THE Journal
OF THE ARKANSAS MEDICAL SOCIETY
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Too Scared to Look

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Feature Articles

WHAT HAVE WE DONE FOR YOU LATELY?

Session Going Hot and Heavy

DAVID WROTEN
EXECUTIVE VICE PRESIDENT

We are now in the trenches of the legislative session. By the time you receive this issue of *The Journal*, the General Assembly will have begun the process of holding hearings on scope of practice bills. Today, January 28, is the final day to file legislation that increases the scope of practice for health care providers. Once filed, there is a two-week waiting period before hearings begin.

Before today is over, we expect several scope of practice bills to be filed. Here is what we know, as well as what we expect.

Optometry – As part of a national effort, optometrists have filed legislation to allow them to do surgery. Three states allow them to perform surgical procedures on and in the eye and surrounding tissue. Three other states allow them to do surgery on the eyelid. AMS has already been working with the state and national ophthalmology organizations to educate legislators on the dangers of this legislation, and the public is joining the fight. A poll of Arkansas voters shows overwhelming opposition, with 85% saying Arkansas should reject this legislation.

Advance Practice Nurses – We expect several bills to be filed before the day is over that would expand the scope of APRNs. Among those bills will be attempts to allow prescribing for Schedule II drugs, repeal of the collaborative practice agreement requirement, mandated equal reimbursement as physicians, and mandated recognition as primary care providers for programs like Medicaid and the patient-centered medical home. Nurse practitioners are good at what they do and have an important role in patient care, but the interests of patients are best served when nurse practitioners work as part of a health care team. Arguments that they are as well trained as primary care physicians simply do not hold up to scrutiny. Fast-track, and internet-based APRN programs are no replacement for four years of medical school and three years of patient-centered, clinical residency programs.

Certified Registered Nurse Anesthetists – CRNAs are advanced practice nurses with additional training in anesthesia care. Their practice act allows them to administer anesthesia "under the supervision of a physician." That usually means an anesthesiologist. However, in many places – like rural Arkansas and even ambulatory surgery centers, where anesthesiologists are unavailable – the supervising physician is usually the operating surgeon. CRNAs say that removing the supervision requirement will increase access. The reality is that they are already practicing anywhere they wish. The supervision requirement, particularly in the case of it being the surgeon, acts as a safety valve with the surgeon assuming his or her rightful place as the head of the surgical team. There is no evidence that removing the requirement will increase access.

Pharmacists – The pharmacy profession is changing rapidly, with multiple organizations playing a role in legislative issues. You have organizations representing chain pharmacies, others representing community pharmacies, and then others, like the Arkansas Pharmacists Association, representing them all. This session, we anticipate dealing with efforts to expand pharmacists' ability to give immunizations, dispense oral contraceptives, and dispense anti-smoking drugs – all under a general, statewide protocol. Back for the third session will be legislation to allow substitution of interchangeable biosimilars. I have to say that unlike the other health care provider groups, pharmacists actually try to work with us, often resulting in legislation that benefits both professions. The biosimilar substitution bill is a joint effort of AMS and APA, but it is too early to determine whether we will reach agreements on the other issues.

So, those are the scope of practice bills we know are going to be introduced before the day is over (1/28/19). There may very well be others. One thing is certain: **your involvement and attention to these issues is crucial.** Don't be lulled into thinking that just because *we* believe it's bad medicine, that legislators will believe that as well. If they do not hear from their physicians back home on these issues, they could easily assume you are ok with, for example, optometrists performing surgery. AMS

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It's Hard to Envision the Future While Constantly Reviewing the Past

My wife and I recently took a vacation to Colombia; yes, Colombia. When telling family and colleagues our plans, there was a similar look of consternation on everyone's face. The next most common response was, "Isn't that dangerous?" I even had a patient tell me the day before we left, "Don't you know that country's government is corrupt and terribly dysfunctional?!" (The irony, of course, was that his statement was made in the midst of a prolonged government shutdown right here at home, with political parties paralyzed by scandal and the inability to compromise.)

The truth is that Colombia has made great strides over the last decade and has become a frequent travel destination for people from all over the globe. In fact, Medellin (yes, the city most notorious for the crime and devastation of the Escobar Cartel days) was voted the most innovative city in the world in 2013. In doing so, it beat out Tel Aviv and New York with developments in urban planning and cultural insight. What did city leaders do to deserve this? They used multiple methods of new public transportation to bring together a community of citizens that were previously isolated from both entering the city center easily and from getting organized police protection in their borough due to a challenging topographical terrain. These new transportation methods include a large north/south and east/west transit train; smaller trams out from the main transit line; and escalators and cable cars to assist with ascending/descending steep hillsides that previously would take a significant endeavor to conquer. What previously might have taken a typical citizen several hours in transit each day for work, now can be accomplished in a matter of time that would be considered a reasonable commute. When you ask people in this city how this progress can be made so quickly in the shadow of a recent violent past, they would say, "You can't dwell on the past, you can only acknowledge your history and move on."

How is this important to the practice of medicine? Well, like many of you, I spend a significant amount of time every month in meeting rooms combing over data from last month, last quarter, and last year. We are assessing length of stay for inpatients, dynamics surrounding re-admission rates, and workflows in various patient care settings. This is clearly a necessary evil, as we often identify areas for quality improvement measures to be implemented and maybe even an unnoticed change in workflow that alters efficiency. As an educator of residents, I attend regular meetings to review cases and assess the outcomes of particular cases based on plans of care. Again, this is necessary for identifying areas of improvement. As a teacher of medical students, I am involved in group discussions to recognize ways of teaching an ever-changing style of learners on our local level, but globally the literature continues to look back and discuss the Flexner report and "the way it was."

While all these areas of reflection are important, we need to accept the reality that the individual patient sitting in front of you today sees little-to-no benefit in our length-of-stay data moving a decimal point and our learners (who are changing more rapidly than ever as technology allows for easier dissemination of resources) will likely obtain zero benefit from another re-assessment of the teaching methods employed decades ago. Let's not dwell on these aspects of our past, but rather acknowledge them and spend more time focusing on innovation for the future.

Now, I am not pretending to have a list of solutions just waiting to be implemented, but maybe it is time to "reinvent the wheel," which is something people have been urging me *not* to do as far back as high school. At our most recent AMS meeting in Heber Springs, we spent time in small groups discussing our vision for the future as a medical society. In doing so, we came up with ideas regarding possible political efforts, educational endeavors, and how we can work as a collective group of physicians to combat impending obstacles. Within these groups, we were no longer specialists, surgeons, or primary care providers. Instead, we were doctors focusing on the future without dwelling on the past. While precious time to sit and ponder is not something many of us have an abundance of, I encourage all of us to use at least some of this time to think about the future of our practice and innovations that can be implemented to directly address patient care moving ever forward. A lesson learned from those with less to take for granted. AMS

by CASEY L. PENN

Too Scared to Look
Are You Maintaining Medical Cybersecurity?

William "Trey" Whatley, a Federal Bureau of Investigation special agent and Cyber Action Team member, warned AMS members at last year's annual session about the importance of cybersecurity. "I want you to understand how hostile the environment is for medical information," he said. "A credit card can be replaced … but a person's health information is simply private or public. You can't just change your medical history – your diagnosis, your prescriptions, your blood type, DNA, anything like that is intimately associated with you. When that loss happens, it's a serious matter."

Despite the serious warning, many seem to have a general disregard for learning more about cybersecurity.

Is it too technical, are we too busy, or are we just fearful to the point of inaction? Loretta Duncan, MS, FACMPE, CHC, is a senior medical practice consultant for SVMIC (State Volunteer Mutual Insurance Company), the AMS-endorsed carrier for medical professional (malpractice) insurance. She helps explain what could make some of us disregard a topic like ***cybersecurity.*** "I think the idea of cybersecurity is so overwhelming and frightening that it seems easier to ignore than to actually deal with," said Duncan. "Unfortunately, ignorance can lead to a lack of protection that can jeopardize patient care, practice reputation, and financial stability."

Avoidance may indeed be a dangerous mentality, according to information shared by The Office of the National Coordinator for Health Information Technology. Its Guide to Privacy and Security of Electronic Health Information (2015) states, "Health care providers may believe that if they are small and low profile, they will escape the attention of 'hackers' … Yet every day there are new attacks aimed specifically at small to mid-size organizations because they are less likely to be fully protecting themselves. It is important to have strong cybersecurity practices in place to protect patient information, organizational assets, your practice operations, and your personnel, and of course to comply with the HIPAA Security Rule. Cybersecurity is needed whether you have your EHR locally installed in your office or access it over the Internet from a cloud service provider."

Cybercrime is a common occurrence that is only growing in the health care sector. According to 2015 data from the Identity Threat Resource Center, the medical sector ranked "second in the number of breaches reported (35.4% of 780 total breaches) and first in the number of affected records (over 121 million records)."

The Department of Health & Human Services, in its National Cybersecurity Awareness Month Newsletter (October 2018) shares that electronic protected health information, or ePHI, is a hot commodity on the black market – more so than other personal data "because it can be used to steal identities and commit health care fraud."

As frightening as this subject can be, there *are* things you can do to help protect your clinic and patient information from today's prevalent cyber threats.

A List of Prevalent Threats

Identify Threat Resource Center data named hacking, or phishing, as the number one strategy of attack by cybercriminals. (The number two risk to cybersecurity? Employee error or negligence!)

From the DHS newsletter, "Phishing remains one of the most common and effective social engineering tactics for stealing user credentials and other sensitive information. Malicious actors send deceptive emails to users, enticing them to disclose login credentials or click links that may install malware (malicious software). The effectiveness of phishing attacks can be greatly reduced with proper training to keep information system users aware of the threats of phishing attacks and business associates to implement security awareness and training programs for all workforce members including management."

Susan Decareaux, CPCU, RPLU, CISR, is the assistant vice president of Underwriting, Pricing & Risk Analysis at SVMIC. On *phishing*, she wrote, "Employee education is important. Cybercriminals are getting smarter and are able to disguise their phishing emails to appear to come from one of your vendors or another trusted source. Caution should be used before opening any attachment, and verification of the email source should be done for all incoming emails, especially those with an attachment."

The cost to respond to a data breach, according to SVMIC data, is "$10-30 per patient record," a number that includes notification expenses, legal fees, and credit monitoring services. "Additional costs such as IT forensics and potential fines or penalties could lead even a small breach to cost well over $100,000."

Other risks, some more preventable than others, fall under what Whatley earlier dubbed a "lack of preparedness." These may be eliminated easier than some other threats, with help from qualified personnel. They include open or unsecured Wi-Fi, vulnerable network connections, unvetted employees, and unguarded devices. "In your clinics, technology is all around," Whatley shared. "If there's a laptop in a room that is accessible by patients or other people – can it be physically removed? Is it encrypted? Is the data encrypted in place?"

As physicians or clinic managers, you should routinely discuss cybersecurity with a proven and trusted IT provider who can make sure you're aware of where your data is and how it's being protected. **(For helpful tips related to choosing your IT provider, see our sidebar on page 200.)** In addition, you and your IT department may need to take steps to secure your network and remote configurations through encryption. ***Encryption*** is defined (DHS newsletter) as "the conversion of electronic date into an unreadable or coded form that is unreadable without a decryption key."

In addition, are you utilizing anti-malware, proper setup of audit logs, and regular generation of secure, tested, hack-free backups? Are you monitoring regularly to catch breaches sooner rather than later? Further defenses to investigate may include whitelisting, proper patch management (updates), a reduced attack surface (limiting what plugs into your network), segmenting, and authentication management (frequently changed, complex passwords).

Another growing threat is ***ransomware***, defined by The Ransomware and HIPAA Fact Sheet (DHS) as "a type of malware (malicious software) distinct from other malware; its defining characteristic is that it attempts to deny access to a user's data, usually by encrypting the data with a key known only to the hacker who deployed the malware, until a ransom is paid. After the user's data is encrypted, the ransomware directs the user to pay the ransom to the hacker (usually in a cryptocurrency, such as Bitcoin) in order to receive a decryption key. However, hackers may deploy ransomware that also destroys or exfiltrates data, or ransomware in conjunction with other malware that does so."

Coverage If and When

A professional and proven IT services is obviously important. However, when you're attacked by cyber monsters, another tool that may assist you is proper insurance coverage. Through your medical malpractice liability coverage, you may already have some coverage against security attacks; however, a devoted policy to this effect may offset the cost of recovery.

"Although not all attacks can be prevented, a partnership with a cybersecurity insurance company can facilitate your response and mitigate the damages," wrote Decareaux (SVMIC.com). "Where SVMIC's professional liability policies already include supplemental cybersecurity coverage in the amount of $50,000, SVMIC partners with NAS Insurance Services to offer access to further coverage at discounted premiums."

As to the worth of the added coverage, Decareaux described a group of six primary care physicians in middle Tennessee who decided to purchase it. "The practice administrator realized that the potential risk of a cyber-attack or information technology system failure and the ensuing costs to recover data, possible lawsuits, and regulatory fines and penalties could add up to more than the basic limits provided by SVMIC," she wrote. "The group had experienced minor losses … some involving errors by their own staff, and one protected health information violation was caused by an outside vendor.

"These experiences convinced the administrator how vulnerable the group was to potential loss … with the estimated cost of a cybersecurity loss at a minimum of $30 per record, and possibly more due to the potential for regulatory fines and penalties, it was relatively easy to see that the potential for loss is great, and by contrast, the premium is relatively affordable."

According to Decareaux, the Tennessee practice also implemented mandatory staff training on PHI and HIPAA and put in place an extensive internal and external IT security system that meets or exceeds Federal Meaningful Use PHI and IT standards.

Security standards such as these can be a challenge to keep up with. Duncan, who specializes in HIPAA privacy, security, and breach notification compliance, reminds physicians that, in addition to malpractice coverage, SVMIC offers education and regulatory help on the subject right here in Arkansas. "Being the victim of a cybersecurity incident can trigger many negative outcomes for a medical practice, with the worst being access to patient information and the ability to provide patient care," she said. "It is imperative that practices take the steps necessary to protect their patient data and have policies and procedures in place to act if an incident occurs. Compliance with the HIPAA Security Rule is a major step in this process."

Are you doing all you can to protect patient data? Are you meeting HIPAA requirements? Are you listening to the warning Whatley offered members last year? "The more that can be put into securing information, the better," he advised. For more information and professional assistance from experts in the fields of HIPAA and cybersecurity, call SVMIC at 870.540.9161. You can also always call AMS for more information.

Author's Note: *The Journal reached out to the FBI for further tips to share. Due to the government shutdown that was in effect during the writing of this article, the Bureau was not able to share additional information.*

ADDITIONAL RESOURCES

SVMIC

SVMIC.com shares important bulletins and related articles as well as links to important tools like the Security Risk Assessment Tool (SRA Tool).

HealthIT.gov

Through its website, the Office of the National Coordinator for Health Information Technology offers numerous related resources. For example, ONC offers "Top 10 Tips for Cybersecurity in Health Care" at http://www.healthit.gov/providers-professionals/cybersecurity-shared-responsibility.

Search its Health IT Playbook (https://www.healthit.gov/playbook) for more tools and topics of interest.

The Identify Threat Resource Center

A U.S. nonprofit support organization, the Identify Threat Resource Center exists to broaden public education about cybersecurity and to help in understanding and resolving cases of identity theft, data breach, cyber security, scams/fraud, and privacy issues.

https://www.idtheftcenter.org

IT 101 – Choosing an IT Provider & Getting Started

The following answers were provided to *The Journal* by Al Aquino of Onet-IT in Little Rock (info@onet-it.com). Aquino is the son of a practicing physician and has substantial knowledge of medical-field compliance concerns. Through his company, Onet-IT, he provides support to several medical clients that include ophthalmology clinics, a surgery center, a cancer center, and a law firm focused on health law.

Choosing an IT Provider

Does the IT provider have experience in the field you're in?

Does your IT company have previous experience serving medical clinics? You need someone who understands the industry you're in. Also, if you use certain software, you need to make sure that your IT provider is familiar with the systems you have and that they can support those servers, networks, and software that you have. For instance, are they adept at handling compliance issues related to the medical field? Can they read logs, run HIPAA compliance scans, and identify and implement HIPAA-compliant firewalls?

Can you expect reasonably fast service?

In my business, I have a tiered support response time. If you have an issue that affects business continuity, I'm going to give that priority. If a client's software has been compromised or there is some threat facing them, that takes precedence over a simple software update. As of now, 100% of my clients understand that. They know that when *they* need me in an urgent manner, I will be there.

Basic Protections – the Bare Minimum

It's hard to say what the "musts" are, as hackers can attack from many angles, but according to Aquino, there are some basic safeguards you must not ignore:

HIPPA has a three-tiered model of safeguards. It includes physical, technical and administrative security. Your IT provider should be able to help with these critical areas:

Physical – You must have physical security. Many places I visit have been following a lot of guidelines – they have the best firewalls, they have the best antivirus and ant-intrusion items in place. However, if anyone can walk right into the server room, you are not physically protected. You must have that.

Technical – This is where firewalls come in. There's a list of firewalls that are HIPAA compliant. You need anti-intrusion software – with tracking, monitoring, and logging in place.

Administrative – You need to know who has access. In other words, within your software where you keep medical records, you need to keep track of who has access to them. AMS

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- Use the Be Well fax form, which can be downloaded at **bewellarkansas.org** (the fax number hasn't changed: 1-800-827-7057)
- Call 833-283-WELL to connect patients to the Be Well Call Center. If counselors are not available, leave the patient's contact information and they will receive a callback within one business day. The number 1-800-QUIT-NOW still works and will route callers to the Be Well Call Center.

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CASE STUDY

Leadless Pacemaker Devices

Kanishk Agnihotri, MD; Sabeeda Kadavath, MD
Anil Kumar Jonnalagadda, MD; Hakan Paydak, MD

Abstract

Since their initial introduction, implantable cardiac devices have been increasingly utilized in medical practice. Leadless Cardiac Pacemakers (LPMs) function as their conventional predecessors, but they have the advantage of not requiring a transvenous lead, which can minimize the various complications associated with lead insertion. Two LPM devices are available currently; the Nanostim device and the Micra device. These share a similar design and delivery methods but differ in size and some internal characteristics. Major drawbacks of these devices are that they can only pace through the right ventricle and there is lack of long-term data regarding their utilization. Limited data is available about their use, and more research is needed to justify their incorporation into clinical practice.

Introduction

Cardiac pacemakers are extremely effective in the management of brady-arrhythmias. Since the first device insertion more than 50 years ago,[1] there has been a bonafide increase in their utilization, with advancement of implantation techniques, longevity of batteries, and the incorporation of programmable features for better physiologic pacing. More than 700,000 devices are used annually worldwide, with 250,000 in the U.S. alone.[2] Nevertheless, they all share the same core components with a subcutaneous pacing unit and electrical leads implanted into the endocardium via transvenous route.

Since most complications were related to the venous leads, there is increased interest in developing smaller devices without the need for hazardous lead insertion. Currently, there are two devices that have shown great applicability and promising results, even though they are limited by a lack of long-term results and come with certain introduction complications due to the learning curve associated with their use.[3] To date, only single-chamber pacing systems are available through the right ventricle (RV), with more to be studied and possible development of dual chamber and multi-chamber pacing.

Leadless cardiac pacing systems have been approved for use in Europe since 2013, and in April 2016 in the U.S. Currently, two leadless pacemaker systems are commercially available, with slightly different sizes and implantation requirements:[3]

1) The Nanostim device (developed by St. Jude Medical), measures 42 x 6 mm and requires an 18-French introducer sheath. 2) The Micra device (developed by Medtronic), measures 26 x 7 mm and requires a 23-French introducer sheath.

Landmark Studies

Since their introduction into practice, LPM devices have been extensively studied and are still under more research to determine their effectiveness, reliability, outcomes, and complications. We present some of the most important landmark studies regarding these devices.

The LEADLESS Trial was one of the pioneer studies to evaluate the LPM device, and enrolled 33 patients who needed RV pacing. The leadless device was delivered via transfemoral venous approach in 32 of the 33 patients (97%). Thirty-one patients (94%) were free from complications at 90 days. One patient suffered tamponade from RV perforation, which led to death.[4]

The LEADLESS II Trial was a prospective, multicenter trial and included more patients. It enrolled 526 patients who also needed RV pacing. Primary safety and efficacy endpoints were met in 300 patients,[5] who were followed for six months. Among these patients, 11 had unsuccessful device implantation. Ninety-three percent (270 of 289) met the primary endpoint of acceptable pacing capture threshold and sensing amplitude of rate response. Reported device-related complications were dislodgment (1.7%), elevated pacing threshold (which required repositioning of device (1.7%), and RV puncture and perforation leading to tamponade (1.3%).

The Micra Transcatheter Pacing Study enrolled 725 patients who needed RV pacing. In 719 patients (99.2%), the device was introduced and implanted successfully. Primary endpoint of freedom from device adverse effects at six months was 96%, and the second primary endpoint of adequate pacing capture threshold was assessed in 297 patients, among whom 292 (98.3%) reached acceptable pacing capture (at 0.24 ms pulse width).[6] Approximately 12% of patients had elevated pacing thresholds at time of device implantations, and 85% returned to normal pacing threshold at six months post-implant.[6] Long-term performance at 12 months showed that 96% remained free of major device-related complications, compared to transvenous pacemakers (HR 0.52; 95% CI 0.35-0.77).[6]

The SELECT-LV Study was a prospective, non-randomized study of safety and efficacy of leadless pacing for cardiac resynchronization therapy (CRT) among patients who "failed" conventional CRT. In this study, the leadless device was successfully implanted in 34 of 35 patients[7] and biventricular pacing was achieved in 22 of the 34 patients. Nevertheless, significant complications occurred in three patients (9%) at the time of implant and eight patients (23%) within the first month.

Components and Function

The two available LPM devices share a common design, with some differences. The first device is the *Nanostim*, which was developed in 2012 by St Jude Medical group. It consists of a cylindrical capsule that contains the power source, electrode, and circuity. It is a single-chamber pacing device and is delivered to the RV through an 18-French sheath, then fixed into the myocardium by a helical screw.[3] The Nanostim device is designed to be retrievable, which can be helpful if the pacing is not adequate and the device needs reinsertion. It uses a VVIR pacing system, and the rate response is dependent on a temperature sensor. Estimated battery life ranges from 8.4 to 12 years, depending mainly on the burden of pacing and communication with the St. Jude interpretation system via surface ECG (usually 250 Hz).

As for the Micra Transcatheter Pacing System (TCPS), it was developed in 2013 by Medtronic Inc. in Dublin, Ireland. It also consists of a cylindrical capsule, but it is smaller in size, with 26 mm and 6.67 mm in diameter. Similar to the Nanostim device, it is delivered through the right femoral vein but using a 23-French sheath. The device has self-

expanding tiles to fix it into the RV myocardium. It differs from the Nanostim device in that it is not retrievable, but it is small enough that another device can be introduced when the battery dies. It utilizes a VVIR pacing system, with the rate response based on a three-axis accelerometer rather than the temperature sensors. Pacing with low pulse allows for longer battery life, and it is programmed via radiofrequency transmission. The other important feature is that it is MRI safe.

Advantages & Disadvantages

Despite their widespread use, conventional device complications remain high. Up to 10% of patients undergoing pacemaker device implantation develop complications, with 6% chance of major complications such as venous thrombosis or tricuspid valve regurgitation.[8]

Electrical leads are very reliable and flexible, yet they are accountable for a majority of these complications. At the time of implantation, the incidence of traumatic events, including pneumothorax and cardiac perforation, can go up to 1-2.7%.[9,10] Lead dislocation rates at the time of implantation and within 30 days are 2.4-3.3% (9,10). Long-term risks include lead fracture (1-4%) (11), venous obstruction (8-21%),[12] tricuspid regurgitation (5%),[8] and infection (1-2%).[13] Furthermore, pocket-infection rates for TV systems are 1-2% at initial implant and 3-4% after generator changes.[13]

Leadless systems can also be very helpful in patients with complicated vascular access where conventional pacemakers cannot be utilized. Comparing the rates of complications, the reported rate of pericardial effusion associated with conventional pacemakers is 1% versus 1.5% in LCP and 1.6% in TPS implants.[9,14)]

Dislocation of the leadless system is not uncommon as well. Six dislocations of the Nanostim device occurred 1-14 days after implantation: four in the pulmonary artery and two in the femoral vein,[15] but no long-term dislocations occurred. All devices were then successfully removed without complication by using snares.[5] No dislodgements were reported from the Micra study.1[5]

The most significant limitation of the Nanostim and Micra devices is the restriction to single-chamber, ventricular pacing. Single-chamber pacemakers, both atrial and ventricular devices, make up less than 10% of pacemaker implants.[16] The most common reasons for implantation in the Leadless II Study were chronic atrial fibrillation with slow ventricular response (56%), sinus rhythm with infrequent pauses or syncope (34%) and sinus rhythm with high-grade AV block (9%).[5] In the Micra study, advanced AV block was the most common indication (49%), followed by sinus node dysfunction (43%).[15] Dual-chamber pacing allows for atrioventricular synchrony, which has been shown to minimize pacemaker syndrome. Furthermore, chronic ventricular pacing can lead to ventricular dyssynchrony and systolic heart failure.[16]

Indications & Contraindications

The most common indications for permanent pacemaker implantation are sinus node dysfunction and high-grade, or symptomatic, atrioventricular (AV) block. This is no different from leadless systems, with the previously discussed drawback of being only single-chamber pacers. Guidelines for implantation of cardiac pacemakers have been established by a collaboration of the American College of Cardiology, the American Heart Association, and the Heart Rhythm Society (ACC/AHA/HRS).[16] The need for permanent pacing in patients with sinus node dysfunction is based largely upon the correlation of bradycardia with symptoms or symptomatic chronotropic incompetence. Acquired AV block is the second most common indication for permanent pacemaker placement.[16] Other less common indications are congenital heart block, neuromuscular disease, long QT syndrome, HOCM, or heart failure.

Other similar contraindications are syncope of undetermined etiology, which requires extensive investigations before putting a pacemaker; sinus bradycardia without significant symptoms, or sinoatrial block / sinus arrest, without significant symptoms. Asymptomatic, prolonged RR intervals with atrial fibrillation or other causes of transient ventricular pause are also not an indication for pacing.[16]

Asymptomatic, second-degree Mobitz I (Wenckebach) AV block, reversible AV block such as those associated with electrolyte abnormalities, Lyme disease, sleep apnea, enhanced vagal tone, and some cases that occur postoperatively usually do not require permanent pacing.[16]

Future Research

It is evident that the absence of a TV lead decreases the complications of these devices' insertion, and since they are fairly new to practice, more research and studies are needed to further validate their use in practice guidelines. Areas of research should include developing smaller and less traumatic delivery systems to avoid mechanical complications. Development of multi-chamber or dual-chamber devices would eliminate hesitancy involved in choosing the leadless system for patients. More research is warranted to further formulate their efficacy.

Conclusion

Despite their recent introduction into practice, leadless cardiac devices have shown promising results and encouraging outcomes in terms of addressing patients' morbidities. Even though their revolutionary design stands out, more research and studies are needed to follow up on their long-term complications and to overcome their design limitations.

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A CLOSER LOOK AT QUALITY

Suicide is Preventable

LADEANA BELL, MS, LPE-I and MOLLY M. GATHRIGHT, MD

Half of all Americans will experience a mental health crisis during their lifetime. Most crises go unrecognized and untreated.[1] For an increasing number of people, their mental health crisis includes a suicide attempt or suicide death.

While the awareness of suicide as a public health concern has increased, the suicide rate has also increased, according to the Centers for Disease Control and Prevention.[2] Arkansas ranks 14th in the nation in suicide deaths with 555 lives lost to suicide in 2016, more than double the number of homicides.[3] Suicide is the second-leading cause of death for ages 15–34; the fourth-leading cause for ages 35–44, and the seventh-leading cause for ages 45–55. On average, one Arkansan dies by suicide every 16 hours.

Mental health is a key part of overall health and health maintenance visits should include mental health screening. Providers should check for mental health changes in all patients, even those with no diagnosed mental illness.

One study found that suicide victims are often likely to have visited their primary care physician (PCP) in the one month prior to their death.[4] Because people have long-standing relationships with their PCP, PCPs are in an integral position to prevent suicides. Some individuals may need to be seen by a specialist or need more intensive mental health intervention. However, the reality is that primary care may be the only setting in which many patients receive health care and it should include behavioral health care. For a person at risk of suicide, a visit to the PCP may be their one chance to access care.

Physicians, especially in rural areas and underserved areas with limited access to mental health professionals, must become more comfortable with being that one point of contact. This may seem daunting and is a

Suicide Symptoms

If a person talks about:

- Killing themselves
- Feeling hopeless
- Having no reason to live
- Being a burden to others
- Feeling trapped
- Unbearable pain

These behaviors can signal risk, especially if related to a painful event, loss or change:

- Increased use of alcohol or drugs
- Looking for suicide methods; searching online
- Withdrawing from activities
- Isolating from family and friends
- Sleeping too much or too little
- Visiting or calling people to say goodbye
- Giving away prized possessions
- Aggression
- Fatigue

Changes in mood to:

- Depression
- Anxiety
- Loss of interest
- Irritability
- Humiliation or shame
- Agitation or anger
- Relief or sudden improvement in mood

FOR MORE INFORMATION:
www.sprc.org/settings/primary-care/toolkit • www.samsha.gov/suicide-prevention

definite shift from the traditional training of "refer for consult."

Research has provided increasing knowledge about the underlying mechanisms of suicide and suicidal behavior, who is at risk for suicide and how to intervene. The key message for all practitioners is: Suicide is preventable.

Integrating behavioral health care into an individual's overall wellness plan is a first step to suicide prevention. Be willing to ask the suicide question and work towards mental health "checkups" as part of the wellness visit, like blood work and blood pressure.

Contrary to the once popular myth, asking about suicide does not plant the idea in a person's head. Interviews with attempt survivors (known as those with "lived experience") indicate that being asked about suicide in a concerned manner often provides some relief.[5] In her suicide research, Ursula Whiteside, PhD, states, "Many described feeling that they weren't listened to or understood and this, in itself, was driving their suicidal thoughts." Think of the patient with chronic physical pain that is so poorly controlled or long-standing that it affects every area of their life. When the physician acknowledges this suffering, it does not make the pain subside, but it potentially creates an atmosphere of trust and opens an opportunity to begin a new treatment plan. Similarly, the person thinking of suicide needs to be acknowledged.

By utilizing the chronic disease model, suicide prevention can be treated in health care systems like we treat any chronic disease. Risk is managed by providing interventions to decrease risk. For example, there are well-known risk factors for heart attack and having a subsequent heart attack. Applying this same model can provide a suicide prevention framework. It can help reduce feelings of being overwhelmed at the prospect of taking a more pro-active role in patients' mental health care.

Patients with a history of mental illness or substance use disorder (SUD) should be on your radar to assess increased risk factors. On the other hand, there are patients in acute distress with no history of mental illness or SUD. A PCP visit may reveal a recent significant life stressor which subsequently triggers a mental health screening or conversation with the patient.

Risk status would include such things as a history of bipolar disorder, major depression, SUD, traumatic brain injury, and serious physical health conditions including pain, previous suicide attempts or middle age. These risk factors cannot be changed but provide a general guideline to use regarding who may be at risk.

How much a person's risk level increases at any point is referred to as "risk state." If a patient's life drastically changes due to recent changes in marital status, job loss, grief or situational stressors, the risk state increases. These subgroups often have an undiagnosed underlying low-level depression or anxiety disorder. When a life stressor complicates their emotional health, the risk state rapidly declines. Assessing mental health as part of every visit can potentially lead to detection and better outcomes.

Every person with suicidal thoughts does not require psychiatric hospitalization, but action is indicated. Action can include, but is not limited to, securing a safety plan and means reduction for each care setting (i.e., arrange and confirm removal or reduction of lethal means). The safety plan should include the National Suicide Prevention Lifeline number (1-800-273-8255) and the crisis text line (741741 text TALK). Additional protective factors include follow-up phone calls to check on at-risk patients, verifying and encouraging follow-up appointments with a mental health provider, and collaborating with patient's family and friends (as patient allows and including a release of information) to discuss the safety plan.[6]

Suicide prevention is everyone's business. All physicians can be integral in this public health challenge by thinking of the three As: awareness, assessment and action.[7] As practitioners become more aware of the problem and are better equipped to assess it, they are poised to take lifesaving actions. ▲

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Early Impact of Cardiovascular Rehabilitation on Medication Requirements in Patients with Coronary Artery Disease

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Abstract

Polypharmacy is common in patients with coronary artery disease (CAD). This study evaluates the impact of cardiovascular rehabilitation on alleviating polypharmacy practices. We collected retrospective data on CAD patients in a cardiovascular rehabilitation program at the Arkansas Heart Hospital, and average number of medications were compared before and after rehabilitation. Results demonstrated a significant decrease in antihypertensive requirement (2.42±1.56 before to 2.13±1.48 after, p=0.0316), insignificant decrease in antihyperlipidemics, no change in antidiabetics, and decreased total medication requirement approaching significance (9.08±4.35 to 8.75±4.10, p=0.0574). We concluded that cardiovascular rehabilitation programs can play a role in alleviating polypharmacy in patients with CAD.

Introduction

Cardiovascular rehabilitation programs provide great benefit to patients with coronary artery disease (CAD).[1] Current AHA guidelines recommend that patients with a diagnosis of CAD participate in at least 30 minutes of exercise per day for a minimum of five days per week.[2] Additional guidelines are in place outlining dietary modifications for these patients.[2] Cardiovascular rehabilitation programs are playing a large role in increased adherence to these suggested lifestyle modifications.[3] Many of these programs not only utilize exercise sessions for patients, but also educate patients on the implementation of healthy dietary habits.

In addition to challenging lifestyle modifications, patients with CAD are often prescribed numerous daily medications, making the practice of polypharmacy common.[4] The reasons for this vary and can include the need for strict control of cardiovascular risk factors to avoid progression of the disease. The presence of multiple comorbidities in patients with coronary artery disease further increases the need for concomitant medications.[4] Polypharmacy presents an increased risk for drug interactions, adverse drug effects, and issues with medication adherence, among other things.[5]

The various positive effects of cardiovascular rehabilitation programs could alleviate the need for polypharmacy and its associated issues. Because of increased use of these programs, there is further incentive to investigate the role that they may play in overall medication requirements for patients with CAD.

Methods

Study Design and Data Collection

This is a retrospective analysis of patients with CAD who have participated in a cardiovascular rehabilitation program at the Arkansas Heart Hospital. Inclusion criteria for the study: 1) The patient must have a diagnosis of coronary artery disease; 2) The patient must have fully participated in the cardiovascular rehabilitation program at the Arkansas Heart Hospital. Each session of rehabilitation included one hour of guided exercise, with some sessions being followed by cooking or diet education classes. Full participation was considered completion of 72 sessions of outpatient rehabilitation, or 18 weeks of enrollment in the program; 3) The patient must be taking at least one antihypertensive, antihyperlipidemic, or antidiabetic medication.

Data was collected using electronic medical records from the rehabilitation clinic. Daily progress reports written by the therapists included any medication changes made between that session and the previous session. These reports were used to identify medication changes made during the course of rehabilitation. A patient's medications before rehabilitation were compared to their medications after completion of the program.

Primary and Secondary Endpoints

The primary endpoints used for data collection include: 1) discontinuation of any medication; 2) addition of any medication; 3) discontinuation of either an antihypertensive, antihyperlipidemic, or antidiabetic medication; 4) addition of any antihypertensive, antihyperlipidemic, or antidiabetic medication; 5) decreased dose of either an antihypertensive, antihyperlipidemic, or antidiabetic medication; and 6) increased dose of any antihypertensive, antihyperlipidemic, or antidiabetic medication. Average number of medications per patient were calculated and analyzed for significance. A secondary endpoint investigated which medication type was most likely to be discontinued first.

Statistical Analysis

Data analysis utilized t-testing to demonstrate statistical significance in the differences observed for medication requirements before and after rehabilitation. The software used was Stata version 11.1 (Stata Corp LLC, College Station, Texas, USA).

Table 1. Patient Demographics

Average Age (years) 70.0±4.1	Number	Percent
Male Sex - no. (%)	17	(70.83%)
Female Sex – no. (%)	7	(29.17%)
Ethnicity - White - no. (%)	24	(100.0%)
History of MI - no (%)	8	(33.33%)
History of Stroke - no. (%)	1	(4.17%)
Previous PCI - no. (%)	12	(50.0%)
Previous CABG - no. (%)	14	(58.33%)
Former Tobacco Use - no. (%)	9	(37.50%)
Current Tobacco Use - no. (%)	2	(8.33%)
Hypertension - no. (%)	22	(91.67%)
Hyperlipidemia - no. (%)	19	(79.17%)
Type II Diabetes - no. (%)	9	(37.50%)
Congestive Heart Failure - no. (%)	4	(16.67%)
Peripheral Vascular Disease - no. (%)	9	(37.50%)
Atrial Fibrillation - no. (%)	9	(37.50%)
Stable Angina - no. (%)	9	(37.50%)

Note. Age is in average years ± standard deviation. All other values are averages with the raw number of patients and percentages.

Results

Twenty-four patients met the inclusion criteria for this study. Patient demographics are outlined in Table 1.

Patient Characteristics

Average BMI before rehabilitation was 30.34±5.15kg/m,^{2} and after was 29.39±5.11kg/m.^{2} Average resting heart rate before the program was 66.08±10.75 beats per minute, and after the program was 68.13±10.91. Average resting systolic blood pressure before rehabilitation was 132.67±16.89mmHg, and after was 119.75±16.64mmHg. Average resting diastolic blood pressure before rehabilitation was 78.13±7.75mmHg, and after was 71.38±9.93mmHg. Patient characteristics are outlined in Table 2.

Primary and Secondary Endpoints

Nine out of 24 patients (37.50%) were able to discontinue at least one antihypertensive, antihyperlipidemic, or antidiabetic medication. Seven (29.17%) decreased the dose of at least one of these medications. Two (8.33%) added at least one of these medication types. One (4.17%) increased the dose of one of these medication types. Of the patients who discontinued a medication, the medication most commonly discontinued first was a calcium-channel blocker.

Before participation in rehabilitation, patients were taking an average of 2.42±1.56 antihypertensive medications per patient. After participation, this dropped to 2.13±1.48 per patient, a decrease shown to be significant (p=0.0316). Average antihyperlipidemic medications per patient before rehabilitation was 0.79±0.51. This decreased to 0.75±1.48 after rehabilitation, a decrease shown to be insignificant (p=0.3277). Average antidiabetic medications required before rehabilitation was 0.5±0.72 per patient. There was no change in antidiabetic reported for any patient during the time period of this study. Total medication requirement for any medication type before rehabilitation was 9.08±4.35 per patient. After rehabilitation this decreased to 8.75±4.10, a decrease approaching significance on analysis (p=0.0574). These results are outlined in Table 3.

> ***Because of increased use of these programs, there is further incentive to investigate the role that they may play in overall medication requirements for patients with CAD.***

Discussion and Conclusion

More than half of the patients in this study were able to either discontinue or decrease the dose of a medication, a result that highlights the effect that cardiovascular rehabilitation programs can have on medication requirements for patients with CAD. Special attention was paid to three medication classes: antihypertensives, antihyperlipidemics, and antidiabetics. These three classes were chosen as primary areas of focus due to the known impact that cardiovascular rehabilitation should have on the risk factors of hypertension, hyperlipidemia, and type 2 diabetes mellitus.

It was shown that the decrease in antihypertensive requirement was statistically significant. This result is consistent with what would be expected, as previous research has demonstrated that proper diet and exercise can play a large role in lowering systemic blood pressure.[6] A variety of mechanisms come into play when discussing decreases in blood pressure. The dietary portion of this rehabilitation program likely led to decreased sodium intake, which has been shown to lower blood volume.[7] Mechanisms behind decreasing blood pressure with exercise are less understood,

> Continued on page 208.

Table 2. Patient Characteristics Pre- and Post-exposure

Characteristic	Pre-exposure	Post-exposure
BMI(kg/m^2)	30.34±5.15	29.39±5.11
Resting Heart Rate (beats per minute)	66.08±10.75	68.13±10.91
Resting Blood Pressure – Systolic(mmHg)	132.67±16.89	119.75±16.64
Resting Blood Pressure – Diastolic(mmHg)	78.13±7.75	71.38±9.93

Note. Characteristics are displayed as average ± standard deviation before rehabilitation (pre-exposure) and after rehabilitation (post-exposure).

Table 3. Average Medication Requirement Pre- and Post-exposure

Medication Class	Pre-exposure	Post-exposure	P Values
Antihypertensives	2.42±1.56	2.13±1.48	0.0316
Antihyperlipidemics	0.79±0.51	0.75±1.48	0.3277
Antidiabetics	0.5±0.72	0.5±0.72	---------
All Medications	9.08±4.35	8.75±4.10	0.0574

Note. Values are displayed as average number of medications±standard deviation before rehabilitation (pre-exposure) and after completion (post-exposure). The "All Medications" section includes the average number of all prescribed medications for patients in the study before and after rehabilitation. Significance was determined at p<0.05.

but may involve changing levels of catecholamines, normalization of autonomic control, or altered levels of vasoactive compounds.[8,9]

The change observed in antihyperlipidemic medication requirement was found to be statistically insignificant (p=0.3277). Current research would lead one to expect at least moderate reductions in LDL levels after implementation of a proper diet, with exercise playing a complementary role.[10] The mechanism for reductions in LDL, cholesterol, and triglyceride content vary depending on dietary approach, but can involve reducing the amount of fat and cholesterol consumed in the diet so there is less packaged into chylomicrons, and thus less transferred to the liver for packaging into LDLs.[10] There are many possible explanations for why patients in this study did not experience a decreased requirement for antihyperlipidemic medication. One includes small sample size, which could influence the statistical analysis of any observation. A second explanation is that lipid profiles were not closely monitored throughout the course of rehabilitation. It is possible that some patients could have discontinued or decreased their dose of antihyperlipidemic, but did not because lipid levels were not monitored.

The final medication class of focus in this study was antidiabetics. No patient in our study experienced a change in antidiabetic requirement. This is inconsistent with expectations, as research has shown exercise and diet to improve type II diabetes mellitus by a variety of mechanisms. Some exercise-mediated mechanisms include increased insulin sensitivity in the periphery, increased mitochondrial content and function, and better overall glycemic control.[11] It is also possible to control type II diabetes with diet alone. One potential reason why no change was seen involves the intensity of exercise used in cardiovascular rehabilitation. Some studies suggest that it is primarily high intensity exercise that impacts A1C levels.[12] The AHA addresses exercise intensity and safety for patients with CAD by stratifying patients into different classes based on certain characteristics. This statement recommends that a person classified as "moderate to high risk" be supervised continuously during their exercise sessions, and that they have sessions individualized to their own abilities.[13] Patients in this risk group may not tolerate high-intensity exercise. Thus, their exercise sessions may not have significantly impacted their A1C levels.

A few study limitations have been mentioned briefly. To highlight, primary limitations include small sample size and short time frame without follow up after patients completed rehabilitation. Other limitations include limited patient demographics and lack of laboratory analysis of triglyceride and glycated hemoglobin levels. A final limitation is that there is no control group in the study, which limits the conclusions that can truly be made from our observations. Despite these limitations, the results of this study support the hypothesis that participation in a cardiovascular rehabilitation program may lead to a decrease in polypharmacy practices commonly seen in patients with CAD. It is hoped that this study will highlight one more aspect of the usefulness of cardiovascular rehabilitation and contribute to the growing research supporting the use of these programs.

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Eruptive Xanthoma as Presenting Sign of Hypertriglyceridemia

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Introduction

Cutaneous xanthomas is a broad term for skin lesions that present as yellow nodules, papules, or plaques. The prevalence of cutaneous xanthomas is unknown as it has not been well-documented in the literature. There are multiple variations of xanthomas, including but not limited to: plane xanthomas, verruciform xanthomas, tuberous xanthomas, tendinous xanthomas, and eruptive xanthomas.

Planar xanthomas are the most common form, constituting 95% of all xanthomas.[1] They are soft plaques that can be found on the neck, trunk, and eyes. When they appear on the eyes, they are called xanthelasma. They can occur in the absence of hyperlipidemias, but their presence still warrants a metabolic evaluation.[2] Verruciform xanthomas have a characteristic verrucous appearance and are commonly found in the oral cavity or anogenital area. This subtype of xanthomas is unique in that it is not related to a systemic disease; rather, it is thought to be a result of chronic immunological reaction.[3] Tuberous xanthomas are yellow and may be surrounded by erythema. They can be flat or papular and usually present on the extensor surfaces of joints. Tendinous xanthomas are hard, mobile subcutaneous nodules that appear on the tendons of hands, feet, knees, and Achilles tendons. Occasionally, depending on the location, the nodules may be painful.[4]

Eruptive xanthomas (EX) are described as a suddenly appearing inflammatory cluster of red-yellow papules typically 1-4 mm in size. Eruptive xanthomas appear more commonly on extensor surfaces of arms and legs, shoulders, or buttocks, and less commonly on lips, eyelids, or ears.[5] There have also been cases described in the literature of EX appearing along lines of trauma, which is known as the "Koebner phenomenon."[6,7] Patients may also have ophthalmic involvement such as lipemia retinalis, salmon-colored retina with creamy white retinal vessels.[8] EX is predominately present in patients with very high concentrations of triglycerides, often greater than 2,000mg/dl, or uncontrolled diabetes mellitus.[5,6,9,10,11] Inherited dyslipidemias that result in hypertriglyceridemia include lipoprotein lipase deficiency, apolipoprotein C-II deficiency, or hepatic overproduction of very-low-density-lipoproteins.[12] Occasionally, it may even be the first sign of these systemic diseases.[13]

The pathogenesis of cutaneous xanthomas and its relation to hyperlipidemia can be explained by the metabolism of dietary cholesterol and fat. Lipid levels in the blood are determined by measuring lipoproteins and triglycerides. Absorption of fat and cholesterol occurs in the small intestine. Next, they are enzymatically digested and reassembled into particles called chylomicrons containing triglycerides and cholesterol. As chylomicrons are transported in the blood, they are broken down by an enzyme, lipoprotein lipase, found on the endothelial cells of capillaries. This process forms free fatty acids and chylomicron remnants. Free fatty acids will later be reconstituted into triglycerides at peripheral tissues, while chylomicron remnants return to the liver where they are used in metabolism.

The liver exports very-low-density lipoproteins (VLDL), which serve to deliver triglycerides and cholesterol to peripheral tissues. In the blood, VLDLs are enzymatically degraded into low-density lipoproteins (LDL) and free fatty acids (14). In states of chronically elevated lipids, LDLs leak through capillaries and become embedded in the connective tissue of the dermis. Subsequently, macrophages respond to the LDLs' presence and engulf them, forming foam cells.[15] Histopathologic exam shows macrophages with foamy cytoplasm and dermal extracellular lipids.[4,12]

Primary causes of hyperlipidemia include inherited genetic disorders that are transmitted through autosomal dominant and recessive inheri-

> Continued on page 212.

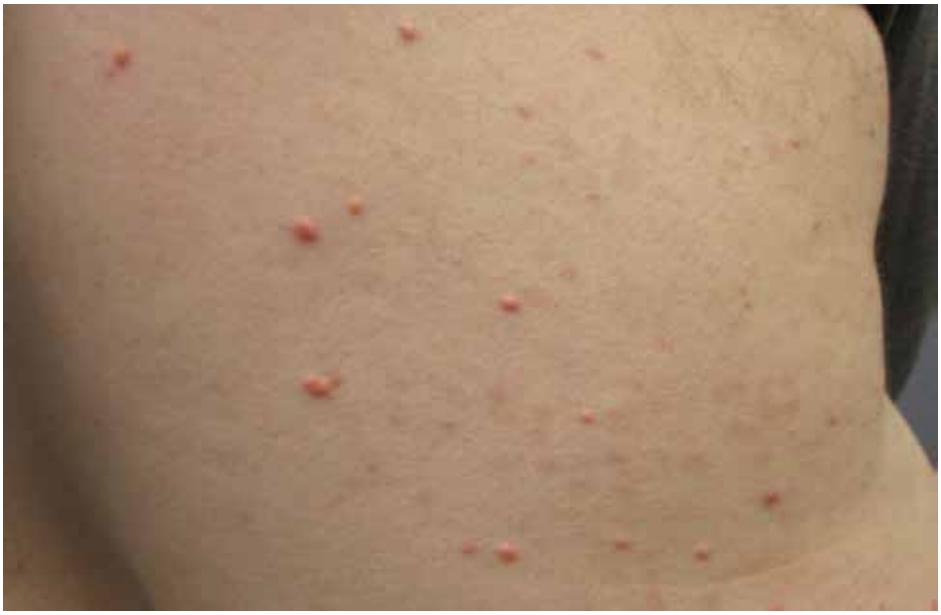
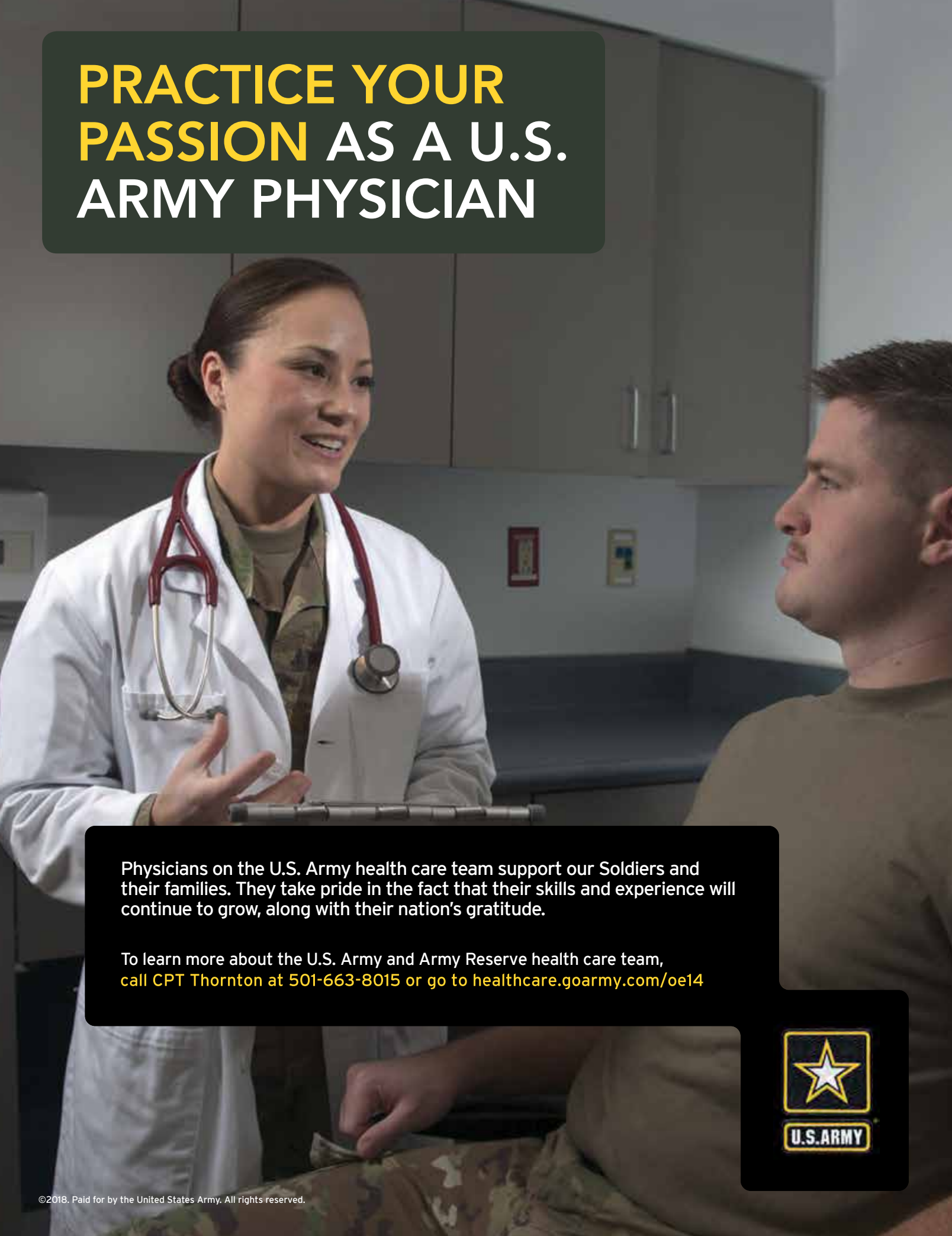


Image 1: yellow-domed papules and tan macules on the lateral back



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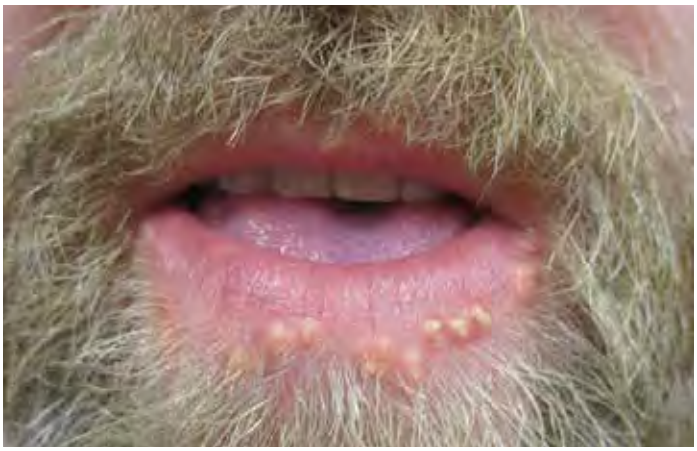

Image 2: yellow-domed papules on the lower lip mucosal and cutaneous surfaces

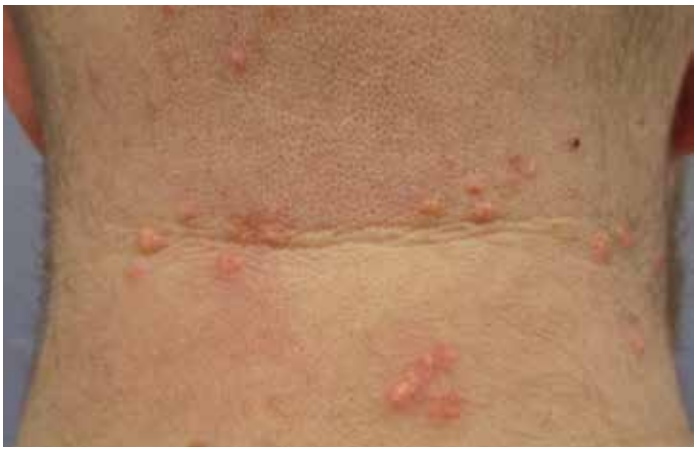

Image 3: yellow-domed papules, some umbilicated and some coalescing, on the posterior neck

tance.[4] Secondary causes of hyperlipidemia may be a result of more common systemic diseases including: diabetes, obesity, nephrotic syndromes, and hypothyroidism.[16] Additionally, medications that increase lipid levels such tamoxifen, steroids, and retinoids, as well as intoxicants like alcohol, can result in hyperlipidemia.[5,6,17]

Case Presentation

A 43-year-old white male with a past medical history of type II diabetes mellitus presented with a one-month history of reddish-yellow, fleshy, clustered papules on his lower lip, posterior neck, and posterior trunk (see photos 1-3). A 3mm punch biopsy of a posterior neck papule was performed. The histopathological findings were consistent with eruptive xanthoma evidenced by foamy cell infiltration of the dermis along with intracytoplasmic lipids. Additionally, extracellular lipid material was present in the dermis. Subsequently, a lipid panel, Hemoglobin A1c (HbA1c), complete blood count, and complete metabolic panel were performed. The patient's HbA1c was 10.3%, suggesting the patient's diabetes mellitus was uncontrolled. The patient's cholesterol was within normal limits; however, he had a triglyceride level of 11,314 mg/dL. Other laboratory findings were unremarkable.

Discussion

Our patient presented with florid, fleshy papules. Although the diagnosis of xanthomas can be made clinically, we wanted to confirm with a biopsy. Since clinically eruptive xanthomas appear as fleshy papules, there is an extensive differential diagnosis. Most commonly, the differential diagnosis of eruptive xanthomas includes: sebaceous hyperplasia, granuloma annulare, xanthoma disseminatum, and nodular basal cell carcinoma.

With the exclusion of verruciform xanthomas, the identification of a cutaneous xanthoma requires evaluation for concurrent metabolic disorders.[12] Work up and management of the underlining condition is paramount and can prevent serious complications of elevated triglycerides such as coronary disease or pancreatitis.[5,6,10,18] If a patient is found to have a severe elevation in triglycerides, it may be pertinent to collect a thorough family history, not only of cardiovascular disease, but also of other symptoms of dyslipidemias. Establishing the presence of an inherited disorder would be beneficial for not only the patient and their family members, but also for their health care providers. Treatment of xanthomas is dependent on their etiology. Xanthomas related to dyslipidemia usually resolve with control of blood lipid levels.[19] Lesions not attributed to an underlying disease may be surgically excised. Patients often seek relief of xanthomas for cosmetic purposes.

We present this case out of interest since it is unusual for a patient to present with such uncontrolled diabetes and triglycerides to a dermatologist. It is important for all health care providers to be cognizant that dermatologic changes are often the presenting sign of internal diseases. It is important for clinicians at all levels to be aware of this potential presentation, as early detection and treatment can improve patient outcomes.

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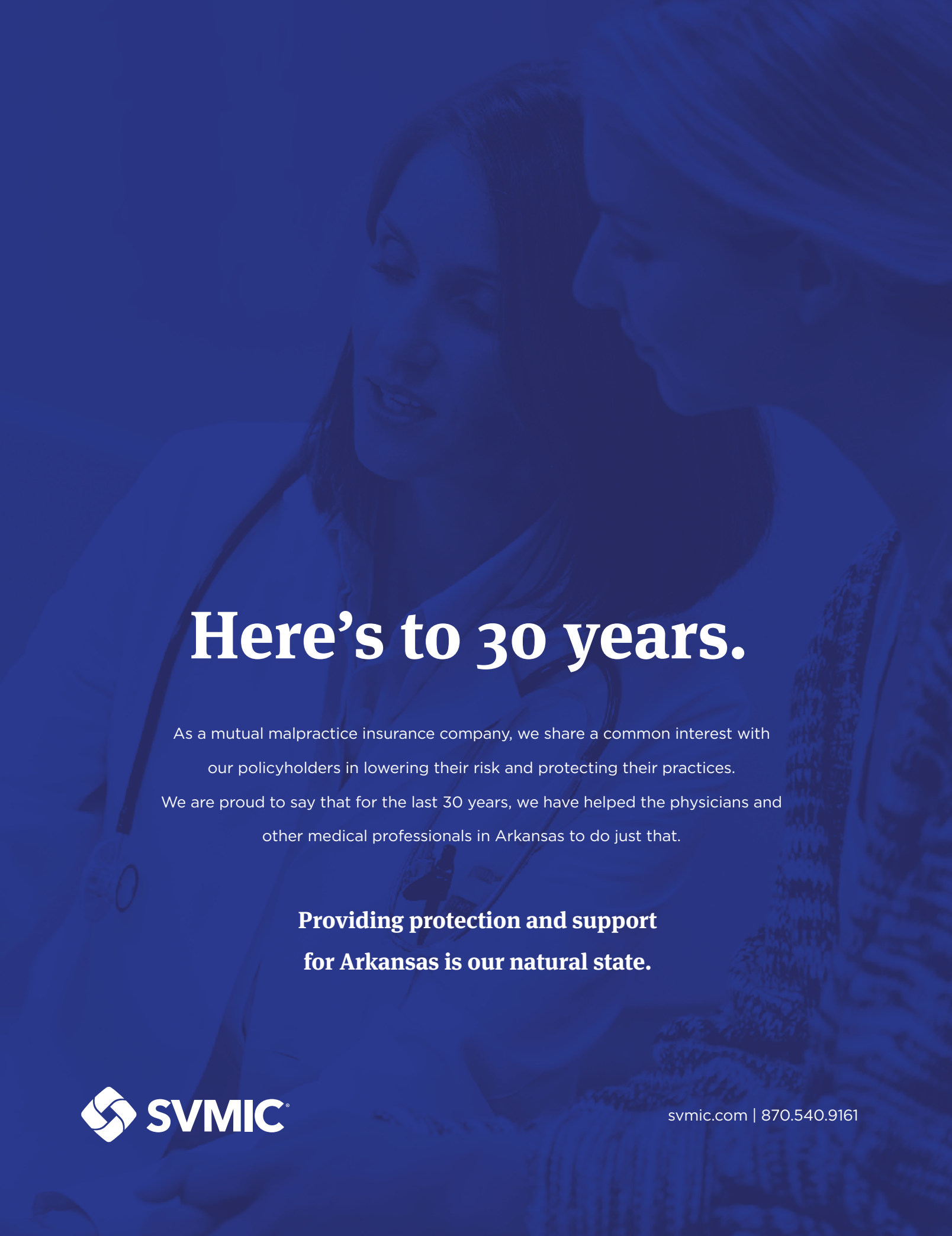
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