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COVID-19 Vaccination Uptake
A Look at Arkansas

IN THIS ISSUE

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COVER STORY

COVID-19 Vaccination Uptake
A Look at Arkansas

Casey L. Penn **56**

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BY **DAVID WROTEN**
EXECUTIVE VICE PRESIDENT

More Help in the Fight Against COVID-19

AMS is poised to take a new step in helping physicians help their patients and their communities in the fight against the COVID-19 pandemic. Building off the highly successful PPE effort, AMS has been awarded a grant from the Arkansas Department of Health for a three-year project to improve and promote COVID-19 vaccination rates.

The grant will enable AMS to initiate a variety of programs that support physician engagement in the vaccine distribution effort while also going directly to the public to encourage vaccination. Here are some of the components of the grant:

1. AMS will develop professional print and video materials that will be pushed out over TV and other media sources directly to the public while also providing materials to physician offices to use in their patient-education efforts.

2. For clinics wanting to participate in the vaccine effort but who need additional resources, AMS will provide grants for freezer units, portable coolers, generators, safety equipment, and supplies necessary to keep patients and staff safe.

3. Education and training tools will be provided to clinics who need additional resources to comply with vaccine distribution requirements including identification, documentation, and tracking.

4. AMS will be able to assist local clinics who wish to provide community vaccine events and will coordinate with ADH staff to identify locations around the state where these would be most beneficial.

Planning is currently underway, and we anticipate forming several work groups of physician volunteers to help steer these efforts.

We were approached and encouraged by ADH to apply for this grant after seeing the success and capabilities of the AMS in meeting the PPE challenge last year. AMS distributed approximately 3,000,000 pieces of PPE to more than 500 clinics across the state.

MORE ON COVID-19: As this goes to print, Gov. Asa Hutchinson has just declared a new public health emergency in light of the alarming increase in COVID-19 cases, pushing our hospital capacity to the max. Stories of COVID-19 patients waiting in ambulances because of a shortage of hospital beds is becoming a major issue. He also announced the calling of a special session of the General Assembly to consider amending recently passed legislation that prohibits local school boards from implementing mask mandates. While many school districts may elect not to require masks, others (especially those in hard-hit areas that are experiencing a major surge in cases) should have the freedom to decide for themselves. It is important to remember that children under age 12 are not currently eligible for vaccination and masking may be the only safe way to resume in-person schooling given the current alarming uptick in cases. The day of the announcement, there were nearly 2,843 new cases, 1,055 currently in the hospital with 219 on ventilators. Of the hospitalizations, 95% are unvaccinated.

We were approached and encouraged by ADH to apply for this grant after seeing the success and capabilities of the AMS in meeting the PPE challenge last year.

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BY BALA SIMON, MD, DRPH, DIPABOM, DIPABLM, FAAFP

COVID-19 Pandemic: Endgame or Infinity War?

COVID-19 pandemic has ruled our lives and livelihood for the past year and a half now. The Global death toll exceeded four million as of early July 2021. While the promise of COVID-19 vaccination has given new hope for humanity to quell the pandemic and restore our lives and livelihood, the differential vaccine uptake and new COVID variants may stand in the way.

Since the beginning of the pandemic, over 17,000 hospitalizations were due to COVID-19 and close to 6,000 Arkansans died due to it. As Arkansas acquired COVID-19 vaccinations in late December/early January, 96% of COVID-related hospitalizations were among the unvaccinated and 99% of COVID-related deaths were among the unvaccinated. As of July 15, 2021, 1,021,383 Arkansans are fully vaccinated, and another 237,833 Arkansans are partially vaccinated. This still falls well below the national average of 68% with at least one vaccination, standing at only 43% in Arkansas. This low level of vaccination leaves a vast swath of Arkansans who are unvaccinated to new COVID-19 infections and a vast pool of host for viral replication and emergence of new COVID-19 variants. Potential vaccine coverage gaps against new COVID-19 variants, leading to breakthrough infections, should be a serious cause for concern.

Returning to pre-pandemic life depends on the course and direction of our COVID-19 mitigation efforts. The differential vaccine uptake, either due to access or due to hesitancy, and the new COVID strains, have really challenged our efforts to quell this pandemic. In a recent viewpoint by Dr. Kofman and colleagues published in the *Journal of the American Medical Association* (July 8, 2021), he pointed out four different scenarios for COVID-19 Pandemic: eradication, elimination, cohabitation, or conflagration.

While the world is trying to grapple with this pandemic, it is our responsibility to come together as physicians and health care providers and work hard to move our state and our nation from cohabitation to elimination.

The first scenario is COVID-19 eradication. This is possible when the vaccine uptake is substantial and/or the infection-associated immunity helps the population develop herd immunity, and it is also done before the new COVID-19 variants pop up. This scenario seems unlikely, at least in the near future, as the world grapples with slow vaccine uptake and rampant new COVID-19 variants.

The second scenario is COVID-19 elimination. This is possible when the vaccine uptake is high and emerging COVID-19 variants are dealt with using booster vaccines. This also needs to happen along with counter measures to prevent any further zoonotic spread from bats, minks, or other animal reservoirs. This scenario seems to be happening in countries like Israel, New Zealand, Vietnam, and Brunei.

The third scenario is COVID-19 cohabitation. This scenario is playing out in several countries as they grapple with differential vaccine uptake due to access or hesitancy. When a significant portion of the population are unvaccinated, they serve as a reservoir for the virus leading to ongoing infections and emergence of new variants from viral replication. This leads to continuous infections among the unvaccinated, potential reinfections, and vaccine breakthroughs among the vaccinated. This may very well lead to a tolerable endemicity replacing the pandemic phase. Kofman et al point out that the U.S., the United Kingdom, and China are currently in a state of cohabitation.

The fourth scenario is COVID-19 conflagration. This scenario happens when a large segment of the population is unvaccinated due to access, hesitancy, or other reasons. This leads to a steady state of moderate-level endemicity as the virus has continuous opportunity to replicate and adapt to evade any host or vaccine associated with an immune response. Infection would periodically arise even among the vaccinated due to the evasion of new variants, waning vaccine efficacy, or transmission from the unvaccinated. Most developing countries, such as India, parts of Southeast Asia, and much of South America, are in a state of conflagration.

While the world is trying to grapple with this pandemic, it is our responsibility to come together as physicians and health care providers and work hard to move our state and our nation from cohabitation to elimination. To achieve the elimination goal, the combined vaccine-associated immunity, and that from infection-associated immunity, should reach a threshold high enough to provide community-wide herd immunity. Currently, COVID-19 vaccines are available to Arkansans 12 years of age and older. There are COVID-19 vaccination locations all across the state, and these can be accessed at the Arkansas Department of Health website (https://www.healthy.arkansas.gov/programs-services/topics/covid-19-map-of-1-a-pharmacy-locations).

As "The Avengers" movie saga mega-villain, Thanos, says to his daughter Gamora, "Little one, it's a simple calculus. This universe is finite, its resources, finite. If left unchecked, life will cease to exist. It needs correcting." COVID-19 is our Thanos, and we are the Avengers. It will take all our collective work in making the COVID-19 Endgame happen. The views expressed in this commentary are those of the author's, not of the Arkansas Department of Health.

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BY CASEY L. PENN

COVID-19 Vaccination Uptake

A Look at Arkansas

Earlier this year, during the AMS annual membership meeting, state officials updated AMS member physicians on COVID-19, rising variants of the virus, and vaccination roll-out and uptake.

This month, we follow up on that discussion with an overview of where Arkansas stands in terms of vaccination uptake and hesitancy, variant concerns, and efforts underway to improve uptake and accessibility. We'll also look at physicians' roles in educating patients to help drive up the number of fully vaccinated individuals.

The state's vaccination program began in December 2020. Like surrounding states, Arkansas took a phased approach that involved prioritizing who first received the vaccine. (*Visit the July 2021 Journal to refresh on informative information regarding pandemic case numbers and history, available vaccines and efficacy, vaccine adverse effects, vaccination deployment, and more*). Now several months into distribution in the state, the demand for vaccines has fallen off sharply. During the Society's annual meeting in May, José R. Romero, MD, Secretary of the Arkansas Department of Health, gave a thorough report, in which he associated vaccination with a decrease in death from this virus. "The first case in Arkansas occurred on March 11, 2020, and as of May 14, 2021, we have had just over 338,000 cases," he reported, later noting how vaccinations had changed the game for the better. "We continue to see between two and seven deaths a day, but I can tell you that the number of deaths has plummeted since we began vaccinations."


JOSÉ R. ROMERO, MD

As of August 1, ADH has reported 388,436 COVID-19 cases and 6,157 associated deaths.

Vaccination Uptake and Hesitancy

Figure 1 shows the current vaccination numbers from Dr. Romero (as of July 6, 2021) for Arkansas. The elderly have been the most eager to be vaccinated, and the youngest among us have, so far, been the least willing. In Arkansas, the older individuals (65 and up) have the highest uptake for full immunization (63.2%) followed by individuals 55-64 (49.2%), 45-54 (40.7%), and on down the line to the most hesitant groups, ages 16-24 (23.8%) and ages 12-15 (10.1%).

Age Category	Percent With At Least 1 Dose	Percent Fully Immunized
12 – 15	15.9%	10.1%
16 – 24	31.0%	23.8%
25 – 34	34.5%	27.2%
35 – 44	43.0%	34.7%
45 – 54	49.7%	40.7%
55 – 64	59.1%	49.2%
65 and older	74.5%	63.2%

FIGURE 1. CURRENT VACCINATION NUMBERS FROM DR. ROMERO (AS OF JULY 6, 2021).

With the number of vaccinated individuals having plateaued, state officials have moved from trying to meet demand for the vaccine to trying to convince more Arkansans of the importance of getting the vaccine. Of course, physicians are on the front lines when it comes to educating Arkansans on public health issues.

"Physician and health care providers are the single most important trusted source for medical and vaccine information," Dr. Romero told *The Journal*. "Our patients will listen to us if we take the time to talk to them. I encourage physicians to educate their patients regarding COVID-19, its complications, and COVID-19 vaccines." See the sidebar, next page, for Dr. Romero's suggested "short list" of information to share with patients who are hesitant to receive the COVID-19 vaccine.

Nirvana Manning, MD, has been making time to talk about this with her OB/GYN patients. She is the chairman and the service line director for Women's Health at UAMS and practices obstetrics at Midtown Women's Clinic at UAMS.

"There are some that just aren't going to get it, and that's completely their choice. As a physician, I feel it's my responsibility to tell them what can happen," said Dr. Manning. Last year, amid the pandemic, Dr. Manning's clinic was seeing many asymptomatic, positive cases in patients who showed up in the Labor & Delivery department. One year later, they're seeing something very different. "If they're showing up with symptoms, patients are sick and acutely decompensating. Our ICU stays are longer. We're seeing pregnant women getting very sick with this Delta variant. It's changed my way of informing patients."

As she encounters patients in states of pregnancy, pre-conception, or post-conception, she sees unique opportunities to address habits and decision making. "It's often a time in people's lives when they may not be thinking of themselves as much as they are an unborn child or future fertility. It's a time that encourages behavioral changes for the better – be it stopping smoking, alcohol, or other [destructive] behaviors – but sometimes it also enhances hesitancy for certain things that are not well known."

NIRVANA MANNING, MD

As patients come in, Dr. Manning has found them in three categories in terms of COVID-19 vaccination – strongly for, adamantly against, and somewhere in between. "I find that the people in the middle, which really is a larger portion of our population, are just scared," she said. "They're hearing a lot of things from both sides. They don't want to do anything wrong, and they're feeling stuck in the middle."

She has worked to discredit false ideas that are in circulation. For instance, she and her staff have fought to eliminate a popular myth that insinuates that getting the COVID-19 vaccine would somehow keep someone from being able to get pregnant. "There is nothing to substantiate that," said Dr. Manning. "We've had multiple physicians do interviews. We've investigated the data behind it. We can speak to it robustly.

"Others that show some hesitancy just want to know what's going to happen. When we take the time to break it down for them – when we say, 'there's no way you're going to contract COVID-19 from the vaccine, it's not changing your DNA, and it could potentially protect this infant or baby when they can't get vaccinated for some time' – we find that 50% of people will go ahead and get it."

For those patients who are at ease and ready to be vaccinated, the clinic has taken steps to facilitate that. "At UAMS, we were offering the vaccine in central areas," she said. "We moved vaccinations into our clinic and have seen quite an improvement in that, if we can get them from one of the floors down to the bottom floor to get their vaccine, they won't talk themselves out of it. They have spoken with their physician, they make their educated decision, and we can go ahead and give them the vaccine right then in the clinic. It has worked very well."

The Variants – Another Reason for Vaccination

Dr. Romero's updates indicate that educating patients should include mention of concerning variants. "Variants are most important because they have an impact on our vaccination strategy and our need to become vaccinated," he stressed.

"Any of these [mutants] can jockey into a higher position depending on the number of individuals they're able to infect. That is why we want to get everybody vaccinated as soon as possible. Each individual person that is not vaccinated serves as a vessel, if you will, to develop a new variant or to spread the new variant effectively."

– José R. Romero, MD

"Physician/health care providers are the single most important TRUSTED source for medical and vaccine information. Our patients will listen to us if we take the time to talk to them. I encourage all physicians to educate their patients regarding COVID-19, its complications, and COVID-19 vaccines," said Arkansas Secretary of Health José R. Romero.

As for what is important to share with your patients, Dr. Romero suggested:

1) Vaccines are safe.
2) Vaccines are effective in preventing hospitalization and death.
3) An individual who becomes infected after receiving the vaccine is not a vaccine failure. The main purpose of the vaccine is to prevent hospitalization and death.
4) COVID-19 is a serious medical condition. Even healthy individuals can have an adverse outcome.
5) Long-term effects of COVID-19 infection, even with mild disease, can be significant. We are learning more and more about this as time goes on.
6) Children and adolescents can have severe complications of COVID-19 infection including hospitalization, multisystem inflammatory syndrome of children, Long COVID-19, and death.
7) Adolescents should be vaccinated prior to the beginning of the school year.
8) The U.S. has a robust safety monitoring system that can detect rare vaccine adverse events.

What a fitting follow-up to his previous warning (at May's annual meeting), when he described several variants and said, "Any of these [mutants] can jockey into a higher position depending on the number of individuals they're able to infect. That is why we want to get everybody vaccinated as soon as possible. Each individual person that is not vaccinated serves as a vessel, if you will, to develop a new variant or to spread the new variant effectively."

Arkansas started with 11 variants in early April 2020 and now, 18 months later, has seen evidence of nearly countless variants. Dr. Romero has concentrated on "variants of concern" for their evidence of increased transmissibility, more severe disease, significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic failures. To date, some of the variants of most concern in Arkansas have included the Alpha variant B.1.1.7, (UK), the Gamma P.1 variant (Brazil), and the Delta variant B.1.617.2 (India), which we're hearing so much about in the press for its dominance in Europe and now here in the U.S.

On July 2, ADH issued an advisory regarding the Delta Variant of SARS-CoV-2 in Arkansas stating that the CDC designated the Delta variant a "variant of concern" here in the U.S. and describing how this mutation alters the virus function. CDC reports have shown that "unlike the human genome, which is slow to mutate, RNA viruses, such as SARS-CoV-2, are able to quickly mutate. Once the mutation occurs, it may alter the viral function (for example, enhance receptor binding), or may have no effect on how the virus functions. A new virus variant emerges when the virus develops one or more mutations that differentiate it from the predominant virus variants circulating in a population. Accumulating data shows that Delta virus may have increased binding with human ACE receptors and increased transmissibility when compared to previously emerged variant viruses. New Public Health England (PHE) research suggests the Delta variant is associated with a 64% increased risk of household transmission compared with the Alpha variant (B.1.1.7, formerly UK variant), and is 40% more transmissible outdoors. Analysis of data from Scotland recently published in *The Lancet* indicated that Delta variant approximately doubles the risk of hospitalization compared with the Alpha variant."

Just as viruses can mutate, resulting symptoms can change, too, making detection more difficult. Also from the advisory, "Clinical knowledge regarding differences in symptoms caused by the Delta virus infection is currently limited. According to the patient data from the UK, where the Delta variant now accounts for 91% of the COVID-19 cases, disease caused by this variant may not present in typical fashion with cough and fever. An ongoing UK-based study (Zoe COVID-19 Symptom Study) enables public to enter their COVID symptoms on a smartphone application for the scientists to then analyze. Analysis of such data shows that top symptoms of Delta variant infection are headache, followed by runny nose and sore throat, while fever and cough were less common; loss of smell was not in the top ten. Most cases were in young people who had not yet been vaccinated, and the variant appeared to be far more transmissible, with every person infecting several others. Implications of such findings are that infected persons may not perceive themselves as having COVID-19 symptoms and, accordingly, [may] not seek health care, and health providers may not pursue an appropriate testing."

With such information in mind, Dr. Romero encouraged all those who are eligible to get fully vaccinated and encouraged physicians and health care workers to continue to keep a high index of suspicion – and therefore, keep testing – for COVID-19 in patients with *any* compatible symptoms. "Information available for the Pfizer-BioNTech and Moderna vaccines indicates that they retain their ability to protect against the new Delta variant. Information regarding the Johnson & Johnson vaccine will take a while to become available," said Dr. Romero. "It's important to note that individuals must be fully vaccinated with two doses of the Pfizer-BioNTech and Moderna vaccines. Immunity following natural infection does not afford the same protection as that derived from vaccines."

Outside Efforts to Encourage Vaccinations

Because of the Delta variant's increased transmission ability, the need to increase vaccinations has become that much greater. Physicians and other stakeholders in the state are working hard to encourage increased uptake in vaccinations. For example, several northeast Arkansas organizations worked together on

a community vaccination event in March. The event, held in Jonesboro, resulted in the administration of 1,662 COVID-19 vaccines.

Groups involved included NYIT College of Osteopathic Medicine at Arkansas State University (NYITCOM at A-State), the City of Jonesboro, the Jonesboro Regional Chamber of Commerce, Arkansas State University, NEA Baptist Health System, St. Bernards Healthcare, UAMS, The Hispanic Center of Jonesboro, Emerson Ambulance Service, and Medic One Ambulance.

"We came together not as individual groups, but as individuals with the common goal of stopping this pandemic in our region and fighting back on the devastating effects we've all seen that this virus can cause," said Shane Speights, DO, dean of NYITCOM at A-State.

Since the event, NYITCOM at A-State has held a number of mobile vaccination clinics throughout Northeast Arkansas to distribute the remaining doses. Through the Delta Care-A-Van, NYITCOM's mobile medical unit, medical students and faculty have fully vaccinated approximately 2,800* individuals through clinics in places like Pocahontas, Blytheville, Wynne, West Memphis, and Batesville.

Step Up to the Plate: Vaccinate!

The Arkansas Medical Society, too, has been doing its part with help from member physicians, ADH, and the Arkansas Travelers, Little Rock's minor league baseball organization. Using the Arkansas Travelers season as its vehicle, the Society initiated a campaign to raise vaccine awareness and provide vaccine accessibility to game attendees.

The Step Up to the Plate: Vaccinate! campaign involved physicians and other educated individuals standing by at the games to educate fans and offer on-site vaccinations, which resulted in 40 vaccinations. While that may not sound like much on the surface, the "spreading awareness" part of the campaign was highly successful – with radio and television spots, promotional products, and other advertising efforts reaching hundreds of thousands of listeners, viewers, and attendees over the course of the campaign.

"While we did want to vaccinate as many people as possible, our ultimate objective was to spread awareness and increase vaccine confidence by having trusted physicians at the event," said Laura Haywood, AMS membership and communication specialist, who facilitated the campaign along with Laura Hawkins, Mary Ann Mansfield, and other Society staff.

David Black, MD, is a physician practicing at OrthoArkansas. He was one of the physician volunteers at the games. "This is a critical time in the health of our state," said Dr. Black. "I enjoyed working with AMS physicians from different areas of practice to offer protection for Arkansans from the COVID-19 virus and variants."

Bailey Sutliff, a medical student at UAMS, also volunteered for one of the games. She said, "It was a great experience getting to interact and educate the public on such an important topic. With the clinic being at a baseball game, it provided a comfortable environment to emphasize the significance of the vaccine and remind us how important it is to strive towards bettering the health of our community!"

Late July's return to February numbers of daily cases lets us know that as physicians and as a state, we are far from finished dealing with the COVID-19 pandemic. For this reason, AMS will continue to do its part and to keep members informed. The Journal thanks José R. Romero, MD and the ADH for their important contributions to this article. For weekly updates on COVID-19 numbers in Arkansas, stay tuned to healthy.arkansas.gov.

*As of mid-July

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A CLOSER LOOK AT **QUALITY**

The New "Normal"

CHAD RODGERS, MD, FAAP

Many of us struggle to remember what life was before the pandemic. For me, my husband and I had a meeting, event or dinner almost every night. Hurried drives to and from meetings and the office several times a day. Rushed Monday mornings. We filled our weekends with chores and activities. We watched our neighbors spend their entire weekend driving their kids to birthday parties, sporting events, and sleepovers. I lived in my home for almost 13 years but barely spent any awake time there. I worked 10-12 hours a day. Because of our chaotic schedule, we felt spread thin, sleep deprived, and emotionally exhausted.

At the beginning of 2020, we were recovering from Christmas, an "In Between" party, and New Year's Eve. I left in February to ski in Colorado with friends for the week and then flew home to turn around to fly to Florida for a few days of rest. When we returned, my husband flew to Seattle for a week for work. On the news, there was talk of a virus identified in China now present in Seattle in a nursing home that resulted in several deaths.

In a few weeks, we saw this virus spread across the country. My best friend was scheduled to come to Little Rock from NYC to see his family and a planned visit with me. NYC was now identified as a hot spot. People were getting sick. Some were dying. Hospitals were overwhelmed. I remember a sad conversation with my friend telling him it was not safe to travel. We didn't know exactly how this virus spread. We feared it lived on surfaces for long periods or that it could linger in the air or spread through a cough. As a pediatrician, we feared children would get very sick and could die. We were seeing many of our senior population getting sick, being hospitalized, and dying.

It seemed like a few days passed until mid-March, the state and many parts of the country closing. Everyone was encouraged to stay home and stay safe. Kids were sent home from daycare and school to learn. We were buying up bleach cleaning supplies, paper towels, and toilet paper. Businesses were closing their doors. Companies were moving their workforces remote where they could. We stopped seeing our parents and our grandchildren. We only spoke with our neighbors from a distance in the front yard. We only took essential trips to the grocery store and ate at home. I "got" to go to work in the clinic. However, the patients seeking care were only coming in if they had to out of concern for the illness.

State and Federal governments began funding supports to allow virtual education, unemployment benefits, increased sources for food, support businesses heavily hit by the pandemic. Children were "learning from home" through virtual technology when available. Parents became teachers and full-time childcare providers. We all became isolated. Many people struggling with mental health issues were getting worse, and people who had rarely struggled with anxiety and depression were struggling. Our seniors were suffering silently alone at home or in living facilities.

The months seemed to drag on through the summer into the fall into winter. We took to our couches and caught up on Netflix. We started home projects and attended zoom meetings and social hours. We connected with old friends, read that stack of books that had been next to the side of the bed for years, met out in the yard and porches with our

neighbors, enjoyed our patio and fireplace, started cooking meals at home, and traveled the Natural State to hike and swim.

In a short 9-12 months, we learned so much more about the virus. We learned that it doesn't live on surfaces as long as we initially thought, masking was an effective way to prevent respiratory spread, and how we could get together in small groups with safe distancing. Businesses started to reopen. People started going back to their health care provider for necessary preventive care.

Finally, the vaccine arrived. We got vaccinated with anticipation and excitement. I cried the day I got my vaccine as months of anxiety melted and the glimmer of hope that this pandemic would come under control. We were back to seeing our close family and friends in safe ways.

Here we are a year later. We still don't know the future. People often ask when we will get back to "normal." Will we see another spike in cases? Will this virus go away? Will we need boosters? When can we stop masking? When can we safely travel internationally? When can we see Elton John in concert?

I do not know what normal will look like as we move forward. I hope we all come out this healthier and happier people. I think we will prioritize the events we go to and the people we spend time with. I think we will have a deeper appreciation for seeing our extended family more. Traveling will be very exciting, and the memories we make will be that much sharper.

In the medical profession, weaknesses in the health care system came into focus. The crisis magnified health inequities. We worked to adapt and address many issues during extremely trying times. Medical care was challenged and improved. New technology allowed us to keep taking care of patients. Many were fortunate to have access to funding that kept our practices open and improved our practice settings. Transformation often comes out of a crisis.

My hope for health care professionals is that we come out wiser and stronger. We need to rebuild a system that has been stressed and continue to improve the care that we give to our patients. ▲

Dr. Rodgers is chief medical officer at AFMC.

The Arkansas Department of Health and AFMC have partnered to offer free COVID-19 vaccine clinics across the state, making it easier for individuals to receive the vaccine. The no-cost vaccines are available at local festivals, events and farmer's markets. A few universities and schools are also hosting vaccine clinics.

Governor Hutchinson has stressed the importance of Arkansans getting vaccinated by announcing a directive on May 4 to have 50% vaccinated in 90 days. We are making progress towards that goal, with a little over one million Arkansans currently vaccinated. Those who receive vaccines are eligible for incentives, including a $20 Arkansas Scholarship Lottery Scratch-Off or Arkansas Game and Fish Gift Certificates.

The COVID-19 vaccines are safe, effective, and help prevent the spread of COVID-19. For more information or to find a vaccine event near you, please call **1-800-985-6030**.

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SEPTEMBER 2021

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Gasoline-induced Milium Formation

Abstract

A 60-year-old man presented to clinic with asymptomatic, yellow-white, cystic papules within diffuse scars on bilateral dorsal hands. The patient reported repetitive use of gasoline to clean motor oil and grease off of his hands. Histology from a shave biopsy of one of the papules demonstrated milia en plaque. This report discusses types of milia and their causes, specifically gasoline, as well as important differential diagnoses to consider for this case.

Case

A 60-year-old man presented to clinic with asymptomatic skin lesions on the hands. The lesions had been present for a few months and were rapidly multiplying. Examination revealed yellow-white, cystic papules within diffuse scars on bilateral dorsal hands. Patient denied any history of blisters or recent trauma to his hands. He denied any sensitivity to the sun, any regular medications, and any use of non-steroidal anti-inflammatories. He reported the scars were from manual labor over the years and were not recent. He reported frequent, recent use of gasoline on his hands as a cleaning agent. Shave biopsy of one of the lesions demonstrated a dermal-based cystic space lined by squamous epithelium with central keratinaceous material with a focal connection to an eccrine sweat duct, consistent with milia en plaque and eruptive milia.

Discussion

Milia are small, benign, keratinous cysts. The causes of milium formation are categorized as primary and secondary. Primary milia can be present at birth or spontaneously arise at an older age. They typically present on the face near the eyelids, cheeks, and nose. Secondary milia develop after an inciting incident, like a new medication, trauma, or disease.[1] Histologically, primary milia appear as a small, keratinous cyst emerging from a vellus hair follicle near the attachment of a sebaceous duct, and secondary milia can present identically or emerging from other epithelial structures such as the epidermis, a hair follicle, or an eccrine sweat duct.[1,2,3] Milia en plaque (MEP) is a rare milia presentation characterized by numerous milia within an erythematous plaque. Classic location sites for MEP include the postauricular and periorbital areas, but other facial and trunk eruption sites have been noted.[4] MEP has been associated with multiple systemic diseases, trauma, and organ transplantation but also develops in individuals with no previous health issues. Multiple eruptive milia (MEM) is another rare milia presentation distinctly characterized by a large number of milia in a given skin area developing suddenly over weeks to months.[1]

Traumatic causes of secondary milia include abrasion,[5] tattoos,[6,7] dermabrasion,[8,9] radiotherapy,[10] chemical peels,[11] skin grafts,[12,13] and ablative laser therapy.[14] There are reports of trauma-induced milia en plaque after cryotherapy.[15]

Gasoline is a petroleum-based liquid that is often used by farmers as a cleaning agent to remove oil and engine grease from their hands. Petroleum is a product known to induce milia formation; therefore, it is reasonable to suggest that cutaneous gasoline exposure is also capable of inducing milia formation. This patient's history of recent gasoline exposure placed a benign process like eruptive milia high on the differential diagnosis list, but there are serious, mimicking conditions that should also be considered for an eruptive, papular rash on the dorsal hands.

Porphyria cutanea tarda (PCT), a disease resulting from a defect in the heme biosynthesis pathway, presents with friable skin and blisters on sun-exposed body areas. PCT is important to rule out in this case, as it is associated with infectious causes, can lead to liver cirrhosis, and would need prompt medical treatment,[16] Epidermolysis bullosa acquisita (EBA), an autoimmune bullous dermatosis, can also present as blisters that heal as scars.[17] The patient's lesions appeared papular instead of

bullous, and he denied sun-sensitivity. Both of these conditions were able to be ruled out by history. If history had been less diagnostic, a biopsy for H&E and direct immunofluorescence (DIF) can differentiate between milia, PCT, and EBA. If porphyria is suspected via history and biopsy, lab work can differentiate between the different types of porphyria.

Gasoline is a known skin irritant, and this case report describes a benign sequalae of gasoline exposure as the development of milia en plaque. This case highlights the importance of obtaining a thorough history and being familiar with cutaneous conditions caused by household irritants used by many members of our local industrial and agricultural communities.

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COVID 19 and Spontaneous Esophageal Perforation: A Case Report

Abstract

Pulmonary manifestations of the novel coronavirus, COVID-19, have been discussed heavily in the literature; however, there has been no literature to date discussing the pathophysiology or incidence of esophageal perforation in the COVID-19 patient. This case report describes a 65-year-old COVID-19 positive male presenting with an atypical presentation of a spontaneous esophageal perforation highlighting the special techniques required to diagnose and treat the patient.

Introduction

While COVID-19 has been classified as a predominantly respiratory illness, some patients have had involvement of other organ systems including neurological, gastrointestinal, and hematological symptoms.[1] Pneumomediastinum as well as mediastinal lymphadenopathy have been reported in COVID-19 patients.[2-3] There has been no association described in the literature between COVID-19 and esophageal perforation. This case report describes an esophageal perforation in a patient with COVID-19.

Case Presentation

This is a 65-year-old male with history of previous distal esophageal perforation from vomiting (Boerhaave's type) treated with an esophageal stent and gastrojejunostomy tube in 2017. In April 2020, he presented to the emergency department with intractable nausea and vomiting. This had started two days earlier with an episode of hematemesis followed by dyspnea and intermittent fevers. His only home medications were a proton-pump inhibitor and sucralfate. An initial chest x-ray was obtained and demonstrated bilateral lower lobe effusions. Laboratory abnormalities included leukocytosis of 17,400, acute kidney injury (creatinine of 1.6 mg/dL), hypokalemia (potassium of 2.7 mmol/L) and lactic acidosis of 2.4 mmol/L. D dimer was slightly elevated and anion gap was 16. A CT scan performed to evaluate for pulmonary embolism in the emergency department revealed extra-luminal air posterior and to the right of the esophagus concerning for a perforation and bilateral effusions. He was transferred to our institution for a higher level of care.

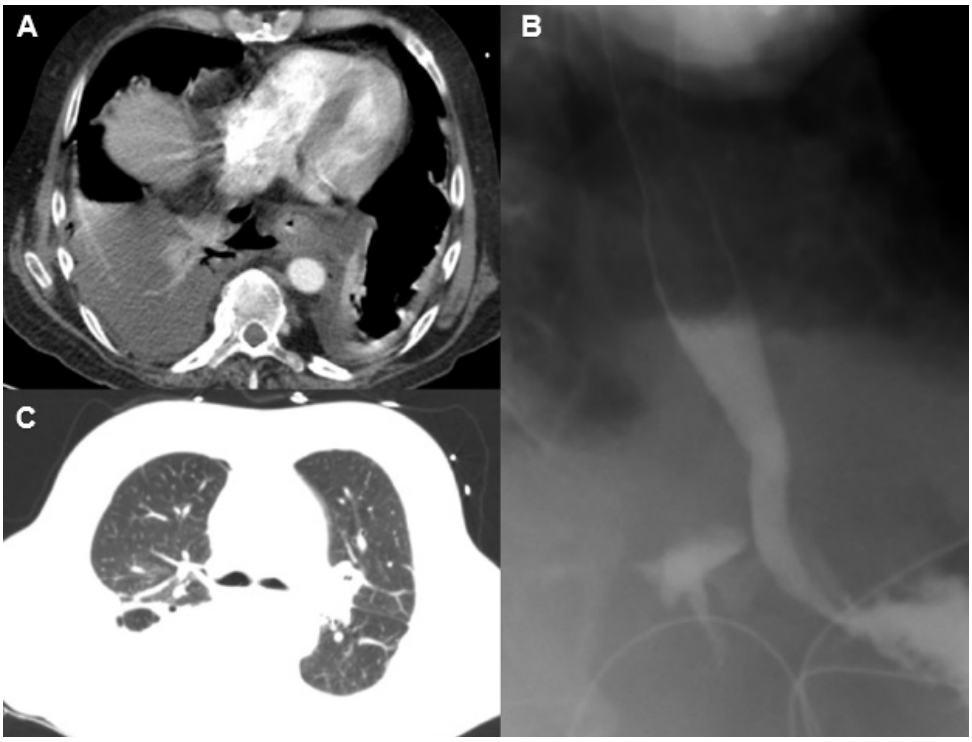

FIGURE 1: A-ESOPHAGRAM UPON PRESENTATION, REVEALING LEAK OF CONTRAST MATERIAL INTO RIGHT POSTERIOR CHEST; B-INITIAL CT SCAN SHOWING BILATERAL EFFUSIONS; C-INITIAL CT SCAN SHOWING LACK OF CLASSIC RADIOLOGICAL FINDINGS OF COVID-19.

On arrival, his vitals were: pulse 65, blood pressure 93/56, SpO2 100%, and temperature of 36.5 C. On review of systems, he endorsed some dyspnea and malaise. He was retired and reported living a relatively isolated life in a small rural town. He had a history of alcoholism in the past, but currently consumed two-to-three alcoholic drinks per day and did not use tobacco. He reported a lessened desire to consume alcohol in the days prior to presentation, with no heavy alcohol abuse leading up to the vomiting event. He had diminished breath sounds bilaterally, a soft abdomen, and well-healed midline laparotomy incision and gastrostomy site. A CT scan with contrast showed severe esophageal edema at the distal third, with a complex pleural fluid collection in the posterior mediastinum, suspicious for perforation (Figure 1A). A water-soluble contrast esophagram demonstrated obvious leakage of contrast material, confirming esophageal perforation (Figure 1B). He met screen criteria for COVID-19, including fevers, malaise, and cough; therefore, a COVID-19 test was performed via nasopharyngeal swab in the intensive care unit upon arrival. The rapid qualitative RT-PCR test resulted as positive even though his CT scan did not have any of the classic findings of COVID-19 (Figure 1C).

(CONTINUED ON PAGE 66)

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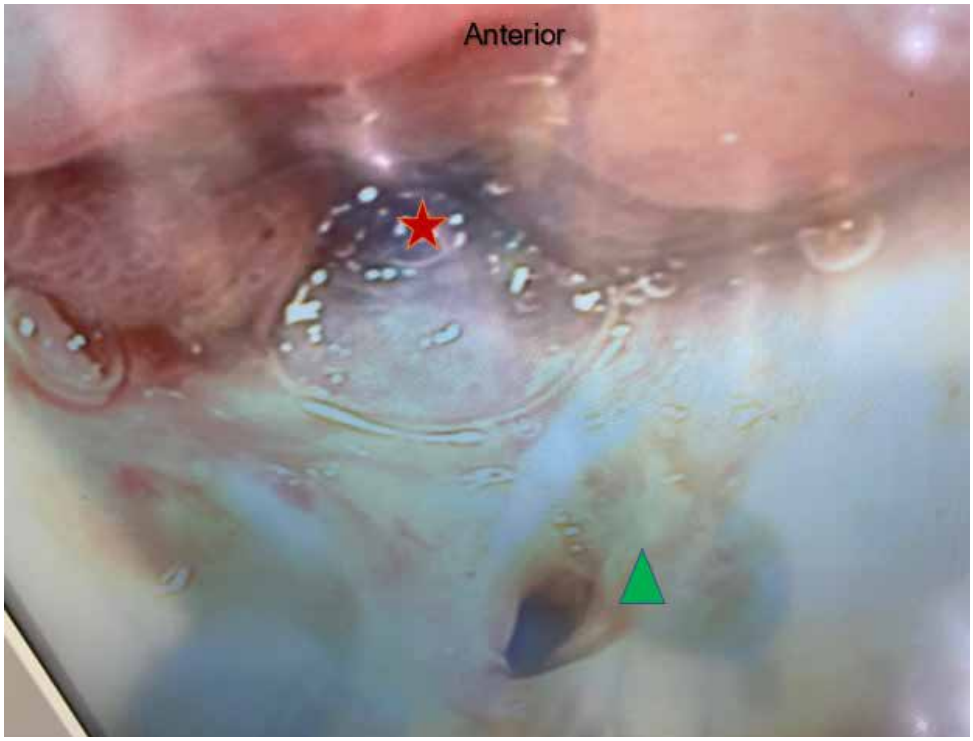

FIGURE 2: ESOPHAGOGASTRODUODENOSCOPY; STAR DENOTES GE JUNCTION, TRIANGLE REPRESENTS PERFORATION AT RIGHT POSTERIOR ESOPHAGUS.

He was taken emergently to the operating room. The esophagogastroduodenoscopy revealed a 2-3 mm perforation at 39 cm from the incisors at the four o'clock position, with the gastroesophageal junction at 40 cm from the incisors (Figure 2). Because of the perforation having occurred almost 48 hours prior and due to the relatively small size of the defect, it was felt that an esophageal stent was the best option to address the perforation. An EndoMaxx (Merit Medical, South Jordan, UT, USA) 23x150 millimeter fully covered esophageal stent was deployed successfully, with fluoroscopic guidance (Figure 3A, 3B). A gastrojejunostomy tube was endoscopically placed through the patient's previous gastrostomy site. Bilateral thoracoscopic decortication was performed, left followed by right, with extensive contamination of gastric contents into the pleural spaces, more significant on the right. A LigaSure device (Medtronic, Dublin, Ireland) was used to open the pleura around the esophagus near the site of the perforation to allow drainage of the mediastinum. Nasogastric tube decompression of the stomach along with gastric gravity decompression via gastrojejunostomy tube was continued until post-operative day eight, when a repeat esophagram was performed to evaluate for leak, which was negative (Figure 3C). He was initiated on a clear diet and then advanced to full liquids. His chest tubes were removed on post-operative day 10 and 11, sequentially, following further demonstration of clinical stability.

This suggests our patient may have had pulmonary signs of COVID-19, which were likely subclinical and not the primary manifestation of the disease.

Infectious disease service was consulted and suggested using clinical markers to track COVID-19 infection including IL-6 and CRP.[4] His CRP initially drawn on post-operative day four was 105.10 mg/L and IL-6 on post-operative day five was elevated to 145.7 pg/mL. These trended downward to a value of 12.90 mg/L and 26.1 pg/ml respectively, on post-operative day seven, when a repeat COVID-19 test resulted as negative suggesting clinical resolution of COVID-19 infection.

He remained on the COVID-19 isolation floor throughout his hospital stay. Our patient refused alcohol withdrawal prophylaxis and never showed signs of alcohol withdrawal. He was maintained on antibiotics and anti-fungal agents for 13 days and was discharged home with oral antibiotic and anti-fungal treatment on post-operative day 13 in good condition, with plans to remove esophageal stent and repeat his esophagram in four weeks.

Discussion

To our knowledge, this is the first case report describing spontaneous esophageal perforation in a patient with COVID-19.

The patient's chest x-ray and CT scan did not reveal any of the classic radiologic findings of COVID-19 (Figure 1C). It has been noted that the radiological findings of ground-glass opacities are more commonly located in the lower lobes in a subpleural distribution,[5] which may have been obscured by the bilateral effusions in our patient caused by the esophageal perforation. Bronchoscopy performed at the time of surgery demonstrated extensive mucous production bilaterally. This suggests our patient may have had pulmonary signs of COVID-19, which were likely subclinical and not the primary manifestation of the disease.

Most Boerhaave's perforations are seen preferentially on the left side, due to structural weakness at that portion of the esophagus.[6] Spontaneous recurrences are rare.[7] Given his history of emesis, we anticipated the perforation on the left-posterior location, but clearly, spontaneous perforations can occur on either side, which emphasizes the importance of pre-operative imaging.

It is also important to note challenges in caring for patients with COVID-19 and esophageal pathology. We administered fluid conservatively to prevent pulmonary edema. We also faced challenges with obtaining an esophagram, given that our fluoroscopy suite lacked negative pressure air clearance. To combat this, we taped off the doorways, wore N95 equipment for airborne precautions throughout the procedure, and terminally cleaned the room afterwards. Assessment and management of esophageal perforations is time sensitive due to rapid progression of mediastinal sepsis. Although the patient had COVID-19, he was able to undergo diagnosis and treatment in an expeditious manner, and no health care providers involved in the case subsequently contracted COVID-19.

This case report depicts an esophageal perforation in a patient with COVID-19. While there has been no conclusive evidence linking esophageal perforations as a complication or presentation of COVID-19, more research and observation of COVID-19 patients is required to determine whether an association exists.

Acknowledgements

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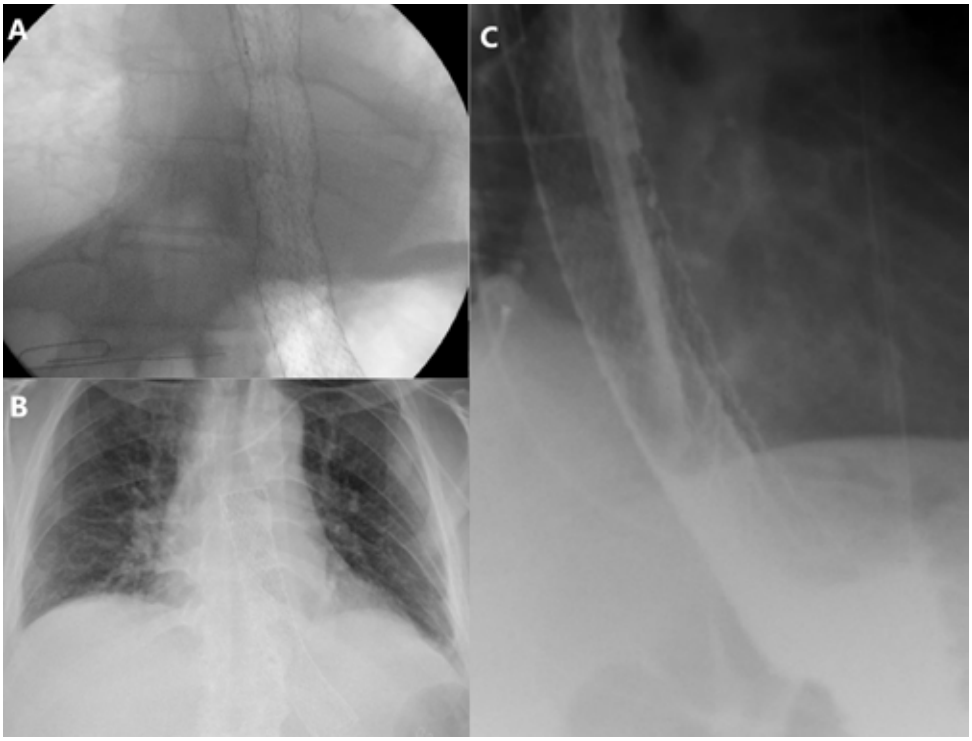

FIGURE 3: CLOCKWISE FROM LEFT: A-STENT PLACEMENT UNDER FLUOROSCOPIC GUIDANCE, PAPERCLIP DENOTES GASTROESOPHAGEAL JUNCTION; B-CHEST X-RAY ON DAY 13, WITH STENT AND NO RADIOGRAPHIC EVIDENCE OF COVID INFECTION; C- ESOPHAGRAM ON DAY EIGHT.

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Left Ventricular Apical Ballooning: An Acute Mimic of Myocardial Infarction in the Community Setting

Introduction

Takotsubo cardiomyopathy (TC), colloquially known as apical ballooning syndrome, is a temporary heart condition that occurs almost exclusively in women.[1] With an unknown etiology, TC remains a difficult diagnosis without reasonable suspicion, especially considering its similarity to suspected acute coronary disease.[2] The pathophysiology of Takotsubo cardiomyopathy is not entirely understood but commonly presents under severe emotional and physical stress, acute illness, psychiatric event, or injury.[3] Although most patients recover within a month, clinicians who can recognize this uncommon syndrome will save hospital resources and patients from unnecessary, invasive treatments and tests. Patients falsely diagnosed with a myocardial infarction in the hospital setting undergo an invasive cardiac catheterization that reveals no acute blockages; this confounds many clinicians and TC is therefore sometimes a diagnosis of exclusion. Along with the avoidance of intrusive tests, early diagnosis often leads to a different treatment plan than that of an acute myocardial infarction. This suggests the treatment plan is also in part due to the lack of evidence of long-term therapy efficacy.

All clinicians, regardless of specialization, can benefit from the patient described in this report. The patient described in this report is a peculiar case involving comorbidities that include chronic obstructive pulmonary disease, coronary artery disease, and diabetes type 2; these increase the difficulty in diagnosing this rare syndrome.

Case presentation

A 78-year-old caucasian man with a past medical history of gastroesophageal reflux disease, chronic obstructive pulmonary disease, chronic back pain, essential hypertension (HTN), and diabetes mellitis presented with substernal pleuritic chest pain, shortness of breath, and lightheadedness that began at home. The patient has no significant family history. He is ambulatory at home and lives by himself with nearby family. He has smoked a pack of cigarettes per day for 55 years. Home medication includes 5mg amlodipine for HTN, 20mg benazepril for HTN, 80 mg simethicone for COPD, 1 tab glimepiride for diabetes mellitis, and 50 mg tramadol oral tablet as needed every four hours for pain.

FIGURE 1: INITIAL ELECTROCARDIOGRAM SHOWING ST ELEVATIONS IN LEADS II, III, AVF, AND V3–V6.

During his presentation in the emergency room, his vital signs were the following: febrile (37.8 °C), heart rate of 108 beats/min, blood pressure of 113/69 mmHg, respiratory rate of 16 breaths/min, and oxygen saturation of 94% on room air. On presentation, he was well-appearing, well developed, and in no acute distress. His skin was pink, warm, dry, and intact with no visual or suspicious lesions. His head was normocephalic and atraumatic without any masses. His eyes were symmetric, equal, round, and reactive to light. Ear, nose, and throat exam revealed no masses or deformities. Lung exam noted decreased air entry at the bases, with normal rhonchi. Heart sounds were regular rhythm and rate without rubs, gallops, or murmurs. Abdominal exam revealed nontender, non-distended abdomen with no masses or organomegaly. Patient was alert and oriented to person, place, and time with no gross motor strength defects.

His laboratory studies revealed a hemoglobin level of 10.9 g/dl (normal range for males, 14.0 to 18.0 g/dl) and a troponin I level of 0.84 ng/ml (normal range, 0 to 0.4 ng/ml). Other laboratory findings, including electrolytes, liver function tests, renal function tests, complete blood count, serology, coagulation, and urinalysis, were all within normal limits.

An initial ECG was notable for ST elevations in leads II, III, aVF, and V4–V6, concerning for ACS (Figure 1). He was given aspirin, nitroglycerin, and intravenous heparin before the cath lab. Left heart catherization was performed from the right femoral artery approach. It demonstrated nonobstructive coronary artery disease with 50% left ventriculogram and basal segment hypokinesis, consistent with the diagnosis of apical balloon syndrome (takotsubo

cardiomyopathy) (Figure 2). Following the procedure, his chest pain and shortness of breath resolved, and repeat EKG showed resolved ST elevations. (Figure 3).

Discussion

Although Takotsubo remains an elusive illness, a reasonable suspicion from clinicians can improve health outcomes in patients presenting with non-specific cardiac symptoms with numerous comorbidities. Bringing awareness of the integration of multiple body systems including neural, autonomic, endocrine, and circulatory in emotionally distressed patients will allow providers to create treatment and prevention strategies for future patients.[4] Prompt treatment in the acute stage can prevent life-threatening complications like arrhythmias, thromboembolism, and cardiogenic shock.[5] Although the pathophysiology of Takostsubo is unknown and suspected to be multifactorial, there are a few proposed mechanisms. The main proposed mechanisms include myocardial ischemia, left ventricular outflow tract obstruction, and hyperactivation of the sympathetic nervous system.

Microvascular dysfunction leading to myocardial ischemia has been suggested by researchers as a mechanism leading to Takotsubo syndrome.[6] Although patients usually have a coronary angiography performed in suspicion of an atherosclerotic plaque blockage, most results reveal an absence of coronary pathology. A limitation of coronary angiography imaging is the lack of ability to visualize the blood vessels on a microscopic scale, including microcirculation. There is conflicting literature about microvascular involvement in the development of this syndrome. Left ventricular outflow obstruction in Takotsubo patients may cause dangerous decreases in blood pressure leading to cardiogenic shock. Literature studies have found a correlation between a small left ventricle size and mid-cavity obstruction.[7] This could lead to the ballooning effect found in Takotsubo, but this does not explain damage to the basal layer and sparing of the apices. Therefore, outflow obstruction is thought to be more of a complication rather than a cause for this syndrome.

FIGURE 2: LEFT VENTRICULAR ANGIOGRAPHY IN SYSTOLE DEMONSTRATING SEVERE HYPOKINESIS OF THE LEFT VENTRICLE WALL SEGMENTS IN SETTING OF NONOBSTRUCTIVE CORONARY ARTERY DISEASE.

Many facets of this condition are not completely understood, and current knowledge to guide optimal clinical management is limited. The increasing incidence supports the importance of recognizing and improving care for those with Takotsubo syndrome with establishment of global registries.

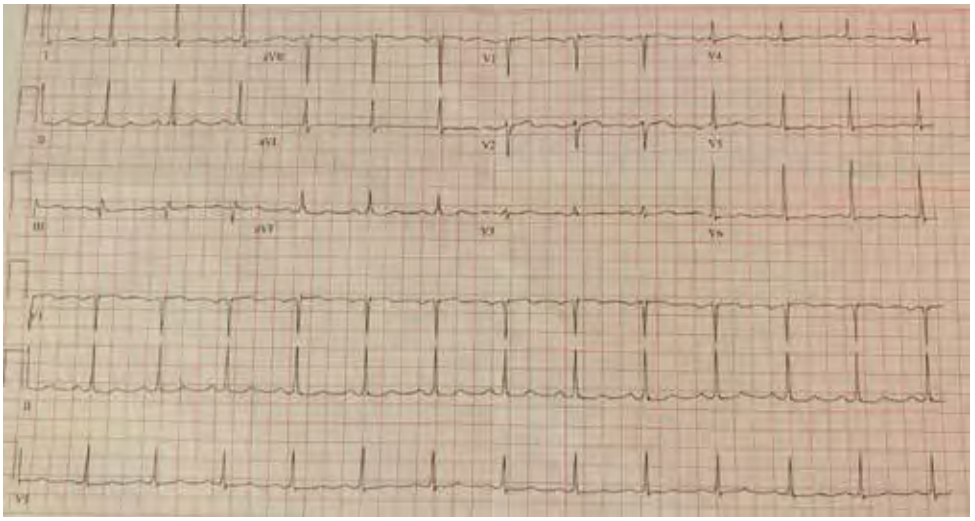

FIGURE 3: REPEAT ELECTROCARDIOGRAM OBTAINED 24 HOURS AFTER THE INITIAL ELECTROCARDIOGRAM SHOWING NORMAL T-WAVE PROGRESSION AND RESOLVED ST ELEVATIONS IN LEADS II, III, AVF AND V3–V6.

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Make a Difference

Each one of us can make a difference. "Together we make change" is a quote from Barbara Mikulski. I am sure she was not referring to the difference we make every day practicing medicine nor was she referring to the change we make when we all work together in politics. We are fortunate that there are politicians in our state that have a health care background, including Senator John Boozman, Dr. Stephen Magie, Dr. Joe Cloud, and Dr. Lee Johnson. Prior to his political career, Sen. Boozman graduated from the Southern College of Optometry in 1977 and practiced as an optometrist. Dr. Magie is a state representative from Conway and continues to practice as an ophthalmologist. Dr. Cloud is a retired obstetrics and gynecologist who is now a state representative from Conway.

Dr. Lee Johnson has over 25 year of experience as an emergency medicine physician, as well as many years of experience in medical administration and city government. He has served in the Arkansas House of Representatives since 2019. We sat down with Dr. Lee Johnson to gain insight into the 2021 legislative session, since there are many bills that affect the practice of medicine directly and indirectly. We were most intrigued by the "pharmacy bill" amended by Dr. Johnson himself. We asked him to discuss with us the two pieces of legislation that most impact doctors practicing medicine.

Act 503, colloquially known as the Walmart Pharmacy Bill, was created to allow pharmacists to treat certain health conditions, to modify pharmacy therapeutic substitution, and to allow delegation of physician dispensing. "You could write a whole article just on this bill," Dr. Johnson emphasized as we spoke about the different parts to this bill. These new reforms affect numerous physicians and pharmacists who practice in the state. Given the bill's widespread effects on the Arkansas health system, it is essential for medical providers to understand its key points.

The first part of this bill allows pharmacists to treat influenza and streptococcus A pharyngitis, following a statewide written protocol. Currently in Arkansas, pharmacists can test for flu and strep but can only treat under an individualized protocol with a local physician. This bill standardizes the treatment protocol statewide. Once the law is enacted, the written protocol will be developed between the Arkansas Pharmacy Board and the Arkansas Medical Board, with the Medical Board having the final approval.

The second part of this bill allows pharmacists to write prescriptions for over-the-counter (OTC) medications, supplies, and devices that are covered by a patient's insurance provider as a cost-reduction measure. For example, patients on Medicaid many times need prescriptions for OTC medications such as acetaminophen to allow insurance payment of these drugs. With the Pharmacy Bill, pharmacists can now write and fill these OTC medications for patients at the pharmacy, saving both the physician's and the pharmacist's time by eliminating the need for the prescribing physician's verbal or written prescription.

The third part of Act 503 allows for therapeutic substitution if it provides a cost-benefit to the patient and is not specifically prohibited by the prescribing physician. Therapeutic substitution permits pharmacists to replace medications of the same class based on insurance coverage and availability. Instead of calling the prescribing physician to get approval to substitute one medication for another, HB1246 allows the pharmacist to do this independently. This reduces financial burden on patients and increases the overall efficiency of this process. If a physician does not want a drug substitution, the physician simply checks "dispense as written," and this will prevent therapeutic substitutions.

The pharmacy bill does not just affect pharmacists. It also allows physicians to dispense certain medications including anti-inflammatory medications, anti-nausea medication, antibiotics, antihistamines, cough medications, anti-hypertensives, diabetic medications, and cholesterol medications. For the maintenance medications including anti-hypertensives, diabetic medications, and cholesterol medications, physicians can now dispense the first 30 days of this medication. The subsequent prescriptions must be filled at a pharmacy. Allowing physician dispensing will presumably prevent unfilled prescriptions and increase patient compliance, as patients can now leave the office with the medication in hand.

Rep. Lee Johnson, MD is also excited about his bill HB1781, now Act 758. "What is great about this bill is it increases access to care and allows patients to get the medications they need," says Rep. Johnson. Previously, Medicaid beneficiaries were limited to three Medicaid-paid prescriptions per calendar month. With Act 758 reform, Medicaid benefits will be expanded to allow six Medicaid-paid prescriptions per month. While most medications count toward the six prescriptions per month, certain prescriptions are exempt and do not count against the monthly limit, such as tobacco-cessation products and family planning items. Under Act 758, the category of exemption medications was broadened to include prescription drugs used in the management of high blood pressure, hypercholesterolemia, blood modifiers, diabetes, and inhalers to treat respiratory illness. Rep. Johnson says, "now patients don't have to choose which medications they can afford."

These are only two of the many legislative actions that will impact how we practice medicine. To read more about these bills and others, please visit www.ARKMED.org/advocacy. We also encourage you to consider becoming more active in the politics of practicing medicine. We realize that we are preaching to the choir since, if you are reading this article, you already are a member of the Arkansas Medical Society. Time and money are two of our valuable and finite resources. If you have more time than money, please consider contacting Scott Smith at the Arkansas Medical Society or your local representatives on how you can become more active in our great state. If you have more money than time, please consider contributing to ARKMED-PAC or your specialty society political action committee. We consider our annual contributions to PACS the best insurance policy for the practice of medicine. We look forward to hearing your thoughts and opinions. This is a rapidly changing time for the practice of medicine—we want to be a part of the change.

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