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ABOUT THE COVER

Dr. Jessica Kisicki (kneeling) of Cheyenne is pictured with Guatemalan patients and a fellow volunteer on a 2018 volunteer mission trip to La Pila with Great Commission Outreach.

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Pharmacy Partnerships Expand Care

BY ROBERT MONGER, MD

Looking for a way to improve access to healthcare for your patients? The Centers for Disease Control (CDC) says that one cost effective strategy to improve treatment access and quality is for prescribers to form partnerships with pharmacists through collaborative practice agreements that allow pharmacists to expand their participation in patient care. For the past two years I've served on a collaborative practice oversight committee at the Wyoming Board of Pharmacy and during that time I have learned a lot about the rapidly changing landscape of pharmacy training and practice, but many people are not aware of all the clinical services that pharmacists can now provide in collaboration with physicians.

For example, most physicians are familiar with pharmacy led clinics for patients taking chronic anticoagulation medications. Typically, a patient taking warfarin will come to the clinic regularly to have their PT/INR checked, and the pharmacist will use the test result to adjust the warfarin dose and at the same time provide patient education regarding drug interactions, dietary concerns, etc.

In recent years, however, pharmacists have greatly expanded their clinical care skills and now routinely help manage many additional medical conditions including diabetes, hypertension, smoking cessation, thyroid disorders, and hyperlipidemia. A best practices guide* for cardiovascular disease prevention programs developed by the CDC documents that involving pharmacy participation in patient care is linked to improved cardiovascular outcomes for patients. The CDC guide states that, "collaborative drug therapy management (CDTM) enabled by a collaborative practice agreement (CPA) is a formal partnership between qualified pharmacists and prescribers to expand a pharmacist's scope of practice. CDTM is a cost-effective strategy for lowering blood pressure, blood sugar, and LDL cholesterol levels; improving treatment quality; and increasing medication adherence" and goes on to say that strong evidence exists that CDTM enabled by a CPA is effective.

Many pharmacies are open evenings and weekends and patients can often walk in without an appointment, which improves access to care, and pharmacists sometimes have more time than physicians do to educate patients regarding their medical conditions and medications. There is also the potential for pharmacists to use telemedicine to improve access to care especially for patients in rural areas.

CLIA approved laboratory testing is now available in many pharmacies, meaning that a patient may be able to go directly to the pharmacy to have their lab tests done and medications adjusted. For example, a patient could go to their pharmacy to have their thyroid function tests checked and the pharmacist could then adjust their thyroid dose as needed. For many patients this is a much less expensive alternative to using hospital labs, and it frees up physicians from routine medication management to focus on patients with more complicated medical issues.

Collaborative practice agreements in Wyoming are governed by the Wyoming Board of Pharmacy, and as of early 2019 the Board has now approved a total of eight collaborative practice agreements for providers around the state; it is anticipated that this number will significantly increase over the next few years. While some of these collaborative practice agreements take place at institutions such as the State Hospital in Evanston and the UWFM residency program in Cheyenne, others involve individual primary care providers.

Interested in finding out more about collaborative practice agreements? The Wyoming Board of Pharmacy has a template you can use to help you develop specific agreements with a pharmacy, and the Board can also help you review the statutory rules that govern such arrangements. For example, it is important to have well defined protocols in place such as what to do if a patient is noncompliant, or how to notify the physician in case of an adverse drug reaction. It is also important for the patient to continue as an active patient with the physician and for the physician to closely collaborate with the pharmacist and to specifically let the pharmacist know what you want them to do.

Collaborative practice agreements are an effective way improve clinical outcomes. Medication management provided through a pharmacy may often be less expensive and more accessible for patients than similar services obtained through a hospital lab or medical clinic and can potentially be provided using telemedicine. For more information consider talking with your local pharmacist or contacting the Wyoming Board of Pharmacy.

Citation: Centers for Disease Control and Prevention. Best Practices for Cardiovascular Disease Prevention Programs: A Guide to Effective Health Care System Interventions and Community Programs Linked to Clinical Services. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2017. www.cdc.gov/dhdsp/pubs/docs/Best-Practices-Guide-508.pdf.


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Fighting for What's Right for Our Members

BY SHEILA BUSH

We often tout the WMS legislative successes to our members and attempt to convey the degree to which our advocacy team fights to strengthen and bolster the physician voice in important state regulatory and legislative conversations. Likely at some point in time during the discussions surrounding this topic of advocacy members have become fatigued and frustrated because our position on an issue wasn't consistent with their personal opinions or triggered anger because WMS didn't win on the bills of the utmost importance to them.

All of the positive responses, as well as the negative ones, are appropriate and earned, as we win some battles and lose others. WMS won't get every issue right every time, and in a group of vastly different personal and professional backgrounds we can't possibly represent all opinions all the time, but what we will do is never stop fighting to the very best of our ability for what we think is right for our members and their patients.

> "There's no time to waste in getting the medical society front and center in key conversations around the state."

The 2019 Legislative Session was one for the records in more ways than this column has room to explore. WMS took some hard hits and was pulled into a few of the most contentious debates I've seen in my time with the organization. Five different scope of practice battles consumed our efforts while we did our best to weigh-in and appropriately represent our members in legislative debates surrounding abortion, insurance regulation, restructuring the family medicine residency programs, and air ambulance regulation, not to mention the year's long debate in response to the growing concerns around opioid addiction and abuse.

One irrefutable fact is that healthcare is a critical priority for Wyomingites and consequently each of our legislators. Senate President Drew Perkins (R-Casper) was quoted in his opening remarks saying, "We [the state] can enhance competitiveness and access to medical care without having to recruit a single new healthcare provider just by allowing providers to perform the services in which they are trained." These words represent an attitude that tells me we are at a time in Wyoming where we can watch the coastal waters recede, exposing the ocean floor, as a tsunami approaches. That tsunami will be legislation attempting to further erode the lines, differentiating physicians from all the other healthcare providers on the team, along with a myriad of other ideas in healthcare cost transparency, data sharing and technology innovation. While all of these ideas may have merit, the devil will forever be in the details. WMS will be charged with ensuring the light is shined on those details, warning of the unintended consequences that can come from the quick fixes of today.

There's no time to waste in getting the medical society front and center in key conversations around the state. Whether it's continuing the talks we started with our new Governor and the ENDOW project or taking a more active role in organizations like the Wyoming Business Alliance, the time is now to make sure the physician voice and critical perspectives are a valued piece of the dialogue. Focus and energy being dedicated to this effort are exponentially increasing, and the last thing we want is for WMS to not be well-positioned to contribute and weigh-in on those efforts as they develop, rather than responding once they're formed.

If you haven't already, check out the full legislative summary available on the WMS website and make plans to attend our annual conference this summer. We are heading back to the Jackson Lake Lodge where WMS and WAPA members, along with nearly all of our prominent state specialty societies will gather to share stories, hear exciting educational presentations and plan for the future. WMS can't do any of what we do without every single one of you. If you disagree with any of this year's legislative outcomes, I urge you to call your county trustee or reach out to WMS directly. Our door is always open to our members. We value your opinions and we need your vast experience to help to inspire the future of healthcare in Wyoming!

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Human Papillomavirus in Wyoming

BY ALEXIA HARRIST, MD, PHD, FAAP

My thrill at being asked to contribute to Wyoming Medicine was quickly followed by the difficult process of choosing a topic. As State Health Officer and State Epidemiologist at the Wyoming Department of Health (WDH) I have the privilege of working on many health issues that impact the lives of Wyoming residents, all of which deserve dedicated attention. To that end, I chose a topic that I am particularly passionate about, and that touches multiple elements of public health and preventive medicine – from cancer screening to vaccination to sexual health education. It's something for which the public health and medical communities have the tools we need to prevent disease – all that is left for us is to work together to implement them to their full capacity.

That topic is Human Papillomavirus (HPV). HPV is a group of over 150 related viruses that are transmitted through intimate skin-to-skin contact. The Centers for Disease Control and Prevention (CDC) estimates that 80% of Americans will be infected with HPV in their lifetime, and that at any given time nearly 80 million adolescents and adults are infected – that is one out of every four people. While 90% of HPV infections are cleared by the immune system without adverse health effects, infection can lead to the development of anogenital warts and cancer. HPV is responsible for more than 90% of cervical and anal cancers, 70% of vaginal and vulvar cancers, 60% of penile cancers, and 70% of oropharyngeal cancers in the United States.

In Wyoming, there are an average of 65 new cases of cancer diagnosed per year in anatomic sites where HPV is found; the most common site is the oropharynx (~29 cases/year) followed by the cervix (~21 cases/year). Screening for cervical cancer among women ages 21-65 years reduces cervical cancer incidence and mortality. However, cervical cancer screening rates among Wyoming women are low. Data from the Wyoming Behavioral Risk Factor Surveillance System indicate that in 2016 only 73.2% of Wyoming women ages 21-65 years received a pap test in the past three years, significantly lower than the average U.S. rate of 79.8% and placing us tied for the lowest rate among reporting states. There are currently no recommended screening protocols for the early detection of oropharyngeal, anal, vaginal, vulvar, or penile cancers.

But the good news, of course, is that we have a vaccine. The HPV vaccine, first licensed in 2006, followed the Hepatitis B vaccine as the second that provides primary cancer prevention. The vaccine consists of recombinant HPV capsid proteins that form virus-like particles that are non-infectious, non-oncogenic, and stimulate higher levels of neutralizing antibody than natural infection. The 9-valent vaccine currently in use in the United States protects against infection with the two HPV subtypes most commonly associated with anogenital warts (types 6 and 11), the two high-risk HPV subtypes associated with over 60% of HPV-associated cancers (types 16 and 18), and five HPV subtypes associated with another 10% of HPV-associated cancers (types 31, 33, 45, 52, and 58). HPV vaccine is recommended by the Advisory Committee on Immunization Practices for both males and females as a two-dose series beginning at age 11-12 years; those who begin the vaccine series at 15 years or older and those who are immunocompromised require three doses.

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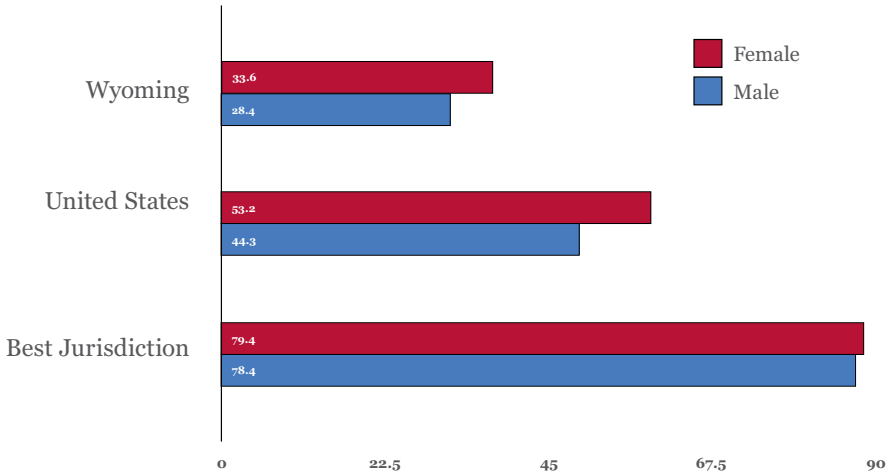
Despite the high degree of efficacy and safety shown by HPV vaccines in clinical trials and post-licensure studies, vaccine uptake has been slow compared to other vaccines. Here in Wyoming, HPV vaccine coverage among our adolescents is consistently among the lowest in the United States. According to the 2017 National Immunization Survey-Teen , the percentage of Wyoming adolescents who are up-to-date for HPV vaccination was only 33.6% among females and 28.4% among males aged 13-17 years, which is the lowest and third lowest, respectively, among reporting jurisdictions. Up-to-date vaccine coverage in Wyoming is significantly below that of the United States average and, shockingly, less than half that of the jurisdictions with the best coverage (see Figure 1).

Figure 1: Percent of Adolescents Aged 3-17 Years Who Are Up-To-Date on HPV Vaccination, by Sex, 2017



Why is uptake so low? I imagine that those of you who see adolescent patients can name many of the reasons. Studies indicate that barriers include those that apply to other vaccines – the cost of the vaccine, inconsistent preventive care visits, the need for multiple visits to complete the series, and concerns about vaccine safety. Some barriers, however, are specific to the HPV vaccine, including parental concerns about the potential effects on sexual activity, lack of understanding about how common HPV is and risk for infection, perceptions that the HPV vaccine doesn't directly benefit boys, and questions about why the vaccine needs to be given at such young age. The stigma that surrounds the discussion of sexually transmitted diseases can be a barrier to both providers and parents, despite the fact that the ultimate benefit of the vaccine is cancer prevention.

These studies also consistently show, however, that a strong recommendation from a health care provider is the single best predictor of whether parents choose to vaccinate their adolescents against HPV-associated cancers., A strong recommendation includes recommending the HPV vaccine on the same day and in the same way that the Tdap and meningococcal vaccines are offered. It includes being able to respond to parental concerns about vaccine safety (there have been no associated serious side effects), about the timing of the vaccine (HPV vaccination is recommended before the onset of sexual activity, in the same way we recommend a bike helmet is put on before starting to ride), about the effects on sexual activity (multiple studies have shown that the HPV vaccine does not make adolescents more likely to be sexually active or start having sex at a younger age), and about not having a direct benefit for boys (the HPV vaccine protects against infections that can lead to anal, penile, and oropharyngeal cancers.) The CDC has developed evidence-based guidance for healthcare providers on speaking with patients about the HPV vaccine (https://www.cdc.gov/hpv/hcp/index.html).

WDH has several ongoing activities dedicated to increasing the rates of HPV vaccination in Wyoming. During quality improvement site visits with public vaccine providers, the Immunization Unit presents clinic HPV coverage rates and provides technical assistance on improving rates. The Immunization Unit will also be hosting two provider education days in Casper and Cheyenne in June, 2019 with Dr. Gary Marshall to provide education on addressing vaccine hesitancy. The Wyoming Cancer Program dedicated its January 2019 Wyoming Cancer Coalition meeting to education about HPV and strategies to improve vaccination and screening rates. The Cancer Coalition has also developed an HPV workgroup to further discuss ways to improve HPV vaccination in the state. These activities are in addition to our regular activities that address immunization, cancer screening, and sexual health, including our public vaccine programs, The Wyoming Breast and Cervical Cancer Screening Program, and the Wyoming Personal Responsibility and Education Program (WyPREP), which provides evidence-based teen pregnancy and sexually transmitted disease prevention services in schools and community settings.

As a new attending pediatrician working in an emergency department 5 years ago, I became interested in and ultimately chose to go into public health so that I could try to prevent as many children as possible from ever needing to come see me. Even if one Wyoming child never has to receive a diagnosis of cancer because of this vaccine, that would be a great achievement – but the data show it can be many more than one. HPV vaccination is one of many powerful examples of how public health and health care providers, working together, can improve the health of both individuals and our community.

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Looking Forward:

Societies Continue Work in Key Focus Areas

BY ELIZABETH SAMPSON

Wyoming's medical societies have been working this year to represent the interests of medical providers. These societies were active in 2018 and will continue to be so in 2019.

Wyoming's medical societies have been working this year to represent the interests of medical providers. These societies have been active in 2018 and will continue to be so in 2019.

The Wyoming Academy of Family Physicians is focusing on physician well-being in 2019, which will be the spotlight of their annual meeting in Jackson this summer.

"Currently, there are plans on Wyoming physicians presenting on this issue including Dr. Betsy Spomer, a WAFP member, but we have just applied for a half day national AAFP program on physician well-being to join us in Jackson to expand the offerings on this subject," said Dr. Dean Bartholomew.

He said the WAFP has undergone a transformation over the last 18 months to make sure it can become an influential player in the Wyoming medical community. The mainstay of this transformation was a revision of the bylaws to allow the board of directors to be filled with interested physicians no matter their location in the state.

"The WAFP now has a fully-filled Board of Directors for the first time in years," Bartholomew said.

They have been active in reviewing national policy stances of the American Academy of Family Physicians as a whole and have weighed in on the AAFP stance on Centers for Medicare and Medicaid Services (CMS) proposed fee schedule changes as well as the AAFP policy statement on healthcare models.

They've also been working with the Wyoming legislature.

"The WAFP helped to sponsor and fund advocacy of child endangerment legislation that allows for healthcare providers and law enforcement to remove at-risk children from the home where abuse has occurred so that these children can undergo medical examination for their safety," Bartholomew said.

Lastly, the WAFP continues to support the family physician workforce. They help sponsor medical students who attend family-physician centered trainings and conferences, and help sponsor Wyoming family physicians who are attending the Wyoming Leaders in Medicine Physician Leadership Academy. In January 2018 the WAFP sponsored the first-ever group KSA at the WMS/WAFP annual meeting in Jackson.

Bartholomew asked that anyone with questions, ideas or concerns to contact him at drbart93@gmail.com.

The Wyoming Chapter of the American College of Physicians held their annual meeting in Laramie in October, which allowed them to interact with medical students, see the new WWAMI facilities and regenerate excitement about working with students. They will hold their annual meeting in the fall again, and hope to get future providers involved.

"The time to expose medical students to what internal medicine is early in their career," said Dr. Mike Tracy.

Other work includes having a new hospitalist committee that is making a forum for hospitalists to communicate and interact with one another.

Ultimately, they also hope to increase the visibility of internal medicine and increase involvement across the state.

"The Wyoming chapter is small," said Tracy. "We'd like to be small but mighty."

Throughout 2018, the Wyoming Chapter of the American Academy of Pediatrics worked on an HPV education and awareness campaign in conjunction with the Utah Chapter of the AAP, and they will continue this campaign in 2019. This project aims to help providers gain more knowledge about the benefits of the HPV vaccine and works to increase the HPV vaccination rates. They are creating appropriate materials to teach both providers and patients about the vaccine.

Dr. Suzanne Oss said the project has received positive feedback from all the pediatric offices who have taken part in it, and it counts as Continuing Medical Education (CME) for providers.

Gun safety for children is another 2019 focus. Dr. Oss stressed that this is not a gun control initiative, but rather a program for gun safety in homes where there are both children and guns.

Working alongside the WAFP and WMS, the Wyoming Chapter of the AAP is also advocating in favor of Wyoming Senate File 0060—Protection of children-child endangerment amendments. Oss explained that this legislation, if passed, will allow children who are in a home where another child has been abused to be examined for child abuse as well.

They will hold their annual meeting in conjunction with the WMS meeting in Jackson. At last year's conference they offered education on asthma, allergies and behavior and mental health. This training was open to both pediatricians and any other providers who wished to attend.

Finally, members of this academy serve as pediatric representation to agencies such as neonatal and newborn screening and Wyoming disaster planning.

Lobbying on behalf of the state's physician assistants is a big part of what the Wyoming Association of Physician Assistants does. This year they hope to send delegates to Washington D.C. to lobby, just as they did last year. PA Shawn Ficken said this lobbying mostly has to do with reimbursement.

They will hold their annual conference in conjunction with the WMS conference in Jackson, which Ficken said is a good opportunity for networking with other providers from around the state. At last year's conference at Little America in Cheyenne they had speakers and discussions as well as breakout sessions like a suturing refresher course.

Again this year they will give two PA students who are members of the WPA a $1,000 scholarship.

The Wyoming Ophthalmological Society spent the early part of 2019 actively fighting against Wyoming Senate File 55, the Optometrists Practice Act Amendments. This bill, sponsored by the Joint Labor, Health & Social Services Interim Committee would allow optometrists to perform eye surgery in Wyoming, said Dr. Anne Miller.

The specific wording of the bill is as follows: a person holding a license to practice optometry under this act is authorized to perform advanced optometric procedures upon the human eye and adnexa for which the licensee has received training from a college of optometry accredited by the Accreditation Council on Optometric Education or any other accrediting body of optometric education.

When the Wyoming legislative session ended, the bill had been postponed indefinitely by the House.

Working to expand their membership is a top priority for the Wyoming Association of Psychiatric Physicians. They are a small group in a large state, but they hope to grow.

"Our purpose is gaining membership," said Dr. O'Ann Fredstrom. "There are two groups we want to benefit. One is our psychiatrists themselves, and two are the patients." She added she would like to visit with any psychiatrist in the state who is not already a member or is not active to find out what they would like to see the organization working toward. She asks that they contact her at teton2@wyom.net.

She said the work they are already doing is keeping an eye on the work of the state legislature and remaining in contact with their legislators. Fredstrom said one challenge they face is the fact that Wyoming has not signed on to the Medicaid expansion.

"That has greatly limited a lot of people's access to care," Fredstrom said. "It has impacted our mental health ability here."

Finally, they plan to hold their annual meeting in June in conjunction with the WMS.

Creating a labor sharing agreement is the current work of the Wyoming Society of Anesthesiologists. They are creating a bulletin board of sorts that lists anesthesiologist groups around the state and notes which ones need coverage so people can go on vacation or attend to other matters.

"In smaller communities where you have a community hospital, you really can only afford to have two or three providers cover the same specialty, said Dr. John Mansell. "That means you are on call every third night for your whole career."

Working with other Wyoming providers is more affordable than flying in doctors from out of state to cover shifts. It also will allow Wyoming doctors to pick up extra work if they want to.

Being able to work in places around the state other than their home base has the added benefit of helping these anesthesiologists get to know their colleagues in a large state.

Anyone who wants more information about this should contact Mansell at johnmansell7@gmail.com.

Mansell, also of the Campbell County Medical Society said their upcoming meetings will include short presentations about resources available in the Gillette area that will augment a healthy lifestyle. Those will include information about nearby wilderness activities, personal trainers from local gyms, healthy recipes from area restaurants and gourmet food stores and tour guides from places like the Black Hills.

He said the goal is to make sure their providers have access to things that reduce stress and burnout and encourage taking steps to improve their health.

Laramie County Medical Society makes it a point every year to provide networking and socializing opportunities for their physicians. With their members working both independently and employed by Cheyenne Regional Medical Center or other large medical groups, these events allow them to meet up with people they wouldn't see on a regular work day. Positive feedback from their members encourages LCMS to continue hosting this type of event.

For example, they hold an annual summer barbecue and a Christmas party with Santa at the Nagle Warren Mansion in Cheyenne.

"We understand the gauntlet of medical school residency, taking care of patients and just the stress of just being a doctor," Dr. Kristina Behringer said of the importance of meeting together with other doctors in the community. "There's an immediate understanding and sense of belonging." She said it also helps to alleviate physician burnout.

"The physician community, our patients and the employees feel the loss of a physician leaving, so we want to work with anyone we can partner with to promote the community to the physicians and keep them here," she said.

One such partnership is the one LCMS has with Cheyenne Regional, who they work with toward recruitment and retention. They are also working with the hospital's foundation to host physician and PA dinners.

> "In smaller communities where you have a community hospital, you really can only afford to have two or three providers cover the same specialty. That means you are on call every third night for your whole career."
>
> DR. JOHN MANSELL
> Campbell County, WY

LCMS is active with the Wyoming legislature and Wyoming Leaders in Medicine. Every year they hold a legislative update with an invitation to legislators where they can discuss issues that will affect physicians and their patients. The Wyoming Leaders in Medicine session in Cheyenne is held at the same time as the legislative update. In addition to having a great conversation with the legislators, they also had the chance to meet with Mike Ceballos, the new director of the Wyoming Department of Health.

Each year Natrona County Medical Society hosts a family Christmas party, a summer ice cream social and a pre-legislative review. They also offer educational opportunities for their members and others throughout the year on a variety of topics.

Their second annual gala is another big event for 2019, where Dr. Stephen Brown will receive the Natrona County's Physician Service Award. Last year's recipient was Dr. John Barasso.

Several county medical societies are hoping to become more active in the coming year. Albany County Medical Society donates any funds in their account each year to any local clinics who need assistance. Sheridan County Medical Society is in a rebuilding state. They have already held a quarterly chapter meeting in July with about eight people attending. They are looking for more member involvement.

Albany County Medical Society donates any funds in their account each year to any local clinics who need assistance. Sheridan County Medical Society is in a rebuilding state. They have already held a quarterly chapter meeting in July with about eight people attending. They are looking for more member involvement. Several other county medical societies are hoping to become more active in the coming year

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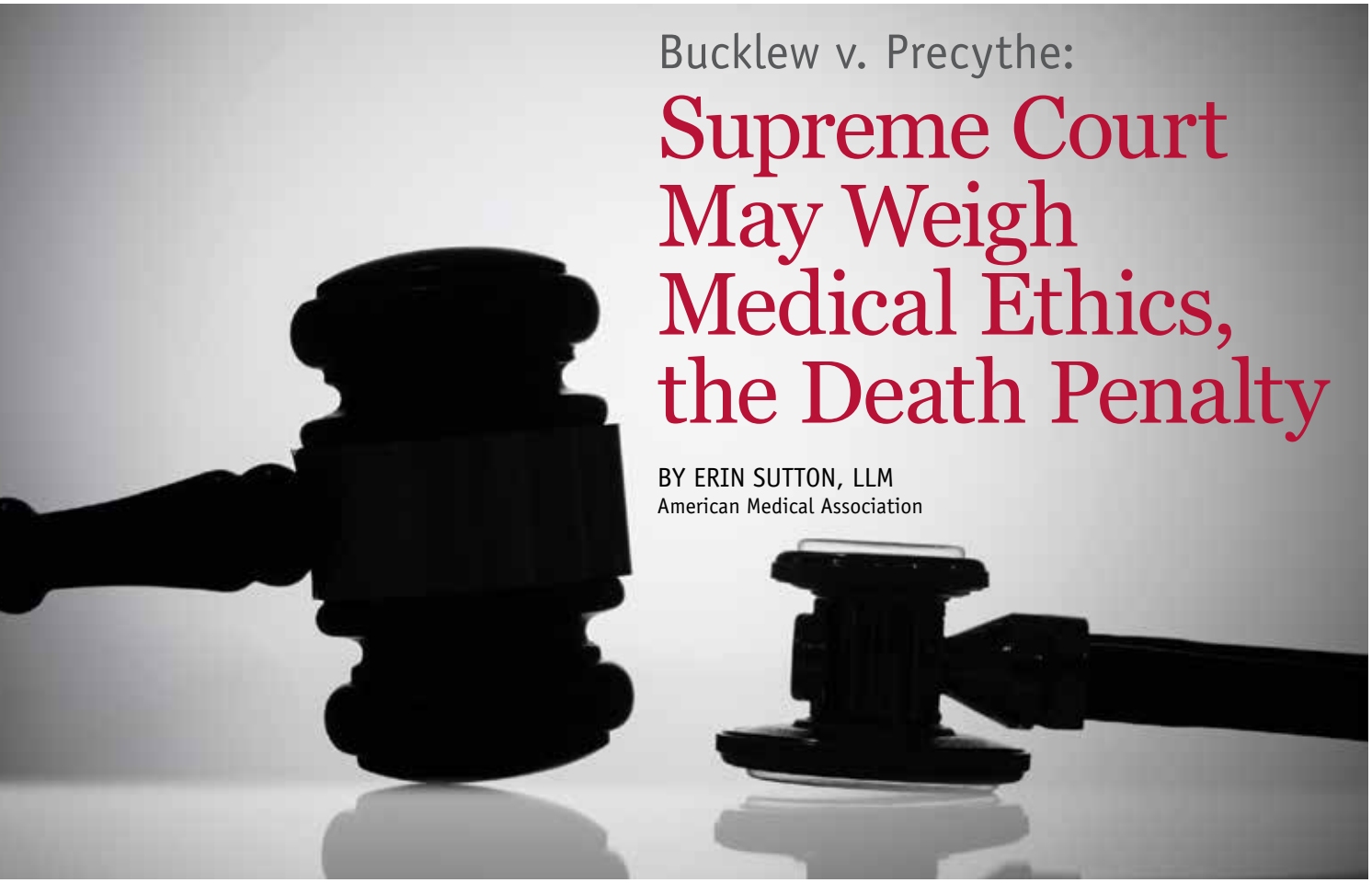

Bucklew v. Precythe:

Supreme Court May Weigh Medical Ethics, the Death Penalty

BY ERIN SUTTON, LLM
American Medical Association

One of the American Medical Association's ethical opinions may affect a case presently before the United States Supreme Court. That case is Bucklew v. Precythe, and the ethical opinion is 9.7.3, which prohibits physician participation in capital punishment. The case and opinion draw attention to larger themes in the practical application of physician ethics, some more clear-cut than others. The AMA's Code of Medical Ethics makes clear that physicians owe a duty first and foremost to the patients they treat, not to the government to serve as executioners. But thornier questions emerge when physicians must determine where they could cross that line, especially for physicians who may treat patients sentenced to death.

In the case described below, a physician who previously examined a patient on death row was asked to give his medical opinion on which method of execution would cause the patient less suffering, given the patient's rare and severe medical opinion. The physician determined that to do so would go against medical ethics. The AMA filed a brief before the United States Supreme Court to support and give context to his decision.

The Case Before the Supreme Court

The State of Missouri found Mr. Russell Bucklew guilty, among other crimes, of murder, attempted murder, kidnaping, rape, burglary, assault, and escape from jail. He has been in jail since 1996, and he has been sentenced to death. Following multiple appeals, Mr. Bucklew no longer contests his guilt. Also, he does not contest the death sentence. Mr. Bucklew does contest Missouri's proposed form of execution, which, unless the Supreme Court says otherwise, will be administered by lethal injection.

Mr. Bucklew suffers from cavernous hemangioma, which causes blood-filled tumors to grow throughout his body. Most significantly, he has a particularly large tumor growing inside of, and partially obstructing, his airway. He must control this tumor in order to manage his breathing.

Mr. Bucklew contends that if the State is allowed to proceed with execution by lethal injection, the process of inserting the intravenous line and the time it will take for the drug to take effect will cause his tumor to rupture and cause him to choke on his own blood. This choking, he claims, would constitute cruel and unusual punishment, which is forbidden under the Eighth Amendment to the United States Constitution. Mr. Bucklew has instead asked that the State execute him via lethal gas, which, he asserts, will cause him significantly less pain.

The State, on the other hand, is arguing that the pain Mr. Bucklew might suffer from poisonous gas is no less – or at least not significantly less -- than the pain he might suffer from lethal injection. The State asserts that it is Mr. Bucklew's burden to prove that death by poisonous gas will be less painful than

death by lethal injection, and he had not met that burden. Mr. Bucklew countered that he has gone as far as he can to prove his case, because the physician who examined him said that it would violate medical ethics if he were to opine in favor of death by poisonous gas. So far, the lower courts have found in favor of the State. The Supreme Court, though, is apparently not so sure, and it granted Mr. Bucklew a stay of execution while it hears his case. The justices heard oral argument in November of last year, and the Court could deliver a decision at any time.

The AMA's Amicus Brief to the Court

The AMA's amicus curiae brief—filed last summer—supported neither Mr. Bucklew nor the State of Missouri. Instead, the brief was submitted to educate the Court on the ethical standards physicians must follow when becoming involved with patients on death row.

Opinion 9.7.3 prohibits physicians from participating in legally authorized executions. While it does not explicitly state that a physician may not give a medical opinion that will allow the state to facilitate an execution, the AMA's Counsel on Ethical and Judicial Affairs believes, and the brief forthrightly said, that that is the proper inference. The brief gave three basic justifications for this position.

First, it pointed out the general, historical prohibition against physicians' participation in executions. This started with the Hippocratic injunction against physicians' dispensing a lethal drug or advising such a plan. The prohibition against physician assistance in executions, including the development of protocols for executions, has been adopted by every significant professional medical group that has considered this issue.

Second, the brief pointed out that the physician owes a single-minded obligation to the patient, which could be undermined if there were a suggestion that the physician owes a superseding obligation to a government prosecutor.

This is considered a "slippery slope" argument. Governments throughout history have coopted physicians in pursuit of their goals, which are often different from the goals of patients. The most notorious example is of course Nazi Germany.

But there are too many painful examples throughout history, from the Soviet Union utilizing psychiatrists to imprison political dissidents and then to immobilize them with psychotropic medications, to the present, with reports that the Cuban government uses physicians to advance political purposes by rationing care according to the patients' favor with the current regime.

Physicians should shun these situations. Patients need to know that physicians are their advocates, and physicians put patients' interests above parochial government objectives.

Third, the brief asserted that physician endorsement of one form of execution over another would give a false impression that executions can be carried out humanely or with minimal pain. This is a delusion, and the medical profession should have no part of it. Physicians believe in the scientific method, which requires that fact is accepted as true only after carefully gathered evidence has confirmed its truth. American physicians have no training in killing people, and no scientific experiments quantify how much pain prisoners experience according to which method is used to put them to death.

Governments continually try to convince their citizens that state-mandated executions are conducted with scientific techniques, which somehow makes them appear to be more humane or more civilized.

For example, some states have pressured condemned prisoners to sign Do Not Resuscitate orders in anticipation of execution, and they have mandated the presence of physicians with white coats and stethoscopes to give an air of "seriousness and safety" at executions.

The AMA takes no position on whether capital punishment should continue. This is a moral judgment, which goes beyond medical expertise. What the AMA does feel, though, is that capital punishment is an extreme action, and the public should not be led to believe that it is an acceptable practice because physicians are there to make sure it is carried out in a scientific way.

This article was written prior to the Bucklew v. Precythe decision on April 1, 2019.

Physicians Provide Medical Care Around the World

International Mission Services: Helping Around the World

There are lots of ways physicians give in every day life. Long hours first dedicated to study, and later, dedication to helping and healing. Here we introduce you to a few physicians who went the distance to help patients on international medical mission trips.

Dr. Jessica Kisicki (kneeling) of Cheyenne is pcitured with Guatemalan patients and a fellow volunteer on a 2018 volunteer mission trip to La Pila with Great Commission Outreach.

Dr. Chuck Franklin, a family medicine doctor in Newcastle

Dr. Chuck Franklin of Newcastle has been part of international medical mission trips since 1982, while he was in residency. Today, his wife, a nurse, and their daughter, also a nurse, make regular trips to help people of Third World nations. On occasion he goes on mission trips without his family, which was the case in 2017 when he and a good friend went to some of India's remote villages to care for patients.

Our first mission trip was to the island of Roatan, which is part of Honduras. This was during residency in 1982. This was a two-week elective. At that time there was no medical care except for a nurse who traveled among three islands.

We next went to the mainland of Honduras shortly after Hurricane Mitch. There was rather severe malnutrition and starvation there including a little girl of 11 years old who we treated. She was getting better and started being able to sit up and then walk but then she passed away suddenly.

We've to Honduras or somewhere else nearly every year over the years. I've gone to a number of countries with different groups, including a couple of months in Venezuela, Peru, Nicaragua and Haiti.

Two years ago, I went to India with my good friend Dr. Michael Duerhssen. A government helicopter flew our group into a very remote village on Christmas Eve where we spent the holiday with the people there and then held clinics for a couple of days. We hiked from one village to the next, holding clinics for a day or two at each village. We had to hike out a total of 100 miles to the nearest road.

The local people helped us carry our medical equipment, which consisted of approximately 700 pounds of baggage. All the villages are along the river and we were told that they basically had no medical care except for village health workers who had two weeks of medical education.

For about six months out of each year the villagers cannot leave the valley because of monsoon rains. During the other six months if they want to leave they must hike 100 miles over very rugged terrain, crossing the river many times on bamboo bridges. When the monsoons come, the bridges washout and they're trapped in the valley until after the monsoon season. Then they rebuild all the bridges and hike out the next year.

Anything they want or need to bring, they must carry on their backs. They pretty much live as it was several hundred years ago. They were very clean polite and helpful. There were a lot of Christians as well as Hindus in the valley. We really enjoyed the experience.

I think the most interesting case was when repaired a cleft lip of a little girl that was about 18 months old. We told her

Volunteers in India for a medical mission organized by Chuck Franklin gather around a patient in preparation for surgery. Photo Credit: Chuck Franklin

In India, Dr. Chuck Franklin of Newcastle, worked in rugged conditions. Photo Credit: Chuck Franklin

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> "They pretty much live as it was several hundred years ago. They were clean, polite and helpful."
>
> CHUCK FRANKLIN, MD
> Newcastle, WY

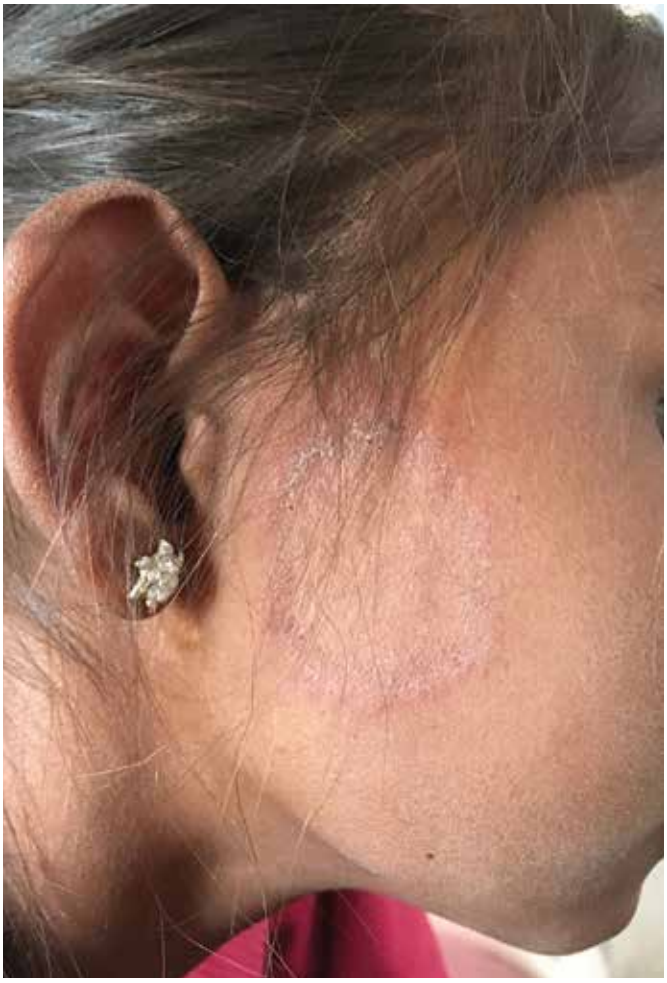
mother that we were not plastic surgeons, and we couldn't do it but she said if we didn't, then no one ever will. So, we sedated her with ketamine and repaired her lip. The next morning, she was eating better. Months later, we received email from an Indian who lives in the town at the end of the road, telling us the girl was doing very well.

Three or four trips have been organized through our church but most of the time we just get local nurses and interested people and make the trip ourselves.

In Venezuela a mission pilot would fly some of us into short dirt strips in small villages, and we would camp out for a night or two and hold clinics. Then he would return to pick us up. Occasionally we backpacked into villages if the plane was down for maintenance. In 2007 I was there for a month. A week after I returned home, the Venezuelan government placed the rest of the group under house arrest and soon after ejected them from the country.

Dr. Julie Neville, a dermatologist at Cheyenne Skin Clinic

Dr. Julie Neville of Cheyenne Skin Clinic joined a medical mission trip organized by Passion to Heal through its Me to We program. From her post – a school in rural Rajasthan, India, she and a team of eight other providers saw 2,000 patients, often unaccompanied school children. Providers weren't "roughing" it, Neville says, as they had a chef providing a variety of Indian meals at camp. On walks around the camp, sari-wearing locals frequently greeted guests with a traditional Indian greeting – Namaste. The trip from Denver to Delhi to Udaipur was long, but along the way she says she developed an awareness of her own limitations and what it means to get back to (medical) basics.



Dr. Julie Neville says cases of ringworm, were common in Rajasthan, India where she volunteered. Photo Courtesy Dr. Julie Neville

I began this trip with a sense of open-mindedness and cautious optimism that my presence in India would help the patients we would be working with and allow for personal growth as to the culture and diversity of another area of the world, in this case, rural Rajasthan, India. It was about expanding my horizon and view of the world. Despite reading about other parts of the world, our own view tends to be limited to the experiences we accrue in our lives and by coming in contact with an area so different from my own, I could grow to appreciate both the differences and similarities universal across the world. In addition, I relished the idea of giving back in appreciation for all the opportunities and training that I was privileged to receive in my life.

On reflection after the trip, I experienced a sense of humility. In beginning to work with the community, the excitement became intermixed with a level of despondency given

There was no shortage of patients in need of help, says Dr. Julie Neville, a dermatologist in Cheyenne. Photo Credit: Dr. Julie Neville

the overwhelming needs of the patients – needs that included malnutrition and poverty. But, after working for a few days, one realized that they too have much to offer including joy in the children and happiness with our presence there and a strong sense of community and one's place in the family structure, often attributes diluted in western cultures.

The presence of hard work and compassion for others was present. This included teachers assisting their students at the clinic or siblings helping each other to navigate what would likely be a confusing and unfamiliar system in receiving health care. In a sense, I believe our place was, to some degree, providing dermatology care but also serving as ambassadors for the Passion to Heal organization's "Me to We" program in which one would hope this small facet of the program will help to build trust in the tribal communities and advance the program's other goals including agriculture and education.

It is hard not to come out of this experience with a sense of gratitude. It is gratitude for one's station in life as a female raised in a country with opportunity and equality to my peers. A gratitude to experience another culture and the vibrancy and beauty held within.

Gratitude for having many of the conveniences that are available to us while many that we worked with deal with the daily struggle of providing for their basic needs of adequate food, water and shelter. It is also gratitude to the patients who welcomed us into their community with joy and to the organization that provided us this opportunity and continues to work daily in India.

With regards to dermatology and healthcare in the area, it

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requires a radical shift from the way we treat patients in North America. Our medical protocols typically rely heavily on testing, whether it is laboratory testing, fungal KOH preparations, bacterial cultures, or biopsies for pathological diagnoses. When these options are unavailable, you learn to treat with what is available in the pharmacy and what is the likely cause. We are trained to diagnose a condition by determining the single etiology for the problem if possible and then targeting treatment to that etiology.

Without testing and without the ability for patient follow-up, we prescribed many more combination creams having efficacy against bacteria, fungus, parasitic diseases and anti-inflammatory steroids in order to broadly cover many potential causes of the skin condition.

Many of the dermatologic problems we saw, including lice, scabies and bacterial infections, can be treated but one becomes aware of the limitations present and the necessity of accommodation and adjustment for the resources available. Often children were present with their school group only and when instructions are given to an 8 -year-old child without their parents present, and given the high illiteracy rates in the area, it's hard to know if written information will be understood and the message adequately conveyed. In addition, a child with lice may return to their home and sleep head-to-head with other members of their family who likely also are infected, so we tried to encourage these children to also have their family members treated.

As we took care of many patients who may not have been familiar with how to use the creams, open the tubes and how much to use, we enlisted demonstrations of products and often took to massaging in the cream to show them how it was done. This served the two-fold purpose of demonstration but also enlisted the power of touch which transcends the language barrier.

Many of the conditions we saw are attributable to the conditions in which the patients live. Eczema, dry skin and lips were common and likely exacerbated by the arid climate and prevalent smoke produced by cooking using wood fires indoors and a lack of ventilation systems. Adequate hydration was more difficult given the necessity of hauling drinking water. Most patients had little access to lotions and so we encouraged them to use mustard and coconut oils, which are available to them. Dry, cracked hands and feet are common and attributable to fact that the majority of patients arrived without shoes and given the agrarian nature of the society. Many of the children I saw did not have socks, which would enhance the moisturization capabilities of the creams we gave them. We saw many cases of tinea with often cases of inflammatory tinea capitis in the scalp including kerions and lymphadenopathy. Given the proximity to animals - goats sleep in the same home as their owners - this was likely part of the cause.

> "This was such a humbling and powerful experience in stepping outside of my comfort zone and witnessing a culture and medical practice so different from my own."
>
> JULIE NEVILLE, MD
> Cheyenne, WY

Malnutrition, anemia and parasitic diseases were prevalent given the inadequacy of consistently reliable food sources, vegetarian diets with insufficient protein sources and the presence of open wells as a water source in which parasites were common and the practice of boiling water before drinking was not common. We witnessed several cases of active mumps as children are not vaccinated against this as well as varicella. It is much less likely in western medicine to see these conditions given our high vaccination rates for both.

Overall, this was such a humbling and powerful experience in stepping outside of my comfort zone and witnessing a culture and medical practice so different from my own. It is a lesson in assessing my limitations in what I could treat and developing adjustments to work around this.

It went back to the basics of diagnosing and treating conditions to the best of my ability without testing. It is also a centering experience in which we all become focused on the minute details of our own day-to-day lives and by getting a chance to experience the lives of others much different from your own, you become appreciative for what you have been given.

Dr. Jessica Kisicki (in spectacles) gathers colleagues turned friends for a photo op during her June 2018 misison trip to La Pila, Guatemala. Photo Credit: Dr. Jessica Kisicki

A volunteer with the Great Commission Outreach works with a Guatemalan patient. Photo Credit: Dr. Jessica Kissicki

Jessica Hughes Kisicki, the director of the Emergency Department at Cheyenne Regional Medical Center

Dr. Jessica Kisicki works in emergency medicine for Cheyenne Regional Medical Center. She traveled to La Pila, Guatemala with Great Commission Outreach in June 2018, where the organization has partnered with the village and provide healthcare with volunteers visiting every three months. This was her third trip to Guatemala, and certainly not her last – she hopes to adopt another village and apply GCO's principals there.

Friends of mine started the faith-based Great Commission Outreach (GCO) in 2016 to provide medical care and help a small community thrive independently in southern Guatemala. So, I was happy to join their work and serve the 120 families and other villages in the area.

La Pila is a village about two hours by bus from Antigua, a trip we took daily from our hotel. Once at the clinic, we see patients and give them primary care and medications. If there is a greater need, we work to set up care in the cities. An example of that being eye surgery to treat a boy's strabismus.

Generally, we give every patient we see vitamins and anti-parasite medications because they can be deficient and there is not clean drinking water. Our work in La Pila isn't just about medical care, but in supporting the general health of the community. Last summer, donations allowed us to buy water filtration systems which we installed, allowing families to access clean drinking water. We have teamed up with the village people to install flush toilets, cementing dirty areas in the school, painting the school and making benches for the school.

We focus some attention on the school, with the goal of keeping children in school as long as possible. We also created the opportunity for people to sponsor children in the village if they are in school. We provide a food basket and breakfast for the child each day as long as they stay in school.

We do this work in a place where resources are scarce, but while maintaining the culture and supporting their basic needs.

When we visit on Sundays, the local Guatemalan women make us a chicken soup with fresh vegetables.

We are trying to help the people of La Pila become self-sufficient. The unmarried women, who also are unable to work, now have a shop in which they make and sell items. This new enterprise allows them to earn money to support their children.

Being able to spend your time (and talents) serving others is life changing, and with that in mind, I'm planning another medical mission trip to Thailand in October.

Sarah Maze, WWAMI Student

Sarah Maze, a second-year student at the University of Washington School of Medicine, was raised in Ranchester. She traveled to Dhulikhel, Nepal, through the school's Global Health Immersion Program on a Global Opportunities Fellowship in summer 2018. A Spanish-speaker, Maze's first medical mission trips were in Honduras. In Dhulikhel, her focus was on a public health campaign on gestational diabetes.

My primary goal was, first and foremost, to learn about

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Community partners from the departments of Nutrition, Pharmacy, Physiotherapy, Community Programs, and Education pictured with Sarah Maze (pink shirt, front row) after the first Gestational Diabetes Mellitus Education Session at Dhulikhel Hospital, August 2018.

the community--their unique needs, approach to healthcare, understanding of healthcare and chronic disease. With that knowledge I could effectively work with local partners to create a project that would have a positive impact and made sense in their current structure. So, in communication with local care providers and community members, I identified a specific need in gestational diabetes education. The hospital in Dhulikhel is a community hospital, serves a vast population and supports numerous departments, and medical, nursing, dental, and physiotherapy schools. They currently hosted diabetes education sessions for patients and community members, facilitated by nurse educators and pharmacists. That session is great, but it doesn't focus on gestational diabetes.

The maternal mortality rate in Nepal is dangerously high due to a number of factors including lack of infrastructure for travel in rural areas, low health literacy, cultural practices, lack of primary care and follow-up, to name a few, and the incidence of gestational diabetes is steadily increasing.

I decided to work with departments around the hospital and combine all their current methods of gestational diabetes diagnosis, education and follow-up into three elements. First, weekly gestational diabetes education session held in the obstetrics and gynecology ward for patients who were there for appointments or who had recently been diagnosed along with family and community members.

Second, creating an educational brochure to distribute at the hospital and rural outreach clinics. Third, create a one-page infographic detailing culturally specific diet recommendations to manage the condition.

The diet plate I created by taking pictures of local foods at markets and transforming the current recommendations that were distributed by the hospital nutritionists into completely picture format, which made it more accessible for patients of all literacy levels.

There is a rising trend toward early intervention and education about chronic disease in Nepal. Like many countries, the Nepalese are in the midst of an epidemiological transition from a largely infectious disease burden to one of chronic disease. The general understanding of healthcare and disease in this manner is important for people to understand and takes time. Dhulikhel Hospital does phenomenal community outreach and education efforts, so their community is making great strides in understanding the idea of chronic disease and the importance of risk factor reduction and lifestyle modification.

It is hugely important to see this work through the lens of the community and culture, and it was a privilege to work with local care providers and educators to learn about their current methods and how to best reach our target population.

Dhulikhel Hospital has a rather significant international presence, including students there for clinical rotations, visiting physicians there for guest lectures at the medical/nursing/dental schools, so it was a different experience than I'd had in the past with smaller organizations. That in itself presented an interesting opportunity to learn about healthcare structures around the world. I also entered into my Nepal experience speaking very little Nepali, which was not something I have faced in my previous travels.

Weekly, we had dinner at a local cafe and had a Nepali lesson by the owner and his sons, which helped to slowly build my vocabulary, but certainly not to the point where I would feel comfortable having an important conversation in Nepali.

The language barrier was an interesting challenge. Many people spoke English and others could if necessary, but I wanted to be able to communicate with people in familiarity. So that was an expected, and welcomed, yet challenging obstacle.

Interestingly, the hospital conducted the majority of its business in English including keeping patient charts in English, though some patients were not well versed in the language.

This experience continues to bring me joy and leaves me excited to continue exploring and incorporate international work into my future career as a physician.

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WWAMI Student Profiles

In the spring edition of Wyoming Medicine Magazine, we take the time to profile Wyoming students who are in their first year of the WWAMI program. This year, we asked them the following questions:

1. What is the name of your undergraduate institution and major? If you have a graduate degree, you can list that as well.
2. What has been the highlight of med school thus far?
3. What areas of practice are you considering and why?
4. What do you like about the WWAMI program?
5. What brought you to the field of medicine?
6. What is your favorite book or movie and why?

Amanda Golden

Cody, Wyoming

1. University of Nebraska-Lincoln, bachelor's in psychology
2. The highlight of medical school so far has been the interactions I have been able to have with patients. Hospital mornings provide an opportunity to investigate different diagnoses and learn about symptoms and conditions that add to the information we have learned in class. Additionally, I have really enjoyed the Primary Care Practicum. I have learned about different techniques and procedures and grown in my confidence and ability to interview and interact with patients. I am thankful we have these opportunities to work with patients early in our education.
3. I am currently considering either OB/GYN or pediatrics. As a physician, I want to build long-lasting, quality relationships with my patients where I can truly invest in their health and wellbeing. I am passionate about women's health and have always loved working with children.
4. I love our small class size. Being in a class of 20 has allowed us to grow close as a group and bond right away. Each person is able to share unique perspectives and life experiences that enrich the class as a whole and allow us to look at issues from many different angles. Being in a small class also allows us to have more individual attention and instruction from instructors. This has greatly enriched my learning.
5. I have known I wanted to be a physician since I was in sixth grade and I have not wavered from that decision since. I always loved my science classes and thought the human body was amazing. Additionally, being in the medical field leads to lifelong learning. The field is constantly growing and expanding and providing new, fascinating information to digest. I wanted to work in a field where I could be a leader within my community, enjoy lifelong learning, and invest in the well-being of others. The medical field allows me to do just that.
6. My favorite book is "Tuesdays with Morrie" by Mitch Albom. I first read this book for Death and Dying, a class I took in undergrad. I loved this book because it talked frankly about the ups and downs of human life while giving advice about how to live life to the fullest and how to die with dignity and grace. It also showed the importance of spending time with those you love and sharing stories to learn what shaped them into the person they have become.

Caleb Brackett
Big Piney, Wyoming

1. University of Wyoming, bachelor's in microbiology
2. The highlight of med school so far is being able to learn from so many incredible instructors. Our anatomy lab coordinator has done a fantastic job of providing a hands-on learning experience with ultrasounds, prosections, and everything in between. The same applies for the foundation of clinical medicine lectures and activities. I could not have hoped for a more supportive educational experience.
3. Family medicine has always been at the top of my list for what kind of field I want to practice in. I'll be able to take care of a wide range of patients with many different conditions. I'll also be able to stress the importance of prophylactic care and make a big impact in a smaller Wyoming town.
4. The WWAMI program has given us significant patient exposure. We have a few mornings at Ivinson Hospital, shadowing opportunities galore, and preceptorships in different fields of medicine. Likewise, we have patient simulations that coincide with what we are learning in our blocks.
5. I have always been fascinated by the body and have been doing community service since I was in elementary school. I'll be able to combine the best of both worlds and have a fulfilling occupation.
6. I can't say that I have a single favorite movie. It's kind of an impossible question. I'd say that a few of my favorites include: "The Princess Bride," "Scott Pilgrim vs. the World, "The Dark Knight," "Up," and "Eternal Sunshine of the Spotless Mind." I have an extensive must-watch movie list.

Alexis Anderson
Jackson, Wyoming

1. University of Wyoming, bachelor's in physiology
2. The highlight of medical school so far has been our primary care practicum experience. It has been insightful in allowing us to practice physical exam skills, differential diagnosis formulation, and assessing how to treat patients in real time.
3. I have yet to make a decision regarding my specialty. As I have not had the opportunity to see internal medicine, OB/GYN, pediatrics, cardiology, or any other such specialties, I have not been able to pare my list down. I did find interest in our cardiology block and enjoyed working in the emergency department with my primary care practicum. However, I cannot make any significant decisions at this time due to lack of exposure.
4. I love the strong connection to the surrounding communities, the small class size, and the support the program offers. WWAMI is constantly encouraging students to pursue passion projects while supporting us in our academic studies. Such encouragement helps create a good school-life balance.
5. I saw a three-legged toad when I was 4 or 5. I "doctored" the toad for a few weeks and that is when I knew I wanted to go into healthcare. I have continued that pursuit since then.
6. My favorite book is "The Art of War," by Sun Tzu, because it applies in almost any situation.

WWAMI Student Profiles

Aleksandra "Ola" Zarzycka
Cheyene, Wyoming

1. University of Wyoming, bachelor's in microbiology.
2. My highlight has been the FCM simulation patients. This is the time that we truly get a chance to apply what we are learning in class to a real life situation with a patient. I really enjoy learning about the patient's history and figuring out what their diagnosis is.
3. I am looking at primary care, but I truly don't know which area yet! Pediatrics has always interested me, but I am keeping an open mind.
4. My favorite part of the WWAMI program is how close our class has become. From the professors teaching us to my classmates, everyone is so nice and it truly makes class fun!
5. Medicine has always attracted me because of its combination of science and service. Practicing medicine will allow me to stay in tuned with my science side by getting to learn constantly. But the most important aspect of medicine, in my opinion, is helping others live their best life.
6. My favorite movie is "Eat, Pray, Love." I love to travel and explore different cultures and this movie encapsulates just that.

Jesse Hinshaw
Kemmerer, Wyoming

1. University of Wyoming, bachelor's in chemical engineering, master's in molecular biology.
2. My favorite part of medical school so far has been being able to connect all of the medical knowledge we gain in class with the clinical experiences I have had with my preceptor and hospitalist. It is really rewarding to see the efforts I put into studying pay off when I can understand what is happening in the hospital.
3. I am currently interested in internal medicine and emergency medicine, but I have not ruled anything out. I would like to be in a field that will allow me to participate in expanding medical technology fields like medical genetics and telehealth in Wyoming.
4. We are lucky in the WWAMI program to have such a small class size with such a large availability of access to our instructors and mentors. Our exposure to clinical medicine is also incredible, we are frequently able to see knowledge from our courses applied in real scenarios.
5. I was initially brought to the field of medicine by looking up to my father, a physician. However, throughout my education, I have found my own interests in medical technology and using medicine to improve the lives of the individuals in the communities around me.
6. That is a hard question, but I think my favorite movie is "Scott Pilgrim vs. The World." Who doesn't like video games, rock n' roll, and a good love story?

Sean McCue
Cody, Wyoming

1. Carroll College (Montana), bachelor's in biology
2. I have really enjoyed the clinical experiences offered through the WWAMI program. In working with my preceptor Dr. Emma Bjore, and physician mentor Dr. Julie Carlson, I have had the opportunity to work closely with patients and put my clinical skills into practice.
3. I am open-minded about which area of practice I want to pursue. Currently, I'm interested in emergency medicine and internal medicine due to the broad scope of practice inherent to these fields.
4. The small class size, affordability, and emphasis on early clinical experience combined with the resources of a large, well respected institution make this program an incredible opportunity for Wyoming students.
5. I was drawn to the field of medicine by a desire to integrate my interest in human physiology with the positive experiences I had working with patients as an EMT. Additionally I appreciate how a career in medicine incorporates teamwork, lifelong learning and service.
6. I have always been a fan of movies about space exploration, so "Interstellar" and "The Martian" are at the top of my list.

Rida Fatima
Rock Springs, Wyoming

1. University of Wyoming, dual bachelor's in microbiology and molecular biology.
2. All the clinical experiences that have been incorporated in to our first year of medical school through hospital mornings, preceptorship, and shadowing have been the highlight for me. We get to meet interesting people from all walks of life and apply the knowledge we learn in class.
3. I am unsure of exactly which specialty to choose because I still have so much to experience. I am drawn to primary care because it will allow me to make long-lasting relationships with my patients while being very involved in disease prevention. I am especially interested in Internal Medicine because of the wide variety of pathologies I will be exposed to.
4. I am so grateful to be a part of WWAMI because we get the love and support of a small program with the access to all the resources of a large institution. Everyone involved with the WWAMI program cares so much about each of us and are invested in our success. Our mentors and teachers are so eager to share their wealth of knowledge with us and are always looking for great teaching opportunities.
5. Medicine has long been a passion for me. I am motivated to pursue medicine because it provides me with many opportunities to help others take care of themselves and offer support during their hardships, triumphs, and everything in between. I am especially interested in providing care to those who have been neglected or underserved. It is a dream of mine to be involved in helping extend healthcare to those that have been unable to access it previously, locally and globally
6. This one is hard to answer. I guess I will go with "Take the Lead" because I love dance movies!

WWAMI Student Profiles

Conner Morton
Casper, Wyoming

1. University of Wyoming, bachelor's in family and consumer sciences.
2. Being able to learn material knowing that it could potentially apply to any specialty of our choosing is probably my favorite part (until board scores strongly sway me to go into family medicine). The weekly clinical experience is also a relief from the day-to-day grind of bookwork. Seeing how the knowledge is put into practice is such a big part of medicine, so early exposure to that is refreshing.
3. I currently enjoy emergency medicine the most, but have recently found interest in critical care and family medicine. They all have their quirks, but the fast pace of the ER with quick decision-making is what has initially drawn me toward it.
4. I think the best is still yet to come when we begin our clerkships and see the diversity that the different WWAMI regions bring to our clinical experiences.
5. The ability to serve others with a combined love of science and lifelong learning.
6. Favorite Book: "Neither Wolf Nor Dog." Favorite movie: "Office Space."

Reed Ritterbusch
Sheridan, Wyoming

1. Augustana University (South Dakota), dual bachelor's in biochemistry and sociology
2. The highlight of medical school so far has been my clinical experiences with my preceptor. I have felt very fortunate to see a diverse set of patients in a family medicine practice and to have great patient care mentoring so early in medical school. Another highlight has been winning the UW 3-on-3 basketball tournament with some of my classmates.
3. I have not decided on any particular specialty and am looking forward to more clinical exposure and clerkships to begin narrowing down specialty choices.
4. I like the range of opportunities available to us in the WWAMI program and having a small class size so we can really get to know our classmates. I love being in Wyoming and the access to the outdoors for fun, but also appreciate that we have the resources of a major academic center in Seattle at our disposal.
5. What brought me to the field of medicine was an appreciation of how medicine bridges together science, service, problem-solving, and teamwork. I always felt like the impact a physician can make on their patients and a community is a special and rewarding thing.
6. My favorite book is "When Breath Becomes Air" by Paul Kalanithi. It's a very thought-provoking and inspiring book for anyone interested in medicine.

Elliott Trott
Jackson, Wyoming

1. Ohio State University, bachelor's in biology
2. My highlight of medical school thus far has been my preceptorship at Cheyenne Children's Clinic with Dr. Katarzyna Zarzycki. She allows me to have a lot of time working independently with patients. Further, after seeing patients she works diligently to help improve my clinical acumen.
3. While I have an interest in surgery, I believe it is still too early to hone in on one intended field. I will have a better understanding of which field I want to pursue once I complete all of my third-year rotations.
4. My favorite part about WWAMI has been the early clinical exposures. Through both our hospital mornings and our primary care practicum, we have a lot of one-on-one time learning how to interact with and create differential diagnoses for our patients.
5. I grew up in a medical household. With a nurse anesthetist as a mother and a physician for a father, dinner conversations frequently revolved around interesting cases. While it felt as though medicine was the family business, I was still unsure what I wanted to pursue once I started college. However, once I began volunteering at free clinics, I realized the impact access to healthcare can have in the lives of others. The unique impact medicine has in the lives of those in need is what drew me to this field.
6. My favorite movie is "Step Brothers." Even as a medical student, everyone needs a juvenile laugh once in a while.

Logan Taylor
Sinclair, Wyoming

1. University of Wyoming, bachelor's degrees in Spanish and electrical engineering.
2. Getting to know my classmates and making friends with other students who have similar goals has been great. It has provided a real sense of belonging and friendship, which I really enjoy.
3. I am still considering all fields of medicine. I hope that some of the third-year clerkships will help me narrow down what my interests are. Regardless of the specialty, I look forward to returning to Wyoming and becoming part of a community.
4. I enjoy the small class size and individual care that the WWAMI program provides for those of us in Laramie.
5. After completing several engineering internships, I realized I enjoyed both science and interacting with and helping people. I decided to investigate several other professions and after shadowing a physician I discovered it was what I eventually wanted to do.
6. I don't know if I truly have a favorite book or movie but one of my favorites would have to be "Catch Me If You Can" (the book). Frank Abagnale Jr.'s autobiography was one of the most entertaining books I've ever read. His creativity and resourcefulness were admirable. I hope to develop the problem-solving abilities that he had, but apply them to more reputable causes.

WWAMI Student Profiles

Ryan Winchell
Cody, Wyoming

1. University of Wyoming, bachelor's in psychology.
2. For me, the highlight of med school has been making 19 new friends.
3. I'd like to work in emergency medicine.
4. WWAMI offers a nice mixture of rural and urban experiences.
5. I started working in emergency medical services in 2005 and wanted to further my education, which led me to medical school.
6. My favorite movie is "Interstellar."

Alanna Hall
Rock River, Wyoming

1. Creighton University (Nebraska), bachelor's in economics.
2. The highlight of medical school thus far has been my primary care practicum in emergency medicine. Being able to apply class material to the variety of clinical scenarios seen on a daily basis in the ED and to work through patient cases with my preceptor has been invaluable.
3. I'm looking forward to allowing clerkships to guide me in selecting a specialty but at this time I am most interested in psychiatry and internal medicine.
4. I love the community we have within our foundations site while maintaining the benefits and connections of the greater WWAMI region and the University of Washington.
5. I recognized the role that medicine inevitably has in the lives of people from all walks of life and believe a career in healthcare to be fundamentally impactful and rewarding.
6. My favorite book is "Being Mortal" by Atul Gawande. It has really challenged me to perceive the objectives of medicine in a more holistic and humanistic way.

Marcus Couldridge
Casper, Wyoming

1. Western Washington University, bachelor's in biological anthropology.
2. The first summer experience at my TRUST (Targeted Rural Underserved Track) site in Thermopolis has been a highlight.
3. I'd like to focus on family medicine, because I enjoy the relational part of medicine along with the flexibility and diversity.
4. I like the WWAMI program because of the support systems both from the University of Wyoming and University of Washington.
5. My mom was a big influence on my decision to pursue medicine.
6. "Harry Potter and the Order of the Phoenix" (book NOT movie). Most recently, my favorite book is "Neither Wolf Nor Dog" by Kent Nerburn because it challenges my privilege and the notion of "helping."

Renee Wollman
Huron, South Dakota

1. University of Wyoming, bachelor's in physiology.
2. Our time with preceptors and spending time in the hospital is a great opportunity to apply the general knowledge taught in the classroom in a clinical setting. I'd say it's a highlight to finally be able to see what being a physician entails.
3. Most of my clinical exposure has been to the surgical field and emergency medicine, my interest is directed accordingly. Both areas offer stimulating environments with high-risk situations that push the comfort zone of medicine. While it certainly is interesting to a first-year medical student, I'm sure my perspective will continue to change with increased exposure to other disciplines.
4. Our small class size has formed a cohesive group that has made it easy to transition into the medical school environment. We have become a true family and being part of each other's lives has been truly amazing and an advantage both socially and educationally.
5. I became interested in medicine when I realized its role in integrating all the academic fields with potential for endless innovation without neglecting the humanity component.
6. "Pan's Labyrinth" is a movie about innocence and imagination not only prevailing in the face of evil but forging a new and different path, either by imaginative ingenuity or madness, depending on how you would like to interpret it. "The clues to the answer can be found by those who have eyes to see."

Adam Blaine
Gillette, Wyoming

1. University of Montana, dual bachelor's in economics and resource conservation.
2. Working with our clinical faculty, preceptors, and hospitalists have been a highlight of my first year. Our clinical experience is an outstanding opportunity that applies and reinforces the topics we cover during our studies.
3. Family medicine is the area of practice at the top of my list. Throughout our first year I have been fascinated by many of the topics we have covered. From immunology to pulmonology, I have found that a family medicine physician sees a little bit of everything we study.
4. WWAMI's unique class size provides the best setting to learn in a friendly environment with faculty members you can actually get to know. It also offers the strong backing of the University of Washington that provides opportunities in research and exploration that might not be found in a smaller school.
5. During my training as an EMT I was drawn to the science and patient care of medicine. I further developed a passion for physiology as I continued my education as a post-baccalaureate student at the University of Wyoming. In addition to the science I volunteered at a free clinic where I found the personal patient care extremely fulfilling. As a student I am excited to continue my studies to help patients achieve better health outcomes.
6. My favorite book is The Boys in the Boat by Daniel James Brown. The personal story of struggle, work ethic, and teamwork was an inspiration.

WWAMI Student Profiles

Reno Maldonado
Laramie, Wyoming

1. University of Wyoming, bachelor's in kinesiology and health promotion
2. So far, the highlight for me has been the ability to learn information in class and then take that information and apply it in a clinical setting. With so many willing and excited mentors in the community we as students are able to really get great hands-on experience and teaching.
3. Currently I am leaning toward surgery. However, I have not narrowed down any specific sub specialty. I look forward to the ability to keep exploring all of the unique specialties.
4. I have really enjoyed being part of a larger collaboration with the WWAMI states. It is truly special to have access and exposure across such a wide area.
5. Throughout high school and my undergraduate education I always knew that I wanted to be a physician. As I sought opportunities for exposure to healthcare my passion for medicine just grew and always left me wanting more. Seeing the impact that I could have as a physician on patients and my community is ultimately what keeps me excited and eager to learn more.
6. My favorite movie is "The Big Lebowski."

Trey Thompson
Cheyenne, Wyoming

1. University of Wyoming, dual bachelor's in molecular biology and microbiology
2. There have been a lot of highlights so far, including learning the basics of wilderness medicine at NOLS and learning hands-on skills during our workshops. My favorite highlight has been every morning that I have spent with my preceptor. Getting this much direct patient contact experience this early in medical school is a wonderful way to reinforce why I am pursuing this career, especially in the midst of lecture-heavy days.
3. There are so many different fields of medicine that are fascinating to me, and I am really excited to continue to gain more first-hand experience in the different areas. The idea that I might end up in a specialty that wasn't even on my radar prior to applying to medical is really exhilarating to me.
4. In addition to gaining such valuable clinical experience so early in medical school, I really like the WWAMI program because it allows me to continue my education in my home state. It is such a privilege be one of twenty students that are able to pursue medical education right here in our backyard. Our small cohort really allows for supportive learning environment that I think is unique to this program.
5. Medicine seemed like the perfect intersection of my strong passion for science and desire to work with people. The clearest "light bulb" moment, which finally cemented my career choice, came the night before I graduated high school. My grandmother surprised me with my grandfather's medical bag that he took with him and used during house calls. It still had some of his instruments inside. After hearing numerous stories from my mother and grandmother about his career, this vestige of his career and life, which I was never a part of, was the most thoughtful gift I have ever received. It was the last sign I needed to officially begin the path to this career.
6. My favorite movie is "Inglourious Basterds." I am a huge movie nerd, and slight history nerd as well. I think the aesthetic of this movie is undeniably flawless. The way Quentin Tarantino masterfully weaves tension through clever dialogue, even in multiple languages throughout this movie, is incredible.

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Wearable Medical Devices Give Abundant Data—and Risks

BY MIRANDA FELDE
MHA, CPHRM, Vice President, Patient Safety and Risk Management

Since 2013, the number of US consumers tracking their health data with wearables has doubled. And that number continues to rise: During the third quarter of 2018, the wearables market saw a nearly 60 percent increase in earnings over the prior year.

Wearables are electronic devices worn on the body, often like a watch. Wearables can track patient data like heart rate, blood pressure, or blood glucose. They can also track activity level, e.g., counting steps.

Promoters of wearables say that they could provide physicians with abundant data when caring for patients with chronic health issues. They also predict that combining wearables and gamification—e.g., competing with family members to see who can "score" the most steps in a day—may lead to improved health and better health outcomes.

However, skeptics question whether gamification will really lead to healthier behaviors long-term. And questions abound about what to do with wearables' data and how to protect it. Wearables bring promise, but also real risks for patient safety and physician liability.

Benefits of Wearables

Promoters of wearables believe wearables will drive the transition to intelligent care, whereby physicians have access to more data—in which they can identify actionable components. Florence Comite, MD, a New York endocrinologist who describes wearables as "almost like magic," uses data from wearables to tailor her interventions for patients with chronic conditions.

Wearables can help patients take action, too. In one recent study, diabetes patients using a wearable app showed randomized controlled trial results comparable or superior to patients taking diabetes medications.

Promoters of such digital strategies hope that they will encourage healthy behaviors while requiring fewer office visits purely for monitoring purposes, thereby reducing healthcare costs while improving patient experience and engagement. For instance, David Rhew, MD, chief medical officer for Samsung, hopes that wearables can help patients move to the highest level of patient activation, Level 4:

The Four Levels of Patient Activation

- Level 1: Predisposed to be passive. "My doctor is in charge of my health."
- Level 2: Building knowledge and confidence. "I could be doing more."
- Level 3: Taking action. "I'm part of my healthcare team."
- Level 4: Maintaining behaviors, pushing further. "I'm my own advocate."

Some apps promote healthy behaviors with gamification. For instance, a user might compete with family or friends to take the most steps each day, either informally or through an organized group. Harvard professor Ichiro Kawachi, PhD, wrote in JAMA Internal Medicine that this is "an opportunity for clinicians to turn health promotion into an engaging, fulfilling and fun activity." Sponsors hope that such groups can promote accountability, responsibility, and mindfulness about activity and health conditions.

Skepticism about Wearables

It is too soon to say whether wearables will increase healthy behaviors and/or reduce office visits, thus lowering healthcare costs. Some studies have found that wearable devices have no advantage over other forms of goal tracking or social support in helping people meet their health and fitness goals. A 2016 study from the University of Pittsburgh, for instance, found that "young adults who used fitness trackers in the study lost less weight than those in a control group who self-reported their exercise and diet.

Risks of Wearables

Though each device has its pros and cons, all wearables generate concerns for physicians, including:

- Poor data quality: Data from wearables may or may not be reliable enough for medical use.
- Data fixation: Patients may fixate on one number—steps per day, for instance—at the expense of other health variables, such as their diet, sleep habits, etc.
- Lack of interoperability with electronic health records (EHRs): If a patient's wearable cannot stream data to the patient's EHR, then how can the physician's practice securely acquire the data?
- Data saturation: Physicians receiving patient data from wearables risk being soaked by a data

fire hose. Physicians need a plan and a process to determine what measurements are relevant to a given patient.

- Unclear physician responsibilities for collecting, monitoring, and protecting data: HIPAA applies to patient data collected by physicians, but differing state laws mean that a physician's specific responsibilities for monitoring and protecting patient data vary by location.
- Lack of data security—and liability for physicians: Wearables are subject to cyberattack. In addition to presenting obvious risks to patient safety, this may also present liability risks to physicians—who may be expected to notify patients of recalls issued for their wearables.

Next Steps

As more and more physicians are accepting—or requesting—their patients' data from wearables, questions include: How can we tell when data from wearables is accurate? When it's actionable? When it's secure?

Certainly, physicians interacting with data from wearables should independently confirm that data before changing a patient's care, and should store data from wearables securely.

For help implementing remote patient monitoring in your practice, see the American Medical Association's (AMA's) Digital Health Implementation Playbook.

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WYOMING

New System Provides Easier Access to Information

BCBSWY Works to Streamline Provider Services for Wyoming

On the first of January, BCBSWY transitioned its entire operating system to a new platform, replacing a system that had been in use for more than 30 years and could no longer meet the complexities of today's health care and reimbursement opportunities.

As anyone knows who has ever experienced a computer system conversion or a medical records update, the advances and ease of the new system are welcomed, but it doesn't come easily or without glitches and hiccups – both expected and unexpected.

"Our service levels for physicians and other health care professionals have been impacted by this change, adding some extra burdens on your practices and barriers for your patients," said Kris Urbanek, Director of Provider Relations at BCBSWY. "These impacts are temporary, and we are working diligently to improve processes and turnaround times."

Having a new system means that BCBSWY is counting on offering you faster and easier service, and we're committed to streamlining our processes. As a reminder of some of the changes we've made:

Your Availity Provider Portal provides a full suite of online tools. This secure, and easy-to-use online site lets your office verify eligibility and benefits, submit medical claims, check claims status and view remittance advices. Submitting prior authorization requests through Availity is expected to be available by midsummer.

The new claims processing system is now fully compliant with the National Correct Coding Initiative (NCCI). You may have noticed some slight processing changes, so it's important to make sure your office staff and third-party billing vendors are using those common edits.

"We'd encourage your offices to use the Availity portal for convenience and faster answers to your questions," Urbanek urged. "We post policy updates and other news on the portal as an easy way to get the information you need. Provider resources and forms will continue to be available on our website at BCBSWY.com/providers," he added.

If you can't find what you're looking for online, you can call our dedicated provider services line at 888-359-6592.

BCBSWY values its partnership with Wyoming's physicians, hospitals and other providers. NWe'll continue to improve our services and responsiveness to you, and we're dedicated to working together to give Wyoming families the security of knowing they have quality health care services today and in the future.

Cheyenne Regional Medical Center

Ankle Arthritis: Management and the Role of Total Ankle Arthroplasty

BY ANDREW STITH, MD
Fellowship Trained Orthopedic Foot and Ankle Surgeon

Ankle arthritis can be a debilitating problem for patients leading to pain, loss of function, and overall decreased quality of life. The causes of ankle arthritis are myriad but often stem from prior trauma and inflammatory arthropathies such as rheumatoid arthritis or gout. The initial evaluation requires a thorough history and physical exam to elucidate the location of a patient's pain, the amount of deformity present, the amount of disability it causes in the patient's life, and what the patient's goals of treatment are. Standing X-rays of the ankles are important to obtain to evaluate the amount of arthritis, the alignment of the hindfoot, and if any deformity is present. Advanced imaging with a CT scan can provide information regarding deformity, cystic changes, and if degenerative arthritis is evident in adjacent joints such as the subtalar joint.

Conservative management options are employed first to manage symptoms of ankle arthritis in patients that have early degenerative changes, minimal pain, or wish to avoid surgery. The most common conservative treatment options include oral anti-inflammatory medications, steroid injections, physical therapy to maintain joint mobility and strength, and custom Arizona-style lace-up ankle brace.

> "Total ankle arthroplasty has become a popular option in patients with end-stage ankle arthritis."

When end-stage arthritic changes are evident on X-rays and conservative measures are no longer effective in managing patients' symptoms, surgical management is indicated. The traditional gold-standard surgery for ankle arthritis is a fusion of the ankle joint. This procedure is an excellent option in younger, highly active individuals who will be placing a high level of stress on the ankle over a longer lifespan such as laborers with post-traumatic arthritis. It is also typically preferred for patients with significant angular deformity of the ankle with ligamentous insufficiency. The benefit of an ankle arthrodesis is that once healed, the fusion can last the life of the patient and generally will not require revision. The downside of ankle fusion is the loss of motion at the ankle joint. This is partially compensated by motion at the midfoot and while most patients can ambulate normally, increased stress can occur at adjacent joints leading to possible degenerative changes down the road.

Total ankle arthroplasty has become a popular option in patients with end-stage ankle arthritis. Current generation implants have made great progress in improving implant longevity and fixation, reproducible results, and improvement in patient reported outcomes. The concept is similar to that of total knee and hip arthroplasty, replacing the tibial and talar arthritic surfaces with metal components with a polyethylene liner to allow low friction motion at the joint. The benefits of an ankle replacement include maintaining ankle joint range of motion, decreasing stress on adjacent joints, and allowing patients to ambulate with a more normal gait. Typically, patients can bear weight sooner after an ankle replacement than if they underwent a fusion. Successful ankle replacements are possible in patients with significant deformities of the hindfoot; however, this often requires a 2-stage approach to correct the alignment of the foot prior to proceeding with ankle arthroplasty. The downside of ankle replacement is the risk of requiring surgical revision. The polyethylene liner can slowly wear over time, requiring replacement. Additionally, the bone surrounding the metal components can fail, requiring either a revision of the components or conversion to an ankle fusion. This risk of requiring revision is naturally higher in younger patients who will have the ankle replacement for more years of their life. Highly active/athletic patients also are at risk of more rapidly wearing their components out, requiring earlier or multiple revision surgeries.

Ankle arthritis is a common problem that decreases patients' quality of life. Management can span from conservative treatment in a brace to ankle fusion or replacement. While fusion is preferred in younger highly active patients, total ankle arthroplasty has become a valid option to manage ankle arthritis in selected patient populations, and the indications are gradually expanding as research into the field progresses and long-term outcomes become available.

Children's Hospital Colorado

Ovarian Cysts: Observation versus Surgery and When to Worry about Torsion?

BY PATRICIA HUGUELET, MD
Section Chief, Pediatric and Adolescent Gynecology, Children's Hospital Colorado,
Assistant Professor of Obstetrics and Gynecology, University of Colorado School of Medicine

Ovarian cysts occur frequently in children and adolescent girls and may be discovered due to symptoms, routine physical examination or incidentally through imaging studies. Historically, ovarian cysts and masses discovered in children and adolescents were removed surgically, often involving removal of the entire ovary. During the last decade, however, the management of ovarian masses has shifted toward a more conservative approach with ovarian preservation. The reasons for this are likely multifactorial, including advances in radiologic imaging, the identification of tumor markers, and an increase in the availability and accessibility of pediatric and adolescent gynecologists within pediatric healthcare systems.

Benign ovarian masses are classified as either non-neoplastic or neoplastic. The majority of non-neoplastic cysts in this population are physiologic, and can further be classified as simple or follicular, corpus luteum, hemorrhagic, or paratubal cysts. These cysts may be diagnosed as a result of acute pain, or they may be discovered incidentally during routine physical examination or imaging. At the time of diagnosis, if there is high concern for torsion, surgical exploration is required. However, if torsion is not suspected, the majority of non-neoplastic cysts can be managed expectantly with serial ultrasound imaging. Reimaging after eight to twelve weeks often reveals resolution of the cyst. Some adolescents will then elect to start hormonal suppressive therapy to prevent future cysts, but this decision should be individualized and discussed with the treating gynecologist. Hormonal suppression does not cause regression of existing ovarian cysts.

The decision to proceed with surgery for cysts that do not resolve spontaneously is generally based on the patient's symptoms, physical examination and imaging findings. Although size thresholds are often discussed by providers, the literature does not support a single size threshold as an indicator for mandatory surgical exploration.

Ovarian neoplasms are much less common than non-neoplastic cysts, accounting for approximately 1% of all tumors in children and teens. Most ovarian neoplasms are benign; fewer than 10% are malignant. In girls and adolescents, the majority of these benign ovarian neoplasms are mature cystic teratomas (dermoid cyst), serous and mucinous cystadenomas. The majority of malignant neoplasms in children and teens are germ cell in origin, compared with epithelial cell tumors which account for most malignant neoplasms in adults. Ultrasound is the imaging study of choice to distinguish between these masses, with assessment for cystic and solid features, as well as Doppler flow to look for increased vascularity which frequently occurs with malignancy. Tumor markers for germ cell tumors (LDH, AFP, HCG and Inhibin) are useful when imaging studies suggest malignancy. Surgery is always recommended in the setting of an ovarian neoplasm as it will not spontaneously regress. However, surgical intervention is still directed towards preservation of the ovary, with unilateral salpingo-oophorectomy reserved only for masses with a high suspicion for malignancy.

Patricia Huguelet, MD

It is important to note that torsion can occur with a cyst of any size, particularly when long utero-ovarian pedicles are present. The embryologic ovary originates at the level of the 10th thoracic vertebrae and descends to the true pelvis by puberty. Prior to menarche, the ovary is an abdominal organ and therefore, the normal ovary is more susceptible to torsion on the naturally elongated utero-ovarian pedicle. After menarche, most cases of torsion occur in the setting of an ovarian cyst or mass that causes the enlarged ovary to twist on its smaller, vascular pedicle. Signs and symptoms of torsion include the sudden onset of lower abdominal pain, nausea, vomiting and low-grade fever. Ultrasound evaluation most consistent with ovarian torsion includes size discrepancy in ovarian volumes, peripheralization of follicles, and centralized edema. Doppler flow can be utilized to evaluate for blood flow to the ovary, but should be interpreted with extreme

caution as 30% of cases of acute ovarian torsion in the adolescent patient will still demonstrate normal Doppler blood flow to the ovary.

An attempt should always be made to salvage the torsed ovary by untwisting the vascular pedicle, thereby allowing reperfusion of the ovary. If a cyst is present, it should be removed to prevent recurrence. Ovarian sparing surgery is always preferred given the long-term risks of unilateral oophorectomy. The potential negative effects of oophorectomy include an increased risk for earlier menopause, premature ovarian failure, diminished ovarian reserve and fertility, and long-term adverse effects on bone health, sexual functioning and cardiovascular health. Regardless of the necrotic appearance of the ovary at the time of surgery, detorsion with surveillance is the recommended management as most ovaries will show return of follicular activity. After detorsion, reimaging of the ovary can be performed several weeks later to assess for return of ovarian function.

> "During the last decade, the management of ovarian masses has shifted toward a more conservative approach with ovarian preservation."

It is also important to recognize that sometimes the fallopian tube alone can be twisted on its pedicle. If not recognized in a timely manner, it can also adversely impact an adolescent's future fertility. In a case series published by our Adolescent Gynecologists at Children's Hospital Colorado, > 90% of teenage girls with isolated tubal torsion has documented normal blood flow to the ovary, making the diagnosis particularly challenging. In our case series, the triad of a simple paratubal cyst, normal blood flow and pain out of proportion to exam was highly predictive of isolated tubal torsion and something that we look for routinely to better assess and surgically mange our patients.

For consultation, referral of diagnostic dilemmas contact the Children's Hospital Colorado Pediatric and Adolescent Gynecology team through One Call at 720-777-3999. For additional education on this topic you can listen to the Charting Pediatrics Podcast, available on Apple Podcast, GooglePlay and Spotify, and listen to Season 2, Episode 19: Ovarian Cysts and Torsion Risk.

Afton, WY
Clayton Brown, MD
Michael R. Pieper, DO

Arapahoe, WY
Lindsay McAuley, PA-C

Big Horn, WY
Jonathan Herschler, MD
Edward Hobart, MD
Gregory G. Marino, DO
D. Scott Nickerson, MD

Big Piney, WY
William David Burnett, MD
Brendan Fitzsimmons, MD*

Billings, MT
Alan Dacre, MD

Boulder, CO
Michael Wasser, MD

Bozeman, MT
William Bennett, MD

Buffalo, WY
Brian Darnell, DO
Hermilio Gonzalez, MD
Grace Gosar, MD
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Lawrence Kirven, MD
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Martin Ellbogen Sr., MD
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David J. Erk, MD
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