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South Dakota medicine

THE JOURNAL OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

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WHAT ARE TRUMP ACCOUNTS?

BENEFITS, FEATURES, AND TAX CONSIDERATIONS

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What are Trump Accounts?

Trump Accounts are tax-deferred investment accounts for children under age 18, created under the One Big Beautiful Bill Act (OBBBA). The child is the legal owner of the account, while a parent or guardian manages it until the child reaches adulthood.

The accounts are designed to encourage long-term investing for children through low-cost, broad U.S. stock index funds. Key Trump Account features include:

Tax-deferred investment growth, annual contribution limits of $5,000 per child, limited access before age 18, a one-time $1,000 federal contribution for eligible children born between January 1, 2025, and December 31, 2028.

Accounts are expected to launch beginning in July 2026. Current guidance suggests families will establish the accounts through IRS Form 4547 or online.

Who Benefits Most from Trump Accounts?

Families With Young Children

The biggest beneficiaries are likely families with newborns or very young children, especially those eligible for the $1,000 federal seed contribution. The power of long-term compounding is significant. For example, assuming a 10% annual return and no additional contributions, that initial $1,000 could grow to $5,500 over 18 years. Left untouched until age 65, it could grow to nearly $500,000.

Long-Term Investors

Trump Accounts may appeal to parents and grandparents who want to start investing early for children, teach long-term investing habits, build savings beyond education-only purposes, take advantage of tax-deferred growth.

Unlike a 529 plan, Trump accounts are not limited strictly to educational expenses, giving families more flexibility.

Employers Offering Family Benefits

The law also allows employer contributions up to $2,500, creating a potential new workplace benefit. Several large companies, including Bank of America and JPMorgan Chase, have already announced plans to contribute or match contributions for employees' eligible children.

For employers, this could become a recruiting and retention tool, a family-focused employee benefit, a payroll-based savings program similar to retirement plan matching.

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Thinking Different: Faculty Development for a New Generation of Physicians

Jason J. Kemnitz, EdD

I've always appreciated a good idea wrapped in simple language. A well-placed quote, a clean framework, or even a clever tagline has a way of sticking with you longer than a dense paragraph ever will. Apple's "Think Different" campaign is one of those ideas. It did not focus on specifications or features. It focused on people willing to push boundaries, challenge assumptions, and see things a little differently.

Now, before you wonder what a Silicon Valley marketing campaign has to do with teaching rounds or clinic schedules, I would argue quite a bit. Because if there is one area in academic medicine that benefits from a fresh perspective, it is faculty development.

We spend a great deal of time talking about how we teach. We share strategies around feedback and evaluation. Yet every so often, it is worth asking a more difficult question: are we changing how we teach, or are we simply refining what we have always done?

Much like many areas in medicine, faculty development has been built on tradition. Physicians are expertly trained in clinical care and research, yet most step into teaching roles without formal preparation as educators. Instead, they learn by modeling what they experienced themselves.

At the same time, the learners in front of us are changing. Today's students and residents are accustomed to rapid access to information, personalized learning pathways, and constant digital interaction. Many are using artificial intelligence tools to organize, summarize, and test their knowledge. They are not waiting for information—they are navigating it.

This is where "thinking differently" becomes more than a slogan. It becomes a responsibility.

We have already seen the role of the educator begin to shift. The traditional lecturer has largely given way to the facilitator, and increasingly, to the coach. But even that evolution is not the endpoint. The next step asks us to become designers of learning, individuals who create experiences that challenge learners to engage, reflect, and adapt.

In clinical teaching, structure often brings a sense of control. Clear answers and efficient teaching points help keep the day moving. Yet some of the most meaningful learning moments occur in uncertainty, when a student pauses, reflects, and works through a problem that does not have an immediate answer.

That shift requires something we have not always emphasized in medicine: creativity. Once considered peripheral, it has become central. Physicians are expected to navigate complex systems, integrate new technologies, and make decisions with incomplete information. Creative and critical thinking are daily necessities. If we expect our learners to develop these skills, we must be willing to model them ourselves.

Artificial intelligence adds another layer to this conversation. It is already present in clinical care and increasingly embedded in learning environments. The goal is not to resist it, nor to rely on it entirely, but to understand how to use it well. Our responsibility as educators is to provide that context, helping learners understand where AI can add value and where human judgment must take the lead.

Learners still look to faculty not just for knowledge, but for example. That is where faculty development has its greatest impact, not in a single session or strategy, but in culture.

We know from experience that learners are always watching. They notice how we interact with patients, how we respond to pressure, and how we handle the moments that do not go as planned. Teaching is rarely a one-way exchange. It is a shared experience where we learn from our students as much as they learn from us.

So what does it mean to think differently about faculty development?

It may be as simple as giving ourselves permission to try something new in a teaching encounter. It may involve creating space for reflection, asking not just what we taught, but how and why we taught it that way. It may mean engaging colleagues in conversation and sharing what we might try next time.

Apple's campaign celebrated those who challenged the status quo. In academic medicine, we do not need to be radical, but we do need to be intentional. If the goal of medical education is the betterment of society, then how we teach matters just as much as what we teach.

The opportunity in front of us is not to abandon what works, but to build on it with curiosity, creativity, and a willingness to see our role a little differently. Because in the end, faculty development is not about perfecting a system. It is about preparing the next generation to improve it.

Special congratulations to SSOM's own faculty who thought different and are now being inducted into the South Dakota Hall of Fame. Drs. Susan Anderson, H. Eugene Hoyme and Daniel Petereit. We look forward to celebrating with you this fall. To see their contributions to South Dakota check out the South Dakota Hall of Fame homepage.

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Addressing Social Determinants of Health in Challenging Times

Ben Meyerink, MD
President, South Dakota State Medical Association

I was recently on call and a patient with diabetes contacted me about hypoglycemic issues while on insulin. Typically, this is a straightforward problem with easy adjustments and solutions. However, this patient told me that their issue was managing their insulin with no ability to afford food for a number of days at a time. This took me aback. Most of us cannot fathom being in this scenario and I would assume many of us often overlook situations like this happening in our own backyard. Not only was this patient affected, so were her children who I had no idea before this phone call, were facing so many barriers to living healthy lives.

While we may not be overtly in a recession, I think we can all sense the pressures many are facing in our communities and state right now with rising costs for daily needs like gas, food, and housing. If you are like me, you probably only see this as affecting your life in terms of things like investments and not in tangible ways. However, for many of our patients, this affects them firsthand every single day and in the case of this patient, it could mean life or death. Thankfully, our state does have a number of resources for patients like this, but many people, including physicians, are not aware of these programs. While it is important to learn about cutting edge medications, tests, and other advances, sometimes it is equally important to learn about resources to help meet the most basic needs humans face.

The reason I bring up this topic here is because the SDSMA is actively working to help the citizens of our state address these needs. Recently, we made a large donation to Feeding South Dakota. Our association is in a strong spot financially and we see it as our duty to give back to both our members as well as our patients. We hope to continue being a philanthropic organization and donate to similar causes for years to come. In addition, our recent SDSMA Annual Conference was a resounding success. Not only was it well attended, it provided high quality education and growth. This year's topic was Lifestyle Medicine, a topic I have been passionate about for years now. Through this, we involved our Department of Health and many physicians to discuss not only the tenants of this field, which certainly crosses all specialties, but also educate you all on ways our state can help support patients living healthier lifestyles which we know will lead to significantly better long term outcomes. In our current economic times, this becomes more challenging but makes it even more critical to involve community programs, churches, governmental programs, and other resources to help patients succeed.

Patients do often make the best teachers, and in the case of this patient, she reminded me that sometimes my own patients' greatest barriers are not a prescription, procedure, or a diagnostic test. Instead, this patient needed to be connected to a social worker, community resources, and reminded of nutritional aspects that will often ascend anything I can do in the exam room. If you have ideas for ways the SDSMA can continue to help give back to our communities, I would welcome any ideas and new partnerships. Social determinants of health can often be more challenging to solve than most disease processes. However, I am thankful we have organizations like the SDSMA and our state health department who partner with physicians to help South Dakotans achieve better health outcomes.

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HISTORICAL SERIES:

Origins of the Stethoscope

Andrew Kremer, MS IV; and H. Bruce Vogt, MD

Introduction

René-Théophile-Hyacinthe Laennec, born on February 17, 1781, is widely credited with the creation of one of the most recognizable medical tools: the stethoscope. One cannot walk through a clinic or hospital anywhere in the world without encountering this instrument—whether draped around a clinician's neck, tucked into a pocket, or carried at the hip. A mainstay of modern healthcare, the stethoscope consists of earpieces, tubing, a diaphragm, and a bell. However, the modern stethoscope differs significantly from its earliest form. Herein, we examine the origins of this indispensable tool and the brilliant mind behind its design.

Laennec was born in northwestern France, where he lived until the age of 5. Shortly before his 6th birthday, his mother died from complications of tuberculosis. He subsequently went to live with his great-uncle, a priest, who raised him for seven years. At the age of 12, Laennec moved again, this time to live with a different uncle, a physician affiliated with the university. The early influence of these two men is evident in Laennec's life and character. He became a devout Catholic, described by friends and family as exceptionally kind and charitable, embodying many key Christian virtues. He also pursued a career in medicine.

Laennec possessed an inquisitive mind, one inclined toward invention and innovation. These qualities contributed to several medical discoveries, though he is best known for developing the stethoscope.

The stethoscope remains one of the most accessible and essential tools in a clinician's repertoire. Its relatively simple design and intuitive function have made it a cornerstone of the modern physical exam. It is understood easily by examining the components, for example, the diaphragm and bell. These are the parts placed directly on the patient. The diaphragm transmits higher-frequency sounds by generating pressure waves in the air-filled tubing, while the bell captures lower-frequency sounds.

Over time, the stethoscope has undergone significant advancements, including improved materials and design, as well as the incorporation of additional technologies such as sound amplification, recording capabilities, and wireless connectivity. With the emergence of artificial intelligence, newer models are even capable of providing AI-generated interpretations of auscultatory findings in real time.

Although auscultation is now straightforward with the use of a stethoscope, clinicians historically had to rely on more rudimentary methods. Before its invention, auscultation was performed manually—by placing one's ear directly against the patient's body to listen to sounds of the heart, lungs, or abdomen. As a physician trained in the practices of his time, Laennec was well accustomed to this method.

However, a particular patient encounter became the catalyst for innovation. A woman presented in distress, and her body habitus, along with a large bust, made manual auscultation both difficult and potentially inappropriate. Laennec wished to preserve the patient's dignity and avoid the discomfort or perceived impropriety of direct contact. Seeking a solution, he improvised by rolling several sheets of paper (some accounts mention up to 24 sheets of paper) into a tube to extend his reach. This simple device allowed him to auscultate the patient effectively enough to complete his examination.

This moment marked the beginning of the stethoscope's development. Laennec decided to build out his idea, an early model is pictured below in Figure 1, and Laennec named it simply, "the cylinder." This early model of the stethoscope is on display at the science museum in London. You can see how a more permanent model made of wood was a more feasible next step compared to a rolled tube of paper sheets. Dr. Laennec is depicted in figure 2 using the cylinder to auscultate a patient. The internal beveling shown in figure 3 displays how early attempts to amplify auscultation findings were approached. It further serves as an interesting corollary to the modern stethoscope and the use of the bell and diaphragm. A widened opening at the start of the internal working in figure 3 to pick up the sounds functions the same as the diaphragm and bell. Further, you can see how the later portions of the internal workings of figure 3 reduce in diameter to allow for passage of the sound waves towards

Figure 1. A closer view of an early stethoscope model.

Science Museum London / Science and Society Picture Library, CC BY-SA 2.0 https://creativecommons.org/licenses/by-sa/2.0, via Wikimedia Commons.

Figure 2. A depiction of Dr. Laennec examining a patient with an early model of his stethoscope "or cylinder" while medical staff watch.

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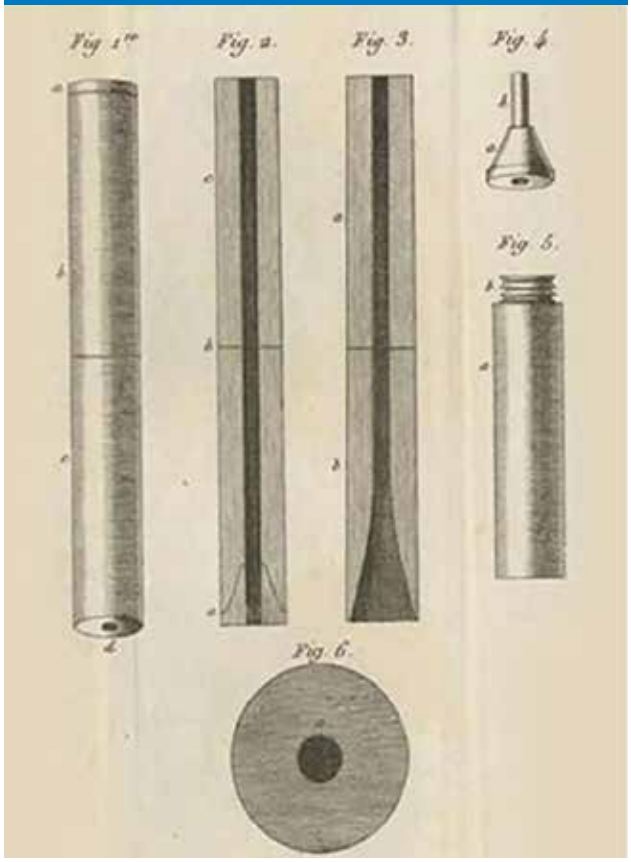
the end of the cylinder. Again, a correlation to the modern stethoscope, though now days we use tubing and earpieces to transmit our auscultatory findings.

Conclusion

Dr. Rene Laennec had a difficult beginning to his life; but with the careful stewardship of his influential uncles, he was able to pursue a medical degree, remain inquisitive throughout his life, and eventually create the first stethoscope. Even though the stethoscope looks different now, without Dr. Laennec's desire to maintain the dignity of his patients

Figure 3. An early stethoscope model broken down to show component parts and the internal beveling. This picture is taken from Dr. Laennec's own treatise on auscultation and can be found as one of the last pages of this text in its English translation.



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we wouldn't have had the initial design. Dr. Laennec's life may have been cut short by tuberculosis, but it is said that his tuberculosis diagnosis was made using auscultatory evidence derived using his stethoscope. Dr. Rene Laennec embodied many great characteristics and his impact on patients is seen (or perhaps more appropriately, heard) every time we place our diaphragm or bell on a patient.

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An Investigation of Historical Injustices in South Dakota Medical Journals: 1931-1960

Sangah Park, MS II; and Henry Travers, MD, FACP

Abstract

Exploration of the role of South Dakota medical journals in perpetuating historical biases and injustices from 1931 to 1960 continues a line of research that initially considered the period from 1912 to 1930. The *Journal-Lancet* and the *South Dakota Journal of Medicine and Pharmacy* as well as South Dakota newspapers (for eugenics only) in the years 1931-1960 were searched using key terms in five categories: Native American, Black American, the intellectual disabilities, gender and sexuality, and eugenics. Relevant articles containing key words were archived in databases (DEVONthink and Claris FileMaker) structured to permit systematic examination of the material. We found that Native Americans continued to be denigrated as savages and incapable of participating in efforts to change reservation environments and reduce disease prevalence, predominantly syphilis and tuberculosis. There was widespread acceptance of the eugenic assertion that individuals regarded as defective, tubercular or feeble-minded inherited their conditions and could pass them on persisted during this period. The belief in the greater fecundity of "defectives" was a presumed risk to the displacement of "normal" people and was the basis for continued efforts at sterilization, removal to institutions, and restrictions on their right to marry. References to eugenics fell off sharply after 1935. Homosexuality was regarded variously as both deviant and a variety of normal behavior. Distinct from the earlier period, references to Black individuals as racially inferior all but disappeared. There was growing recognition, primarily referring to Black communities, of the need to extend medical care to the poor. We conclude that physicians writing in the South Dakota medical journals during this time perpetuated biased views in the categories we studied with a reduction in biases concerning Black individuals, eugenics and the feeble-minded after 1930.

Introduction

Implicit biases related to community constructs can encompass race, ethnicity, mental capacity, sex, or age.[1] In healthcare, implicit biases impact care delivery to marginalized groups. In the case of Native Americans, for example, "Racism against Indigenous Americans...shaped centuries of dispossession, war, subjugation, and impoverishment...," as medical "...authors theorized about the merits of savagery and civilization, decried Indigenous medicines, speculated about susceptibility to epidemics, or prophesized Indigenous extinction."[2]

We had recently studied biases, racial stereotypes, hierarchies and injustices as recorded in South Dakota medical journals from 1912 to 1930.[3] We applied our findings to two recurring themes in reviews of health care bias: first, the benefit to the medical profession and society at large in acknowledging bias in healthcare and educating care givers about it;[4] and second the responsibility of healthcare workers for examining their own biases and innate beliefs. The core benefit is the provision of equitable and individualized care to all.[5]

In the present research, we extend our study for the years 1931 to 1960 *Journal-Lancet* and *The South Dakota Journal of Medicine and Pharmacy* focusing on Native Americans, Black Americans, people with disabilities, eugenics and gender. Illuminating how biases impacted the state's ability to address and improve the care of these groups remained the primary goal of our work. We limited this study to 1931 to 1960 because time to gather and analyze journal and newspaper articles, within the Medical Student Summer Research Program of the University of South Dakota Sanford School of Medicine, was limited to only 8 weeks.

Methods

Our research methods have been previously described.[6] Briefly, we examined volumes of the *Journal-Lancet* and the *South Dakota Journal of Medicine and Pharmacy*, digitally archived in the *Internet Archive*.[7] Each volume was searched for keywords or terms chosen for their relevance to the four groups we investigated: Native American, intellectual

disabilities, gender and sexuality and Black American (Table 1). We also investigated views on eugenics both in the journals and in South Dakota newspapers. Relevant articles were captured using commercial software (Snagit)[8] in portable document formats (PDFs).

The PDFs were organized using DEVONthink.[9] For eugenics specifically, South Dakota newspapers published from 1931 through 1960 were searched using newspapers.com for the terms eugenic, eugenics, and eugenist and clippings from relevant articles were added to the DEVONthink database.

Each entry in DEVONthink was searched for the textural context of the search terms (Table 1), searching multiple terms simultaneously – including keywords in the quoted text – and quotations from the text were transferred, in addition to citation information, into the relational database Claris FileMaker Pro for analysis.[10]

Results

Three hundred and forty-one individual articles were retrieved using the key words listed in Table 1. Of these, 172 articles contained information relevant to biases and were transferred to FileMaker for analysis.

The Black Race. In the period from 1912 to 1930, both trachoma and tuberculosis were associated particularly with Black and Native American communities. In 1935 Walsh perpetuated a notion from prior decades when he declared that "All races are subject to trachoma except the pure black."[11] This was the only reference to the disease in the study period connecting it to race.

Montank's 1924 observation that the blood of Black populations was "highly infective" for tuberculosis[12] was paralleled in 1934: "Hughes, in a study of the bacillary content of sputum, showed that the sputum of the Negro, as compared to the White, contained, on average three times as many bacilli."[13] This observation was related to high mortality among Black individuals as a racial phenomenon, a disease concept that would later be discredited[14,15] although controversy persisted.[16] Studies of tuberculosis in colleges showed that Black students in historically Black colleges had an incidence of tuberculosis similar to Black students in urban (largely white) colleges, even though "...the economic status of the Negro students is lower than that of whites. The incidence of disease in Negro college students is less than that found in the general Negro population and in many groups of whites."[17] A report in 1942 of the examination of 17.5 million men from the Selective Service indicated no racial differences in several criteria for rejection, including tuberculosis.[18]

Racial bias was evident in other diseases including granuloma inguinale ("The Negro race is far more susceptible than the white race"),[19] cardiovascular disease ("...the negro race is very susceptible to heart disease" [20] and "It is fairly generally agreed that the negro dies about ten years earlier of vascular disease than the white..."[21]), appendicitis ("...the death rate per 100,000 was higher for each period of study for both the colored male and female group as compared with the whites for the same ages."),[22] pernicious anemia ("The disease does not occur in negroes."),[23] and neurosyphilis ("Neurotropism is more common among white people than among Negroes.")[24] Sometimes misconceptions arose for physiognomic reasons: melanoma was thought rare in Black people[25] and their pupils were said not to dilate when given ephedrine.[26]

For some of these conditions as well as others (including pregnancy and childbirth), there was growing recognition that poverty, poor living conditions, and limited access to health care were the real culprits rather than race.[27] Adair observed in 1931 that hospital facilities "...are more inadequate than those for the white population,"[28] while a decade later Lyght reported, in a discussion of tuberculosis, that "The crowded and unsanitary conditions under which a great part of our Negro citizens live are responsible for facilitating the spread of the bacilli..."[29] Later in our study period, the *Journal* called for an end to racial segregation[30] and, while recognizing long national history of segregation,

Table 1. Keywords chosen to search journal volumes 1931-1960.

Native American	Intellectual disability	Eugenics	Gender & sexuality	Black American
Native(s)	Alien/Alienist	Eugenic(s)	Queer	Race
Savage(s)	Feeble-minded	Eugenist	Gay	Racial
Indian(s)	Retard(s)	Sterilization	Homosexual	Colored
Reservation(s)	Idiot(s)	Race-building	Sexual deviant	Negro(es)
Tribe(s)	Retardation	Race-deterioration		Black(s)
Redman/Redmen	Defective(s)			Darkies
Squaw(s)	Backward(ness)			

misrepresented actual progress toward equal rights.[31]

There were only rare references that could be viewed as caricatures of the Black community. Maeder noted that trichomonas was common in Negro women and followed that observation with "Promiscuous sexual habits and poor genital hygiene play an important role."[32] Gregg referred to the Negro's "happy-go-lucky disposition," characterizing the southern Negro's life as "unhurried, unworried."[33] Balancing these were reports of the success of Black doctors treating white patients[34] and a Black physician's (Daniel Hale Williams) triumph in cardiac surgery.[35]

Feeble-mindedness and Eugenics. Prior to the 19th century, those individuals labeled feeble-minded were largely cared for in communities.[36] Beginning in Enlightenment France, the rising influence of medicine on jurisprudence led to "...a person who was seen consistently across most of the eighteenth century as belonging to, and the responsibility of, communities, to a type of person who needed to be detained and treated under medical supervision in institutional settings."[37]

Articles in South Dakota journals embraced this trend in the early 20th century,[38] and it continued through midcentury supported by the now 150-year-old belief in medicine's central role in defining and understanding feeble-mindedness. In the early 1930s a new law required mandatory reporting of the feeble-minded to the state which would "apprehend, examine, commit, establish guardianships, transport and maintain the custody" of such individuals.[39] By 1951, about 8,500 of "such individuals" were identified.[40]

Misconceptions from past years persisted during this period. Aylen considered the moron of two types, "the sexual problem and the criminal";[41] Adler argued that the organically defective child contributed "to the increasing numbers of failures in our society"[42]; and Crafts wrote "The mentally defective especially the female of the moron grade, is a social and moral menace. She is the most prolific source in diffusing venereal disease."[43] Pankow believed that "mental defectives" with "morbid anger" roamed the world "looking for something to get angry about."[44]

Institutionalization and medical supervision were promoted earlier in these 30 years[45,46] for the purposes of restoring individuals "to competency if possible" and "to protect society against his social inadequacy."[47] Beginning in the 1940s and continuing to the 1960s was the increasing realization that fundamental concepts of feeble-mindedness and consequent institutionalization were respectively incorrect and unhelpful.

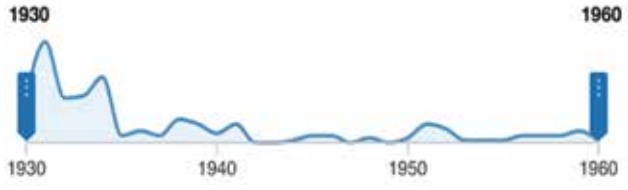
While IQ tests could identify levels of ability and permit their classification,[48] physicians were cautioned about the "stigmata of degeneration" being unreliable for the diagnosis of feeble-mindedness.[49] Similarly, articles encouraging support of parents and families of "defective" children and promoting rehabilitation appeared, a reversal of the practice of institutionalization.[50-55] In addition, medical professionals began to successfully campaign against laws "containing stigmatizing terms which seem to cast the mentally ill patient in the role of criminal."[56]

Feeble-mindedness was closely entwined with eugenic concepts ("Eugenics needs, above all else, the guidance of the medical scientist" [57] and "I think doctors will have to be the leaders in any effective program of eugenics...for the benefit of the race.")[58] Eugenics co-opted the birth control movement in the United States which had begun earlier in the century and focused primarily on contraception as a means of reducing the mortality from "back alley" abortion.

> "Aside from the obvious and cogent immediate demands of public health and preventive medicine, it is a reasoned hypothesis that birth control will better the race and diminish unnecessary suffering brought about by hereditary inadequacy, moral, mental and physical, by encouraging the propagation of the race by stocks whose adequacy is evidenced by past and present achievements..."[59]

Newspapers continued to report the need for eugenics practices[60] as women's clubs, continuing their practices from previous decades, promoted eugenic ideas.[61,62] A report on the German genetics program described the breadth of its genetic practices, including sterilizing people for "inferiority" or "worthlessness."[63] While newspaper references to eugenics fell sharply after 1935 (Figure 1), eugenics sentiments continued into 1940.[64] Thereafter authors began to comment that eugenic sterilization was "contrary to public policy"[65] and recognized that, for "defectives", "...the influence of heredity is about the same as diabetes, half as much in obesity and one-eighth as in migraine."[66]

Figure 1. Newspaper accounts of eugenics in South Dakota.



Native Americans. During this period references to Native Americans continued to characterize them as "very backward and superstitious",[67] "savage races",[68] "an ignorant and superstitious race of people…not the most desirable field in the world for the practice of our profession"[69] and similar terms.[70-74] An anonymous remark in *Gullible's Travels* noted "Gained much knowledge of Indian lore—mostly sordid."[75] Abt wrote that "Love, in our sense of the word is said to be unknown to the North American Indian."[76] Tuberculosis continued to be a major health concern, but its frequency and severity among Native Americans decreased substantially by 1960.[77] Recognition that tribal persons were no different from whites in susceptibility and response to the disease did not lessen the concern of some that tubercular Indians endangered the white population.[78,79] Northrup, for example, commented, "This nucleus of uncontrolled tuberculosis represents a hazard to the remainder of the state as the Indians do not stay strictly on their reservation."[80]

It was during these three decades that specialized treatment facilities were constructed for Native Americans,[81,82] reversing the circumstances prevalent in the early 1930s when Native American health care was not a priority. The view that Indian health care was a federal government responsibility ("Indians are charity patients of the government")[83] was modified by an effort to integrate Native Americans into the general medical systems of the state.[84-85.] Some physicians recognized that segregation was "responsible for the high morbidity and mortality rates among Indians when compared with contiguous or adjacent segments of the general population." They pointed out that for tuberculosis control programs, in particular "complete participation of the Indians" was necessary.[86] Recognition of the need for Native American participation represented a departure from the previously expressed view that "The intelligence of the Indian was not equal to the solution of this problem."[87] While a state's public health infrastructure was called upon to include Native Americans, plans for this always included participation by the Bureau of Indian Affairs.[88]

Gender and Sexuality. The articles we encountered all dealt with homosexuality. It was regarded as a perversion, a neurosis, a social maladjustment, a deviance from the norm and an endocrinopathy.[89] Kurzrok, in 1935, suggested "there is no absolute maleness or femaleness", noting further than genetic sex at fertilization would be "modified by a number of mechanisms that may subsequently come into play."[90] Kurzrok also described homosexual men producing the female sex hormone *theelin* (estrone), but he did not examine heterosexual men for the same substance.

That same year, psychiatrist Abraham Brill at New York University, pushed back on the idea of the homosexual as a degenerate or mental defective: "Homosexuality is not a sign of insanity or of any mental deficiency."[91] Nonetheless, he referred to curing the condition where a person would become sexually normal. This suggests Brill may have harbored the notion that homosexuality was abnormal. While physicians wrote about conditions associated with aberrant sexual development (e.g. intersex), such articles were rare.

In contrast to the infrequency of medical articles about gender and sexuality, South Dakota newspaper articles mentioning homosexuality numbered in the hundreds in the decade from 1950-1960 most of which focused on homosexuals in government. It was a time of the first Kinsey reports on sexual behavior in America as well as the McCarthy hearings about communists in government. The view that "Divergents from the sexual norm are pitiable, and in general live a life of mental and spiritual torture, full of frustration and persecution"[92] was widespread. The same newspaper article, claiming that "Most 'queers' eventually acquire a tendency to hysteria…and travel in packs…", supported the congressional purge then taking place in Washington, DC. According to an *Argus Leader* article in 1950, Senator Henry Styles Bridges "…told the Senate yesterday that Secretary of State Acheson would like to contend that 'the spying is all over and ended and the spies are gone' from the State Department 'because 91 homosexuals have been kicked out…'"[93]

Partly because deviant behavior frequently focused on homosexuality and partly because of the sensationalized reports of alarming growth in the number of sexual crimes in the years 1931 through 1947, South Dakota, in 1959, considered a law dealing with sexual psychopaths.[94] The law would have required a crime to be committed, the accused to be found a sexual psychopath by a panel of psychiatrists, and a court trial by a judge. Since sodomy was then a crime, homosexuals would be at risk for violating the statute. In spite of references South Dakota's sexual psychopath laws in reviews of the subject,[95,96] these referred only to one statute, SD §13.1727, covering sexual molestation of children. No sexual psychopath law was enacted in South Dakota during this period.[97]

Discussion

Ideas from earlier in the century about disease associations with race, the Native American as an intellectually inferior

savage, and the feeble-minded as a menace continued into the years between 1931 to 1960. At the same time, it became clear that tuberculosis, for example, was associated with poverty, crowded living conditions and lack of access to health care rather than race. This recognition, and the actions of physicians and civil authorities taken consequently, resulted in a marked decrease in tuberculosis incidence and improved treatment of those with the disease. Still present in the minds of some, however, was the need for action not for the sake of the afflicted, but to protect the white race from the ravages of the disease.

Viewing health care for Native Americans as a federal government responsibility persisted, although efforts began in this period to integrate Native American health care into the public health infrastructure of the state. The movement to involve Native Americans themselves in the planning, evaluation, and execution of health care programs offered considerable promise for improved Native American health care by 1960. Although as late as 1960, Native American tribes continued to be characterized as "primitive",[94] such references had become rare.

The period we studied marked a shift away from institutionalization of the feeble-minded and those suffering from other neurological disabilities (e.g. epilepsy). The widely accepted notion of stigmata revealing the defective individual to the physician was replaced by the recognition that such signs were unreliable. Physicians encouraged legislators to reject the equation of the mentally ill with criminality, prostitution and the dissemination of disease.

Eugenics continued to have its adherents in the 1930s and was an important pillar of the birth control movement, but its effects on social policy diminished sharply after that as did literature and newspaper references to it. By 1960, eugenics held no place in birth control practices.

Medical writing about gender from 1930 to 1960 was largely focused on the slowly growing understanding of biologically aberrant sexual development and homosexuality. As reflected in newspaper articles, public perceptions of homosexuality were rooted in concepts of perversion, insanity, public danger, and curability. The few journal articles we identified were, in contrast, more circumspect. Kurzrok's 1935 article asserting that "there is no absolute maleness or femaleness" now seems prescient considering today's public gender discussions. At the time it reflected a transforming view of gender in human behavior.

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Skin Cancer Prevention Outreach for Agricultural Workers: A Farm Show Survey

Leah Naasz, MD; Kianna Thelen, MD; Emily Eisenbraun, MS IV; and Candace Zeigler, MD

Abstract

Background: Agricultural workers are at increased risk for skin cancer due to prolonged ultraviolet (UV) exposure, yet many underutilize sun protection. Brief, community-based educational interventions may improve knowledge and preventive behaviors.

Objective: To provide targeted skin cancer education and promote sun protection behaviors among agricultural workers in South Dakota.

Methods: Twenty agricultural workers attending the Vermillion and Sioux Falls Farm Shows participated in a pre- and post-educational survey. Inclusion criteria included: ≥18 years old, English-speaking, and working in agriculture. Participants completed a seven-question pre-survey assessing sun exposure, sun protection habits, and knowledge of skin cancer. They then received a 10-minute tutorial on skin cancer risk factors, sun protection, and self-examinations. A post-survey assessed knowledge gained and intended behavior changes. Paired t-tests and Wilcoxon signed-rank tests evaluated pre- to post-intervention changes, with significance set at $p < 0.05$.

Results: Post-intervention, participants showed significant improvements in recognizing melanoma warning signs (mean $\Delta = 0.90$; $p < 0.001$) and identifying the most common type of skin cancer (mean $\Delta = 0.65$; $p < 0.001$). Intent to use sunscreen increased significantly (mean $\Delta = 0.38$; $p = 0.009$), though no meaningful changes were observed for wide-brim hat or protective clothing use. Participants reported a high likelihood of engaging in sun protection behaviors (mean 4.38/5).

Conclusion: Brief, targeted educational sessions at farm shows effectively increase skin cancer awareness and self-reported intent to adopt sun-protective behaviors among South Dakota agricultural workers.

Introduction

Skin cancer is the most common cancer worldwide in the fair-skinned population, with nearly 5 million people being treated each year in the U.S. alone.[1] Within recent decades, the incidence of skin cancer is on the rise.[2] Since skin cancer mainly affects sun-exposed skin, agricultural workers may be at an increased risk for skin cancer due to their prolonged exposure to UV radiation.[1] In recent years, many methods of sun protection have been developed to address this issue, such as wide-brimmed hats, UV protective clothing, and sunscreen, yet some farmers are reluctant to engage in these sun-safe practices. A study done in 2015 found that as few as 23% of farmers reported using sunscreen when outdoors for 15 minutes or more.[3] While this study identified some of the factors that contribute to poor sunscreen use in farmers such as inconvenience when working and discomfort when wearing protective clothing, they also found that farmers with higher knowledge scores regarding sun protection were more likely to use sun-protection.[3] Therefore, the employment of a skin cancer education presentation given to farmers may increase their use of sun protection and, ultimately, decrease their likelihood of developing skin cancer.

On a local level, a recent study evaluated skin cancer behaviors of agriculture workers that attended the Sioux Falls Farm Show in 2020. This study identified the risk factors of skin cancer that farmers in rural South Dakota are exposed to: working outside 8-10 hours daily for most of the year, poor sun protection habits, limited sunscreen use, and minimal use of skin self-examinations.[4] This 2020 study concluded by highlighting the need for sun protection counseling opportunities that are easily accessible to this susceptible population. Therefore, this scholarship pathways project was designed to provide targeted sun protection education for South Dakota agricultural workers in a convenient location: The Vermillion and Sioux Falls Farm Shows.

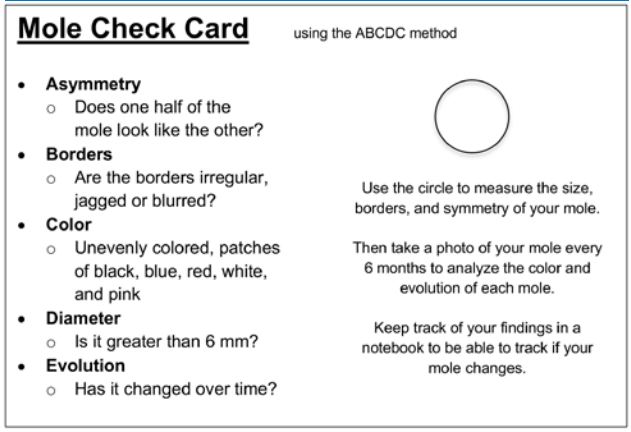
Methods

This study was approved by University of South Dakota, Sanford School of Medicine's IRB. A booth was reserved at the Vermillion and Sioux Falls Farm Shows on January 3-5 and January 24-26, respectively. This booth was shared with the USD School for Health Sciences, where manual blood pressures for farm show participants were being recorded. USD medical students were at the booth from 9 am-5 pm on Wednesday and Thursday and 9am-3pm on Friday for each farm show. Signage was used to encourage passersby to volunteer to participate. The volunteer participants were screened for eligibility by a medical student based on the following inclusion criteria: 1) being an agricultural worker or in a profession related to agriculture, 2) English-speaking, and 3) 18 years of age or older. After confirming eligibility, participants signed a consent. Once consent was given, participants took the seven question pre-educational session survey on Qualtrics that asked their age, gender, the number of hours in a day and months in a year spent working outdoors, personal and family history of skin cancer, and current sun protection habits. The questions regarding time spent outdoors were answered with multiple choice options containing two-hour intervals (e.g., 0-2 hours, 3-5 hours, 6-8 hours, and 9+ hours). General knowledge about the most common skin cancer was written as a multiple-choice question and recognizing melanoma warning signs (ABCDEs of melanoma) was written as a true or false question.

The pre- and post-surveys were developed by the authors. Content validity was ensured through comparison to American Academy of Dermatology (AAD) handouts and an expert review. The surveys used consistent wording, format, and administration procedures to enhance reliability and allow for meaningful comparison between pre- and post-intervention responses.

After the pre-survey, participants received a one-on-one or group 10-minute educational session on the risk factors of skin cancer, sun protection guidelines, and keys to self-examination as outlined by the AAD. Then, a post-survey was given to assess the knowledge the participants gained, their likelihood of using sun protection practices, and performing skin self-examinations as a result of the information discussed in the educational session. Participants also had to identify what information they learned using a check-all that apply option. This post-survey also included the same questions as the pre-survey about the most common skin cancer and recognizing melanoma warning signs (ACDEs). These responses were compared to one another in an effort to determine the effectiveness of the presentation and knowledge gained. At the end of the post-survey, a summary of the educational material presented was given to the participants as a take-home handout. This included a wallet-sized handout outlining the ABCDEs of melanoma and other signs that indicate need for clinical evaluation for a lesion of concern (Figure 1).

Figure 1. ABCDEs of melanoma wallet-sized handout.



For each of the 20 study participants, pre- and post-educational session scores were compared on each survey item. Paired *t*-tests were used for approximately normally distributed continuous scores, and Wilcoxon signed-rank tests were applied for ordinal or non-normal data. A significance level of $p < 0.05$ (two-tailed) was used to determine meaningful changes. Additionally, questions regarding "somewhat likely, very likely, etc." responses were analyzed via the Likert scale.

Results

Twenty agricultural workers completed a pre-survey, participated in the educational session, and then completed a post-survey. Analysis of the paired pre- and post-surveys revealed significant improvements in participants' knowledge and self-reported behaviors. All measured items showed an upward trend following the educational session, indicating that participants gained knowledge and reported greater intention to practice sun-safe behaviors. Statistical tests confirmed that these improvements were significant for nearly every item ($p < 0.05$, many with $p < 0.001$). In particular, the largest gains were observed in recognizing melanoma warning signs (ABCDEs) knowledge and intent to increase skin self-examination frequency. Key improvements included:

- Knowledge outcomes. Recognition of the ABCDE criteria for melanoma increased by a mean of 0.90 points (SD 0.31; $p < 0.001$). Identification of the most common type of skin cancer improved by a mean of 0.65 points (SD 0.49; $p < 0.001$).

- Sun protection habits. Planned sunscreen use after the educational session increased significantly, with a mean change of 0.38 (SD 0.50; $p = 0.009$). No significant changes were observed for wide-brim hat use ($\Delta = -0.06$ [SD 0.68]; $p = 0.72$) or protective clothing use ($\Delta = 0.12$ [SD 0.62]; $p = 0.43$).
- Post-only outcomes. Among participants who completed the post-survey (n = 29), the mean likelihood of engaging in sun protection behaviors was 4.38 (SD 0.82) on a 5-point Likert scale, indicating responses between "somewhat likely" and "very likely."

Figure 2. Likert scale comparison of mean differences in pre- and post-surveys regarding knowledge gained and the likelihood of performing self-reported behaviors.

Survey item	N	Mean Δ (SD)	*p*-value
ABCDE knowledge	20	0.90 (0.31)	< 0.001
Common cancer knowledge	20	0.65 (0.49)	< 0.001
Sunscreen use	16	0.38 (0.50)	0.009
Hat use	16	-0.06 (0.68)	0.718
Clothing use	16	0.12 (0.62)	0.432

Analysis of paired pre- and post-surveys demonstrated significant improvements in participants' knowledge and self-reported sun protection behaviors following the educational session. Recognition of melanoma warning signs (ABCDEs) and identification of the most common type of skin cancer showed the greatest knowledge gains ($p < 0.001$). Sunscreen use also improved significantly ($p = 0.009$), but no meaningful changes were observed for wide-brim hat or protective clothing use. Post-educational session, participants reported high intentions to engage in sun protection, with mean likelihood ratings between "somewhat likely" and "very likely." Overall, these findings suggest the 10-minute educational session was effective in increasing skin cancer awareness and promoting positive behavioral intentions among participants.

Discussion

Overall, the findings of this study demonstrate that a brief, targeted educational session at local farm shows can significantly improve knowledge, self-reported intent to use sun protection behaviors, and overall attitude about sun safety among agricultural workers in South Dakota. These findings align with studies in other populations, where brief, targeted educational sessions also improved sun safety knowledge and protective behaviors.[5,6] Together, these results suggest that concise, community-based interventions are effective across diverse groups, reinforcing their value for agricultural workers in South Dakota. In this study, all measured survey items showed an upward trend, with the most significant gains in melanoma knowledge and intent to increase self-exam frequency. No participant showed a decline in scores, indicating a uniformly positive impact. Notably, participants showed marked improvement in recognizing melanoma warning signs (ABCDEs), intent to perform skin self-examinations, and the likelihood of engaging in sun-safe behaviors such as using sunscreen. These findings support the hypothesis that improving awareness through accessible education can positively influence preventive sun behaviors in high-risk agricultural populations.

Despite these encouraging findings, there are limitations to consider. The study used a small sample of self-reported data, which may be biased, and long-term adherence to sun-protective behaviors is unknown. Outcomes may vary by presenter, and the English-speaking South Dakota sample limits generalizability to the broader agricultural population. Future longitudinal studies are needed to assess the lasting effects of targeted education.

Conclusion

This study highlights the effectiveness of brief, community-based education in improving skin cancer awareness and sun protection behaviors among agricultural workers in rural South Dakota. By delivering targeted skin cancer education in a convenient setting like the Farm Show, this study was able to reach a high-risk population and demonstrate meaningful gains in knowledge and intent to adopt preventive practices. These findings support the continued integration of accessible interventions to reduce skin cancer risk in underserved populations.

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SDSMA MEMBER SPOTLIGHT

Jyotroop Kaur, MD

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Practice location: Chief Resident, Internal Medicine Residency Program, USD SSOM (completing program in June 2026); Gastroenterology Fellowship Program, USD SSOM (beginning summer 2026)

Faculty appointment: Clinical Instructor, Department of Internal Medicine

Member since: 2023

WHY I CHOSE MY SPECIALTY

I chose internal medicine for its intellectual depth and the opportunity to manage complex multisystem diseases. Through early exposure to endoscopy and research, I developed a strong interest in gastroenterology for its unique blend of procedural and clinical skills, along with opportunities for innovation. While an internist at heart, I am drawn to this subspecialty to offer better patient care with gastrointestinal diseases which contribute to a high healthcare burden in our community.

WHY I'M A MEMBER OF THE SDSMA

SDSMA has been a meaningful part of my journey as a resident, offering a platform to connect with peers and mentors. It has actively supported my professional and academic growth through opportunities in publishing, collaboration and advocacy. As I transition to fellowship, I see myself continuing this journey through the help of SDSMA to further contribute to the medical community and patients of South Dakota.

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Rural Presentation of Kawasaki Disease with Leukopenia and Transaminitis

Lucas Goetz, BS, MS IV; Abbey Rieber, MS IV; and Nanci Van Peursem, MD

Abstract

Kawasaki disease (KD) is an acute, self-limited vasculitis that primarily affects young children, and early treatment is essential to prevent coronary artery complications. Diagnosis is clinical and can be challenging in children who present atypically or receive initial evaluation in resource-limited settings. We report a case of KD in a 6-year-old girl who presented to a rural clinic with six days of fever, a progressive polymorphous rash, bilateral conjunctivitis, and mucocutaneous changes. Her evaluation showed leukopenia, marked transaminitis, elevated inflammatory markers, and an extensive negative infectious workup. These findings, along with her older age and a pruritic rash, complicated initial recognition and broadened the differential to include viral exanthems and systemic infections. KD was suspected based on her clinical course, and she was promptly transferred to a tertiary pediatric center, where she met four of the five diagnostic criteria. She received intravenous immunoglobulin and high-dose aspirin, resulting in rapid improvement. Echocardiography showed no coronary involvement. This case reinforces the importance of maintaining suspicion for KD in children with prolonged fever and mucocutaneous findings, even when laboratory abnormalities are atypical. It also highlights the value of early consultation, efficient transfer pathways, and collaboration between rural and tertiary facilities to ensure timely treatment and reduce the risk of cardiac complications.

Introduction

Kawasaki disease (KD) is an acute systemic vasculitis that primarily affects medium- and small-sized arteries.[1] It occurs most often in children under 5 years of age, with a male predominance,[2] and is particularly common in Asian populations such as those in Japan, Korea, and Taiwan, suggesting a genetic predisposition.[1,2] Although the exact cause remains unknown, current evidence points to a combination of genetic susceptibility and environmental or infectious triggers.

The typical clinical presentation includes persistent fever, conjunctivitis, oral mucosal changes, rash, erythema of the palms and soles, and cervical lymphadenopathy.[1] Early recognition is essential, as timely treatment reduces the risk of cardiovascular complications. If left untreated, 15-25% of children develop coronary artery ectasia or aneurysms, making KD the leading cause of acquired heart disease in developed countries.[3] In challenging cases with prolonged fever or incomplete diagnostic criteria, consultation with specialists in cardiology, infectious disease, or immunology may be warranted.

We present a case of Kawasaki disease with an atypical presentation in a child initially evaluated at a rural clinic, highlighting the importance of early recognition with prompt referral and transfer. This case is noteworthy because the patient was older than the typical age group, met only four of the five diagnostic criteria, and demonstrated unusual findings such as leukopenia, significant transaminitis, and a pruritic rash. These features complicated recognition and emphasize the need for clinicians to maintain a high index of suspicion, particularly in resource-limited settings.

Case Presentation

A 6-year-old Hispanic female presented to a rural clinic with her parents for evaluation of persistent fever, rash, headache, and conjunctivitis. Her illness began six days prior with a headache and a mild fever, reaching 100 °F. Over the next several days, the fever worsened and an erythematous rash appeared, first as discrete spots on the left ear, cheeks, and chest. Her parents initially attributed these lesions to mosquito bites. The rash progressively spread to involve the bilateral upper extremities (extending onto the dorsum of the hands) and bilateral lower extremities down to the ankles. The rash spared the palms and was associated with mild pruritus but no pain.

During this time, the patient also developed nonpurulent conjunctivitis. She was evaluated at an outside clinic at the end of the week and was told her symptoms were likely viral in etiology. Over the weekend, her fever persisted despite acetaminophen and ibuprofen, and the rash expanded to cover most of her body, with lesions beginning to coalesce. Parents attempted treatment with cetirizine and cold compresses without improvement.

Additional history showed decreased appetite, low fluid intake, and orange urine. She had no bowel changes, joint or muscle pain, cough, congestion, sore throat, or ear pain. There were no recent sick contacts. Her past medical history included streptococcal pharyngitis treated with cephalexin 375 mg twice daily for 10 days about a year earlier and otitis media treated with cefdinir 120 mg twice daily for 10 days about a year and a half earlier. She took a daily children's gummy vitamin.

On examination at the rural clinic, the patient was alert and interactive but appeared fatigued. Vital signs were within normal limits. Skin examination revealed coalescing erythematous macules covering most of the body, which were non-painful and mildly pruritic (Figure 1A-B). The lips were dry, erythematous, and peeling, with additional peeling erythematous skin around the mouth and cheeks (Figure 1C). The buccal mucosa, palate, and pharynx appeared normal. Ophthalmologic examination demonstrated bilateral nonpurulent conjunctivitis. Mild erythema was present in the bilateral external ear canals. Cervical lymphadenopathy was noted. Cardiopulmonary, gastrointestinal, and neurologic examinations were normal.

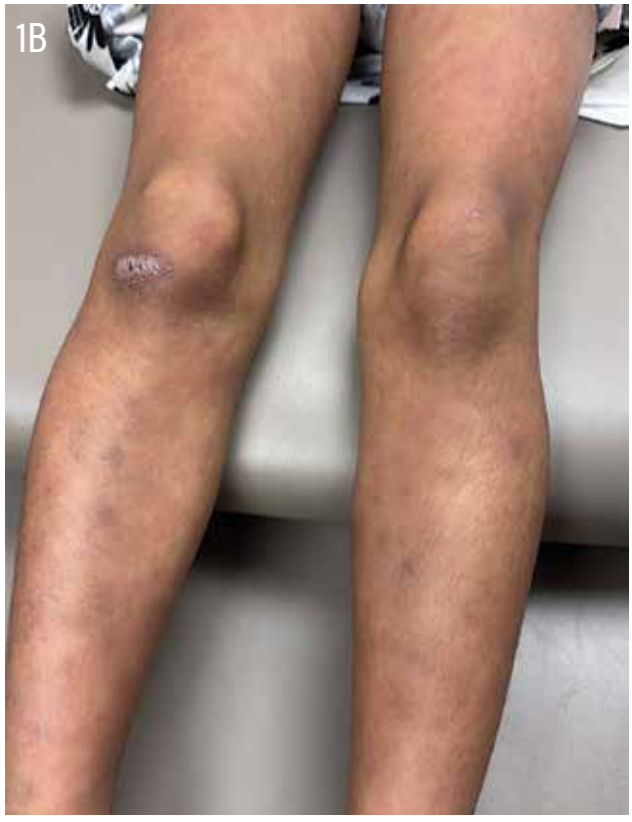
Initial laboratory testing performed in the rural clinic revealed mild leukopenia and markedly elevated liver enzymes and inflammatory markers. Abnormal results are summarized in Table 1. Urinalysis showed 1+ protein and trace leukocyte esterase but was otherwise unremarkable. An

Table 1. Abnormal laboratory findings on initial presentation.

Test	Patient value	Normal range
WBC	3.5 K/uL	4.5-11.0 K/uL
AST	249 U/L	10-40 U/L
ALT	461 U/L	7-56 U/L
Alkaline phosphatase	447 U/L	44-147 U/L
CRP	2.3 mg/dL	<0.5 mg/dL

WBC = white blood cell count; AST = aspartate aminotransferase; ALT = alanine aminotransferase; CRP = c-reactive protein

Figure 1. Coalescing erythematous macules involved the abdomen (1A) and legs (1B). The lips appeared dry, erythematous, and peeling, with additional desquamation around the mouth and cheeks (1C).



extensive infectious workup, including anti-streptolysin O antibody, was negative. Given the persistent fever, evolving rash, elevated inflammatory markers, and abnormal liver function tests, Kawasaki disease was considered high on the differential. The patient was promptly referred and transferred to a tertiary pediatric hospital for further evaluation.

At the referral center, the patient was afebrile on admission. Repeat laboratory testing the following morning demonstrated mild improvement in leukopenia, transaminitis, and inflammatory markers. Comprehensive infectious testing was performed: assays for *Chlamydia pneumoniae, Bordetella pertussis, Bordetella parapertussis*, and *Mycoplasma pneumoniae* were negative. A broad viral respiratory panel, including adenovirus, multiple coronaviruses, human metapneumovirus, influenza A and B, parainfluenza, respiratory syncytial virus, enterovirus, rhinovirus, and SARS-CoV-2, was also negative. In addition, CMV, EBV, *Toxoplasma gondii*, and parvovirus B19 serologies were negative. Transthoracic echocardiography revealed no coronary artery aneurysms or other abnormalities. Infectious disease was consulted, and given her fulfillment of four of the five diagnostic criteria (Table 2) and overall clinical appearance, treatment for Kawasaki disease was initiated. She received a single infusion of intravenous immunoglobulin (IVIG, 40 g in 400 mL) and high-dose aspirin (202.5 mg orally every six hours for eight doses). By the following day, her conjunctivitis and rash had markedly improved, and she appeared more interactive and clinically well. Pediatric rheumatology was also consulted due to a family history of systemic lupus erythematosus in a maternal aunt; screening autoimmune and serologic labs were unremarkable.

Table 2. Kawasaki disease diagnostic criteria.

Fever for at least five days and at least four of the five following features:	
Changes of the oral cavity and lips; strawberry tongue	✓
Polymorphous rash	✓
Bilateral, nonpurulent conjunctivitis	✓
Changes in the extremities: desquamation	
Cervical lymphadenopathy	✓

The patient remained hospitalized for three days. At discharge, she was prescribed low-dose aspirin (81 mg orally once daily). Discharge instructions emphasized close follow-up with pediatric infectious disease and cardiology, including a repeat echocardiogram in three weeks. Additional guidance included avoiding live vaccines for 12 months after IVIG, influenza vaccination to reduce the risk of Reye's syndrome, and supportive skin and lip care with emollients. The final discharge diagnosis was Kawasaki disease.

Discussion

Identifying Kawasaki disease (KD) in rural practice settings often requires adapting standard diagnostic and management approaches to the realities of limited resources. Clinically, KD is defined by a set of diagnostic criteria, but there is no single confirmatory laboratory test. Diagnosis, therefore, depends on recognizing characteristic clinical features and excluding other possible causes, particularly viral illnesses that can present similarly.[4]

At the small rural hospital where this patient first presented, the initial evaluation included basic studies such as a complete blood count, ESR, CRP, glucose level, liver transaminases, urinalysis, rapid strep test, and a viral respiratory panel for RSV, influenza A/B, and SARS-CoV-2. While these results raised suspicion of KD, they were not diagnostic. Additional testing, such as more specific viral studies or echocardiography performed by a pediatric cardiology sonographer, was not available locally. Likewise, there were no on-site pediatric or cardiology specialists for direct consultation, and advanced laboratory studies would have required sending samples to outside facilities.

This patient met the diagnostic criteria for KD, yet several features were atypical, including her older age, presence of leukopenia, marked transaminitis, and a pruritic rash. While mild elevation of liver enzymes is occasionally observed in KD, the degree of transaminitis in this case was notable and could have suggested an alternative diagnosis such as viral hepatitis or systemic infection. Similarly, leukopenia is uncommon in KD and may initially lead clinicians to consider a viral etiology. These findings highlight how variations in presentation can complicate recognition, particularly in settings where the disease is rarely encountered.

In rural practice, KD is often initially misattributed to more common infectious illnesses with overlapping symptoms, leading to delays in treatment.[4] Early recognition is essential, as multiple studies have shown that delayed administration of intravenous immunoglobulin (IVIG) increases the risk of coronary artery complications.[5] IVIG is not routinely stocked at many small hospitals because of limited use, limited familiarity with its use, and inadequate staffing required to admit and monitor patients receiving it.

For clinicians working in rural settings, where KD is

infrequent and confirmatory testing is limited, it is important to maintain a high index of suspicion when a child presents with prolonged fever, rash, and mucocutaneous findings. Differentiating KD from viral exanthems, streptococcal infections, or autoimmune conditions can be difficult, so clinicians need to stay alert and provide clear return precautions when a presumed viral illness is diagnosed. Early consultation with a pediatric specialist and timely transfer to a tertiary facility are key to ensuring that appropriate diagnostic studies and treatment can be initiated without delay. Clear and efficient referral pathways help reduce the time between recognition, transfer, and therapy. In this case, clinicians at the initial hospital coordinated with a regional transfer center to arrange admission to a larger facility with pediatric subspecialty services and the capacity to administer IVIG once KD was confirmed. Prompt initiation of IVIG, in addition to aspirin, led to rapid clinical improvement and normalization of inflammatory markers, aiming to prevent cardiovascular complications.

Follow-up care for potential cardiac sequelae presents another challenge for families living in rural areas, where pediatric cardiology services may be several hours away. Educating parents about warning signs of cardiac complications, such as chest pain, shortness of breath, or decreased exercise tolerance, can help ensure timely evaluation if symptoms arise. Strengthening follow-up systems and patient education can help mitigate the long-term cardiovascular risks associated with KD in rural populations.

This case highlights the importance of maintaining clinical suspicion for KD, even in older children or those with atypical laboratory findings. It shows the value of effective coordination between rural and tertiary care facilities in achieving favorable outcomes.

Conclusion

This case illustrates the diagnostic and management challenges of Kawasaki disease in a rural healthcare setting. Although the patient's presentation was atypical, early recognition and prompt transfer to a tertiary facility allowed for timely treatment with intravenous immunoglobulin and aspirin, preventing cardiac complications. Clinicians practicing in resource-limited areas should remain alert to the possibility of Kawasaki disease in children with prolonged fever and mucocutaneous findings, even when laboratory abnormalities or patient age fall outside the typical range. Establishing clear referral pathways and ensuring access to specialist consultation are essential to improving outcomes for pediatric patients in rural communities.

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Diagnostic Puzzle of Atypical Kawasaki Disease

Michael Roberts, MD; Alexandra Job, MD; Tate Blankespoor, MD; Leah Naasz, MD; Rebecca Hofer, MS IV; Meghan Kuntz, MS III; Jennifer Reed, MD; and Peter Paul Lim, MD

Abstract

Kawasaki disease (KD) is a systemic inflammatory illness characterized by medium blood vessel vasculitis and is considered to be the leading cause of acquired heart disease in children less than 5 years old in developed countries. KD can present as either a classical or atypical/incomplete presentation based on distinct laboratory parameters seen in Table 1. The exact cause of KD remains unknown; however, specific purported infectious agents have been theorized to be linked to it. It classically presents with fever and four of the following: conjunctival injection, oral mucosal changes, cervical lymphadenopathy, changes in the extremities and polymorphous rash. Rarely, KD can present with hepatobiliary syndrome such as hepatic congestion, obstructive jaundice, acalculous cholecystitis and gallbladder hydrops. We present a case of a 12-year-old, otherwise healthy male who presented with an 8-day history of upper respiratory infection symptoms and fevers up to 102 F along with significant jaundice, dilated common bile duct and transaminitis initially thought to be ascending cholangitis. His clinical course evolved to also show rash, abdominal pain, vomiting, diarrhea, cervical lymphadenopathy and non-exudative, bilateral conjunctival injection with limbic sparing. Absence of improvement to antibiotic and distinct clinical evolution prompted the diagnosis of atypical KD. He received high dose IVIG and high dose aspirin with apparent clinical improvement. His surveillance echocardiography studies and subsequent physical exam findings have all been reassuring. This case underscores how KD can initially present as cholangitis and how it can manifest as a concomitant process during a viral infection.

Introduction

Kawasaki disease (KD) is a clinically diagnosed vasculitis in children with a predisposition towards the coronary arteries.[1] Rarer clinical features may include hepatobiliary dysfunction such as hepatitis and gallbladder hydrops.[1] KD is most commonly diagnosed in Asian males under the age of 5.[1] Although the exact etiology of KD remains unknown, evidence suggests that infectious agents can enter the respiratory tract and trigger an immunological cascade.[2] Diagnosis of complete KD includes fever of at least 4 days and at least four of the following: bilateral non-exudative conjunctival injection with limbic sparing, oral mucosal changes, polymorphous rash, extremity changes (peeling and/or rash) and cervical lymphadenopathy consisting of a lymph node greater than 1.5 cm.[1] Patients who experience fevers of at least 4 days and 2-3 features of clinical criteria and compatible laboratory findings without any identified alternative cause may be considered to have atypical KD.[3] Atypical KD can be challenging to diagnose as it often resembles other systemic viral illnesses or other inflammatory syndromes. Due to the risk of severe complications, such as coronary artery aneurysms, prompt diagnosis and treatment within 10 days of fever onset is of paramount importance.[4] Here, we present a case of a 12-year-old male who presented with atypical KD with acute cholangitis.

Case Presentation

A 12-year-old, otherwise healthy male presented to the emergency department (ED) with an 8-day history of nasal drainage, sore throat, body aches, and cough followed by nausea, and fevers up to 102 F. He was initially seen in a local ED for evaluation of influenza. His COVID-19 and influenza tests were negative. He soon experienced vomiting, abdominal pain, jaundice and diarrhea with clay-colored stools and developed a fine, intermittent erythematous rash on the upper abdomen (symptoms and timeline summarized in Table 1 and Figure 1). He was then seen in primary care where workup included a comprehensive blood count (CBC) that showed normal white blood cell count with neutrophil count of 88.6%. His comprehensive metabolic panel showed a sodium of 131 mEq/L (normal range 135 – 145 mEq/L), potassium at 3.3 mEq/L (normal range 3.5 – 5.5 mEq/L), total bilirubin of 4.7 mg/dL (normal range 0.1 – 1.2 mg/dL), aspartate aminotransferase (AST) of 53 U/L (normal range 8 – 53 U/L), alanine aminotransferase (ALT) of 133 U/L (normal range 4 – 56 U/L), and alkaline phosphatase of 424

Figure 1. Timeline of the patient's hospital course of atypical Kawasaki disease and subsequent management and follow-up.

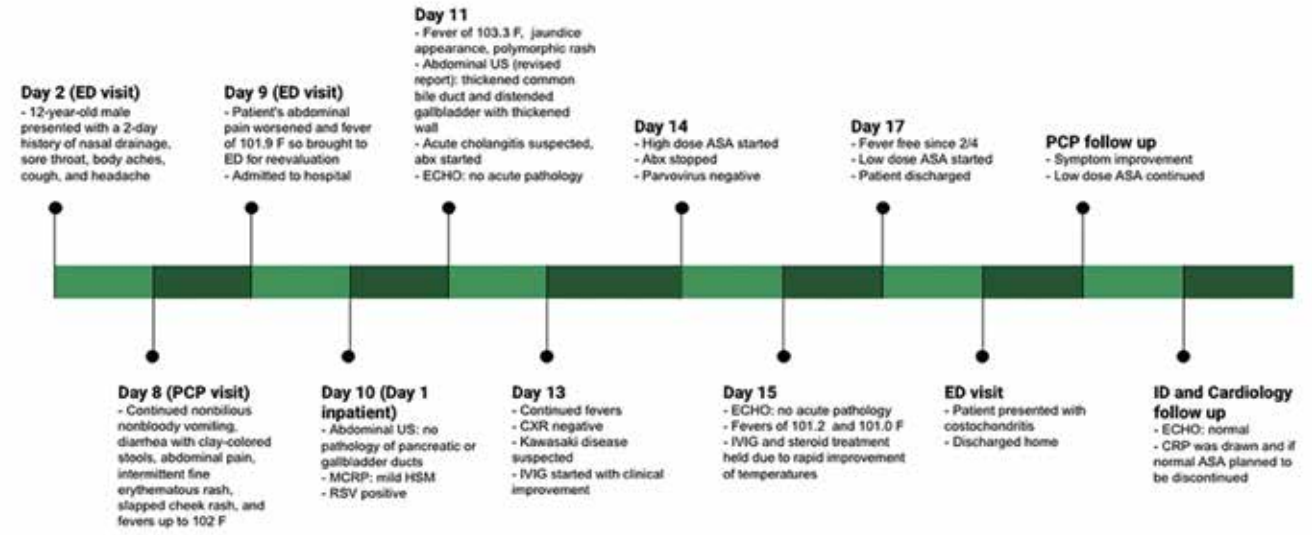


Table 1. Diagnostic criteria for complete and atypical/incomplete Kawasaki disease. Criteria met by presented patient is seen. 'X' indicates satisfaction of criteria.

	Complete Kawasaki disease	Atypical/incomplete Kawasaki disease	Presented patient
Fever of at least 4 days	X	X	X
Bilateral nonexudative conjunctival injection	X		X
Oral mucosal changes	X		X
Polymorphous rash	X		X
Peripheral extremity changes	X		
Cervical lymphadenopathy	X		
At least 3 laboratory findings (anemia for age, platelet count ≥450,000 mm3 after the 7th day of the fever, albumin ≤ 3.0 g/dL, elevated ALT level, WBC count ≥ 150,000 mm3 , ≥10 WBC/hpf on urinalysis)	X	X	X

U/L (normal range 44 – 147 U/L). His C-reactive protein was 6.4 mg/dL (normal range < 0.5 mg/dL). Cytomegalovirus and Epstein-Barr virus serologic testing were negative. His hepatitis serology testing and antistreptolysin-O were all negative.

After continuing daily fevers up to 101.9 F, worsening abdominal pain and progressing jaundice for 8 days, he returned to the ED for re-evaluation. Vital signs included a temperature of 100.1 F, blood pressure of 110/75 mmHg, and pulse oximetry of 96% on room air. Laboratory evaluation showed a normal white blood cell count of 12.7 but a left shift with 87% neutrophils, bilirubin elevated at 5.1 mg/dL, AST at 50 U/L, ALT at 101 U/L, and alkaline phosphatase at 404 U/L. Due to elevated bilirubin, continued fever and dehydration, he was admitted for further evaluation.

Initial differentials included acute cholecystitis, gastritis, and pancreatitis. Workup included an elevated direct bilirubin of 2.6 mg/dL, gamma-glutamyl transferase of 144

Figure 2. Ultrasound of gallbladder. Distension of gallbladder seen.

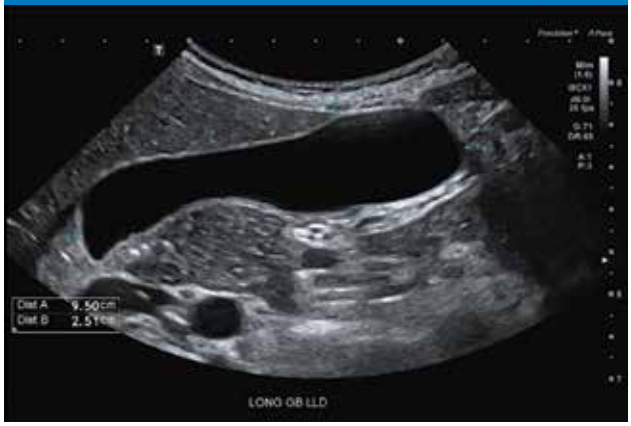
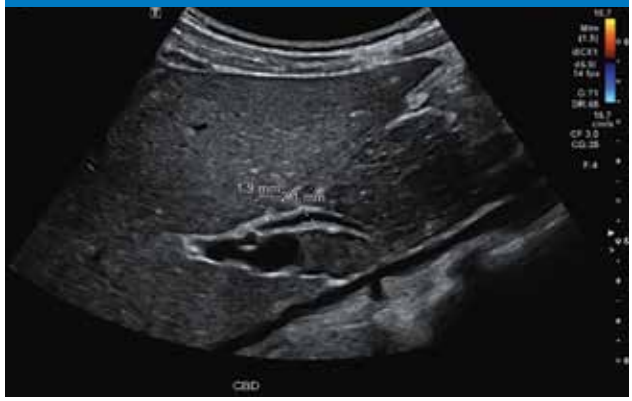


Figure 3. Ultrasound of gallbladder and common bile duct. Thickened common bile duct noted.



IU/L, a negative abdominal ultrasound that did not show pathology of pancreatic and gallbladder ducts, and magnetic resonance cholangiopancreatography that demonstrated mild hepatosplenomegaly without evidence for biliary obstruction or choledocholithiasis. Urinalysis showed 11-20 urine WBCs, 1+ leukocyte esterase, and negative nitrites. The gastrointestinal (GI) team suspected the transaminitis to be caused by a viral infection. A respiratory panel returned positive for RSV. The patient soon developed a macular rash on both cheeks, arms, legs, back and abdomen and bilateral non-exudative, limbic sparing conjunctivitis.

Coxiella A and B and parvovirus serologies were negative. He continued to experience fevers as high as 103.3 F on day 11. His abdominal ultrasound was reexamined, revealing a thickened common bile duct and a distended gallbladder with a thickened wall (Figures 2 and 3). Concern for acute cholangitis prompted empiric treatment with IV ceftriaxone and metronidazole.

Pediatric infectious disease (ID) was consulted. At the time of their physical exam, the patient had developed chapped lips and bilateral conjunctival injection leading to differential diagnoses including an atypical presentation of KD and multisystem inflammatory syndrome in children (MIS-C). Although cholangitis caused by a viral infection was thought possible, it seemed unlikely due to the rash and leukocyturia. An echocardiogram was obtained and normal. No evidence of dilation or aneurysm of coronary arteries were seen.

Two gram per kilogram intravenous immunoglobulin (IVIG) was infused due to the lack of improvement from 48 hours of the IV antibiotics and concern of atypical KD. The next morning, the patient found relief from his abdominal pain, rash and ciliary injection. High dose aspirin was started along with cessation of antibiotics. A repeat echocardiogram remained normal, including coronary arteries. Forty-eight hours after IVIG initiation, two elevated temperatures of 101.2 F and 101.0 F were recorded. Although refractory KD was considered, repeat IVIG was held due to rapid improvement of his temperatures. The patient transitioned from high to low dose aspirin on discharge. A few hours after discharge, the patient returned to the ED with concerns of chest pain in the left anterior chest wall associated with costosternal junction. Evaluation included an unremarkable chest X ray and an EKG significant for RSR prime in V1 V2, thought to be a normal variant. His symptoms were consistent with costochondritis and improved on supportive therapy and pain medication.

In follow up, pediatric GI explored the concurrent autoimmune hepatitis due to his elevation of liver enzymes, total bilirubin, and alkaline phosphatase. The patient's smooth muscle IgG antibody returned elevated at 57 (normal 0-19 units), smooth muscle antibody titer elevated at 1:80 (normal <1:20), and ANA screen returned elevated at 1:320. The slight elevation in these levels was thought to be secondary to IVIG use. Furthermore, downtrending titers on repeat testing and perpetual clinical improvement made autoimmune hepatitis an unlikely diagnosis.

Subsequent surveillance echocardiograms at 2 weeks, 4 weeks and at 6 months were all normal. The patient's CRP also normalized after 2 weeks. The patient is clinically doing well several months later.

Discussion

Kawasaki disease is the second most common cause of vasculitis in childhood with an estimated incidence in the US of 25 per 100,00 children under 5 years of age.[1]

Patients who experience prolonged fever and less than 4 clinical features may be considered to have atypical KD.[3] Hepatobiliary dysfunction, such as gallbladder hydrops and acute acalculous cholecystitis, has been associated with KD; however, cholangitis as a presenting feature is not commonly reported.[5,6] In this case, fevers with jaundice, transaminitis and an abdominal ultrasound showing signs of acute cholangitis prompted the suspicion of acute ascending cholangitis. Since cholangitis is a rare presentation, cholangitis may be an underreported aspect of hepatobiliary complications in KD. In one case, a 16-year-old presented with 3 days of fever, abdominal pain, and rash and later revealed to have met criteria for KD and have evidence of cholangitis on liver biopsy.[7] A similar report highlights the case of a 16-year-old who presented with fever, abdominal pain, and icteric sclerae, and later developed symptoms consistent with KD.[8] Cases like these underscore the need to consider KD when febrile children and adolescents present with a cholangitis picture in the absence of clinical improvement after antibiotics. Careful continued physical exam to assess for the clinical criteria are essential.

Prompt management of KD is aimed towards reducing inflammation of arteries and preventing coronary artery thrombosis.[1] Echocardiogram findings in KD include possible dilation or aneurysm of coronary arteries.[1] According to current American Heart Association guidelines, initial treatment includes a single infusion of IVIG 2g/kg over 8 to 12 hours and aspirin 80 - 100 mg/kg/day to decrease inflammation.[9] Ideally, IVIG should be started within 10 days of the start of illness to prevent coronary artery complications.[1] However, IVIG should still be considered past that timeframe if signs of systemic inflammation such as an elevated ESR (normal range 0 - 10 mm/hr) or CRP levels (normal range < 0.3 mg/dL) persist. If fever has resolved and normal sentinel echocardiogram and no signs of inflammation are seen, IVIG may be deferred with close clinical monitoring and surveillance echocardiogram, albeit clinical opinion may vary.[1] Low-dose aspirin may be started after the patient is afebrile and continued for about 6 to 8 weeks.[9] If persistent fevers ≥ 36 hours after IVIG administration are seen, use of corticosteroids or infliximab or etanercept should be considered.[9] Although aseptic meningitis is a noted adverse effect of IVIG use, it is transient and often resolve completely.[9]

Several epidemiological studies have shown temporal associations between certain viral infections and the development of KD.[10] While no single pathogen has been identified as the causative agent, respiratory viruses have been proposed to play a role in the pathogenesis of KD.[11] One study found that 8.8% of patients had a documented respiratory viral illness.[12] These patients had a higher frequency of coronary artery dilations than those KD patients who tested negative.[12] This highlights the importance of considering the diagnosis during a concurrent viral illness.

Conclusion

We present a case of a 12-year-old male who presented with viral infection and concurrent atypical KD whose initial presentation mimicked acute ascending cholangitis. Diagnosis of KD requires a high index of suspicion in children with a fever of 4 days or more with multisystem involvement, especially when typical KD criteria are only partially met. Prompt treatment with IVIG and high-dose aspirin remain essential in reducing inflammation and preventing coronary artery complications.

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Bugs and Beyond: A Case of Chronic Osteomyelitis

Colewyn Knoblich, MS IV; and Jared Daniel, MD

Abstract

Osteomyelitis is the infection of bone that can be either acute or chronic. Infection occurs through hematogenous spread and bacterial seeding from a distant site of infection, growth of nearby infected tissue, or direct inoculation from trauma or surgery. Hematogenous spread is more common in children and can cause spontaneous osteomyelitis. Chronic osteomyelitis is a rare occurrence that is often prevented by prompt diagnosis and treatment. This case report demonstrates a rare occurrence of chronic osteomyelitis with osteonecrosis and pathological fracture in a young patient with delayed diagnosis and management.

Introduction

Osteomyelitis is an inflammation or swelling of the bone that is usually secondary to contiguous bacterial or fungal infection, but other cases of osteomyelitis are a result of vascular insufficiencies, infected hardware/prostheses, direct inoculation from open wound, and hematogenous spread. Osteomyelitis is more common in younger children (0-5 year of age) but can happen at any age. Hematogenous spread is a major culprit in pediatric populations. Metaphyseal regions of bone are typically involved due to their rich blood supply in the first decade of life.[1] Most cases of pediatric osteomyelitis involve a single bone, but multifocal involvement is not uncommon, especially in neonates where multifocal involvement is seen in up to 40% of cases.[2] Although several organisms have been identified to cause osteomyelitis, *Staphylococcus aureus* remains the most common organism across all age groups. *Streptococcus* and *Kingella kingae* are other common organisms in the pediatric population. Other organisms involved depend on the clinical association. In patients with diabetic foot lesions and ulcers *Streptococci* and anaerobic bacteria are known causes. *Salmonella* osteomyelitis is seen in patients with sickle-cell disease. Immunocompromised patients are at an increased risk for osteomyelitis due to *Aspergillus spp*, *Candida albicans*, and *Mycobacteria spp*. While *Pasteurella multocida* and *Eikenella corrodens* osteomyelitis are associated with human and animal bites. [1]

The symptomology of osteomyelitis is commonly diffuse pain, but other symptoms include fever, warmth, edema, reluctancy to use the affected limb, and an overall ill appearance.[2] Osteomyelitis can be divided into acute and chronic infections, which can present as an uncomplicated or complicated course. An acute case is defined as diagnosis of bone infection within four weeks following clinical manifestations. A drawn-out disease process with relapse of infection at the same bone site weeks to years after an initially successful treatment is defined as a chronic case. Chronic osteomyelitis in children is a rare phenomenon in the United States that can arise from complications of acute osteomyelitis.[3]

Case Presentation

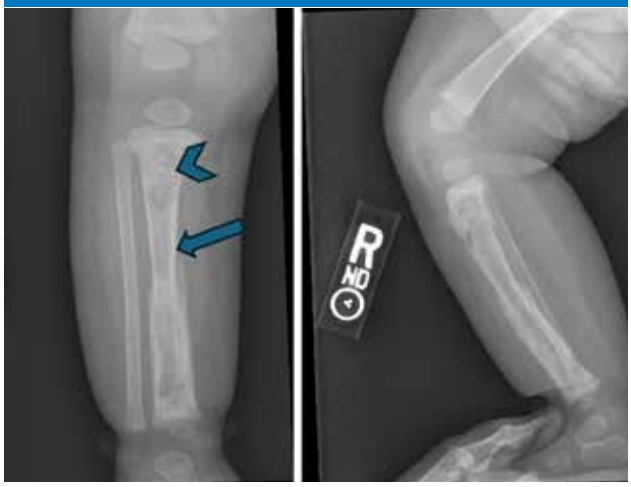
We present a 7-month-old male who was admitted from an outside institution with a history of persistent right leg swelling, cellulitis, blood cultures positive for methicillin-sensitive *Staphylococcus aureus* (MSSA), fever of 102F, and elevated inflammatory markers. He had a significant history of an ear infection treated with amoxicillin. A bedside irrigation and debridement was done at the outside facility due to a soft tissue abscess. Due to ongoing clinical concerns for deep tissue infection and need for sedated MRI, patient was transferred to our facility after 12 days of bacteremia. Clinical examination showed open wound to the right knee (Figure 1). Sedated MRI demonstrated multiple soft tissue abscesses, right proximal tibia osteomyelitis with subperiosteal abscess, myositis of the quadriceps and lower leg compartments. Due to the MRI, he underwent irrigation and debridement of the right knee and lower leg. Intraoperative findings showed right tibial osteomyelitis with right knee septic arthritis and multiple soft tissue abscesses with gross purulence. We took multiple cultures of the abscess in addition to histopathology, which confirmed methicillin-sensitive Staphylococcus aureus and acute inflammatory changes. Postoperative, he continued with infection management with IV cefazolin. Due to the severity

Figure 1. Clinical image of the right knee upon presentation to our institution.

of the infection, irrigation and debridement was repeated after 48 hours. He continued with IV antibiotics for 9 days with downward trend in CRP. He was transitioned to oral antibiotics for management of MSSA with planned 6 week course. He was then discharged to outpatient management after he was transitioned to outpatient oral antibiotics.

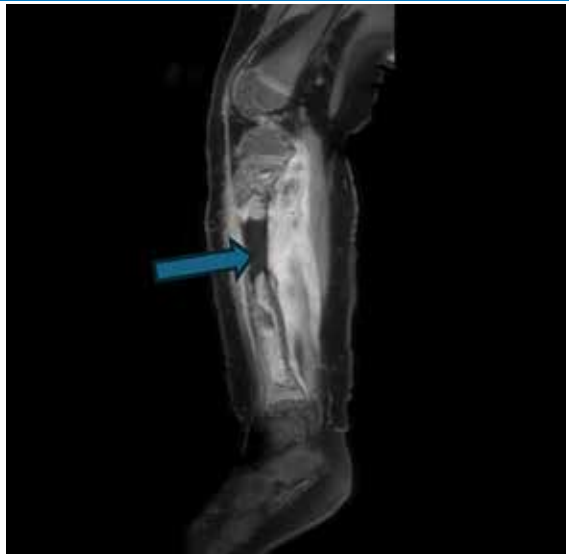
He presented to the pediatrician 5 weeks post irrigation and debridement with pustule formation over the incision line and elevated CRP. Radiographs were obtained and demonstrated an interval lucency within the tibial metaphysis with increasing periosteal callus formation concerning for involucrum formation and lack of periosteal reaction at the diaphysis (Figure 2). An MRI demonstrated extensive

Figure 2. Five weeks post irrigation and debridement radiographs. Area of interval lucency depicted by arrowhead. Periosteal callus formation depicted by bold arrow.



osteomyelitis involving the tibia with pathological fracture with a central area of osteonecrosis at the diaphysis of the tibia and significant myositis of the right lower extremity (Figure 3). Due to the failed outpatient antibiotic course and worsening osteomyelitis necessitated irrigation and debridement of the right lower extremity. We used the location of the pustule to identify the sinus tract which extended toward the tibia. At the time of the surgery, motion was noted at this level consistent with pathological fracture. Systemic debridement of the soft tissues and removal of all nonviable tissues was performed. The right extremity was immobilized with a lower extremity splint and patient was made non-weight bearing on the right lower extremity. He was re-admitted for IV cefazolin. Irrigation and debridement was repeated after 48 hours. Due to failure of previous outpatient oral antibiotics, IV antibiotics were continued via a peripherally inserted central catheter (PICC) following discharge. He continued with the antibiotics for 6 weeks of IV cefazolin and then 6 weeks of oral cefalexin for management of chronic osteomyelitis. He continued with immobilization for the management of his pathological fracture.

Figure 3. Follow-up MRI of the right leg. Osteonecrosis at diaphysis of the tibia depicted by bold arrow.



At follow-up examination, his radiographs showed re-absorption of osteonecrosis. Pathological fracture demonstrated fibrous nonunion with pseudoarthrosis (Figures 4 and 5). Given the bone loss and fibrous nonunion, repeat MRI was completed and showed resolved osteomyelitis. With MRI showing resolution, we discussed additional surgical management which warranted an open bone biopsy prior to grafting to ensure no residual infection.

Figure 4. Six weeks postoperative following repeat I&D. Fibrous nonunion with pseudoarthrosis depicted by bold arrow.

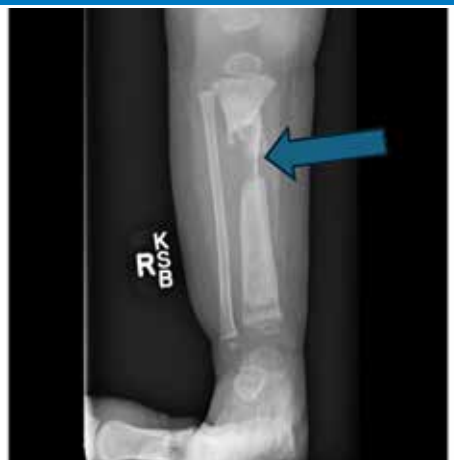
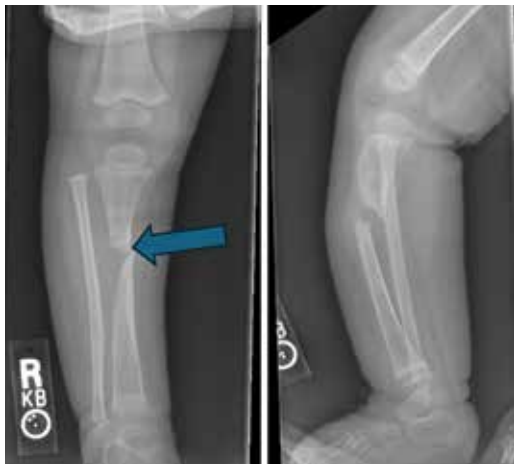


Figure 5. Five-and-a-half months postoperative following repeat I&D showing bone loss. Fibrous nonunion with pseudoarthrosis depicted by bold arrow.



Bone biopsies were collected and visualization of the non-bridging bones established nonunion diagnosis. Cultures and pathology of the biopsies were unremarkable. He was then indicated for open right tibial bone grafting with iliac crest autograft and internal fixation (Figure 6). Follow-up x-rays demonstrated bony union of the previous pathological fracture after 7 months and then we proceeded with hardware removal after 15 month following internal fixation and bone grafting. He is now 2 years postoperative and back to full activities and there has been interval bone remodeling (Figure 7). No additional post-operative complications or further recurrences of osteomyelitis.

Figure 6. Immediate postoperative after bone grafting and internal fixation.

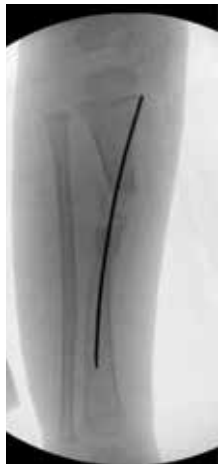
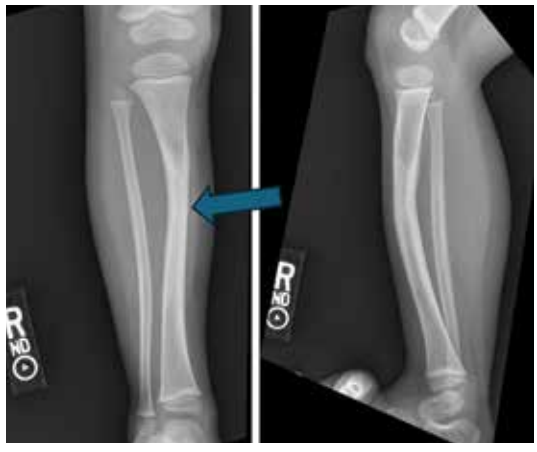


Figure 7. Twenty-two months postoperative grafting and internal fixation. Interval bone remodeling depicted by bold arrow.



Discussion

Several infections in pediatric populations are properly managed in the primary care setting. However, some infectious processes, like osteomyelitis, require management from a multidisciplinary team including pediatric hospitalist, pediatric infectious disease, and orthopedic surgery. Prompt recognition of such infectious etiology and early referral is crucial for proper management and preventing complications of chronic osteomyelitis. Unfortunately, the varying degrees of clinical presentation can complicate a proper diagnosis and delay treatment. The developing musculoskeletal system is comprised of a unique microenvironment that makes it an ideal target for bacteria. Growing muscle and bone is molecularly similar to regenerative tissue and expresses various factors that interact with bacterial virulence factors. These interactions predispose the growing area to bacterial accumulation.[4] Additionally, the area around the physis is a relatively immune privileged site increasing its tendency for infection.[5] Altogether, these characteristics make developing

children vulnerable to spontaneous infections at or around major joints, with lower extremities being more common.[6] When initially evaluating for musculoskeletal infections, plain radiographs should be obtain due to their quick availability, cheaper costs, and ability to quickly exclude causes in the differential diagnosis. The most useful imaging modality is the MRI as it allows complete visualization of periosteal abscesses, sequestrum, cortical erosions, and the extension of the disease process.[2] In younger patients, sedated MRI is typically required and can add to the challenge of timely analysis. Some protocols can navigate this challenge by progressing from sedated MRI to surgical intervention with continuous sedation. In addition to imaging, blood cultures and labs such as erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and complete blood count (CBC) should be obtained. CRP has been accepted as a reliable measure of antibiotic response.

Management of acute osteomyelitis typically begins with intravenous (IV) antibiotics covering the most causative organisms. However, many cases are treated empirically due to cultures returning negative or not being obtained.[7] Empiric antibiotics are typically with a 1st generation cephalosporin, unless there is high risk of methicillin-resistent Staphylococcus aureus which vancomycin is utilized. The duration of treatment is dependent on the institution and patient response to antibiotics. A typical course might be 2-4 weeks of IV antibiotics and transition to oral antibiotics for 6-8 weeks.[6] Some institutions have used a 50% decrease in CRP as a reliable means to shorten IV antibiotic duration followed by 2-4 weeks of oral antibiotics.[8] Regardless, IV antibiotics are commonly administered through a PICC, but this method can put the pediatric patient at risk for various complications. Some studies have compared the effectiveness of PICC vs. oral antibiotics following discharge and found oral antibiotics to be equally as effective compared to PICC antibiotics.[9] For our patient, we used PICC antibiotics following discharge due to a previously failed course of oral antibiotics and recurrence of osteomyelitis. This highlights the role of the multidisciplinary healthcare team to provide the best evidence based care depending on the patient's clinical situation. Complications of osteomyelitis can differ between acute and chronic cases. Patients with chronic osteomyelitis are more likely to require long-term orthopedic follow-up, present with pathological fractures, and need multiple surgeries.[10] Additionally, chronic osteomyelitis is a sequel of delayed diagnosis and proper management in the acute stage which complicates therapeutic management.[11]

Acute osteomyelitis is a common pediatric infectious event that both primary care and orthopedic surgeons might encounter during their clinical practice. Many cases are resolved in the acute stage with timely diagnosis and management. Here we presented a rare case in which our patient had a delayed diagnosis, poor therapeutic response to outpatient antibiotics, and chronic osteomyelitis that resulted in osteonecrosis necessitating the need for bone graft. This case highlights the importance of timely diagnosis of acute osteomyelitis and a multidisciplinary healthcare team approach to treatment and management.

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Rapid-Onset Menstrual-Associated Toxic Shock Syndrome in an Adolescent Female: A Case Report and Clinical Review

Ellie Gubbrud, MS IV; Mackenzie Gustafson, MS IV; and David Withrow, MD

Abstract

Background: Toxic shock syndrome (TSS) is a rare, life-threatening, toxin-mediated illness caused by Staphylococcus aureus or Streptococcus pyogenes. Since its initial recognition in the late 1970s, menstrual-associated TSS has been closely linked to tampon use. While regulatory changes to tampon composition have reduced incidence, TSS continues to be an important cause of fulminant sepsis in adolescents.

Case Presentation: We describe a 16-year-old female who presented with five days of suprapubic pain, nausea, diarrhea, and fever who later developed sore throat, vomiting, rash, and mucous membrane involvement. Examination revealed tachycardia, strawberry tongue, erythematous lips, and a diffuse macular rash. Laboratory studies demonstrated leukocytosis with left shift, hyponatremia, elevated bilirubin, and elevated CRP, consistent with early multiorgan dysfunction. Blood and urine cultures were negative. She was managed with intravenous fluids and empiric broad-spectrum antibiotics including clindamycin with subsequent resolution of hemodynamic instability and complete recovery by hospital day four.

Discussion: TSS is primarily a clinical diagnosis. It requires careful clinical differentiation, as its presentation with fever, hypotension, rash, mucous membrane involvement and multiorgan dysfunction may overlap with PID with progression to sepsis. Management centers on rapid hemodynamic stabilization, empiric antibiotic therapy with agents that suppress toxin production, and removal of the inciting source.

Conclusion: Our case highlights the continued relevance of menstrual-associated TSS in adolescents, and the diagnostic challenges posed by its clinical overlap with other pediatric inflammatory syndromes. We emphasize the importance of early recognition, aggressive supportive care, and appropriate antimicrobial therapy in achieving favorable outcomes.

Introduction

Toxic shock syndrome (TSS) was first described almost 50 years ago, when Todd et. al reported a case series of seven children with sudden-onset high fever, headache, sore throat, diarrhea, erythematous and desquamative rash, refractory hypotension, acute renal failure, hepatic derangements, and confusion.[1-2] Initially underreported, TSS became a prominent focus of study and surveillance in the 1980s as a pattern of cases emerged among menstruating women in the U.S. Eventually, epidemiological investigation and CDC surveillance linked super-absorbent tampons and *Staphylococcus aureus* genital colonization as closely associated risk factors.[2-5] In response, tampon manufacturers removed multiple chemical constituents intended to enhance absorbency, and numbers of reported TSS cases dropped drastically: the peak incidence of 6-12 per 100,000 among women aged 12-49 years old in 1980 decreased to 1 per 100,000 among women aged 15-44 years old in 1986.[6-8]

Today, TSS is better understood as an acute, multisystem, fulminant toxin-mediated illness caused by *Staphylococcus aureus* and *Streptococcus pyogenes*.[9] It classically results in shock and multiorgan failure early in the clinical course. However, despite its relatively high profile and severe risk, diagnosis may be challenging due to its similarity with other, more common illnesses. We present the case of menstrual-associated TSS in a 16-year-old girl, to review the current literature on the pathophysiology, presentation, diagnosis and management of this rare but potentially devastating illness in pediatric patients.

Case Presentation

A 16-year-old previously healthy female presented to the

clinic with five days of suprapubic pain and tenderness, nausea, and diarrhea. Subsequently, she developed a sore throat, arthralgias, dark urine, and copious purulent vaginal discharge. Two days before presentation she developed a fever maxing out at 102 F and vomiting. When questioned about inciting factors, she believed she had left a tampon in for over 24 hours prior to onset of her condition. She believed she had removed the tampon but was unsure. She denied sexual activity.

Vital signs included a pulse of 118 BPM increasing to 146 BPM on recheck, blood pressure of 98/66 mm Hg, temperature of 98.6 F, and oxygen saturation of 98%. She appeared ill and lethargic. Exam revealed diffuse, mild abdominal tenderness, tachycardia, erythematous and swollen lips, erythematous oropharynx, strawberry tongue, and a diffuse, macular, erythematous coalescent rash on the upper and lower extremities. OBGYN was consulted and noted normal external genitalia, acute uterine tenderness, and copious vaginal discharge; cervix could not be fully visualized due to pain. No tampon was palpable on digital exam.

Laboratory evaluation revealed leukocytosis with left shift (WBC 14.86 x 10^3/uL, neutrophils 93%, lymphocytes 5%), mild anemia (hemoglobin 11.5 g/dL, hematocrit 31.7%), hyponatremia (132.8 mmol/L), hypokalemia (3.3 mmol/L), elevated total bilirubin (2.3 mg/dL), elevated alkaline phosphatase (162.8 U/L), BUN/Creatinine ratio of 26.6, A/G ratio of 1.06, and low serum osmolality (259 mOsm/kg). CRP was elevated (29.9 mg/L). Vaginal and cervical cultures were collected.

She was subsequently transferred to the emergency department. Vitals there were pulse 109 BPM, blood pressure 119/71 mm Hg, temperature 99.2 F. She met SIRS criteria (tachycardia, leukocytosis), with strong suspicion for sepsis given her vaginal discharge. Initial management included IV fluid bolus and empiric antibiotic therapy with IV clindamycin 600 mg and vancomycin 20 mg/kg. Blood cultures were obtained. Lactic acid was 1.3 mmol/L. Gonorrhea, chlamydia, bacterial vaginosis, pregnancy test, and rapid strep test were negative.

The patient was then transferred and admitted to the hospital for ongoing management. On admission, physical examination showed progression of her clinical findings, mild hypotension at 111/56 mm Hg. While hospitalized she refused any further pelvic examinations. Transabdominal ultrasound showed a simple ovarian cyst with otherwise normal pelvic anatomy. Her empiric regimen was modified to IV clindamycin 900 mg every eight hours, IV Cefepime 2 g every 12 hours, and a single dose of azithromycin 1 g IV for coverage of bacteremia, TSS, PID, and other infections until cervical testing resulted. Vancomycin was discontinued after a negative MRSA swab.

The following day, the patient's blood pressure dipped as low as 86/34 mm Hg, but this improved with IV fluids over the course of the day. She continued to experience purulent vaginal discharge but had significant improvement in her abdominal pain. Her rash had begun to resolve, with WBC and CRP trending downward. Blood and urine cultures remained negative, while vaginal and cervical cultures were still pending.

By hospital day three, she had continued clinical improvement and was hemodynamically stable. By hospital day four, she had full symptom resolution. Laboratory studies at discharge showed normal WBC (5.8 x 10^3/uL) with resolved left shift and hyponatremia. She was transitioned to oral cephalexin 500 mg BID for 10 days and completed her clindamycin. Vaginal cultures resulted following discharge and showed normal genital flora. Cervical cultures were negative.

At her follow-up visit with her pediatrician one week later, the patient reported complete resolution of symptoms. Further follow-up with OBGYN at three weeks post-hospitalization showed no residual symptoms with no need for further evaluation.

Discussion

Toxic shock syndrome (TSS) is a rare but life-threatening illness caused by exotoxin-producing *Staphylococcus aureus* and Group A *Streptococcus* (GAS). Both organisms produce superantigens which bypass normal antigen processing, stimulating massive T-cell activation. This results in cytokine storm, widespread endothelial injury, increased vascular permeability, hypotension, and multiorgan dysfunction.[1-3,6,9-10] In our patient, early multisystem involvement was evident with fever, tachycardia, hyponatremia, leukocytosis, elevated CRP, and mild hepatic and renal dysfunction.

Clinically, TSS presents with fever, hypotension or tachycardia, diffuse erythematous rash, mucous membrane involvement (e.g., strawberry tongue, red swollen lips), and often gastrointestinal symptoms (nausea, vomiting, diarrhea, abdominal pain).[1,3,5,11] However, as TSS is primarily a clinical diagnosis, distinguishing this constellation of findings from other, similar differentials is crucial.

One such differential diagnosis is Pelvic Inflammatory Disease (PID), an infection of the upper genital tract in female patients most often caused by *Chlamydia trachomatis* or *Neisseria gonorrhoeae*. Primarily a clinical diagnosis, PID with progression to sepsis may present similarly to TSS with fever, abdominal pain, copious vaginal discharge, and uterine tenderness.[12] In rare cases, PID has also been identified as a cause of TSS.[13] While we did consider and treat PID with septic progression as an alternative etiology, her benign imaging, lack of evidence for *C. trachomatis* or *N. gonorrhoeae* infection, and additional findings of generalized desquamation, mucosal involvement, and history of prolonged foreign body exposure in the vaginal canal made TSS a more likely fit. This was retroactively supported by negative vaginal cultures.

Another consideration was Kawasaki Disease, a medium-vessel vasculitis which may also present with fever, rash, mucous membrane changes, and strawberry tongue. However, Kawasaki Disease is exceedingly rare in children over 5 years of age, its presentation does not include copious vaginal discharge, and there were no typical ancillary findings such as thrombocytosis, anemia, or coronary artery aneurysms.[14, 15]

Menstrual-associated TSS was supported strongly by our patient's purulent vaginal discharge and suspected tampon retention for over 24 hours. Since its initial recognition in 1978, menstrual-associated TSS has been closely linked to tampon use. Early investigations identified *Staphylococcus aureus* colonization and an epidermal toxin in affected individuals.[1,4,9] Further epidemiological studies provided evidence that super-absorbent tampons may have created an environment conducive to bacterial growth and toxin production.[2,5,16] Following regulatory changes in tampon manufacturing to reduce absorbency—specifically, the removal of polyester foam, carboxymethylcellulose, and polyacrylate rayon—reported cases of menstrual TSS declined sharply in the 1980s.[6-8]

However, the vaginal microbiome remains complex. *Staphylococcus aureus* may be present in vaginal cultures from healthy individuals, and absent in a minority of TSS cases.[4,16] This highlights the toxin-mediated nature of the disease: clinical suspicion must remain high even in the absence of positive cultures. Our patient's negative cultures did not rule out TSS. Instead, her clinical presentation and rapid response to appropriate treatment supported the diagnosis.

Laboratory findings in TSS include leukocytosis with left shift, thrombocytopenia, hyponatremia, signs of end-organ dysfunction, and elevated inflammatory markers.[3,6,9] Interestingly, blood cultures are frequently negative in staphylococcal cases, but often positive in streptococcal TSS.[6,9] Negative cultures may help differentiate TSS from other forms of septic shock in pediatric patients, an important consideration given that some studies estimate TSS accounts for 11.1% to 17.9% of pediatric sepsis cases.[17]

TSS management involves rapid supportive care, source control, and empiric, broad-spectrum antibiotic therapy.[2,4,6] Clindamycin is favored for its ability to suppress toxin production, while vancomycin is typically added to cover MRSA pending confirmation.[3,6,18] Our patient was put on these agents empirically, with later vancomycin discontinuation following a negative MRSA swab. Cefepime and a one-time dose of azithromycin were added for broad gram-negative and PID coverage respectively. Although no tampon was definitively removed, source control was presumed to have occurred when she did not find retained material, and her symptoms improved.[5,7,9] By hospital day four, her symptoms and laboratory derangements resolved, and she was safely discharged on oral cephalexin in accordance with current guidelines.[3,6,10]

Conclusions

Our patient's rapid recovery and clinical improvement following supportive care and antibiotics emphasizes the importance of early recognition and aggressive management of TSS. Although rare, TSS remains a possibility, and should not be excluded from the differential diagnosis.

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Analysis of Sanford School of Medicine Medical Students' Physical Activity

Emily Eisenbraun, MS IV; Madison Landon, MS III; Tiffany M. Knecht, MS IV; and Craig Uthe, MD

Abstract

Background: Recommendations for physical activity in adults include 150 minutes of moderate intensity or 75 minutes of high intensity aerobic activity weekly. Strength training is recommended at least twice weekly. Current literature regarding medical student adherence to Centers for Disease Control and Prevention (CDC) and American Heart Association (AHA) physical activity recommendations does not encompass South Dakota medical students.7-9 The purpose of this study is to determine what percent of Sanford School of Medicine (SSOM) medical students adhere to CDC and AHA physical activity guidelines.

Methods: This is a USD IRB approved study. A survey link was sent to 291 medical students at the SSOM. The survey included questions regarding physical activity, weight-training, BMI, and age.

Results: 107 SSOM medical students responded to the survey. The average reported weekly high intensity aerobic exercise was 52.8 minutes. The average reported weekly moderate intensity aerobic exercise was 119.4 minutes. 61.7% of students reported completion of recommended aerobic activity, while 38.3% of participants did not meet this recommendation. 50.5% of participants report completing weight training at least twice weekly.

Conclusion: Of the 107 SSOM medical student respondents, 61.7% met AHA and CDC recommendations. A similar study that surveyed 4000 medical students nationwide found that 63.7% of respondents met these aerobic recommendations. Taking into account the smaller study sample, we conclude that SSOM students fall within the normal range of medical students nationwide. Future directions may include increasing the sample size of SSOM medical student respondents and further stratifying these results.

Introduction

In 2018, the U.S. Department of Health and Human Services (HHS) published the second edition of its Physical Activity Guidelines for Americans. In this updated edition, the organization recommends that, for substantial health benefits, adults should do 150-300 minutes of moderate-intensity or 75-150 minutes of vigorous-intensity aerobic activity per week.[1] To differentiate the two, the American Heart Association (AHA) suggests using an individual's ability to converse. With moderate intensity, an individual has increased work of breathing but is still able to talk comfortably, whereas high-intensity exercise impairs an individual's ability to converse without shortness of breath.[2] Additionally, the HHS guidelines suggest adults engage in muscle-strengthening activities two days or more per week. These recommendations, as supported by the Centers for Disease Control and Prevention (CDC) and AHA, help adults maintain adequate physical activity, which is an important factor for reducing cancer and heart disease, as well as improving mental health and well-being. Despite the recommendations, only 46.9% of adults meet aerobic physical activity guidelines, with a subset meeting both the aerobic and muscle-strengthening guidelines (24.2%).[3]

In addition to its importance for all adults, meeting physical activity recommendations is important for medical students for several reasons. First, medical students serve as future physicians and take an active role as current health educators. Their personal health behaviors directly influence their credibility when counseling patients. Evidence shows that clinicians who engage in healthy lifestyle behaviors are more likely to counsel patients on such behaviors, and patients perceive these clinicians to be more trustworthy and motivating.[4] Therefore, if medical students consistently meet physical activity guidelines, they are better positioned to deliver effective counseling on exercise. Second, medical training is associated with high rates of stress, burnout, sleep

Table 1. Sanford School of Medicine medical student participation by class.

SSOM class	Number of participants	Class size	Percent participation	Participants meeting recommended aerobic physical activity	Participants meeting recommended strength training
2026	24	73	32.8 %	75.0 %	50.0 %
2027	21	72	29.2 %	66.7 %	52.4 %
2028	22	72	30.5 %	50.0 %	59.1 %
2029	40	74	54.0 %	57.5 %	45.0 %

disturbance, and mental health challenges.[5] Regular physical activity is known to mitigate many of these issues. Ensuring medical trainees meet recommended activity engagement supports their personal health and enhances academic performance and resilience.

Understanding whether medical students are meeting physical activity guidelines is important to identify gaps between recommended and actual behavior, allowing institutions to understand how well students are positioned to model and counsel healthy behaviors. It can also reveal barriers that prevent students from being active. Current literature regarding medical student adherence to CDC and AHA recommendations for physical activity is outdated and does not encompass South Dakota medical students. The purpose of this study is to identify what percentage of Sanford School of Medicine (SSOM) medical student adhere to CDC and AHA physical activity guidelines and compare this data with other U.S. medical schools to identify areas of improvement in wellness programming and preventive medicine training.

Methods

There has been a push in recent years to increase physician and student physician wellness. Physical activity is an important part of physical and mental wellbeing. This study was conducted to better understand and quantify the exercise habits of SSOM medical students. The study was approved by the USD IRB through IRB number 25-188. To collect data for analysis, a survey link was sent to 291 students at the Sanford School of Medicine. All current students were eligible to participate. The research team encouraged participation through email and verbal recruitment. The survey was developed based on physical activity guidelines outlined by the AHA and CDC.[2,3] The utilized survey questionnaire is shown in supplementary figure 1. Validity and reliability were established by thoroughly explaining the difference between moderate and high intensity activity and ensuring students who reported weekly physical activity also reported a location and type of exercise. After signing informed consent for participation, students answered a variety of questions ranging from true/false to free response. Students were first asked to state age, gender, year in school, and calculate their BMI using the National Institute of Health BMI calculator.[6] The next set of questions asked allowed students to answer, in minutes, how much time they spend exercising at various intensities and where they typically complete their physical activity at. To reduce bias, students answered the survey anonymously. However, for various reasons, surveys introduce another level of potential bias in that respondents may not always answer truthfully, and that should also be considered when compiling final data. Mean, standard deviations, and ranges were collected for the reported data.

Results

Of the 291 SSOM medical students offered the survey, 107 completed it, resulting in a 36.8% response rate. 69 students (64%) identified as female and 38 (36%) as male. The average age of participants was 25.3 years, with a range between 22 and 43 years old. The study sample was comprised of 37% first-year, 21% second-year, 20% third-year, and 22% fourth-year students. The participants were asked to self-identify their BMI based on the National Institute of Health BMI calculator. 3 participants reported a BMI of less than 18.5.

Figure 1. Sanford School of Medicine medical student completion of recommended weekly physical activity.

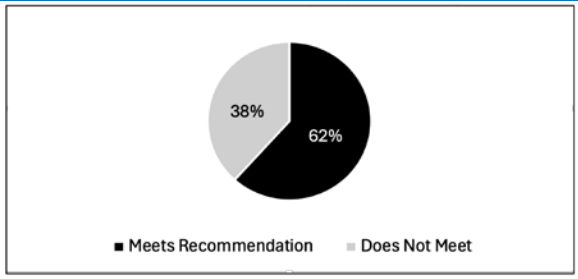


Figure 2. Sanford School of Medicine medical students who met recommended weekly physical activity.

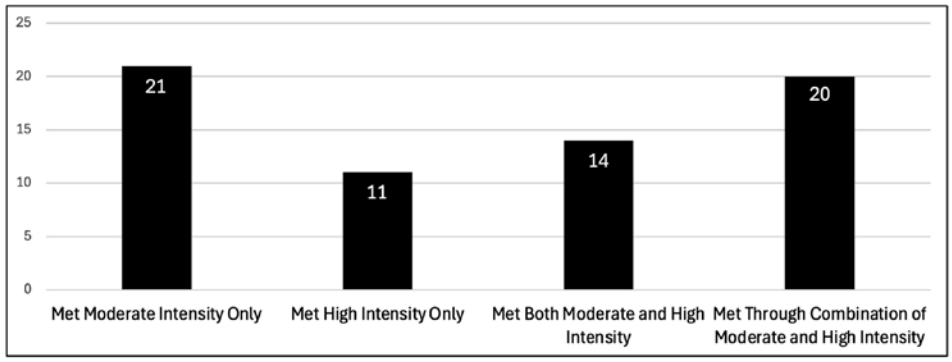
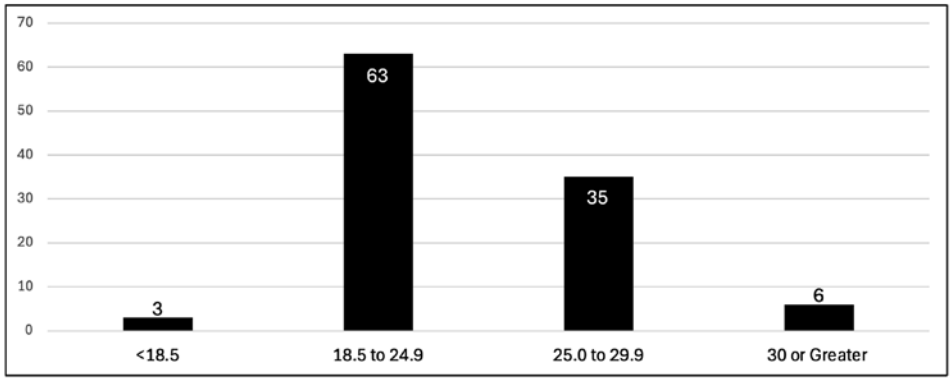


Figure 3. Reported BMI by Sanford School of Medicine medical student participants.



63 participants reported a BMI between 18.5 and 24.9. 35 participants reported a BMI between 25.0 and 29.9. 6 participants reported a BMI of 30 or greater.

The average reported weekly minutes of high intensity aerobic exercise was 52.8 minutes, 95% CI [41.5, 64.1]. Participants reported between 0 and 260 minutes of high intensity aerobic exercise weekly. The average reported weekly minutes of moderate intensity aerobic exercise was 119.4 minutes, 95% CI [101.2, 137.6]. Participants reported between 0 and 480 minutes of moderate intensity aerobic exercise weekly. 21 participants met only the recommendation for 150 minutes of moderate intensity aerobic activity weekly. 11 participants met only the recommendation for 75 minutes of high intensity aerobic activity weekly. 14 participants reported weekly completion of both 150 minutes of moderate intensity aerobic activity and 75 minutes of high intensity aerobic activity. 20 participants met the recommendation for weekly physical activity with a combination of moderate and high intensity activity. This was calculated based on the fraction of the recommended moderate and high intensity activity, added together. 41, or 38.3% of participants did not meet the recommended weekly aerobic physical activity. 50.5% of participants report completing resistance or weight training 2 or more times per week. Participants reported weightlifting, running, walking, high intensity interval training, Pilates, climbing, yoga, swimming, biking, stair-climbing, sports (basketball, golf, tennis, frisbee, hockey, boxing), elliptical, group fitness, dancing, rowing, and calisthenics exercise forms. Participants reported exercise completion at home, apartment gyms, neighborhoods, parks, school wellness facilities, hospital gyms, and commercial gyms.

Discussion

Based on the results, we found that roughly 62% of medical students at the Sanford School of Medicine followed the AHA and CDC guidelines for total weekly physical activity. Multiple studies have assessed these measures at other medical schools. One study of over 4000 U.S. medical students found that 63.7% regularly followed the guidelines for aerobic activity.[7] This study also found that 38.5% of the medical students surveyed followed strength training recommendations. Another study encompassing

200 students from 10 pharmacy and medical schools in California found 41% of participants met the AHA and CDC recommendation through at least 150 minutes of moderate intensity aerobic activity weekly. [8] An additional study conducted at the Ohio University Heritage College of Osteopathic Medicine found that 66.3% of 122 first year medical students completed at least 90 minutes of physical activity in the past seven days. [9] While our study contained a smaller cohort of only 107 participants, the number of medical students meeting physical activity recommendations feel slightly below the average of other U.S. medical schools in the Dyrbye[7] and Guseman[9] studies, but above the average of the Bergeron[9] study.

The use of BMI in medical practices worldwide began during the early 2010's with global health initiatives. These initiatives resulted from data suggesting increased adiposity led to worse health outcomes.[10] A BMI of less than 18.5 is considered underweight, with 18.5 and 24.9, considered healthy, 25.0-29.9 considered overweight, and 30.0 or above considered obese. While now broadly used in practice as a health determinant, some newer studies suggest that BMI may not be an accurate measure of a patient's health due its lack of account for important factors, such as genetics, previous health history, muscle mass, diet, and more. A 2023 study in the American Medical Association Journal of Ethics suggested that BMI is a poor indicator of health status and that using physical activity levels may be more accurate in determining health risks.[10] While this study's survey included self-reported BMI, the characteristics of each medical student's activity, such as time spent exercising and type of exercise, were the primary focus during data compilation. This allowed for a more comprehensive conclusion about the medical students enrolled at SSOM.

Overall, we can conclude that the medical students at the SSOM complete similar amounts of physical activity as other medical students nationwide based off other published study data. Survey studies, by nature, introduce bias in the form of response bias. Participants often answer with what they assume the surveyors would deem the appropriate or desirable answer rather than the truth. Our study had multiple free response questions which could have allowed for responding inaccurately. For example, there was potential for respondents to overestimate or underestimate the time they spend engaging in physical activity. Future directions may include increasing the sample size of SSOM medical student respondents and stratifying results by year in school.

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POETRY

The Front Row

Jacob Quail, MD, FACS

This poem features my experience at the Morbidity & Mortality Conference during my surgery residency over a decade ago. I grew up in South Dakota and completed my surgery residency in another state. My parents were both teachers, so observing how some attendings treated surgery residents during this conference was a shock. It has left an indelible impression on me.

Every Friday was the infamous Morbidity & Mortality Conference.
Residents donned their hard hats and solemnly presented in front of the department.
Present your complications, they preached; it's a surgeon's right-of-passage.
Without exception, all would stress; most would persevere, one quit on the spot.

Attendings sat in the back corner, whispered snide remarks amongst themselves.
Feigning boredom, invariably they turned to the resident, and the barrage commenced.
Their passive-aggressive and condescending questions were the bane of our training.
I still remember what it felt like; heart pounding with icy chills radiating down my back.

Defeated. Sitting there struggling to learn, but elbows on knees with my head down.
I pledged not to act like them if I got through these years of training.
I had to take it one day at a time. On the brink though, could I tough it out?
Tick-tock, tick-tock; the hands slowed almost to a halt.

Amidst their scowling grimaces, finally a ray of hope. A new attending appeared.
An old sage from the East Coast – far from this sunny, but toxic, place.
Brought in on orders to change the culture, he plopped down up front.
Aghast. What was he doing? Didn't he know, attendings sit in the back corner!

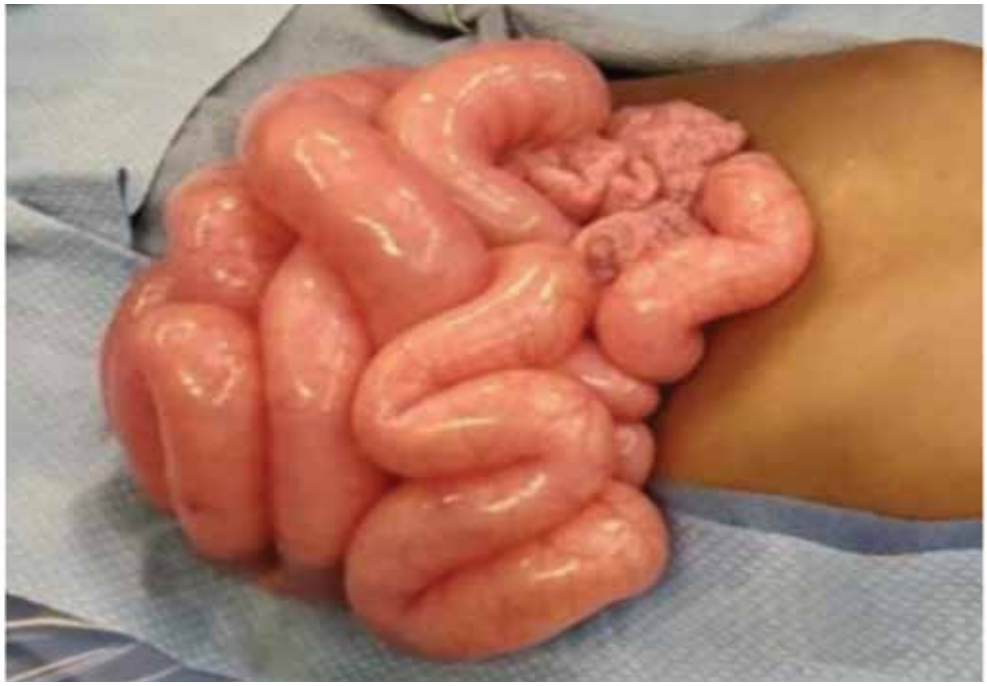
Faced forward now, I admired this new leader ignoring those in the back.
He asked sensible questions and listened with curiosity; a teacher incarnate.
No snickering or chortling and no embarrassment necessary. Shocker!
We stood up straighter then, confident and ready to learn from our mistakes.

It's been over a decade since I left that place.
If you are looking for me now, you will find me in the front row.

IMAGES IN MEDICINE:

Intestinal Pseudo-Obstruction Associated With Acute Epstein-Barr Virus Infection in a 2-Year-Old Child

Peter Paul C. Lim, MD



A 2-year-old boy with G6PD deficiency, otherwise healthy, presented with 5-day history of high-grade fevers, nasal congestion, fatigue, vomiting, diarrhea, and progressive abdominal distension. His initial laboratory findings are significant for elevated inflammatory markers, hyponatremia, elevated creatinine and mild transaminitis. Abdominal CT showed diffuse dilatation of the intestines but with a transition point in the left mid-abdomen consistent with bowel obstruction. He underwent diagnostic surgical exploration demonstrating transition point in mid-jejunum and diffusely dilated bowel throughout without mechanical obstruction (image). The mesentery appeared edematous but there was no ischemic or necrotic area or any mass noted. His post-operative course was complicated by prolonged ileus. Empiric antibacterial agents were discontinued when bacterial cultures were negative. His extensive infectious work up revealed acute EBV infection with viremia of 212,026 IU/ml. His preliminary immunologic work up did not demonstrate any primary inborn error of immunity. He was discharged on hospital day 9. Repeat EBV testing two weeks later showed decreased viral load to 2194 IU/ml. He continued to recover well on supportive management. This case highlights that EBV can manifest in variable clinical presentations including what seems like a surgical abdomen from severe ileus resulting in severe intestinal dilatation and mechanical intestinal obstruction.[1] It is therefore prudent to consider acute EBV infection part of the differential diagnosis in a pediatric patient who presents with intestinal distension with no apparent radiologic mechanical obstruction.

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Lost in Translation: What a Community Interpreter Taught Me About Preventive Care

Lucas Goetz, MS IV

As a medical student training in a rural community, I expected that distance, workforce shortages, and limited resources would shape how patients accessed care. What I did not fully appreciate until recently was how profoundly language alone can determine whether preventive care succeeds or fails in rural settings.

While working on a community-based dermatologic outreach project at a rural cheese production facility, I met many workers who had limited access to dermatologic care despite notable risk for skin disease. Many spoke Spanish as their primary language, and some spoke very little English. Before the project began, I had prepared educational materials, screening protocols, and follow-up recommendations. What ultimately determined whether those efforts were effective, however, was the presence of a trusted community interpreter.

With her help, conversations changed immediately. Questions that might otherwise have been met with hesitation or brief answers turned into meaningful dialogue. Workers asked about skin changes they had noticed for years but never mentioned to a clinician. They shared family histories, concerns about sun exposure, and uncertainty about when a skin lesion should prompt medical attention. Education that often feels generalized became specific, practical, and relatable.

It is easy to believe that prevention is simply a matter of providing information. This experience made it clear that information alone is not enough. Understanding requires language, cultural context, and trust. Without those, preventive care quickly becomes a one-sided exercise rather than a shared conversation.

In rural communities, language barriers are often compounded by other obstacles, including limited access to specialty care, transportation challenges, and lack of insurance. These barriers can discourage patients from seeking care even when concerns arise. In such settings, preventive efforts that rely on brief clinical encounters or written materials may fail to reach those who need them most. Interpretation is not an accessory to care in these moments; it is foundational.

The interpreter's role extended beyond translating words. She helped bridge cultural expectations, clarify misconceptions, and normalize questions that patients may otherwise have felt uncomfortable asking. Her presence signaled respect and inclusion, reinforcing that preventive care works best when developed alongside the community it serves.

This experience reshaped how I think about prevention. As clinicians, we often measure success in diagnoses made or treatments delivered. In preventive care, success may instead look like a patient leaving with greater confidence, understanding, and a sense of ownership over their health. These outcomes may be harder to quantify, but they are just as valuable and depend on communication that patients can truly understand and use.

As our patient populations continue to diversify, especially in rural and industrial settings, language access must be treated as a core component of preventive medicine. Investing in interpretation services is not simply a logistical consideration; it is an ethical one. Without it, well-intentioned efforts can leave the most vulnerable patients unheard.

For me, this project reinforced that prevention begins with listening and mutual understanding, rather than with screening tools or educational handouts. Too often, the barrier to meaningful preventive care is not a lack of medical knowledge, but a lack of shared language.

About the Author:
Lucas Goetz, MS IV, University of South Dakota Sanford School of Medicine

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Your SDSMA PAC membership is very important in electing candidates who understand and embrace our philosophy and vision for the future of healthcare. To contribute to SDSMA PAC, please visit sdsma.org. This list shows contributions as of July 2026.

Member News

Visit www.sdsma.org for the latest news and information.

New Office Ribbon Cutting

The SDSMA held a ribbon cutting on June 12 with the Greater Sioux Falls Chamber of Commerce to celebrate our new office at 1610 S Minnesota Ave in Sioux Falls. Thank you to those who joined us!

2026-27 Health Leadership Institute Cohort Begins in October – Now Accepting Participants

The HLI is now accepting participants for the 2026-27 cohort! Those interested may contact Justin Ohleen at johleen@sdsma.org or 605-336-1965. Sessions 1 and 6 will be held in Sioux Falls. Sessions 2 through 5 will be virtual.

Schedule:

Session 1 – Self Awareness - October 16-17, 2026

Session 2 – Interpersonal Communicatio ns - November 13-14, 2026

Session 3 – Teamwork and Collaboration - December 11-12, 2026

Session 4 – Systems Awareness - January 22-23, 2027

Session 5 – Wellness Centered Leadership - February 26-27, 2027

Session 6 – Influencing Organization Change & Culture – April 2-3, 2027

Learn more about the HLI at sdsma.org.

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SDSMA Joins Healthy Nutrition Collaborative

The SDSMA has joined the South Dakota Healthy Nutrition Collaborative. The collaborative (SDHNC) brings a collective voice to support access to nutritious food, which builds a strong foundation for healthy South Dakota families and communities to prosper. For more information, visit its website at https://www.sdhealthynutritioncollaborative.com.

Member News

Call for Submissions – Third Annual South Dakota Medicine Humanities Supplement

For the past two years, the *South Dakota Medicine* has published an online Humanities Supplement. The journal plans another edition of the supplement this fall and encourages submissions of creative work – visual art, poetry, short fiction, memoir, and historical reflection.

The maximum word length for narrative reflections is 1,500 words. Please review submission guidelines at sdsma.org. Submissions of work may be made at any point through **September 1, 2026**.

How to submit: Material may be sent to Elizabeth Reiss at ereiss@sdsma.org.

SDSMA Annual Conference Presentations

If you couldn't make it to the 2026 Annual Leadership Conference on May 29, or if you just want to revisit the insights shared, the complete programming is now available! See the deep dive into lifestyle medicine featured at our conference, now available on video, and presenter slides are available for download. Catch up on the high-impact sessions, expert strategies, and other takeaways on your own time – visit sdsma.org.

- SDSMA members: Free access
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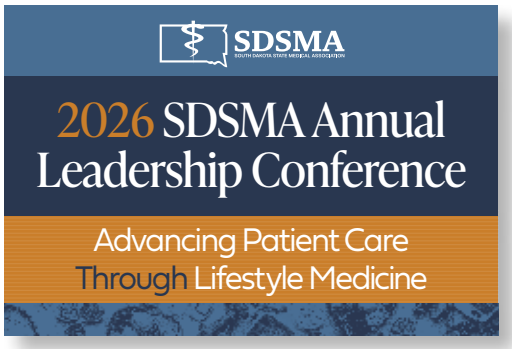

SDSMA Delegates and President attend American Medical Association Annual Meeting

The AMA Annual Meeting, held each June in Chicago, brings together physicians across the nation to engage in discussions and formulate policies to enhance public health and uphold sound medical policy at the federal and local levels. Watch for more information about the meeting and actions taken in upcoming communications from the SDSMA.

SDSMA's delegates to the AMA
Robert L Allison, MD and Robert J. Summerer, DO

For Your Benefit:

Membership Services from the SDSMA

SDSMA Membership Services works hard to ensure that you have the programs and services you want and need, as well as marketing the association to potential new members. We want to hear from you if you have questions, concerns or ideas on how we can serve you better, or if you know of a potential new member. It's your association and we'll work with you to make it the best it can be.

If you'd like more information about Membership Services give us a call at 605.336.1965, visit sdsma.org, or email membership@sdsma.org. We never take your membership in SDSMA or your input and activism for granted.

"For Your Benefit" is the Association's monthly update on programs and services available to physicians through their affiliation with the SDSMA.

Legal Brief Highlight: Reporting Child Abuse

Physicians and other health care professionals are required to report suspected child abuse or neglect and are granted immunity for both making the report and participation in further investigation.

The HIPAA-mandated privacy rules specifically authorize child abuse or neglect reports. If the suspected abuse or neglect is discovered in the physician's clinic, the physician is obligated to immediately make an oral report to the state's attorney, the South Dakota Department of Social Services, or to law enforcement. If the suspected abuse or neglect is discovered in a hospital setting, the physician must report the discovery to the person in charge of the institution or that person's designee. The person in charge must then report the discovery and provide copies of all medical examination, treatment, and hospital records regarding the child. Those who knowingly fail to make the required report and submit the required records are guilty of a Class 1 misdemeanor.

The physician-patient privilege of confidentiality does not exist in any judicial proceeding involving an alleged abuse or neglected child or resulting from the giving or causing the giving of a report concerning abuse or neglect. Any person who makes a report of child abuse is immune from civil or criminal liability. Immunity also extends to the participation in any judicial proceeding resulting from the report of suspected abuse or neglect.

For more information, download the SDSMA legal brief at sdsma.org. The SDSMA provides legal briefs for member physicians on a variety of rules and regulations that apply to the medical profession. For non-members, legal briefs are available for purchase.

Don't forget to send in your favorite scenic photo for

South Dakota Medicine

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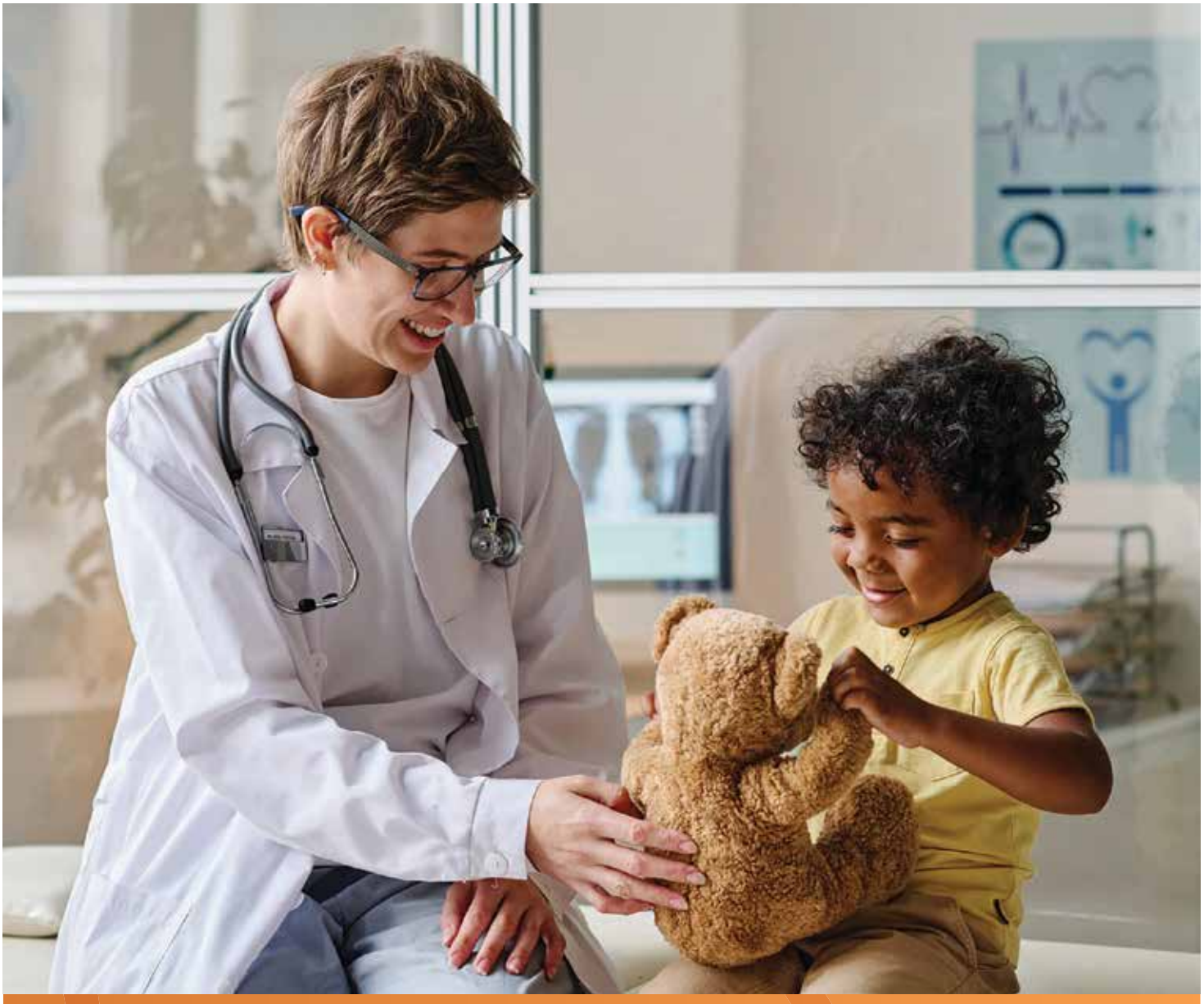

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