

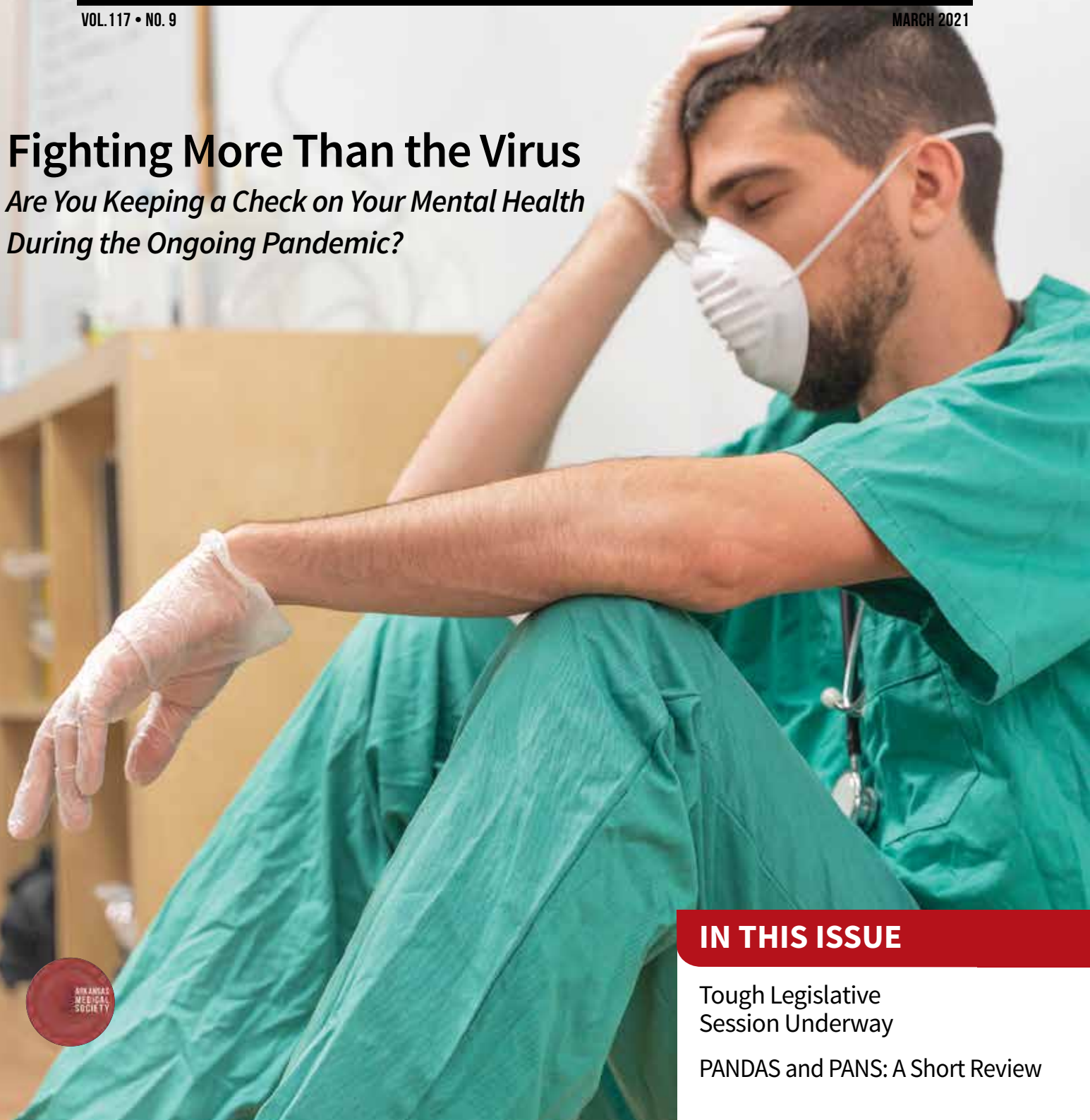
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Fighting More Than the Virus *Are You Keeping a Check on Your Mental Health During the Ongoing Pandemic?*



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WHAT HAVE WE DONE FOR YOU LATELY?

BY DAVID WROTEN
EXECUTIVE VICE PRESIDENT



Tough Legislative Session Underway



Brace yourselves; it's going to be a bumpy ride. The General Assembly is in high gear and, as usual, health care issues are abundant. There are bills that deal with COVID-19, face masks, restrictions on step therapy, changes in telemedicine, a massive effort to repeal the "soda-pop" tax that funds the Medicaid Trust Fund, and reauthorization of Arkansas Works. Oh, and did I fail to mention that there are about 18 bills that deal with scope-of-practice?

The Arkansas Medical Society has its hands full, and the outlook for some of the scope-of-practice bills looks to be cloudy, with a chance of high winds and thunderstorms. There are the usual suspects – namely, APRNs who want full prescribing authority, repeal of collaborative practice agreements, and "primary care provider" status within the Medicaid program. Then there are the pharmacists, led by Walmart, who want not only to vaccinate children down to age three but also to be able to treat certain other so-called minor acute medical conditions and dispense oral contraceptives without a physician prescription. Bills have also been filed to remove supervision requirements of CRNAs, change the statute regarding physician assistants, remove the requirement that certified nurse midwives have a consulting physician, and create a licensing

program for naturopaths. On the bright side, there is also a bill to remove all restrictions on physician dispensing.

AMS members should not assume that the scope-of-practice victories of the past 15 years are any guarantee of success this time around. Also, add to that the COVID restrictions in place at the Capitol that will prevent AMS (or anyone else) from filling committee rooms with physicians in white coats.

It is going to be the most challenging legislative session that most of us have ever been through. When possible, we will attempt to outright defeat some bills. When not possible, we must be ready to look for compromises that protect quality of care and do no harm.

Watch for the AMS Legislative updates and alerts. When asked, contact your legislator as soon as possible ... do not wait. The current rules for this legislative session are that committee chairs must announce their agenda items at least 18 hours before the meeting. That means that in some cases, we will only have one day to generate calls. When possible, and as directed by the updates and alerts, reach out to your legislators ahead of time to discuss your concerns or support of bills.

So, buckle up and hang on tight.

AMS members should not assume that the scope-of-practice victories of the past 15 years are any guarantee of success this time around.

Let's Bring Fred to the Discussion Table

The patient is anxiously waiting to meet his doctor to ask her about the vaccine and its risk to his health. The cancer that is ravaging his body has been forgotten and the side effects from chemotherapy are now “less important.” He is determined not to take the vaccine. He follows his circle of friends on Facebook, and he believes that the vaccine will “kill him.”

In the past, doctors used to be the source of truth about health and disease. They would convey their message to the patients directly or to the masses through official and responsible outlets such as the press, radio, or television. With the advent of the internet and the ubiquitous access to it, classical outlets of information dissemination have lost much of their influence. Everyone has access to the internet now, and that access has exponentially grown to hundreds, thousands, or millions of individuals, if not more. Through this free and unfettered access, many voiceless people have found a voice for themselves and a new power. Further, anonymity liberates people from feeling shame and makes it easier for many to speak and react without consideration for others, often sparing the facts or the truth. It is in this novel context that humanity has had to face the pandemic.

In the long-term, rebuilding our relationships with our patients based on patient-centered and value-based-care principles will allow us to regain their trust.

On the internet, the sources of the information about COVID-19 have been, in many cases, anonymous and invariably inaccurate; yet, despite scientific evidence to the contrary, people believe it. Why? Humans react to the unknown by seeking knowledge from any available sources, even if the information is egregiously wrong. Large groups of the population have grown more skeptical of the official information channels in our society, what is called “the establishment;” they have turned toward sources that amplified these feelings and provided them with an alternative reading of reality that mirrored a politically divided country. News deserts have created a vacuum that allowed this narrative to take hold. While the virus was raging in the bodies, the false narratives about it were spreading, unchecked, in the minds. Indeed, it was a veritable disinformation jungle.

The novelty of the virus made it so easy to spread in a population with no prior immunity to it. Collectively, we knew little about COVID-19; however, as our true knowledge was growing, the false information was growing, too, and replacing any true knowledge at the speed of light. Our “cognitive immunity” has suffered tremendously over the years. The patient-physician relationship has lost depth and quality; and we doctors, have let it slip away from us. Its commercialization emptied it from trust, the most important element in positive human interactions. Trust is the factor that allows a group of individuals to believe that the message delivered to them is accurate and trustworthy. But this is not all. Why would a group of our population believe certain ideas even though they are clearly inaccurate? What happened to the critical thinking of a nation that prides itself on embracing science and using it as a foundation for progress? Here again,

the answer to this question is trust. Many people felt left out by a system that promised them access to the American dream but has not delivered and further, has told them that they were wrong. So, they turned away from that system and became ready to “trust” any sources that validated their feelings. As humans, we hold our feelings as belongings, furthering an unwavering transference from scientific rigor and fact. Once these alternate channels have gained their trust, they embraced any narrative coming from them. This is certainly a bigger problem than physicians can address in their exam rooms.

Physicians still have a great chance to reverse the tide, but they need help. In the short term, the success of the vaccination campaign and the control of the pandemic, here and abroad, is likely to bring an end to the misleading and inaccurate information. Hence, every one of us should be a good ambassador for the vaccination of as many people as possible within the shortest period of time possible. In the long-term, rebuilding our relationships with our patients based on patient-centered and value-based-care principles will allow us to regain their trust. First, reestablishing the sacred bond that transcends monetization and acknowledges the importance and uniqueness of each one of them will open a new door to honest dialogue. Second, allowing patients to bring their unusual ideas, and what they have learned from other sources, to their discussions with their physicians is part of the educational work that we need to do with them. Commonly, I say to my patients, “Let’s bring your Facebook friend, Fred, to the discussion.” After laughter, they feel allowed to discuss the weirdest ideas with me, and we often end up agreeing on a reasonable plan. Regaining our patients’ trust is the first step, and this we can do.

Fighting More Than the Virus

Are You Keeping a Check on Your Mental Health During the Ongoing Pandemic?

Burnout has long been an issue for physicians, nurses, and other health care workers. In 2017, 43.9% of physicians surveyed (2147 of 4893) exhibited at least one symptom of professional burnout, according to a study whose authors work from Mayo, Stanford, and the AMA.* In “normal” situations, burnout is often brought on by exhaustion, a lack of work-life balance, increased work demands, and changes to the health care system.

But add a long-continuing pandemic to that, and burnout becomes even more likely. For roughly a year now, COVID-19 has amplified the normal triggers and added a variety of new stressors to health care’s already high-demand working environment. “Some say ‘we’re all in the same boat,’” explained Associate Dean for Faculty Affairs at the UAMS College of Medicine Erick Messias, MD, MPH, Ph.D. “Some *correctly* say, ‘we’re all in the same storm, but in different boats.’”



ERICK MESSIAS, MD, MPH, PHD

“This storm has affected medicine in diverse ways. Some, like emergency medical physicians and infectious disease physicians, have seen an increased workload. Others, particularly those dealing with non-emergency and so-called ‘elective’ procedures, have seen a marked decrease in workload. The group with more work has dealt with increased fear of contamination – not only of themselves but of their families and other patients. The group with less work has had to worry about consequences for patients postponing visits or procedures.”

Dr. Messias has devoted years to understanding the issue of professional burnout in



medicine. A psychiatrist and epidemiologist, he presented an in-depth lecture on Physician Wellness and Burnout during the 2019 AMS Annual Session. He shared enlightening statistics on burnout and discussed solutions centered on finding meaning, purpose, and control in one’s work (see *July 2019 Journal*.)

Recently, he addressed the shifts that the challenges of this last year have brought to this topic. “In some ways, the pandemic has *improved* well-being and burnout; it has made the sense of purpose we have in health care very clear,” he began. “It has made society value what we do in a much more open way.

For instance, we have seen increased interest not only in medical school applicants but also in health care professions overall, from what some are calling The Fauci Effect. Not just Fauci, but all of us are being seen, in one way or another, as the people taking care of this terrible situation.”

“On the negative side, people are overworked and afraid. There are conspiracy theories about doctors, vaccines, and infections. So, we have the extra burden of taking care of more acutely ill patients, working with public health officials to address public health measures, and educating the public to address ru-

mors and false narratives that are being played out in the media, social media platforms, etc.”

Another development that has caused a lot of stress has been the necessary changes to visitation policies, he continued. “Because of the pandemic, we created these restrictive policies that, while correct from a public health perspective, put us in a place mentally and organizationally where we must tell a family member that their loved one is very sick, may die, and may die alone in an ICU. So, we’ve had many stressors that have been placed on patients as well as health care personnel.”

Personal Workplace Experiences and Responses to the Pandemic

Central Arkansas Pediatric Clinic in Bryant currently falls into the group with a lower patient load. So far, physicians and staff there are not reporting dangerous stress levels,



DAVID WEED, MD

but that doesn’t mean things haven’t been difficult. “Definitely this past year has been difficult,” said David Weed, MD, managing partner. “Our staff has dealt with levels of stress and anxiety that none of us have seen before. We are all worried about the health of our patients, our family, and ourselves. Personally, I’m managing by trying to get plenty of exercise, getting plenty of sleep, and keeping a positive attitude.”

Overall, things seem to be getting better rather than worse as this clinic has seen their protective measures working for them. “I would say we’re all tired of it, but we’ve tried to keep our focus firmly on minimizing exposures and keeping our staff, patients, and physicians safe,” said Cheryl Arnold,



CHERYL ARNOLD

MHA, FACMPE, CAPC administrator. “So far, we have not had any exposures that have been work-related. In other words, our PPE and our habits are working to protect us.”

The vaccine becoming available is an added encouragement. “Most of our employees have now had their first dose of the vaccine,” she said. “While everybody was subject to questions like ‘How long is this going to last?’, this has brought a glimmer of hope that, at least individually, we can have immunity. It feels like a sign of the beginning of the end of the pandemic.”

Residual stress most clinics can relate to involves uncertainty surrounding their future business model. “There *is* lingering concern about financial viability,” Arnold noted. “We’re operating in a more expensive business environment because of the extra things we’re doing now to protect ourselves and our patients. At the same time, our volume is not where it usually is during this season of the year. We’ve done well, but there was some help during 2020 and we are not sure how far the pandemic will stretch into 2021. We’re approaching operations and decision-making with caution and optimism that CAPC will come out of this storm stronger.”

Taking Control of Small Things Can Alleviate Some Stress

Effectively managing stressors can help physicians counter mental health challenges, reported an October 2020 article by Christine Blank published by Physicians Practice, an MJH Life Sciences™ publication. In the article, Blank reported that physicians and other staff members can alleviate future burnout now by “exploring ways to reduce physician stress when patient loads fully return to normal.” Examples included examining documentation templates, workflow practices, and innovative approaches to lingering problems. She quoted Andrew Swanson, VP of Industry Insight for Medical Group Management Association, who recommended, “... Look at small inefficiencies that, over the course of dozens of patient visits each day, create wasted time that frustrates physicians and the care team.”

Such roll-up-your-sleeves exercises can feel like an immediate win. Swanson explained further, “It gives the team time to look inward—time they typically don’t have—to look at underlying reasons for physician burnout.”

Dr. Messias also indicated that physicians can maintain a sense of control for themselves and their staff, even during the pandemic, by

“Now, more than ever, we need each other.”

– Erick Messias, MD, MPH, PhD

getting down to work. “Discuss with your organizations processes like scheduling and phone calls,” he recommended. “Devote time and resources to wellness. Many institutions are creating a chief wellness officer to oversee and organize these initiatives. Finally, take control of electronic medical records!”

During COVID’s extra challenges, UAMS has implemented several new COVID-related wellness efforts. Dr. Messias was involved in this process, along with Natalie Cannady, M.Ed., chief wellness officer; Puru Thapa, MD, medical director of the UAMS Student Wellness Program; and other departments and staff members.

Among the new efforts is Supportive Conversations, a phone line available to UAMS employees that puts them in touch with a supportive person. “What is a supportive person?” said Dr. Messias. “Our first thought was not to make it a mental health issue immediately, so it’s not a counselor, psychiatrist, or psychologist. Instead, we recruited coaches from our own staff. Along with our pastoral care folks – our chaplains – they have made themselves available to talk to people who call anytime day or night. They are trained to screen for specific mental health problems. So, if the caller is faculty, student, or resident, they can be referred to EAP [Employee Assistance Programs] or another appropriate wellness program.”

Other support tools at UAMS have included Supportive Rounds, whereby volunteer social workers visit and spend time with staff working COVID units; Mindfulness Class, which is open to all UAMS employees and led by Dr. Thapa; and a series of videos featuring conversations with mental health professionals about how to address mental health issues.

“Finally, we’ve been engaging from department to department,” said Dr. Messias. “We need to hear from each other, support each other, so the chairs of each department began checking in weekly with their faculty members. The dean is checking in with the

chairs to do the same. The department chairs did some Zoom virtual events, which worked quite well. One was for someone who was retiring, and the event even drew in his former students and peers, some overseas, to express their appreciation.”

More Burnout and Mental Health Options Available to Physicians

Those measures, while largely UAMS-specific, are examples of initiatives that other institutions and clinics can implement as well.

Cannady shared additional strategies that Arkansas physicians can utilize to lessen pandemic-related stress for themselves and their staff. “Take time to let your staff know you care about their well-being,” she said. “Take stretch breaks during morning meetings. Encourage them to practice self-care – like staying hydrated during their shift – and make sure they are taking their breaks to eat. Try some belly breathing exercises with your group or try one of the many short mindful meditations on YouTube or via apps like Calm that can be very helpful and take under ten minutes.”

Cannady also suggested talking with staff members about ways each of you are improving your health or reducing your stress. “Talking about it will normalize it and others will feel like opening up,” she added.

Finally, you can make sure your employees and colleagues know that resources are available to them. “Most of the time, people don’t even know what is available to them in their benefits package for wellness needs,” explained Cannady. “It’s best to remind them often. Services like AR Connect are available to all Arkansans through the Psychiatric Research Institute at UAMS. If you don’t have services through your clinic, point your coworkers there. They can talk with someone 24/7 who is trained to help. That number is 501-526-3563.

“The most important thing for all of us is to pay attention and listen. We get so busy, we miss things. I think we have to stop and ask people if they’re okay. Reach out to your team. Stay open minded ... listen with the intention to hear, not respond. The pandemic has made small issues feel insurmountable, [but] you can help by staying in constant contact, asking questions, and really listening.”

Some physicians may be hesitant to seek treatment for burnout themselves for fear of ridicule. Others may worry that getting help could impact their freedom to practice medicine. Or they may simply feel too busy to bother with it. For those physicians, Cannady recommended getting in touch with someone outside of their own institution or investigating the growing number of apps available to those in medicine. “Services that are anonymous – like our Supportive Conversations service, where you don’t have to tell who you are or where you work – are great for us internally.”

She believes that apps such as BetterHelp, Talk Space, and others are turning out to be one of the best places for physicians to turn because of their busy lifestyles. “Many of these you can just text into, and physicians can reach out when *they* can reach out. Most of them allow you to feel out the

person that you’re working with, to see if your personalities match.”

Of the ongoing pandemic and its effects on the health care workplace, Dr. Messias concluded, “It has been a challenge overall. No one has been spared, but it’s important to keep our perspective. Let’s remember that there is a point that this is going to end.

“Meanwhile, engagement is so important. Now, more than ever, we need each other. We are health care professionals taking care of other health care professionals. We need a sense of community. In your community, you play an important part. So, engage with other people. Find a way to participate in your specialty societies, like the Arkansas Medical Society. Engage with your communities – your health care community, your physician community, your local community. Yes, we need to do it safely, but we need to find a way to do it.”

Resources

*Changes in Burnout and Satisfaction With Work-Life Integration in Physicians and the General US Working Population Between 2011 and 2017

(<http://www.mayoclinicproceedings.org/>)

Mayo Clin Proc., September 2019;94(9):1681-1694, <https://doi.org/10.1016/j.mayocp.2018.10.023>

How to Create a Clinician Wellness Committee

<https://www.acponline.org/practice-resources/physician-well-being-and-professional-fulfillment/how-to-create-a-clinician-wellness-committee>

Support Line for Physicians 1-888-409-0141

The Physician Support Line is a free and confidential support line for physicians, staffed by over 600 volunteer psychiatrists. The website explains, “Because there is no formal doctor-patient relationship established, the call does not have to be reported to any medical board as therapy.”

The service is only for physicians, but reports that a similar service available to all front-line health care workers and first responders. **1-800-327-7451 (TTY 711)**

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Sudden Weight Gain and Edema in 24 hours in a Patient with Type 1 Diabetes

Abstract

Subcutaneous insulin initiation, or an increase in insulin doses, can sometimes result in a transient form of generalized or localized swelling called *insulin edema*. This is uncommon but is not an allergic reaction to insulin and does not require discontinuation of insulin therapy. An increased awareness among clinicians for this condition will allow them to provide reassurance to patient/families to assist with continued adherence to diabetes treatment plans, especially insulin therapy. Due to lack of specific diagnostic laboratory parameters, this case walks through obtaining relevant medical history and exclusion of other causes of localized or generalized edema.

Case Report

A 19-year-old female with Type 1 Diabetes (T1DM) presented to our Arkansas Children's Hospital emergency room with complaints of sudden onset, generalized edema with ~10-pound weight gain over the past 24 hours.

Swelling had started in both feet and had progressively worsened proximally to her knees, and she complained of some puffiness of hands, feet and abdomen. Review of symptoms was positive for episodic chest pain, with difficulty breathing and palpitations not associated with exercise/activity. She denied cough, nausea, vomiting, abdominal pain, jaundice, puffy eyes, decreased urine output, decreased appetite. Her usual medication included only insulin aspart via an insulin pump. She had recently been discharged following a week-long stay for severe diabetic ketoacidosis (DKA) at an outside hospital. She reported that her diabetes control over the past couple of years had significantly worsened since she moved out of her parents' home. She had been poorly compliant with her diabetes care, as she had not been taking her insulin

for ~5 days before presentation. On discharge after her recent hospitalization, she was prescribed potassium supplementation for one week along with an oral antibiotic (Cefalexin) for gluteal abscess. Since discharge, she had more closely followed her diabetes care recommendations, as well as continued potassium supplements and Cephalexin as directed. Her immediate family was also more involved in her diabetes care, which she appreciated and wanted to continue.

Upon evaluation, she was afebrile with normal vital signs, well hydrated. BMI 19.27kg/m² (25th percentile for age). Her heart sounds were normal, no added sounds, good air entry bilaterally with normal breath sounds. There was no hepatosplenomegaly or ascites. She had pitting edema up to the knees but no objective hand, face, periorbital or abdominal wall swelling. No rashes, tenderness, induration noted except healing abscess in the gluteal cleft without active drainage.

Laboratory studies revealed mild anemia with normal WBC count and platelets. Her electrolytes were normal but had mild hypoalbuminemia [albumin 3.5 (lab reference for age 3.7-5.6)]. Her fingerstick glucose is 170mg/dL (8.5mmol/L) that was in range for her diabetes, but her glycosylated Hemoglobin (HbA1c) was 12.1% (indicative of poor control, target HbA1c <7.5%). Urinalysis revealed mild proteinuria [30mg/dL (normally negative)], mild glucosuria [300 mg/dL (normally negative)] with trace ketones. Her chest radiograph (two views), electrocardiogram, cardiac echocardiogram, ultrasound of the bilateral kidneys as well as lower extremity did not reveal any abnormality. Her thyroid function was noted as normal, too.

The diabetes team was consulted and recommended continuation of insulin therapy.

Due to continued edema and concern for chest pain, she received two doses of furosemide (30 milligrams intravenous) with satisfactory diuresis and resolution of her edema. Her insulin doses were titrated based on her blood sugars, and she continued antibiotics for gluteal abscess with good response. With improvement in her condition, she was able to be discharged home on third day of hospitalization.

Upon outpatient diabetes clinic follow up in a month, she was doing well and noted with improved glycemic control and with resolution of her symptoms, including the excess fluid gain.

Discussion

Insulin edema is a diagnosis of exclusion, usually presenting either at initiation of insulin therapy or with escalation in treatment within one to 10 days.^{1,2} It is a rare and often unrecognized complication of insulin therapy, although described almost a century ago,³ and is not an allergic reaction to insulin.⁴ The severity of edema varies from being subclinical and can go unnoticed to being mild-moderate (as seen in our patient) or present with pleural effusions, ascites, or even cardiac failure.⁵ This edema can occur both with T1DM^{1,2} and as Type 2 Diabetes Mellitus,⁶ though case reports of insulin edema is also reported with Cystic Fibrosis related diabetes.⁷ Many of the cases reported in literature have occurred in children who are lean, with a BMI at the low range of normal.⁸

When initially describing this condition in 1929, Leifer proposed the acute onset edema to be due to rapid retention of tissue fluid secondary to glycogen deposition.³ Newer proposed etiologic mechanisms include an increase in renal proximal tubule sodium reabsorption due to direct anti-natriuretic effect

of insulin on the kidney⁹ or transient hyperaldosteronism.⁴ Others have suggested that similar to pathophysiology of anorexia nervosa leading to re-feeding syndrome, intensive fluid resuscitation during an insulin insufficiency state (like DKA in our patient) may lead to extravasation of fluid to the subcutaneous tissue. This leads to peripheral edema, which is exaggerated with hyperglycemia-related increase in capillary permeability.¹⁰ Genetic susceptibility for this condition was noted by Suzuki et al when they reported four patients with insulin-induced edema after insulin initiation, who all had the 3243 mitochondrial tRNA mutation suggesting role of mitochondrial function.¹¹

Before the diagnosis of insulin edema is made, other common causes of edema – from cardiac, renal, or liver-related causes as well as related to chronic urticaria, certain medications (including Thiazolidinediones¹²) – need to be ruled out, especially if the patient presents with generalized swelling.¹³ Localized swelling, especially in the leg, could be due to deep-vein thrombosis, cellulitis, compartment syndrome, lymphedema, or thyroid disease and needs to be assessed for.¹³

Once other causes are excluded, clinicians need to reassure patients and their families of its transient nature.¹² The majority of cases are asymptomatic within two weeks.¹⁴ It is important, however, for the physician to be cautious in patients with pre-existing hepatic, cardiac, or renal disease and to monitor them closely. The mainstay of treatment is by-fluid restriction and a low salt diet (<2g sodium/day).⁴ The use of diuretics in treatment has been debated due to the self-limited course and should be reserved for severe causes of insulin edema that do not respond to non-pharmacologic options.⁴ Rarely, cases in literature describe the role of ephedrine in such cases, especially those that relate to diabetic autonomic neuropathy.¹⁵ This medication causes a decrease in renin production and a decrease in sodium and water resorption due to pressor effect on the afferent glomerular arterioles and allows for total body fluid levels to decrease and help reduce the effects of the edema.

Our patient was non-compliant with her insulin treatment in the past, and now had features of insulin edema within the expected time frame following “restart” of insulin

therapy. She was appropriately assessed for other causes of her swelling before the diagnosis was made and did well without much intervention.

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PANDAS and PANS: A Short Review

Abstract

A diagnosis of PANDAS (Pediatric Auto-immune Neuropsychiatric Disorders Associated with Streptococcal infections), is often considered for children with tics and obsessive-compulsive behavior. The term PANS (Pediatric Acute-onset Neuropsychiatric Syndrome) or PITAND (Pediatric Infection Triggered Autoimmune Neuropsychiatric Disorder) is often used interchangeably for this condition. Each patient needs careful individual consideration to prevent overdiagnosis and to ensure appropriate management.

Introduction

The treatment of childhood obsessive compulsive disorder (OCD), as well as tics, is challenging and not uniformly successful. The etiology of these disorders is also not clearly elucidated. Although most patients suffering from OCD or tics have an insidious onset and a chronic course, anecdotally others seem to have a rather acute onset or periodic worsening, at times temporally related to a concurrent infection. If an objective infectious or inflammatory cause for these disorders could be established, this might lead to treatment and resolution of these disorders with the use of antibiotics or anti-inflammatory medication.

Dr. Susan Swedo, while working at the Child Psychiatry Branch at the National Institute of Mental Health, attempted to establish such a causal link between Group A beta-hemolytic streptococci infection (GABHS) and described a “new subtype of pediatric OCD.”¹ In her 1998 research paper, she named this condition “PANDAS”: Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal infections. She established diagnostic criteria as summarized in Table 1.² Dr. Swedo stressed that the episodic course of this syndrome was characterized by an abrupt onset or

by dramatic symptom exacerbations, with the symptoms diminishing significantly or resolving completely within 6-8 weeks of onset or exacerbation.³

Pathophysiology

There are numerous proposed mechanisms of pathophysiology of PANDAS. Perhaps the most convincing theory is that of molecular mimicry. Antibodies intended to target GABHS instead target brain proteins, and numerous studies have demonstrated that antibodies directed at the basal ganglia create inflammation in these regions. Regulatory T-cells (RegT) suppress T-cell response against self-antigens at the site of injury; thus, to prevent neuronal injury caused by autoimmunity, it is desirable to enhance the RegT activity. Dopamine has been found to reduce the suppressive activity of RegT. It has been hypothesized that GABHS infection causes greater permeability of the blood-brain barrier, which leads to increased dopamine release. In turn, this leads to local suppression of RegT and ultimately causes acute and chronic inflammation within the basal ganglia, which is the suspected cause of the clinical syndrome. Kawikova et al have studied this association. Thirty-seven children diagnosed with either OCD or tics were compared to a control group of “healthy” children. Children with more severe tics (Yale Global Tic Severity Scale of 20 or greater) were found to have lower RegT. However, when the group

of children diagnosed with PANDAS was compared to children without that diagnosis, there was no significant difference in the number of RegT.⁴ Therefore, even though the above-described etiological hypothesis is attractive, it is not yet firmly established.

Dr. Swedo reviewed the first “50 cases” of acute childhood onset neuropsychiatric symptoms and found that 36 of the 50 children studied had symptom onset triggered by GABHS infection.² A patient was deemed to have GABHS infection on the basis of either a positive throat culture or elevated anti-GABHS antibody titers. However, numerous studies have reported up to 20% of children aged 3 to 15 are pharyngeal carriers of GABHS;⁵ therefore, prior to assigning a diagnosis of PANDAS, it is imperative to establish whether the child has an acute GABHS infection or is simply a carrier. Kurlan et al have attempted to address this issue. They prospectively evaluated 40 pediatric patients previously diagnosed with PANDAS with intensive lab testing over the course of two years. As a control, they also prospectively evaluated a group of pediatric patients who were diagnosed with OCD or chronic tic disorder, without an association with GABHS. A throat culture was performed every four weeks, ASO and anti-DNAse B titers drawn every 12 weeks, and clinical exam performed every 12 weeks. They concluded that the PANDAS group had a higher risk

Table 1

DIAGNOSTIC CRITERIA FOR PANDAS (per Dr. Swedo)

a) Presence of OCD and/or tic disorder
b) Prepubertal symptom onset
c) Episodic course of symptom severity
d) Associated with group A beta hemolytic streptococci (GAS) infections
e) Association with neurological abnormalities (i.e. tics)

for clinical exacerbations than the control group, but that the result was not statistically significant.⁶

Other authors have commented that the relationship between prior GAS infection and obsessive-compulsive disorder (OCD) or tics/Tourette's syndrome in childhood is not as clear. Studies summarized in a paper by Shulman include a prospective cohort study that found that more than 85% of clinical exacerbations in OCD/tic behavior in patients who met criteria for PANDAS had no relationship to GAS infection. Another study found no correlation between clinical exacerbations and changes in a variety of markers of brain autoimmunity. A third study concluded that, compared with specialty clinics diagnoses, patients diagnosed with tics or Tourette's by physicians in the community were significantly more likely to be diagnosed with PANDAS; without meeting the proposed criteria, most lacked supporting laboratory evidence of GAS infection, and they were more likely to be treated with unjustified short-term-to-chronic antibiotic and/or immunomodulatory therapy.⁷

Table 2

DIAGNOSTIC CRITERIA FOR PANS⁸

- a) Abrupt, dramatic onset of OCD or severely restricted food intake.
- b) Concurrent presence of additional neuropsychiatric symptoms, with similarly severe and acute onset, from at least two of the following seven categories: 1. anxiety, 2. emotional lability and/or depression, 3. irritability, aggression, and /or severely oppositional behaviors, 4. Behavioral (developmental) regression, 5. Deterioration in school performance, 6. Sensory or motor abnormalities, 7. Somatic signs and symptoms, including sleep disturbances, bedwetting, or increased urinary frequency.
- c) Symptoms are not better explained by a known neurologic or medical disorder, such as Sydenham chorea, SLE, Tourette's Syndrome, or others.

Therefore, in July 2010, a group of experts modified the term PANDAS to PANS-Pediatric Acute-onset Neuropsychiatric Syndrome. Diagnostic criteria are summarized in Table 2.⁸ The proposed pathophysiology of this disorder is similar to that for PANDAS, that is, a parainfectious or autoimmune inflammatory process affecting the basal ganglia. The exception is that the specific trigger is undefined and is not restricted to a GAS infection. The term PITAND, or Pediatric Infection Triggered Autoimmune Neuropsychiatric Disorder, is sometimes used interchangeably for PANS.

Diagnosis

Most experts believe that the diagnosis of PANS should be restricted to patients who meet the clinical criteria laid out in Table 2. Recently, the Cunningham panel has been proposed as a serologic diagnostic marker for PANS. The panel is composed of five tests: anti-dopamine receptor D1 titer, anti-dopamine receptor D2 titer, anti-lysogangioside GM1 titer, anti-tubulin titer, and CAM KINASE II % of baseline. Results are expressed as whether the level of a particular antibody falls inside or outside the normal range. A num-

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ber of studies have looked at the validity of this test, including a recent one by Hesselmark and Bejero. All Swedish patients who had the Cunningham panel drawn prior to 2014 were eligible to participate. Of the 154 eligible patients, 53 chose to participate. The prior results were collected, along with new blood samples. As control, the panel was drawn on 21 healthy subjects. Compared to a clinical diagnosis of PANS, the panel had a sensitivity of 15-60%, a specificity of 28-92%, and a positive predictive value of 17-40%. The majority of healthy controls had a pathological Cunningham Panel.⁹ Therefore, the significance of such testing is uncertain.

Treatment

A number of case reports have evaluated antibiotics as treatment for PANS/PANDAS, showing an overall effectiveness of 8-52%. A prospective study by Garvey and Swedo does not support antibiotic/antimicrobial prophylactic treatment.¹⁰ Plasma exchange (PLEX) has been reported to have mixed results, ranging from dramatic improvement in symptoms to, more commonly, the treatment being ineffective. Similarly, there are some case reports of successful treatment with corticosteroids, but the majority of the evidence is inconclusive. There are numerous studies evaluating intravenous immunoglobulin (IVIG) use for PANS/PANDAS patients. Hoekstra et al,

studying the efficacy of IVIG compared to placebo in a group of PANDAS patients, reported no significant symptomatic improvement in the group treated with IVIG.¹¹ Another study collated a series of six case reports reviewing 19 different patients with a diagnosis of either PANS, PITAND, or PANDAS. Eleven of the 19 patients were reported to have full remission of symptoms following IVIG.³ A randomized, double-blind, placebo-controlled study of IVIG use in patients with PANS by Williams et al showed no significant improvement in the IVIG treated patients following a six-week trial of IVIG.¹²

Conclusion

In conclusion, PANS may be a definite entity; however, such a diagnosis should be made with caution and only for those patients who meet the clinical criteria detailed in **Table 2**. At present, there is no convincing evidence of a serologic marker for this diagnosis. Some patients may benefit from treatment with IVIG, steroid, PLEX, or a combination thereof; however, exact specifics regarding dose and duration of treatment, as well as efficacy of such treatment, remains largely anecdotal and not conclusive. Therefore, each case should be considered on an individual basis and treatment should be tailored accordingly.

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Impact of Left Ventricular Assist Device on Physical, Physiological, and Psychological Wellbeing of a Patient with NYHA Class IV Heart Failure: A Case Report

Introduction

Left ventricular assist devices (LVADs) are used to treat end-stage heart failure patients who are refractory to medical therapy. LVADs can be used as destination therapy or as bridge-to-transplant therapy, which mainly applies to patients awaiting heart transplant. These patients are placed on LVADs until a suitable heart is available for transplant. LVADs have proven to improve patients' general health outcomes. Besides exercise training programs, post LVAD implementation is expected to improve cardiac pump function and quality of life. These outcomes can result in decreased hospitalizations, length of stays, and decreased overall health care costs. There has been a dearth of clinical literature examining the possibility of functional improvement in patients placed on LVAD. This case report examines the functional and emotional improvement in quality of life in a patient after LVAD placement.

Case Presentation

This case studies a 66-year-old male of African-American decent who was admitted to the Nursing and Rehabilitation Center on June 5, 2017. Before his admission, he had suffered from several health complications, including congestive heart failure, hypertension, Stage III B-chronic kidney disease, ventricular tachycardia, and seizures. He had undergone heart wire left ventricular assist device (HWLVAD) placement on May 2016. Unfortunately, his post-procedure course was complicated. He had to undergo an emergent LVAD exchange because of acute hemolysis. His replaced LVAD had complications of a driveline infection due to Methicillin-sensitive *Staphylococcus*

aureus (MSSA) for which he completed a course of antibiotics.

Patient reported that he could not carry out many activities of daily living (ADL) before his surgical procedure. For example, he could not even stand without support before the surgery. Patient's functioning capacity was classified as New York Heart Association (NYHA) class IV as his level of distress increased with every physical activity he undertook, and he exhibited symptoms even at rest. His ejection fraction at that time was calculated to be 10%. Therefore, at discharge, patient was transitioned to the rehabilitation unit to improve his physical endurance.

Social history consisted of a long history of cocaine use and smoking at least

one packet of cigarettes per day; however, he had stopped smoking six months preceding his last hospitalization. He was married with two children, and several of his family members suffer from heart-related disease. His mother and sister passed away due to myocardial infarction.

His current medications at discharge were Milrinone 0.25 mcg/kg/min drip, Amiodarone 200mg per mouth (P.O) daily, acetylsalicylic acid (ASA) 325 mg P.O daily, Vitamin D 1000 IU P.O daily, Hydralazine 50 mg P.O daily, Levetiracetam 500 mg P.O. twice daily, Potassium Chloride 40 mEq E.R. P.O twice daily, Torsemide 40 mg P.O twice daily, Warfarin 3mg P.O daily.

On physical examination, the patient demonstrated significant findings. He ex-

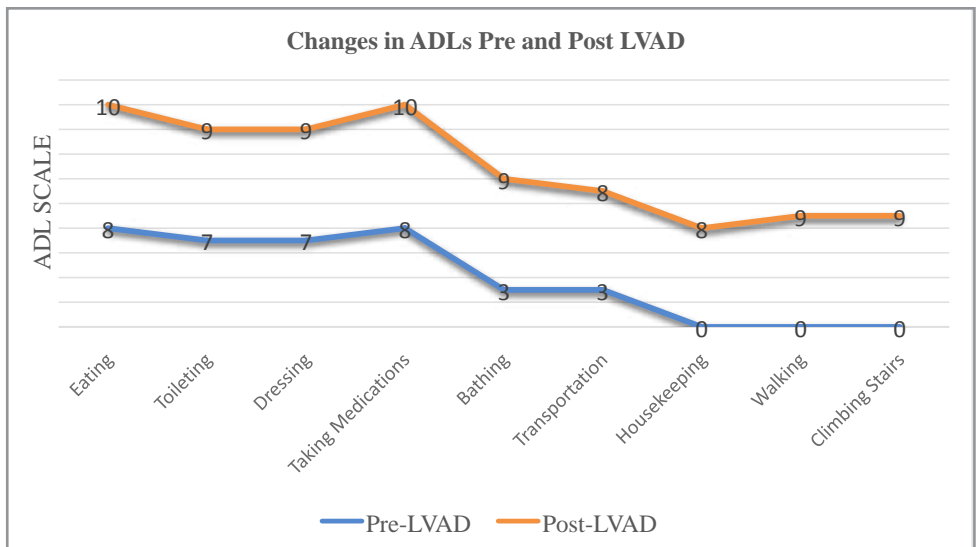


Figure 1 shows the changes in the activities for daily living (ADL) before and after the implantation of the LVAD. The ADLs for all activities significantly increase post-LVAD. The largest increase in the ADL scores are housekeeping, walking, and climbing stairs. Patient was provided with a Patient Health Questionnaire (PHQ-9) to help him compare his symptoms of depression pre-LVAD placement to post-LVAD placement. The total score in post-LVAD was 8 compared to the rating of 21 in pre-LVAD implantation. Figure 2 compares the depression scores recorded pre- and post-LVAD implantation.

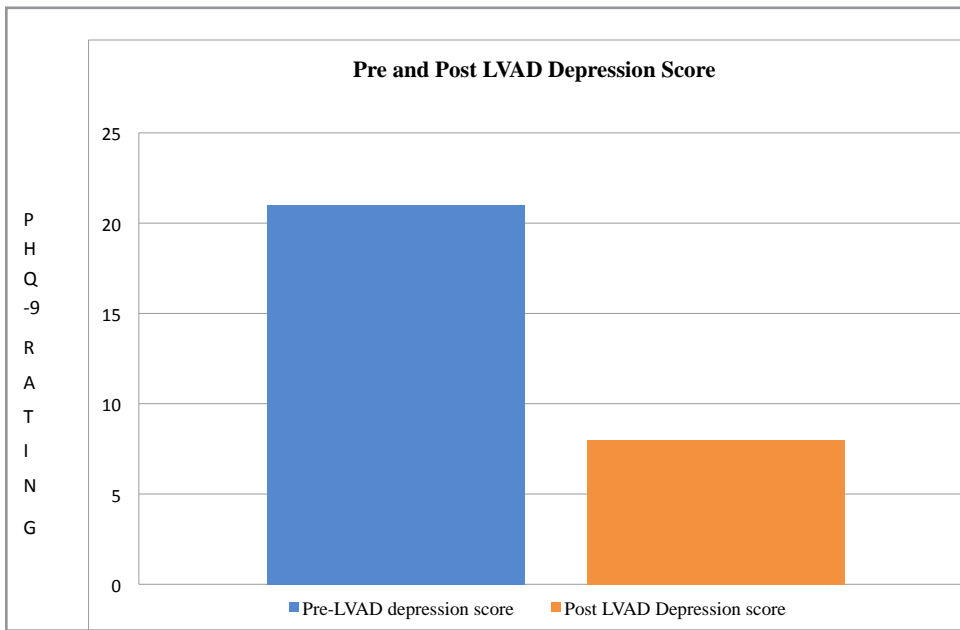


Figure 2. Pre- and post- LVAD depression scores. The depression score measured by the PHQ-9 reduces from 21 to 8 points post-LVAD. Somatic symptoms were the major contributors to the overall depression scores. The burden of somatic symptoms of depression was higher than cognitive or affective symptoms in pre-LVAD placement. Nevertheless, his somatic symptoms improved after the implantation of LVAD. LVAD placement impacted positively on his overall quality of life. The patient's physical strength improved significantly during his stay at the rehabilitation center. Currently, he can ride a stationary bicycle and walk without assistance. At discharge he was advised to make regular follow-ups with the ventricular assist device (VAD) clinic.

hibited peripheral edema with normal peripheral perfusion despite having non-palpable pulses. Also, auscultation of the chest noted clear breath sounds and the whirling sound of an LVAD.

Laboratory workup noted elevated Lactic Acid Dehydrogenase (LDH) 310 U/L, B Natriuretic Peptide (BNP) 5336pg/ml, and INR2.6. Sodium was 139 mEq/L, Blood Urea Nitrogen (BUN)50mg/dL, Creatinine2.6 mg/dL, Albumin3.1g/dL, Hemoglobin (Hgb)9.5g/dL, Hematocrit (HCT) 28.9%, Mean Corpuscular Volume (MCV)76.1fL and platelet (PLT)186K/uL.

Patient's surgical history included prior implantation of temporary right ventricular assist device, implantation of extracorporeal membrane oxygenation (ECMO) circuit, tracheotomy, gunshot injury of right shoulder, inguinal hernia repair and LVAD replacement.

During his rehabilitation course he was continued on Milrinone drip. Mean arterial pressure was calculated with every blood pressure by checking the mean arterial pressure (MAP) and was maintained at 65-85 mmHg.

Discussion

Heart failure (HF) is a highly prevalent condition associated with significant morbidity and mortality. According to Gosev et al. (2018), HF develops when the heart muscle fails to pump blood throughout the body hence leading the cascade to poor health. Congestive heart failure can be fatal if proper treatment is not sought, especially when the disease reaches end-stage. According to "Heart failure" (n.d.), this condition can be caused by ischemic heart disease, diabetes, high blood pressure, arrhythmia, congenital heart defects, and excessive use of cocaine or alcohol (Gosev et al., 2018). The above conditions weaken the heart by releasing certain proteins and other toxic substances into the blood, thus affecting blood flow, leading to the development of HF. Common manifestations of advanced HF include dyspnea, fatigue, exercise intolerance, unintentional weight loss, refractory volume overload, hypotension, and signs of inadequate perfusion. Advanced heart failure should be suspected when a patient with heart failure experiences persistent and severe symptoms despite optimal guidelines provided through medical therapy. Cardiac resynchronization and

heart transplant have emerged in recent years as second-line therapy to heart failure refractory pharmacologic therapy. Left ventricular assist devices (LVADs) play a significant role in establishing cardiac resynchronization.

LVADs are an established therapy for end-stage heart failure as either a bridge to heart transplantation or as a destination to permanent therapy. According to Gosev et al. (2018), the use of LVADs is on the rise because of their positive impacts on patients. These devices are effective and can extend a patient's survival for a long period of time. The latest improvements on LVADs will allow patients to survive for greater than four years with low rates of re-hospitalization (Gosev et al., 2018).

The history of mechanical circulatory support began in 1953. Experts argue that this medical revolution was initiated due to the lack of heart donors (Prinzing, Herold, Berkefeld, Krane, Lange, & Voss, 2016). In 1969, Denton A. Cooley implant-

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ed the first fully mechanical heart. However, researchers' focus soon shifted to the creation of single-chamber pumps to offer cardiac support, and that heralded the era of ventricular assist devices. With each generation of device; size, noise, and infection rates were curtailed (Prinzing et al., 2016). LVADs are expected to improve survival, functional capacity, and the quality of life and thereby reduce the surging costs of health care due to heart failure.

A retrospective multicenter study was conducted between 2005 and 2010. The sample size consisted of 156 subjects. Patients were followed up for a mean duration of 5.2 years. The primary finding of the study was that among LVAD patients surviving four years or longer, mean survival was 7.1 years; these patients continue to have the high functional capacity, with most characterized as NYHA functional class 1 or 11. A randomized controlled study was done in 2001 investigating long-term use of pulsatile LVAD for end-stage heart failure. The sample group consisted of 129 patients. This group was subdivided into two groups. The first, consisting of 68 patients, was treated with LVAD; the second group, consisting of 61 patients, was treated medically. Rates of survival were significantly higher in the LVAD group (52%) compared to the medical group (25%) (Prinzing et al., 2016). Another prospective study demonstrated that LVAD therapy was associated with improvement in the quality of life and functional capacity (Gosev et al., 2018). These data further support the use of LVADs to treat heart arrhythmia complications such as ventricular tachycardia.

Cardiac rehabilitation helps patients by improving their quality of life as well as maintaining cardiac functional capacity. Physical exercises, such as running, improve maximal oxygen intake (VO₂), thus reducing heart failure symptoms and decreasing all causes of hospitalization and mortality. However, there are few studies describing exercise training in patients with LVADs. Kerrigan et al. (2014) conducted a single-blind experiment that demonstrated improved muscle strength and cardio-respiratory fitness. A 17% in-

crease in peak leg torque was observed with post-exercise training program in those patients. A 14.4 % increase in the Kansas City Cardiomyopathy Questionnaire (KCCQ) score, a quality improvement score, was observed in patients with LVAD. Another study that was conducted by Rogers et al. (2009) concluded that continuous use of LVAD in advanced heart failure patients resulted in clinically relevant improvements in functional capacity and heart failure-related quality of life. The patients' quality of life was assessed using Minnesota Living with Heart Failure Questionnaire (MLWHF) and the Kansas City Cardiomyopathy Questionnaire (KCCQ). These study results demonstrate the positive impacts of LVADs as a viable treatment option to improve outcomes while decreasing the cost.

However, the use of these devices presents numerous health care challenges that can lead to re-hospitalization. Some experts have stated that the highest cases of re-admissions are linked to gastro-intestinal (GI) bleeding and infections related to the continuous flow of the LVAD (CF-LVAD). However, a study conducted by Akhter et al. (2015) investigated planned and unplanned hospital readmission rates following LVAD implantation, overall survival, and the costs associated with each hospital admission. The results indicated that patients with LVAD spent 93% of their time out of hospital after implantation and readmissions did not hinder long-term survival (Akhter et al., 2015). Moreover, their research confirmed that the most common causes of readmissions were GI bleed and CF-LVAD-related infections. The median cost of a single readmission was \$7,546 and the median time to first readmission was 35 days (Akhter et al., 2015). Kilgore, Patel, Kielhorn, Maya, and Sharma (2017) demonstrated that the mean cost per patient with a heart failure hospitalization was \$14,631 among Medicare beneficiaries in 2017, and approximately 25% of patients with heart failure were readmitted within a month. Therefore, our health care system needs new strategies that will increase the efficiency of the LVADs while decreasing the cost associated with post-LVAD implantation therapy.

Among patients, advanced heart failure is associated with an increased incidence of depression and anxiety. According to Allen et al. (2010), LVAD placement has demonstrated significant effective strategies that can help in mitigating these heart-related comorbidities by producing a better quality of life (Allen et al., 2010). LVAD placement has demonstrated significant improvement in patients' quality of life and emotional wellbeing within a few months. Mapelli et al. (2014) argues that resuming social activities (such as work and intimacy) contributes to rebuilding self-esteem and confidence. Depression is common in patients suffering from congestive heart failure and has been associated with increased morbidity and mortality.

Multiple studies have assessed the quality of life with LVAD placements. Our patient health questionnaire-9 (PHQ-9) has been validated to measure depressive symptoms in a patient with heart failure, but it does not measure general health problems. Moreover, Severin, Sabbahi, Ozemek, Phillips, and Arena (2019) have observed that even though the aforementioned devices continue to receive praise, they are not effective in improving hemodynamic status. Therefore, many patients in end-stage HF still possess peripheral pathological adaptations. Extensive research should be done to discover and update LVADs to improve the general health outcomes of patients.

Conclusion

Left ventricular assist devices are now acceptable alternative treatment modalities in end-stage heart failure. This case study describes a patient's changes in functional capacity, improvement in depression, emotional wellbeing, and tolerance to physical exercises after undergoing an LVAD placement. LVADs are effective therapeutic tools that can improve the quality of health in heart failure patients and non-candidates for heart transplant. Despite numerous challenges experienced with these therapies, the authors suggest further outcome studies in the field of LVADs that consider physical, emotional and psychological factors.

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 OBITUARIES

LITTLE ROCK - **Arlee Ervin Pollard, MD**, passed away February 12, 2020. Raised on the family farm, Dr. Pollard's early education began in a one-room schoolhouse and, from there, progressed to Oil Trough High School, where he graduated as valedictorian in 1946. He attended Arkansas Tech University in Russellville, where he met his future wife, Helen Jane Cowan. After graduating from the University of Arkansas in 1950 with a bachelor of science degree, he received his medical degree from UAMS in 1956 and completed his residency in anesthesiology there in 1959. Dr. Pollard was board certified in anesthesiology and was a past president of the Arkansas Society of Anesthesiologists. A dedicated and caring physician, he practiced for 35 years before retiring from St. Vincent Infirmary in 1994. Dr. Pollard loved the practice of medicine and welcomed the opportunity to resume patient care by working part-time at the St. Vincent Community Free Clinic and the Federal Occupational Health Care Unit. He also worked with a group of other retired physicians for 20 years at the Military Entrance Processing Station in Little Rock, retiring from that position in 2018. Dr. Pollard is survived by his children Dr. Bill (Sharon) Pollard, Barbara (Steve) Bonds, Joe Pollard of Little Rock, and Dr. Alan (Liz) Pollard; and by three grandchildren.

ALMA - **James David Busby, MD**, passed away January 13, 2021. Dr. Busby began his medical career in Huntsville, Ark., before moving to Fort Smith to work as an assistant professor for UAMS. He practiced medicine in multiple capacities while residing with his family in Alma, and always enjoyed meeting new patients and working alongside other medical professionals. In 2020, Dr. Busby retired from Baptist Health in Fort Smith and from Van Buren as a physician advisor. He leaves behind his wife Joan; daughters Debbie Alsip (Chris), Sara Herlevic (Matt), and Kathleen Shepard (Greg), all of northwest Arkansas; and five grandchildren.

LITTLE ROCK - **James Michael Shea, MD**, passed away January 3, 2021. Dr. Shea graduated from the UAMS College of Medicine in 1984, where he received the Winston Shorey Award for Outstanding Humanitarian Care. He practiced psychiatry for many years at the Little Rock Community Mental Health Center and, in later years, worked with the Veterans Administration, serving in many locales including El Paso, Texas; Memphis, Tenn.; and Springfield, Mo.; and closer to home in Jonesboro and Fayetteville. In 1999, Dr. Shea received an award as Arkansas Mental Health Practitioner of the Year.

POCAHONTAS - **Hal Stephen Barre', MD**, passed away December 30, 2020. Dr. Barre' was a family practice physician, and a member of St. Paul Catholic Church, where he served as a Fourth-Degree member of Knights of Columbus. He was a member of the Pocahontas Rotary Club, where he received the Paul Harris Fellow Service Award. He also received the 50-year Service Award from the Arkansas Medical Society. He is survived by his wife, Bootsie Leone Barre'; daughter, Michelle Barre' Horton; sons, Hal Stephen (Zoraida) Barre' Jr., Christopher Alan (Dawn) Barre', and Joseph Detrick (Denise) Barre'; and many grandchildren and great-grandchildren.

LITTLE ROCK - **Samuel Brooks Caruthers Jr., MD**, passed away December 1, 2020. Dr. Caruthers was a Goldwater Republican. As a radiologist in public practice in Denver, Colo., he railed against the bureaucracy of that system even while thriving as a highly regarded practitioner and teacher. Finally, he accepted a position in the private sector by joining Radiology Consultants in Little Rock, where he continued to rail against the growing convolutions of the modern medical system. Dr. Caruthers was preceded in death by his wife, Helen, and his second son, John Kimbrough Caruthers. He leaves behind his son Samuel Brooks (Stephanie) Caruthers III, his daughter Virginia Leigh Caruthers (Frank), and his beloved grandchildren.

JONESBORO - **James Mark Robinette, MD**, 84, passed away December 13, 2020. He is survived by his loving wife, Frances Wells Robinette; children, Angela Lovett, MD, of Little Rock, Lauryl Hynes DVM (Tim) of Fayetteville, Georgia Robinette, JD (Scott Murphy) of Little Rock, Elaine Roger AOS Culinary Arts, RN, BSN (Barney), James Mark Robinette Jr., JD, of Little Rock, Robert Robinette (Ashley) of Jonesboro, Sarah Robinette of Jonesboro, Paula Reeves of Jonesboro, Kimberly Stearn (James) of Doha, Qatar; 15 grandchildren; and one great-granddaughter.

Dr. Robinette graduated with highest honors from Arkansas High School at Texarkana. At Texarkana College, he was a Phi Theta Kappa. He attended Henderson College briefly before transferring to the University of Arkansas, College of Medicine. He was an Alpha Omega Alpha; received the Avalon Foundation Scholarship, Mosby Book Club Award, and The Buchanan Key; and graduated in the honors program. He received the Mead Johnson Fellowship while in residency at Flower Hospital in Toledo, Ohio. He started his medical practice in Newark, Ark., and soon after, opened a clinic in Jonesboro. Shortly thereafter, he was drafted and served in Vietnam as a Captain in the USAF.

Dr. Robinette worked in private practice in Jonesboro from 1967 to present. He was a charter diplomat of the American Board of Family Practice. In 1977, when taking his first family practice boards, he scored highest in the nation. In 1992, he was board certified in geriatric medicine. Over the years he served as secretary of the Craighead/Poinsett County Medical Society; chief of Medicine at St. Bernard's; and at Craighead Memorial Hospital, held the positions of chief of Surgery, Staff, and Family Practice. He has held memberships in the American and Arkansas Academy of Family Practice, the AMA, the Arkansas Medical Society, and the American Society of Addiction Medicine.



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