A	**Age** > 50	
N	**Neck** circumference ≥17 inches (men); ≥16 inches (women)	
G	**Gender** - male	

Adapted from Chung F, Abdullah HR, Liao P. STOP-Bang Questionnaire: A practical approach to screen for obstructive sleep apnea. CHEST Journal. 2016;149(3):631-8.[8]

Management of Obstructive Sleep Apnea

Moderate or severe OSA should always be treated due to significantly increased risk of cardiovascular and all-cause mortality if untreated.[10-12] Treatment of mild OSA should be considered in symptomatic patients (insomnia, daytime fatigue or sleepiness) or if there are co-morbid illnesses such as - heart failure, ischemic heart disease, atrial fibrillation, hypertension, stroke, pulmonary hypertension, metabolic syndrome, diabetes mellitus, cognitive impairment, and mood disorders. The AASM recommends positive airway pressure (PAP) as the treatment of choice for all severities of OSA.[13] PAP is primarily employed as continuous positive airway pressure (CPAP); however, autotitrating (APAP) and bilevel (BPAP) modes of PAP are also available for select patients. Alternative therapies to CPAP include oral appliances, surgical procedures, and behavioral treatments. (See Table 2.) Recently several new and novel therapies have been introduced.

Continuous Positive Airway Pressure (CPAP)

Continuous fixed positive pressure (CPAP) applied to the upper airway acts as a pneumatic splint and prevents collapse of the upper airway during inspiration. Nasal CPAP was first described in 1981[14] and has since become the first line of therapy for OSA. The Centers for Medicare & Medicaid Services (CMS) approves CPAP use in patients with moderate or severe OSA (AHI ≥ 15) and in patients with mild OSA (AHI ≥ 5 – 14.9) that have documentation of one of the following: excessive daytime sleepiness, hypertension, ischemic heart disease, history of stroke, impaired cognition, mood disorder, or insomnia.[15]

Behavioral Treatment

Behavioral treatments include weight loss, positional therapy, and avoidance of alcohol and/or sedatives before bedtime. These therapies are primarily adjunctive in the treatment of OSA, but they can also be primary treatment of mild OSA. A substantial amount of weight loss to potentially have an effect on OSA is generally considered to be at least 10% of the body weight. Weight loss to a BMI of 25 or less is also considered ideal.

Positional therapy is the avoidance of sleeping in a supine position to counter the gravitational effect of supine sleep on the tongue and narrowing of the airway. There are various ways to attempt to stay off the back during sleep. Cost effective ways include placing tennis balls in a tube sock and attaching the tube sock vertically in the center on the back of a sleep shirt or by wearing a filled backpack to bed. There are also commercially available, FDA approved, positional therapy devices (Zzoma) and sleep positioner alarm systems (Night Shift™)

Oral Appliances

Oral appliances (OA) or mandibular repositioning appliances (MRA) are designed to treat OSA by enlarging the upper airway by advancing the mandible anteriorly. Although not as efficacious as CPAP therapy, oral appliance therapy (OAT) can be an acceptable alternative treatment for snoring, mild OSA, and even moderate OSA. Due to inferior efficacy, OAT should only be used as second line therapy in patients with severe OSA after they have been given a trial of CPAP and failed. There are many OAs on the market; however, only a few are approved by Medicare such as the Herbst, Narval CC,

Table 2
Treatment of OSA based on Severity

	Mild OSA (AHI/RDI 5 - 14.9)	Moderate OSA (AHI/RDI 15 - 29.9)	Severe OSA (AHI/RDI ≥30)
Primary treatment	Observe (Asymptomatic) Positional Therapy Oral appliance Surgery – UPPP	PAP	PAP
Secondary treatment	PAP	Oral appliance Or Surgery - UPPP	Surgery – MMA Or Oral appliance
Adjunctive	Weight loss Positional Therapy	Weight loss Positional Therapy	Weight loss Positional Therapy

AHI – Apnea Hypopnea Index; RDI – Respiratory Disturbance Index; PAP – positive airway pressure; UPPP – uvulopalatopharyngoplasty; MMA – maxillomandibular advancement

Adapted from Epstein LJ, Kristo D, Strollo Jr PJ, Friedman N, Malhotra A, Patil SP, et al. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med. 2009;5(3):263-76.[13]

and TAP. The OA should be custom fit by a dentist knowledgeable in the treatment of OSA. Patients on OAT need to be monitored closely for temporal mandibular joint pain, headaches, gum irritation, and changes in occlusion.

Surgical Treatment

There are many surgical options for the treatment of OSA aimed at bypassing the site of obstruction (tracheostomy), modifying the site of obstruction (majority of procedures), and indirectly treating OSA (bariatric surgery). In general a tracheostomy is considered the gold standard treatment of OSA but has social implications and is undesired by most patients. Uvulopalatopharyngoplasty (UPPP) is the most common surgery. It consists of a tonsillectomy and excision of the uvula and part of the soft palate. UPPP corrects retropalatal obstruction but does not address retroglossal (retrolingual) obstruction. The success rates for UPPP are only approximately 40% - 50%.[16, 17]

After tracheostomy, maxillomandibular advancement (MMA) surgery is the most successful surgical procedure for OSA and reported to be curative in 80% to 90% of patients.[17] Therefore MMA is an alternative treatment for severe OSA.[13] MMA involves moving forward the mandible, maxilla, upper teeth, and lower teeth to increase the retrolingual space and the retropalatal space.

New and Novel Therapies for OSA

Although CPAP is extremely effective, one fourth to one half of patients with OSA have substantial difficulty tolerating CPAP.[18-20] Due to the importance of treating OSA, several new therapies have recently been introduced. These include oral pressure therapy, nasal expiratory positive airway pressure, and upper airway stimulation.

Oral Pressure Therapy (OPT) Winx®

The Winx® Sleep Therapy System provides a light negative pressure in the oral cavity through an individually fitted soft mouthpiece connected to a quiet vacuum by tubing. OPT circumferentially increases the size of the retropalatal and retrolingual airways by pulling forward the soft palate and the tongue.[21]

Nasal Expiratory Positive Airway Pressure (Provent®)

Nasal Expiratory Positive Airway Pressure (Provent®) is another new and novel device that consists of disposable, single night use, one-way valves or resistors that are held in place over the nasal passages by a hypoallergenic adhesive. The one-way valve allows for low resistance on inspiration but high resistance during exhalation thus creating positive pressure throughout the exhalation cycle. This splints open the upper airway creating resistance to collapse during the following inspiration.[22] Long-term studies have demonstrated efficacy in treating all severities of OSA.[23]

Upper Airway Stimulation (Inspire®)

Another promising emerging treatment of OSA involves stimulation of the upper airway via an implantable neurostimulator. This device stimulates the hypoglossal nerve and therefore the genioglossal muscle during patient's breathing leading to protrusion of the tongue and palate. This increases the airway diameter maintaining an open airway. This FDA approved device has been validated as an alternative treatment in carefully selected patients with moderate to severe OSA and a BMI below 32[24, 25]; however, currently it is only being performed in select centers.

Conclusion

OSA is a serious illness affecting about 12% of adults in the US. The majority of patients are undiagnosed posing serious healthcare and economic burden. STOP-BANG score can be used as a reliable screening tool to identify patients with probable OSA. Early diagnosis with an in-lab PSG or HSAT should be followed by an appropriate therapeutic modality. Currently CPAP remains the treatment of choice for moderate and severe OSA. Although not as efficacious as CPAP, there are acceptable alternative therapies for the treatment of mild OSA and more severe OSA in patients that cannot tolerate or adhere to CPAP. As the search for the most efficacious and best tolerated treatment continues, new and novel therapies are emerging.

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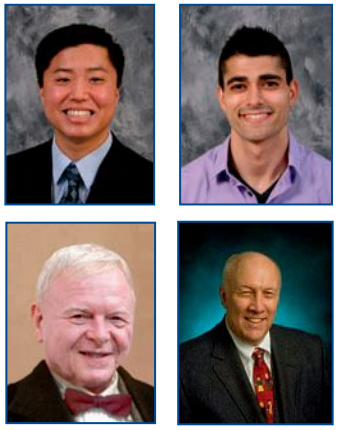
Disclosure

None reported. **MM**

Looking for PANDAS in Missouri

by Jimmy R. Rudloff, BS, Michael S. Cooperstock, MD, Kinan Abou-Kassam, BS & Michael P. Sherman, MD

This review enables pediatricians, family practitioners, and nurses in Missouri and surrounding states to diagnose Pediatric Autoimmune Encephalopathy and initiate care.



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Abstract

This review seeks to educate clinicians and advocate for patients having acute-onset pediatric autoimmune encephalopathy. Primary care providers caring for children are not fully aware of the debilitating illness that changes the life of a child and a family overnight. Our goal is to heighten awareness of a) the initial diagnosis, b) treatment and c) information about referral of affected children by health professionals in Missouri and surrounding states.

Introduction

Since Sydenham described chorea in 1686, this fascinating disease has allowed significant insight into pediatric neurology.[1,2] Our pediatric autoimmune encephalopathy clinic is one of the Child Health services provided by the University of Missouri Health System. Many frightened and frustrated parents directly seek care because the disorder is often unrecognized by primary care providers and school nurses. An online article describes the experience of parents trying to obtain care for an afflicted child.[3] In this review, we describe the disease, provide criteria for initial diagnosis and management, and we offer contact information to health professionals that can assist with managing this unique illness.

Case Reports

Case 1
PANDAS: Pediatric Autoimmune Neuropsychiatric Disorder associated with Streptococcal Infection

Parents of a previously normal 11-year-old girl sought care for her inability to eat due to her fear of choking, which began six weeks after confirmed streptococcal pharyngitis. A gastroenterologist found no abnormalities explaining her dysphagia. Problems swallowing persisted and other symptoms emerged including obsessive-compulsive behaviors, vocal and motor tics, regressive behavior, separation anxiety, irrational fears, anhedonia, episodic rage, attention deficits, and insomnia. She developed new-onset nocturnal and daytime enuresis, and testing excluded urinary infection as a cause. She sought constant reassurance that nothing was in her throat. She feared she would stop breathing during sleep and would die. Among her obsessive behaviors, she surrounded herself with objects. Vocal and motor tics appeared, as well as repeated throat clearing and spitting. Her personal grooming deteriorated and she could not dress herself. She became socially withdrawn and isolated herself from

friends at school. Like many PANS/PANDAS patients, she had episodic aggression and fits of screaming or crying for no reason. The patient was aware of these behaviors and she apologized repeatedly. Her schoolwork worsened with an inability to perform mathematics, poorer reading skills and a worsening in handwriting.

The patient had minimal benefit from psychotropic medications. Her first visit to a PANDAS clinic occurred at four months after onset and clinicians confirmed the diagnosis. Her fear of choking caused a refusal to eat, and an 18-pound weight loss ensued. Despite a throat-clearing tic, the nasopharynx and the rest of the examination had no abnormalities. Anti-streptolysin O (ASO) and anti-deoxyribonuclease B (anti-DNase B) titers were normal.

Laboratory Evaluation

The Cunningham neural antibody panel includes titers to dopamine receptor D1 = 4000 (normal 500-2000), dopamine receptor D2 = 16,000 (normal 2000-8000), anti-lysoganglioside = 160 (normal 80-320), tubulin = 2000 (normal 250-1000), and CaM Kinase II stimulatory antibody was 124% (normal 55-130%).[4,5] We decided her Cunningham neural antibody tests were elevated. Fluorescent antinuclear antibody titer was elevated at 1:160 with a speckled pattern.

Treatment

The patient received cefdinir (14 mg/kg/day orally every 12hr) initially to treat group A Streptococcus (GAS). After 9 days without improvement, we started prophylaxis against re-infection with GAS by giving cefadroxil (500 mg orally twice daily). Two weeks later, the child was still choking and refusing to eat, and weight loss continued. Although happier, problems doing mathematics, reading ability, and sleep disturbances persisted. Her physician maintained prophylaxis with cefadroxil and managed her weight loss with high-calorie protein shakes. Thereafter her weight loss slowed, but symptoms of throat-clearing, vocal tics, anxiety, and irrational fears of choking intensified. Since her symptoms exacerbated, she received a burst of oral prednisone, but severe headaches caused stoppage. A five-day trial of azithromycin worsened neuropsychiatric symptoms. A 30-pound loss resulted in her falling to 80% of her pre-illness body weight. Poor clinical status left no alternative and caregivers hospitalized her for a five-volume plasmapheresis over 10 days. After plasmapheresis, her lymphocyte count declined from 4610 to 2140/mm^3, while neutrophil and platelet count were unchanged. After plasmapheresis, IgG, IgA, IgM, and IgE levels were 10% of original values.

Two weeks after plasmapheresis, her neuropsychiatric symptoms were minimal. For the first time in four months, the child did simple arithmetic, had clear thinking, and began eating solid foods. Nocturnal and daytime enuresis disappeared. The patient's anxiety had dissipated and her mother reported diminished separation anxiety. Vocal and motor tics were almost gone and her pharyngeal symptoms were clearly improved. By 13 years of age, the patient regained all of her weight loss.

Case 2
PANS: Pediatric Acute-onset Neuropsychiatric Syndrome

A four-year-old girl experienced acute onset of vomiting, anorexia, and abdominal pain. The illness resolved over a two-week period. Thereafter, she began crying at home and at preschool without any reason. Two weeks after the illness onset, she developed new-onset anxiety and a marked inability to concentrate or make decisions. Her behavior worsened with irritability and tantrums. She occasionally made illogical or frightening statements about her life, including "Mommy sometimes I feel I don't want to exist anymore." About a month later, without an inciting illness, symptoms flared with a new obsession over germs and a handwashing-related compulsion. The child started to use excessive amounts of toilet paper. She refused to eat for weeks and frequently complained of a lump in her throat. During this time, her behavior cycled between tantrums and periods of happiness. A psychologist instituted cognitive and behavioral therapy resulting in marginal improvement. Her symptomology included disruptive anxiety, anorexia, and aggression against siblings. She also developed undesirable spitting tics. Frightening statements persisted, and her mother recalled her saying, "Mommy I'm worried and I cannot make my worries go away."

Although the patient had a history of streptococcal infections prior to onset of her encephalopathy, she had no positive rapid-streptococcal tests, cultures, or significant elevations in anti-streptolysin O or anti-

DNase B antibodies within two months of disease onset. Initially, she received 30 days of amoxicillin therapy that partly alleviated her symptoms. When examined by another PANS/PANDAS clinic, she had urinary frequency, finger-stretching tics, and dysgraphia. Her Cunningham panel of neural autoantibodies, however, was normal. Fluorescent antinuclear antibody titer was elevated at 1:1280. Her pneumococcal antibodies were protective for 12 of 13 serotypes. Autoimmune encephalopathy was her diagnosis and amoxicillin therapy again provided symptom relief. This child had relapsing and remitting flares interspersed with times of normal behavior. Over time, new symptoms emerged like clothing sensitivity, gagging, and restrictive eating. Her medications included cefadroxil, amoxicillin/clavulanic acid, ibuprofen, vitamin D and naproxen; each resulted in minor improvements during flares.

This child presented to our clinic about two years after her disease onset. Her family history was significant for a brother with PANDAS, her mother with inflammatory bowel disease and a sister with psoriasis. Her physical examination was notable for absent tonsils, but the examination was otherwise normal.

At an age of nine years, she still exhibited strong anxiety, significant anorexia, and obsessive-compulsive behaviors. Weepy events, throat sounds, sniffing, and licking behaviors became tic-related manifestations. Separation anxiety remained a major issue and she continued to sleep with her mother. This child also had significant sensory fears including touching leather and an aversion to meats touching her plate. After reading a book about zombies, she avoided eating hamburgers for fear she would turn into one. She became withdrawn and required education at home.

In 2016, periods of improvement occurred where she can attend school and socialize with friends and family. Presently, she reads at a fourth grade reading level and does mathematics at the eightieth percentile for her age.

Laboratory Evaluation

Her first Cunningham neural autoantibody panel was significant only for increased anti-lysoganglioside. More recent testing was positive for elevated CaM Kinase II. During flares, her throat cultures have not cultivated GAS. Since the initial onset of the neuropsychiatric illness, she has had no positive post-streptococcal laboratory results. Thus, her diagnosis fits PANS better than PANDAS.

Treatment

Her current medications are cefadroxil, vitamin D supplements, and naproxen.

Discussion

This review enables pediatricians, family practitioners, and nurses in Missouri and surrounding states to diagnose Pediatric Autoimmune Encephalopathy and initiate care. PANS and PANDAS are emerging illnesses that need addition to every clinician's diagnostic toolkit. As a Center of Excellence, designated by the National Institute of Mental Health (NIMH) for the treatment of PANDAS & PANS, we want to empower fellow physicians and nurse practitioners to accurately and quickly diagnose these syndromes and refer or consult us about the patients.

The two cases described above are among ~120 children seen from Missouri and adjacent states. The case studies are classic examples of wide-ranging signs and symptoms observed in children visiting our clinic or hospitalized for intensive therapy. Doctor Susan Swedo identified and described the first cases of PANS[1] and PANDAS[2]; however, past physicians also identified these syndromes and their description fits perfectly with these complex childhood diseases.[6,7]

Our understanding of these syndromes has grown significantly since 1998.[8] Scientists have given substantial attention to emerging brain diseases of children by publishing in the scientific literature.[9,10] Physicians have an organized group,[11] and parent groups have formed to assist children and families destroyed by PANDAS.[12]

Currently, clinical characteristics diagnose PANS and PANDAS. Most patients present with an abrupt onset of obsessive-compulsive disorder (OCD), eating disorders, tics, anxiety, fears, urinary frequency, enuresis, and/or a regressive behavior. Indeed, the exceptionally quick onset of symptoms, often overnight, is a critical sign of the disease, but uncertainty exists in classifying subacute presentations. Today, health professionals have no "Gold Standard" laboratory test that confirms a suspected diagnosis. Health care providers recognize the disease by the typical clinical presentation.

Nevertheless, local practitioners have vital tests and treatments to perform immediately. For a child suspected of having PANS or PANDAS, we suggest the following workup and referral. The workup should consider a differential diagnosis including psychiatric and neurologic disorders such as autoimmune encephalitis, anti-NMDA receptor disease, or Sydenham's chorea.[9] Performing a detailed history and physical examination are essential. If sinusitis, moist dermatitis, vulvovaginitis, and perianal cellulitis are present, we recommend a culture for group A Streptococcus (GAS). These infections are associated with the onset of PANDAS. An infection caused by GAS requires an oral antibiotic at an appropriate dose and duration of therapy.[13] Minimum initial laboratory tests must include a throat swab cultured specifically for GAS. A rapid test for GAS-related pharyngitis is optional, but any throat culture positive for GAS means the laboratory must save the isolate for typing of the strain. Our program can facilitate the process. For a patient work-up, we perform baseline and serial follow-up anti-streptolysin O (ASO) and anti-DNAse B (ADB) titers to ascertain an immunologic response to a diagnosed GAS infection.

Once a diagnosis of PANDAS is established, the child enters a stage to prevent exacerbations or disease-related flares. To avoid recurrences, the first duty is a prophylactic antibiotic regimen.

For diagnostic completeness, we would undertake the following testing at the MU Pediatric Autoimmune Encephalopathy clinic, namely, serum IgG, IgG subclasses, IgA, and IgM, mannose-binding lectin, Mycoplasma pneumoniae and Epstein-Barr virus IgG and IgM, anti-nuclear antibody, anti-histone antibody, a HLA-B screen, and saliva collection.

Referral to a PANDAS Center of Excellence is essential for newly diagnosed children, particularly if they are severely ill. Physicians, nurse practitioners and school nurses can seek advice or an appointment by calling our Pediatric Autoimmune Encephalopathy contact number (573-882-2008, Ms. Patricia Walch). During the week, Ms. Walch will either immediately have you speak with Doctor Michael Cooperstock MD or Doctor Michael Sherman MD or schedule an appointment. Both are members of the NIMH PANS Research Consortium and members of the PANDAS PHYSICANS NETWORK.[12] The University of Missouri clinical program is the only major Midwest academic center accepting PANS and PANDAS patients.

Within the next half year, the PANS Research Consortium will publish guidelines on the recognition, diagnosis, and treatment of PANS/PANDAS. These critical documents will be of utmost use to every clinician that has a case of PANS or PANDAS in their practice and member physicians of the PANDAS PHYSICANS network (PPN).[11] The NIMH website can provide more information to physicians and the lay community.[14]

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Disclosure

None reported. **MM**

Liquid Nitrogen Cryotherapy Treatment of Herpes Simplex Epithelial Keratitis

by Frederick W. Fraunfelder, MD, Shashi Alloju, MD & Michelle Patel, MD

Cryotherapy acts as a form of debridement, similar to mechanical debridement, with sloughing of the epithelium occurring after treatment. Freezing may also cause the release of endogenous interferon, which may inhibit the virus.



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Abstract

A retrospective case series was performed in a university setting for all patients with herpes simplex epithelial keratitis who underwent liquid nitrogen cryotherapy from 2012-2015. Outcome measure was clinical evidence of resolution of epithelial keratitis in the cornea with re-epithelialization. All cases of epithelial keratitis showed partial and complete resolution at day 1 and week 1 respectively. Liquid nitrogen cryotherapy is a safe and effective treatment for herpes epithelial keratitis comparable to other published studies.

Introduction

Liquid nitrogen cryotherapy has been used successfully to treat a variety of ocular conditions, including ocular and peri-ocular tumors, trichiasis, pterygium, superior limbic keratoconjunctivitis, and many other ophthalmic conditions.[1] It has also been reported to have been successfully used in the treatment of herpes simplex of the mouth.[2] In addition, there are reports in the literature regarding potential use of cryotherapy to treat herpes simplex stromal and epithelial keratitis using a cryotherapy probe with a temperature of -70 to -80 degrees Celsius.[3-6] In this case series, we describe the successful treatment of herpes simplex epithelial keratitis with a liquid nitrogen cryotherapy spray (-196 degrees Celsius).

Patients, Materials and Methods

A retrospective chart review was performed on all patients who had liquid nitrogen cryotherapy for herpes epithelial keratitis at the Casey Eye Institute, Portland, Oregon, between 2012 and 2015. The study was approved by the local institutional review board and adhered to the tenets of the Declaration of Helsinki. All patients provided written informed consent.

Full ophthalmological examination was performed on all patients including assessment of vision, slit lamp biomicroscopy, tonometry, and fundoscopy. Patients only with herpes simplex epithelial keratitis of the cornea were included in the study. The treatment was performed by the same surgeon (RWF) under topical anesthesia. The treatment procedure was as follows: several drops of proparacaine were instilled for anesthesia. A lid speculum was placed. The patient was placed in front of the slit lamp biomicroscope. Cryotherapy was applied with a Brymill spray probe (Brymill Cryogenic Systems, Ellington, CT) to the epithelial lesion in short bursts to prevent against deeper penetration (see Figure 1). The treated area was allowed to spontaneously thaw and the treatment was then repeated a second time. Ofloxacin drops were prescribed four times daily for one week. Slit lamp photos were performed pre-operatively, post-operative day one and post-operative week one.

Case 1

A 78-year-old Caucasian female presented at her three month post-operative visit after Descemet's Stripping Automated Endothelial Keratoplasty (DSAEK) surgery in the left eye with herpes simplex virus (HSV) epithelial keratitis. On examination, her uncorrected visual acuity was 20/50 and slit lamp exam revealed an attached DSAEK graft and two epithelial dendrites with uptake of sodium fluorescein at the base of the ulcer in the superotemporal cornea (see Figure 2). She underwent cryotherapy to the cornea as described in the methods section.

Figure 1
Brymill spray probe (Brymill Cryogenic Systems, Ellington, CT)



The patient was seen the following day with resolution of the corneal dendrites and the presence of an epithelial defect temporally (6 mm vertically by 4.2 mm horizontally) (see Figure 3). The vision was 20/50 and the DSAEK graft was unchanged. One month after her cryotherapy, there was complete resolution of the epithelial defect and no evidence of her prior HSV keratitis or corneal scarring (see Figure 4). Vision and the DSEAK graft were unchanged and the cornea remained clear without edema.

Figure 2
Case 1: Pre-cryotherapy

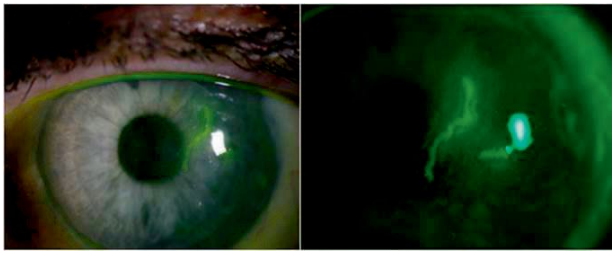


Figure 3
Case 1: One day post-operative

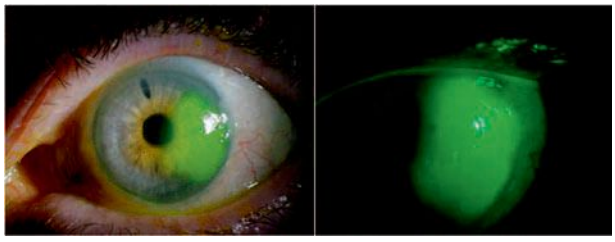


Figure 4
Case 1: One month post-operative



Case 2

A 66-year-old Caucasian male with history of primary open angle glaucoma and previous dendritic keratitis, treated with trifluridine four months previously, presented for follow up of DSAEK graft rejection in the left eye. At this time, he was using trifluridine once per day in the left eye. On examination, his visual acuity was 20/150 (pinhole 20/80), his cornea was thickened with diffuse keratic precipitates and two epithelial dendrites were seen in the left eye. The patient underwent cryotherapy as described in the methods section. He was instructed to stop using trifluridine. The patient did not show for his two day post-operative follow up, but at his one week post-operative visit, the dendrites had resolved and he had no epithelial defect. At this two week post-operative visit, his visual acuity remained stable from his initial visit and his epithelium continued to remain intact. Of note, his previously failed graft in the setting of rejection remained edematous at this time, but there was no increase in edema as a result of the cryotherapy.

Case 3

A 17-year-old Caucasian male presented as a new patient referral for an atypical corneal ulcer in the right eye. The patient initially saw a primary care provider for a red eye with discharge two weeks prior and was started on sulfacetamide drops. He was thought to have an allergic reaction to this and was changed to neomycin-polymyxin-dexamethasone ointment one week later with worsening symptoms on this ointment. He was referred to an ophthalmologist who started him on ofloxacin without improvement. He was then started on durezol without improvement. One day prior to his referral, the ofloxacin and durezol were stopped and the patient was placed on zirgan 0.15% every hour in the right eye. He continued to have worsening symptoms of decreased vision, photophobia, and eye redness. On his presentation, his visual acuity was 20/80 (pinhole 20/50) in the right eye. He had decreased corneal sensitivity and an inferior horizontal epithelial dendritic lesion was present in the cornea. There was no associated intraocular inflammation or corneal edema. The zirgan was stopped, and cryotherapy was performed as described in the methods section. Four days after treatment, his visual acuity was 20/60 (pinhole 20/30+2) and there was epithelial irregularity in the area of the previous dendrite,

but no dendrite was present. There was some underlying stromal haze in this area. Eleven days after treatment, the epithelium was intact and there was scarring inferiorly in the area of the previous dendrite. His visual acuity was 20/50 (pinhole 20/25) at that visit. He continued to have a stable examination and visual acuity one month after treatment, with no recurrence of the dendrites.

Case 4

A 79-year-old Caucasian male with history of penetrating keratoplasty for herpes simplex related disease, five years prior, presented with new diffuse epithelial dendrites in the setting of a failed corneal graft in the right eye. His visual acuity was 20/200 in the right eye. He was using valacyclovir 500 mg two times per day, dorzolamide-timolol drops two times per day, and prednisolone acetate 1% two times per day. He underwent cryotherapy as described in the methods section. He was also instructed to hold his prednisolone drops. He was seen two days later and his dendrites had resolved and he had a central epithelial defect (3.8 mm vertically by 5.5 mm horizontally). One week later, his epithelial defect had resolved and there continued to be no dendritic lesions. His prednisolone drops were restarted and on follow up visit one week later, the patient's cornea remained in stable condition. Of note, the patient had edema in the corneal graft prior to his cryotherapy treatment and this persisted, but did not worsen, with treatment.

Case 5

A 47-year-old Caucasian female with a history of penetrating keratoplasty in 1991 for herpes simplex related disease, presented with dendritic keratitis in the graft of the right eye. She was not on any prophylactic oral anti-viral therapy. At presentation her best corrected visual acuity was 20/50 (pinhole 20/30). She had a corneal epithelial dendrite as shown in (see Figure 5). She underwent treatment as above in addition to initiation of prophylactic dose acyclovir (400 mg BID). Her post-operative day one photo is demonstrated in (see Figure 6). Her post-operative week one photo is demonstrated in (see Figure 7). Her visual acuity remained stable after treatment.

Case 6

A 66-year-old Caucasian male with a history of uveitic glaucoma from HSV in the left eye presented to our clinic with dendritic keratitis. He recently underwent an Ahmed tube shunt implantation procedure for intraocular pressure control. His best spectacle corrected visual acuity was 20/100 in the operative eye. He was already on prophylactic dose Acyclovir 400 mg twice daily as well as prednisolone acetate 1% four times daily. His prednisolone acetate was decreased to once daily and he underwent cryotherapy of the dendritic lesion as mentioned above. He demonstrated

Figure 5
Case 5: Pre-cryotherapy

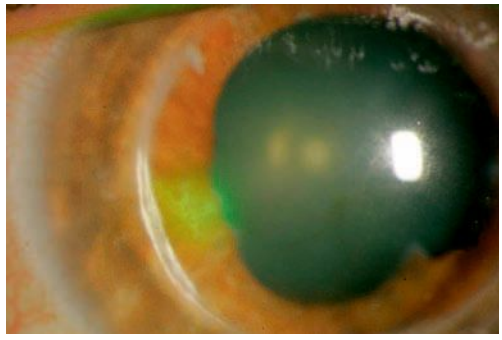


Figure 6
Case 5: One day post-operative

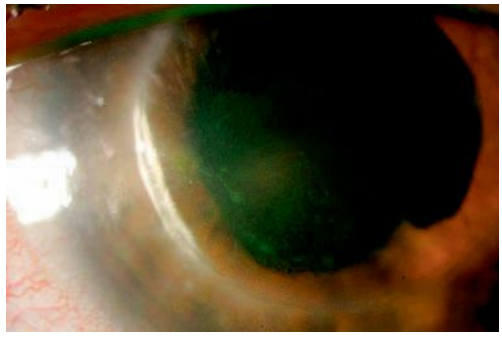
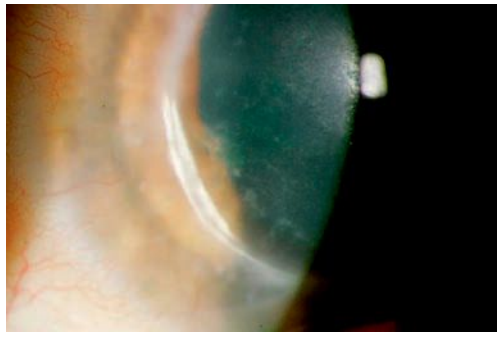


Figure 7
Case 5: One week post-operative



partial and complete resolution of the lesion at one day and one week respectively. His prednisolone was increased per the glaucoma service for post-operative measures. There was no evidence of recurrence or corneal decompensation on further follow up exams.

Discussion

In the case series presented here, we used a liquid nitrogen cryotherapy spray to treat the area of the dendrites (-196 degrees Celsius) in herpes simplex epithelial keratitis. The spray leads to a more superficial treatment versus a cryoprobe. The patients' dendrites were successfully eradicated post-operatively and healed without complication or recurrence. In addition to successful treatment of the herpes simplex epithelial keratitis, there were no

complications, including no damage to the adjacent cornea. If a proper technique is performed, one is able to minimize risk of complications and this is best accomplished with a cryospray for superficial treatment.

In 1965, Krwawicz reported promising outcomes from the treatment of epithelial and stromal herpetic keratitis using cryotherapy, and this was confirmed by other reports by Bellows, Milverton, Fulhorst, and Tarakji.[5,7-10] Temperatures used in the cryotherapy in these studies varied from -70 to -80 degrees Celsius. In the study by Fulhorst they described treatment of thirty-six patients with epithelial herpetic keratitis treated with a cryotherapy probe (2 mm diameter Fison cryoprobe, temperature of -70 to -80 degrees Celsius).[5] They found there was no change in the dendrites immediately after treatment, but that within twenty-four hours there was an epithelial defect, and within three days, 70% (twenty-five patients) were completely healed. Only one patient failed to respond to the cryotherapy (3%), four patients (11%) went on to develop disciform keratitis, and one patient (3%) developed a stromal infiltrate that cleared. In this study, the patients treated with cryotherapy were also given treatment with idoxuridine (IDU) ointment or placebo ointment (randomized) and there was no statistical difference between these two groups in terms of time to healing of epithelium or occurrence of complications. In the study by Tarakji, twenty-one patients were treated with cryotherapy (using a retinal probe of the Amoils cryotherapy unit) and they were compared to fourteen cases that were treated with IDU.[9] The cryotherapy group healed in an average of 2.4 days and the IDU group healed in an average of 6.2 days ($p < 0.01$). Of note, they noted mild epithelial edema and descemet's folds in a few cases that underwent cryotherapy that resolved spontaneously within one week. There was no treatment failure in either group.

In the literature, complications of cryotherapy to the cornea for herpes simplex keratitis have included pain, transient epithelial edema, progression to disciform keratitis, and development of a stromal infiltrate. There is also a potential risk to endothelial cells. One study revealed loss of endothelial cells with freezing times of 5 seconds.[11] It was found that a temperature of 25 degrees Celsius at the endothelial cell level as well as an ice ball of greater than or equal to 5 mm could lead to loss of endothelial cells. Limiting freeze times to less than 5 seconds is thought to decrease risk to the endothelium. Thermocouple experiments on human cadaver eyes have proven that a cryospray iceball remains superficial to the deep stroma and the endothelium of the cornea if applied for less than 5 seconds.[6]

Liquid nitrogen cryotherapy of infected lesions may decrease the amount of ATP that is required for replication of the virus. In addition, freezing may reduce the activity of the viral DNA and RNA. Cryotherapy probably also acts as a form of debridement, similar to mechanical debridement, with sloughing of the epithelium occurring after treatment. Freezing may also cause the release of endogenous interferon, which may inhibit the virus.[2-4]

In 1972, Fulhorst et al. published findings on cryotherapy of HSV keratitis.[5] The investigators used a probe with a cryogen that achieved -70 degrees Celcius. This study provided resolution in 75% of the thirty-six subjects with some dendrites healing immediately and some taking three days or more. In 1978, Tarakji et al. reported on twenty-one HSV keratitis subjects treated with solid carbon dioxide cryoprobes (-70 degrees Celcius) and compared them to a control group of IDU treated patients.[9] The cryotherapy group healed in an average of 2.4 days and the IDU group healed in an average of 6.2 days ($p < 0.01$). Of note, there was some corneal edema in the subjects post treatment early in the post-operative course, but this resolved spontaneously within one week.

Two seconds of cryospray in this case series allowed for a more superficial treatment versus a cryoprobe. It is hypothesized that the colder cryogen is probably more effective at eradicating virus than cryogens that cannot achieve -196 Celcius. In the cases of epithelial keratitis in this case series, the dendrites were successfully eradicated without recurrence. There were no adverse effects noted in any of the patients treated. Thus, liquid nitrogen cryotherapy may be a safe and effective alternative to topical drops and/or oral medications, which may have topical and systemic side effects and poor compliance.

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Disclosure

None reported. **MM**

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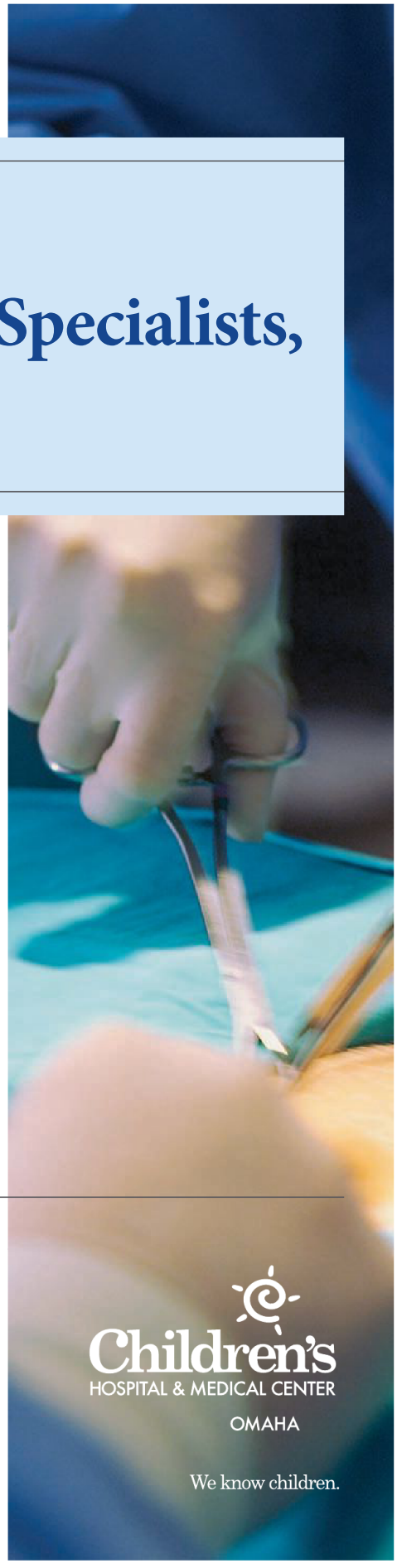
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