

January 2022

Volume 75
Number 1



South Dakota **medicine**

THE JOURNAL OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

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WHAT YOU NEED TO KNOW ABOUT PUBLIC SERVICE LOAN FORGIVENESS

KADIN WHITE, CFP[®], CHFC[®], *Advisor*

Recently, the Department of Education announced some changes to the Public Service Loan Forgiveness program because of the impact of COVID-19. Before we dive into those changes, let me start by providing a broad overview of the program.

In 2007, the Department of Education rolled out the Public Service Loan Forgiveness Program to provide a pathway for employees in government and not-for-profit organizations to receive debt relief on their student loans. This program forgives the remaining balance on any student direct loans after a specified number of “qualified” payments. The PSLF (Public Service Loan Forgiveness) provides forgiveness of any student loans after 120 qualified payments. This means that most borrowers can get rid of their student loan debt after working 10 years in the public sector. Depending on the size of someone’s student loans, this can be a massive benefit.

On October 6th, 2021, the Department of Education announced a limited period rule change that allows borrowers to receive credit for prior payments that otherwise would be deemed ineligible. According to the Department of Education website, the new rules apply to past payments that would count as qualified payments regardless of the type of loan, type of repayment period, or whether the payment was made in full or on time. The main requirement of these changes is “qualified” employment. The rule changes are for borrowers of direct student loans, those that have

consolidated into the direct loan program, and those who have consolidated into the program by October 31, 2022.

There are a couple of additional requirements to take advantage of this limited opportunity. First, you must have worked full time for a qualified employer when the prior payments were made. If you worked part time for multiple employers, you may still receive credit if the combined hours were over 30 hours per week. Credit is only allowed for payments made after October 1, 2007, which is when the program was initially rolled out. The second requirement applies to Federal Family Education Loans, Perkin loans, or other non-direct student loans. Under this rule, you must consolidate into the direct loan program by October 31, 2022.

To take advantage of these changes, borrowers must fill out the PSLF & PSLF Temporary Expanded (TEPSLF) certification & application (PSLF Form) for any period which they worked for a qualified employer and made loan payments. More information can be found on the Department of Education’s website.

Student loan debt in the United States totals \$1.73 trillion and continues to grow 6 times faster than the nation’s economy¹. Now, more than ever, it’s important to seek professional help related to these matters. A financial advisor can help you navigate these complex loans and develop a plan to reach your goals. If you have questions, please reach out to Foster Group. We would love to help.



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Advocating on Behalf of Patients and Physicians

Kara Dahl, MD

President, South Dakota State Medical Association

In November the SDSMA Policy Council met in Pierre for our biannual meeting. I would like to share some of the highlights from this meeting and give you a few updates that have occurred since then.

Starting off the day, we were given several reports, two of which were from ad hoc committees. The Ad Hoc Committee on Membership chair, Susan Anderson, MD, was happy to report to the Policy Council that membership numbers were up in 2021 by 120 members and discussed that the current membership drive for 2022 is underway. Thank you to those who have recently renewed or become new members of the SDSMA. We continue to create value in your SDSMA membership by providing physicians a strong voice as we work together to improve healthcare across our State. Of note, the SDSMA has a new database and website that has improved the online renewal process. If you haven't logged into the new site yet, be aware that your old password will not work. You should click "forgot password" to be prompted in creating a new one.

The Policy Council was given an update from Dean Krogman and Mark East on advocacy and government relations as we go into this legislative session. The SDSMA has been working on many issues over the past year and has formed ad hoc committees on physician wellness, marijuana, and scope of practice to further our efforts on.

The Ad Hoc Committee on Physician Wellness chair, Robert Summerer, DO, spoke of the SDBMOE's monitoring program and their proposed rules for regulation and oversight. As a part of the rules adoption process, the SDSMA asked the SDBMOE to clearly define the structure, criteria, and fees associated with their Health Professional Assistance Program (HPAP). Dr. Summerer also reported that the SDSMA was looking into a few options for wellness programs that would help physicians who are at risk for impairment. This is very timely as recent reports are demonstrating staggering numbers of physicians who consider themselves burned-out or as some physicians now refer to it as suffering from moral injury. The SDSMA would like to provide resources and assistance to physicians in a confidential and meaningful way. Currently, we are looking into contracting with Midwest Health Management Services of Sioux Falls. We will keep you posted with further updates as they become available.

Benjamin Aaker, MD, presented a report on marijuana for

medical purposes. Lynne Valenti, the Deputy Secretary of the South Dakota Department of Health, along with the Geno Adams, SDDOH Medical Cannabis Program manager, were present to give an overview of the current rules and process that has been implemented. Policy Council members had the opportunity to ask questions, voice concerns, and give suggestions. Some of the concerns raised involved lack of physician access to the online registry, security of the website, physician involvement in recommending who can cultivate and home-grow, and the lack of a maximum for THC concentration. The SDSMA supports having a limitation on the percentage/concentration of THC in marijuana used for medical purposes and has asked that physicians be removed from the patient home cultivation certification process. The SDSMA will also advocate for access to the marijuana certification registry. The SDSMA will introduce legislation if needed, and support bills that are brought forth regarding these issues.

Dr. Aaker also gave a report from the Ad Hoc Committee on Scope of Practice and the ongoing efforts to work with the South Dakota Academy of Physician Assistants. Members of the ad hoc committee had a meeting with the academy's leadership to listen to and discuss the concerns of the PAs but ultimately, the PAs want to practice independently and have perceived parity with the nurse practitioners in South Dakota. Members of the SDSMA will continue to meet with the academy's leadership to see if the PAs' concerns can be addressed.

During the meeting, the Doctor of the Day sign-up sheet was passed around. If you haven't signed up for this yet, please do – you can find the remaining available dates and more information about the program at sdsma.org. This program is a great way to serve our legislators and staff at the State Capitol building and obtain a better understanding of the overall legislative process. This also provides the opportunity to network and interact with legislators from across the state.

Toward the end of the meeting, several of the organization's older policy statements were reviewed and updated. This process occurs occasionally to ensure policy statements remain relevant to the current healthcare landscape within South Dakota.

I wish all of you and your families good health this winter and Happy Holidays!

SDSMA Enhances Medical Student Education

Keith Hansen, MD
South Dakota Medicine Editor

As the editor of *South Dakota Medicine*, I would like to invite you to support medical education and renew your membership in the South Dakota State Medical Association (SDSMA) for 2022. If you have already renewed, thank you.

For new medical school graduates, securing a residency over the last few years has become increasingly competitive, primarily due to the expansion of the number of students matriculated into medical schools without any increase in the number of residency positions. The competition is further enhanced by the fact that USMLE Step 1 scores can no longer be used to rank applicants as they are now categorized as pass/fail. Therefore, residency programs are looking for new ways to screen applicants.

Being published in a peer-reviewed journal is one thing that can significantly improve an application for a preferred residency. In fact, some residencies require a manuscript's acceptance in a peer-reviewed publication before they will even consider an applicant for a position.

South Dakota Medicine, published and paid for by SDSMA membership dues, is a peer-reviewed publication that can help expand residency opportunities for USD SSOM medical students. The editor, editorial staff and reviewers all assist our medical students through the process of publication. And while SDSMA dues assist in paying for the production of *South Dakota Medicine*, increases in production costs and reductions in SDSMA memberships has led to restrictions on the financial resources that the SDSMA can put toward the journal. This has led to changes in the way that *South Dakota Medicine* is published, including charging a non-member author fee.

I respectfully request that if you haven't done so yet, please renew your SDSMA membership for 2022 to support the journal, assist in the education of our medical students, and support our students in obtaining the residency of their choice.

All USD SSOM students are members of SDSMA for their entire time in medical school. The SDSMA has several other benefits for our medical students, including leadership positions, advocacy, and public policy efforts. Many of our students take advantage of these programs to learn about advocating for our profession while at the same time improving their CV and their competitiveness for residencies.

How can you help? Renew today at sdsma.org. If I can be of assistance, feel free to contact me.

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State of South Dakota's Child: 2021

Ann L. Wilson, PhD; Tyler A. Hemmingson, MPH; and Brad Randall, MD

I extend my warmest greeting to all of you as our new year begins.

This annual article reports on the new life that has arrived in our state and the sobering reality of how not all babies survive the critical first year following birth. This year's report echoes what we have been hearing nationally about the declining birth rate. Increasing diversity among the state's newborns, however, is apparent and mirrors national trends. Notable among the causes of infant death are sudden unexpected infant deaths that we are increasingly recognizing as accompanying risks in the babies' sleep environment. We can all become educators in creating a community expectation that babies sleep on their backs, alone, and in a crib that does not include soft objects or bedding. As we have vividly learned during the pandemic, efforts that promote public health must include us all and this includes minimizing the risks that could lead to the death of an infant.

I wish you health and wellbeing during our challenging times. We are all reminded that there is much that we can do to protect ourselves, our neighbors, and especially those most vulnerable in our communities, which include our youngest citizens.

Tim Ridgway, MD, FACP, FASGE
Dean, University of South Dakota Sanford School of Medicine
Vice President for Health Affairs
Dr. Charley F. and Elizabeth Gutch Chair in Medicine

Abstract

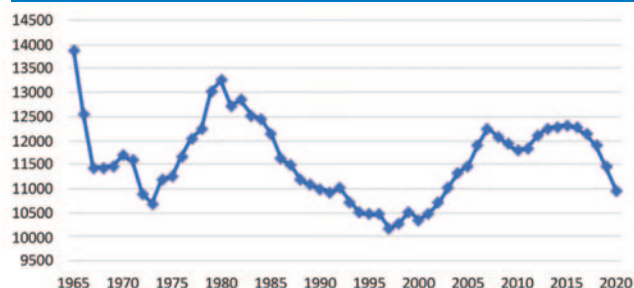
The total number of 2020 resident births in South Dakota continues to decline with a 4 percent decrease from the previous year yielding the state's lowest crude birth rate (12.3 per 1,000 population) since its first recording in 1910. Currently, similar to the U.S., approximately one-quarter of all births are minority. The percentage of American Indian births is decreasing in its contribution to this population of the state with a growing percent of African American and multi-race newborns comprising the minority population in the state. South Dakota had one more infant death in 2020 (n=81) compared to 2019. The decrease in births led to a non-significant increase in the state's infant mortality rate (IMR) from 7.0 to 7.4 that is significantly higher ($p<0.01$) than the U.S. rate (5.6) in 2019. An increase in nine sudden unexpected infant deaths (SUID) from 2019 to 2020 contributed to the rising IMR. Compared to the U.S., South Dakota has a lower percent of its infant deaths among those who are low birth weight (55 vs. 66 percent). Approximately one-third of white infant deaths occurred after the first 27 days of life; this was true for approximately half of all minority infants. Overall, South Dakota's minority infants have significantly higher rates of neonatal ($p<0.05$) and post neonatal ($p<0.01$) death than its whites, specifically due to perinatal causes, SUID, and accidents/homicide. How SUID contributes to the state's IMR is an area for needed attention as these deaths are increasingly known to accompany risks that, if alleviated, could prevent loss of early life.

An examination of data from the year 2020 is the first opportunity to see possible relationships between perinatal outcomes and the pandemic that spanned approximately three-quarters of this year. Drawing causal relationships is not possible, but several observations about the impact of the pandemic are made as natality and infant mortality data for this year are explored in this annual report.

Natality

Very apparent in Figure 1 is the steep decline in births noted between 2019 and 2020 when 10,951 newborns arrived in the state reflecting a 4.3 percent decrease from the previous year.¹ While questions may be raised about how the pandemic affected this decline in births, data show that the decrease in births in 2020 is a continuation of an ongoing trend with nearly a 9 percent (8.8 percent) decrease in births from its previous five year mean (2015-19). A 6.7 percent decrease was noted nationally during these same periods of time.² When the South Dakota decrease is broken down by racial groups for 2020, compared to their means for 2015-2019, a 6.2 percent decrease in births is noted for whites and a 12.3 percent decrease is noted for its minority* (defined in this report as non-white or Hispanic) population. This current downward slope of births mirrors a similar decline that occurred a generation ago between 1980 and 1997. Speculation is raised regarding how this decline will continue and its potential economic and social impact on the state.

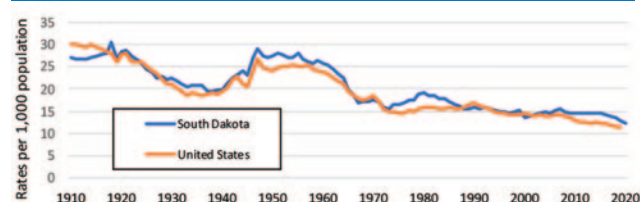
Figure 1. Live births in South Dakota, 1965-2020.



When the state's 2020 births are calculated as a crude birth rate per 1,000 population, Figure 2 shows that its 2020 rate is at lowest recorded point since 1910.¹ The 2020 birth rate of 12.3, however, is higher than the U.S. rate in 2019 of 11.4.² Again, these declining rates have multiple implications for the future of our state and nation.

There are also changing patterns in the place of residency of newborns in South Dakota. In 2020, 46 percent of all newborns were residents of Minnehaha, Lincoln, Pennington, and Lawrence counties. This was true of 42 percent of the

Figure 2. Birth rates, South Dakota and United States, 1910-2020.



births in 2000. Nearly half (48 percent) of South Dakota counties have had a decline over these years in the number of newborns becoming their residents.

The increasing racial and ethnic diversity of the state and country is accompanied by challenges in presenting data that reflect the composition of cohorts of infants. In this annual report and previous reports, data are presented as representing two groups: whites and minorities. Whites include Hispanics and minorities are all other racial groups (total population minus whites). Recognized are differences in the state and country's composition of these groups. For example, Hispanics comprise almost one-third (31.6 percent) of the U.S. population described as "white" and this is true of only 8 percent in South Dakota. Figure 3 shows that over time, in South Dakota, there has been an overall increase in the percentage of all minority births. Currently, 23 percent of South Dakota's births are minority, comparable to the 25 percent that is observed nationally.^{1,2}

Figure 3. Percent minority births, South Dakota and United States, 1965-2020.

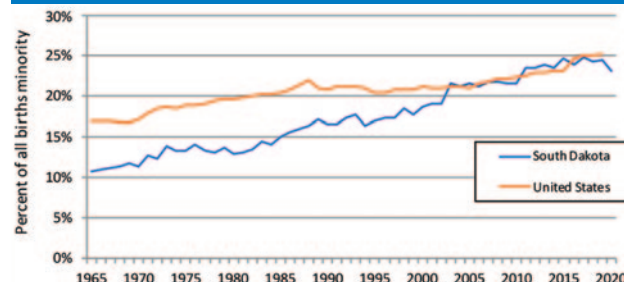


Figure 4. Changing composition of minority population in South Dakota.

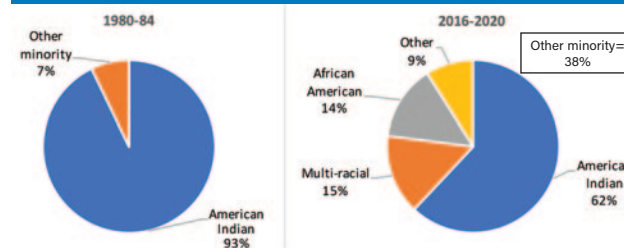
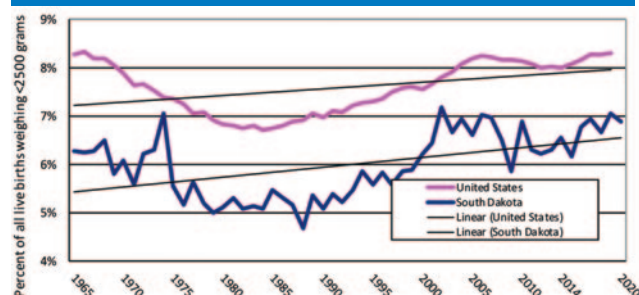


Figure 4 presents data that identify how the composition of South Dakota's minority population (as defined as all newborns who are non-white or Hispanic) has changed over time. Noted in these pie charts is the observation that minorities in South Dakota are increasingly representing populations other than American Indians to include African Americans, multi-racial and other groups. In the early 1980s this was true of only 7 percent of the minority population in South Dakota, but is the case now for over one-third (38 percent) of its population.¹

*The authors acknowledge that the term "minority" may be interpreted to signify social status of various types. This is not intended nor endorsed.

Figure 5. Low birth weight, South Dakota and United States, 1965-2020.



The birth weight of a cohort of newborns provides a measure of its health. Figure 5 shows that South Dakota's 7 percent of newborns who are low birth weight (LBW = less than 2,500 grams) has consistently been lower than that noted nationally (8 percent).¹ However, also paralleling the nation, this percent has been increasing over time. In 2020, there was a slight decrease from 2019 in the overall percent of the state's LBW newborns.

Figure 6. Percent of all births, mid low birth weight (1500-2499 g), very low birth weight (0-1499 g), South Dakota and United States, 1965-2020.

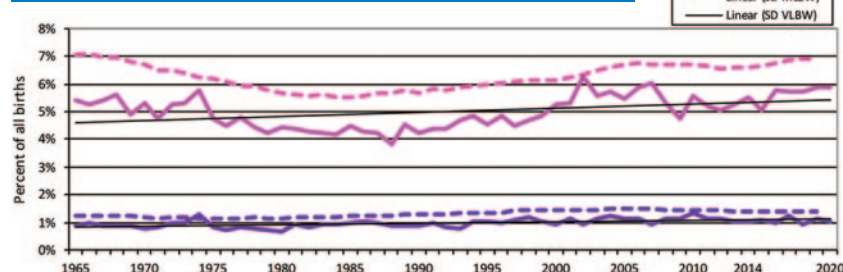
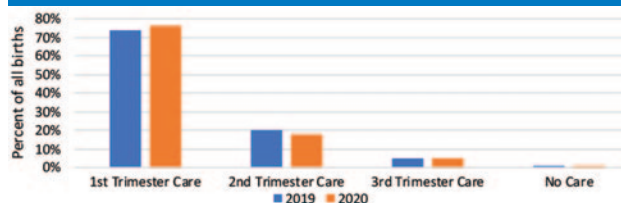


Figure 6 breaks the cohort of LBW newborns into two subgroups of mid low birth weight (MLBW = 1,500-2,499 grams) and very low birth weight (VLBW = 0-1,499 grams). Data in this figure show that the 2020 decrease in LBW noted in Figure 5 was accounted for by no demonstrable changes for either the MLBW and VLBW sub groups.¹

How health care was utilized during the pandemic for non-COVID-related needs was an issue often discussed when medical services were strained by those requiring care for the coronavirus. Further, there was reported hesitation among patients needing routine care that was fueled by fear of exposure to the virus. How the pandemic may have impacted use of prenatal care, important to the outcome of pregnancies, is demonstrated in Figure 7. This figure shows that there was not a decrease in the 2020 onset of prenatal care occurring during the first trimester compared to what was noted in 2019. Indeed, there was even a very slight

Figure 7. Trimester prenatal care began, South Dakota, 2019 and 2020.



increase (74 to 76 percent) in onset of first trimester care noted between these two years. While the U.S. Healthy People 2020³ goal of 84.4 percent of prenatal care beginning in the first trimester was not achieved, the ongoing progress in improving rates of first trimester care reveals positive steps in reaching this goal, especially during a pandemic. Importantly, this slight improvement was noted among both the white population (80 to 82 percent) and among minorities (54 to 56 percent).¹ Speculation regarding reasons for these observations may include women's greater flexibility of time when out-of-home employment was not possible; tele-visits may have also improved access to services.

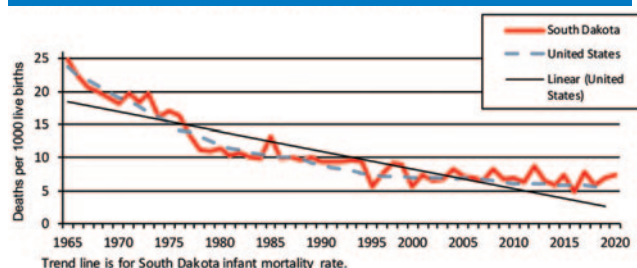
Infant Mortality

Caution must always be exercised when South Dakota's annual data on infant mortality are examined. The IMR is expressed per 1,000 live births and the state's relatively small and currently shrinking base of births impacts rates that can swing with very small shifts in total numbers of infant deaths. This

became very apparent in 2020.

In 2020, there was one more resident infant death ($n=81$) in South Dakota than observed in 2019 ($n=80$).¹ This one additional death led to an increase in the state's IMR from 7.0 to 7.4; the increase largely reflecting the 4 percent decrease in the number of births between these two years. The increase in the IMR between these two years was not statistically significant. Figure 8 shows this 2020 rate for the state continues to be higher than the U.S. IMR of 5.6 in 2019.⁴

Figure 8. Infant mortality, South Dakota and United States, 1965-2020.





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Figure 9. Infant mortality, white and minority, South Dakota, 1965-2020.

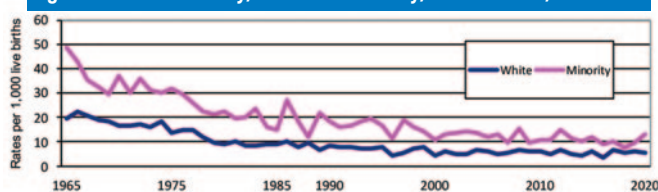


Figure 9 shows that the South Dakota 2020 increase in the IMR occurred among the minority population whose rate increased from 9.5 to 13. Recognition of the 8 percent decrease in minority births between 2019 and 2020 impacted this increase in the rate with the seven additional infant deaths occurring in this group. The white IMR slightly decreased from 6.1 to 5.8. Neither of these changes noted in the IMR for the white or minority populations were statistically significant. As seen in Table 1, the year to year shifts in numbers of infant deaths among minority infants have a larger impact on their mortality rate than is seen among whites as their base of births, upon which the rates are calculated, is smaller.

Figure 10. Neonatal and post neonatal mortality rates, South Dakota, 1965-2020.

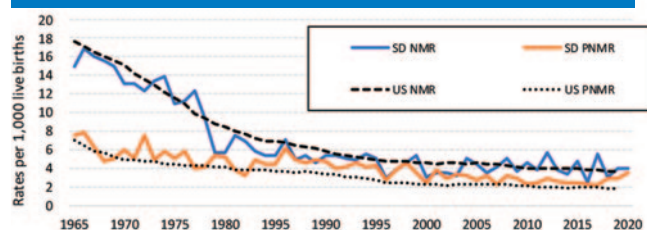


Table 1 and Figure 10 break down South Dakota's infant deaths by when they occur during the first year of life. The neonatal mortality rate (NMR) refers to deaths before the 28th day of life and post neonatal mortality rate (PNMR) refers to those that occur between the 28th day and the end of the first year of life. Small changes in the numbers of deaths also become apparent when they yield rates for the state's NMR and PNMR, but none of these shifts in rates between 2019 and 2020 are statistically significant for either

Table 1. Numbers of neonatal, post neonatal and infant deaths and their rates for South Dakota, 2019-2020.

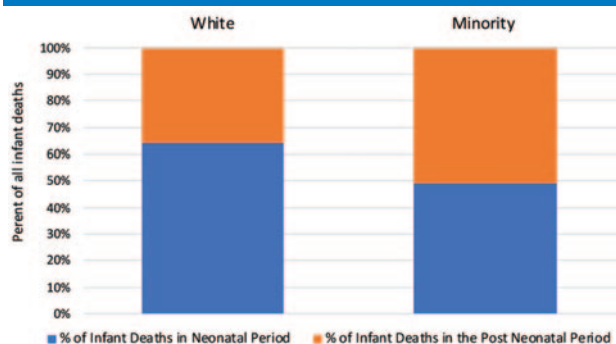
	Neonatal deaths (rate)		Post neonatal deaths (rate)		Infant deaths (rate)	
	2019	2020	2019	2020	2019	2020
White	32 (3.8)	26 (3.1)	20 (2.4)	22 (2.6)	52 (6.1)	48 (5.7)
Minority	13 (4.7)	17 (6.7)	13 (4.7)	16 (6.3)	26 (9.5)	33 (13.0)
Total	46* (4.0)	43 (3.9)	34* (3.0)	38 (3.5)	80* (7.0)	81 (7.4)

*Two 2019 infant deaths (one neonatal, one post neonatal) had race unknown; All 2019-2020 comparisons are NS

the white or minority populations. Nonetheless, the increase in the PNMR is especially apparent when compared to that of the nation as noted in Figure 10. Specifically, this figure shows that in 2020, the NMR was essentially unchanged (4.0 to 3.9) from the previous year, while the PNMR increased (3.0 to 3.5).¹ This increase in the PNMR was from 2.4 to 2.6 for whites and 4.7 to 6.3 for minorities.

Table 1 illustrates specifically how year to year changes in numbers of South Dakota's neonatal, post neonatal and infant deaths are expressed as rates per 1,000 live births. For example, among the state's minority population, there were seven additional infant deaths between 2019 and 2020 that revealed a 36.8 percent increase from 9.5 to 13.0 in its IMR. This increase is apparent in the plots for these years in Figure 9. Among the state's larger population of white births, between 2019 and 2020, there were four fewer infant deaths leading to a 6.6 percent decrease in its total IMR from 6.1 to 5.7. This slight change is also apparent in Figure 9.

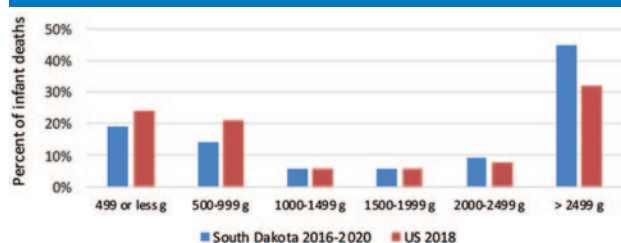
Figure 11. Percent of infant death occurring in neonatal and post neonatal periods, white and minority populations, South Dakota, 2016-2020.



There is racial variation in when (before or after the 28th day of life) infants die during their first year of life. Figure 11 breaks down these data for 2016-2020 in South Dakota showing that for its white infants there is a two-thirds/one-third distribution of deaths in the neonatal and post neonatal periods of time. Among minority infant deaths, the distribution is approximately equal with about half the deaths occurring in either the neonatal or post neonatal periods of time. During these years, as would be expected, between 75 and 85 percent of white and minority neonatal deaths were LBW and approximately one-quarter of all post neonatal deaths for both racial groups weighed less than 2,500 grams.

How does the distribution of infant deaths by birth

Figure 12. Percent of infant deaths by birth weight, South Dakota and United States.



weight in South Dakota compare with those from the entire country? Figure 12 addresses this question showing the most apparent discrepancy is for those infants weighing more than 2,499 grams. Notably, 45 percent of the state's infant deaths are among this weight category, while this was true of approximately one-third of infant deaths nationwide. This observation raises questions regarding the causes of infant death. Figure 13 begins to address this question.

During the neonatal period, Figure 13 shows that nearly all deaths are attributed to either perinatal causes (62 percent) or congenital anomalies (33 percent). In the post neonatal period, sudden unexpected infant death (SUID) is the cause of half of all deaths.

To further examine causes of infant death, Table 2 compares their rates for the state's white and minority populations. It shows, with the exception of congenital anomalies, the causes of infant death between 2016 and 2020 are significantly higher ($p < 0.01$) for the state's minority than its white population. Further, the IMR, NMR and PNMR are significantly higher for the state's minority than its white population. Table 2 also compares the rate of death for the state with those of the nation. These data show that South Dakota's rates of infant death are significantly higher ($p < .01$) for congenital anomalies, SUID, and accidents/homicide than observed nationally.

Figure 13 and Table 2 provide the state's data with five year means. Figure 14 breaks down these data to show how the

Figure 13. Causes of neonatal death, total population, South Dakota, 2016-2020.

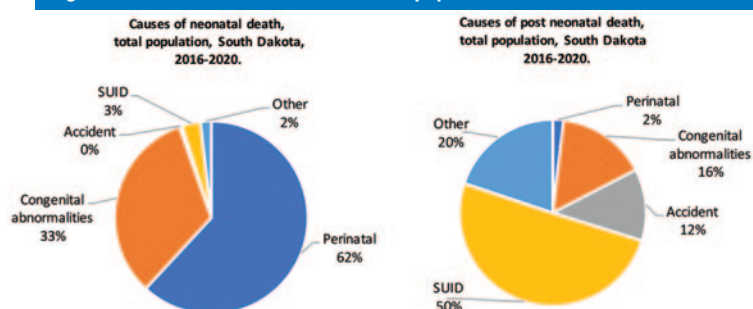


Table 2. Causes of infant death, South Dakota and United States.

Causes of death	Rates per 1,000 live births*						
	South Dakota infant mortality rate				Total population		
	2020	2016-2020		P	SD 2016-2020	U.S. 2019	P SD vs. US
	Total population	White	Minority	White vs. minority			
Perinatal causes	3.1	2.0	3.6	<0.01	2.4	2.7	p=0.114
Congenital anomalies	1.3	1.7	1.5	0.565, NS	1.7	1.1	<0.01
Sudden unexpected death	2.3	1.2	2.5	<0.01	1.5	0.9	<0.01
Accidents and homicides	0.3	0.2	1.0	<0.01	0.4	0.2	<0.01
Other*	0.5	0.4	1.2	<0.01	0.6	0.6	p=0.863
Total infant mortality rate	7.4	5.6	9.9	<0.01	6.5	5.6	<0.01
Neonatal mortality rate	3.9	3.5	4.8	<0.05	3.8	3.7	<0.01
Post neonatal mortality rate	3.5	2.0	5.1	<0.01	2.7	2.0	<0.01

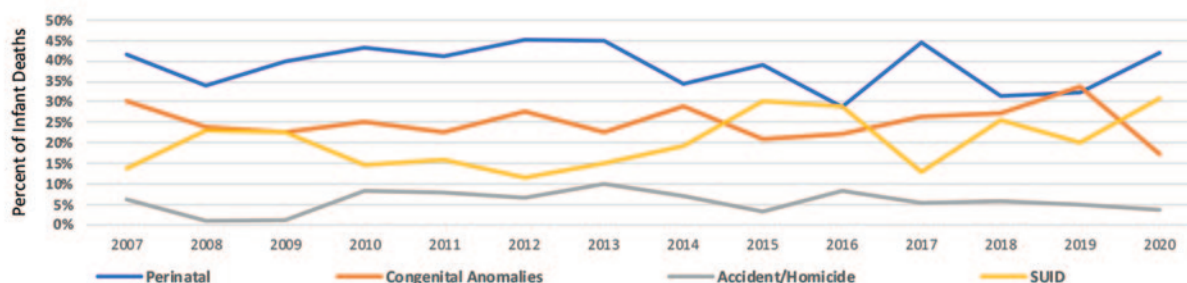
*All South Dakota data are from South Dakota Department of Health.¹ U.S. data from CDC.²

Other = Medical conditions such as infections, malignancies, etc.
p values <0.05 are considered significant.

distribution of infant deaths by cause has shifted year by year since 2007. In 2020, 31 percent of all infant deaths were caused by SUID, an increase from 20 percent in 2019. This is the highest percent of deaths due to this cause noted in the past 13 years and is the only cause whose trend line is increasing over time. Specifically, in 2020, there were 25 SUID deaths in the state (compared to 16 in 2019) yielding its highest rate (2.28) since 1993 (2.33) and they contributed to 66 percent of all post neonatal deaths. Also notable in Figure 14 is the increase noted in the 2020 percent of all infant deaths that were also due to perinatal causes, though the trend line for this percent of infant deaths is decreasing. While "perinatal" causes of death usually means prematurity-related, this was not the case in 2020.

SUID as a cause of death includes three different ICD codes. They are: Sudden Infant Death (SIDS; ICD code=R95), Accidental Suffocation or Strangulation in Bed (ASSB; ICD code=W75) and Unknown (ICD code = R99). Over time, there has

Figure 14. Percent of infant deaths by cause, South Dakota, 2007-2020.



been a shift in how these three causes have contributed to SUIDs. Using five-year moving means that “smooth out” year to year fluctuations in rates, Figure 15 shows that since the 1990s the rate of SIDs has declined. This reflects a diagnostic shift against the use of SIDs, in part related to enhanced death scene investigations that have increasingly identified hazards in the sleep environment of the deceased infant that thereby preclude the use of SIDS as a cause of infant death.⁵ Also apparent in the data in Figure 15 is how the total rate of SUID declined over the 1990s with the onset of the “Back to Sleep” campaign and then stabilized in the early 2000s. Over the past decade, previous progress in achieving lower rates of SUID has faltered and is even reversing. The increase in the 2020 number of the state’s SUIDs has contributed to this unfortunate trend.

Figure 15. Five year moving averages of SUID infant deaths.



Discussion

A story emerges each year as data on South Dakota’s annual births and infant deaths are examined. Observations made for any one year, however, must be reviewed with caution and with an awareness of the context of previous trends. Unlike data from the country as a whole, the state’s relatively small base of births leads to significant shifts in rates even when increases or decreases in numbers are slight. Nonetheless, perinatal outcome data unique to the state can be identified and their significance addressed. Four themes emerge from data in 2020 and each is a continuation of patterns observed in previous years. They are the state’s:

- falling numbers of births and birth rate
- higher rate of post neonatal deaths than observed nationally, with SUID as its leading cause
- disparity between white and minority rates of infant death
- increasing racial diversity in recent cohorts of minority births, representing larger percentages of African Americans, mixed racial newborns, and other races

Nationally, attention has been given to the country’s falling rate of birth. In 2020 the state’s rate of birth was its lowest recorded in over a century. Though the decreasing numbers of births is a shadow of a previous decline noted a generation ago, the trend arouses concerns about population-dependent services such as education and care for the elderly. In South Dakota, this decline is most apparent in the central rural areas of the state where communities are aging.

Consistently, South Dakota’s PNMR has been higher than it is noted nationally. Traditional public health wisdom suggests social issues are associated with survival during this period of time. In South Dakota, while rates of infant death are higher for its minorities than whites, the difference is especially true during the post neonatal period of time. Specifically, comparisons of the state’s white and minority NMR and PNMR show that there is a greater difference in the rates of death between these two groups following the first 27 days of life. In addition, between 2016 and 2020, in South Dakota, compared to the nation as a whole, a higher percent of its infant deaths (45 vs. 32 percent) were among those babies who are not LBW. Though data on causes of death by birth weight are not available for this report, it is known that only 16 percent of post neonatal deaths that occurred in 2020 were LBW and that all SUID deaths occurred after the 27th day of life.

Certainly, a variety of causes lead to death in the post neonatal period, but SUIDs are the most prevalent. If South Dakota’s 2020 rate of SUID was equal to that



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observed nationally in 2019, there would only have been 10 such deaths, instead, there were 25 SUID deaths. Further, South Dakota's total IMR would have been 6 (not 7.4), yet still higher than the U.S. rate of 5.6. These SUID deaths impacted populations disproportionately, with 40 percent occurring among minority babies who make up 23 percent of the births.

Increasingly the majority of SUID deaths are known to accompany preventable risk factors and these are deaths that public health measures and education may impact.⁵ The challenge is in finding ways for these measures to become a part of the routine care of babies. Safe sleep practices that include putting babies to sleep in their backs in a crib without soft objects or bedding must become a norm. Further, co-sleeping with a baby is to be avoided.⁶ This guidance is straightforward and frequently expressed in educational materials and public service media. Yet, when parents are exhausted, stressed or under-resourced they may lack the energy to do what is most safe and recommended for their infants. Further, cultural practices may well prevail when instructions are foreign to generations of infant care traditions. Innovative strategies of conveying guidance are needed to sensitively reach across such boundaries.

Accidents and homicide also contribute more to the state's higher post neonatal mortality rate than noted nationally. Though small in actual numbers (three to five per year), these deaths represent tragic loss of life that also are often preventable and associated with situations that stretch the capacity for enduring tensions when supports are not present to ease the stress of caring for an infant.

Over the years, data reviewed in these reports present trends of a significantly higher rate of death among minorities than whites for perinatal causes, SUID, accident/homicides. The authors recognize the differences in the state and national composition of the two racial/ethnic categories (white and minority) used in this report. For the sake of continuity in the presentation of the longitudinal data, these categories are used and attempts will be made in the future to disaggregate them.

Overall, the increasing diversity of the state and country adds to the complexity of reporting and interpreting the data in this report. Data on race are collected from birth certificates that are self-reported with questionable reliability. Further, the state's population of those who are not white or Hispanic is increasing and represents American Indian,

African American, mixed, and other races and ethnicities. Nonetheless, their actual numbers remain relatively small in South Dakota thus limiting the meaningfulness of potential plots on graphs that create longitudinal trends. It is recognized that when developing targeted interventions for public health prevention efforts, data on specific racial and ethnic groups are important. The trends over time in natality and mortality data for whites and minorities that are presented do provide evidence of perinatal progress and ongoing challenges.

Summary of Conclusions

The authors present these points to summarize the findings in this report:

1. The number of births (and birth rates) continued a declining trend in the U.S. and in South Dakota but did not appear to be impacted by the pandemic. The decrease in the number of 2020 births may explain the increase in the state's IMR for this year as compared to 2019 that occurred with an increase in only one additional infant death.
2. A growing percent of all newborns in the state are residents of four of its most populous counties.
3. Similar to the U.S., approximately 75 percent of the state's annual population of newborns is white or Hispanic. The state's population of minority newborns is becoming more diverse with a decreasing percent of it composed of American Indians with African American, mixed racial groups, and other racial groups increasing their percent of the state's minority population.
4. The state's percent of LBW newborns is lower than that of U.S. but is similarly increasing over time. In South Dakota, a smaller percent of all infant deaths is among LBW infants (55 percent) compared to 68 percent nationwide. Alternately the state has a higher percent than nationally of its infant deaths among those with birth weights above 2,499 grams.
5. The pandemic did not appear to adversely affect utilization of prenatal care.
6. The state's infant mortality rate for 2016-2020 (and neonatal and post neonatal mortality rates) is statistically higher than that of the U.S. in 2019.
7. In South Dakota, the 2016-2020 mean rates of infant deaths are statistically significantly higher among minority than white infants specifically for these causes of infant death: perinatal, SUID, injuries/homicide and other.

8. While the number of South Dakota SUIDs increased in 2020, the use of the term “SIDs” continues to decrease. In 2020, 23 percent of all newborns were minority but contributed to 40 percent of all SUID deaths all of which occurred in the post neonatal period.

Concluding Statement

The pandemic has emphasized for all that our health is affected by our neighbors and our neighbors' health affects our own. The traditional Lakota prayer that includes that statement, “mitakuye oyasin” meaning “we are all related” has special meaning during these months when a virus has threatened everyone in our communities. Yet, its meaning has always had deep significance when the survival of infants during the first year of life is considered. Not until the mid-century of life will the risk of death be as severe as it is in infancy. This is a time when families are dependent on excellent, responsive health care to assure the safe passage of life for their babies, but also when society must find ways to soften this passage by assuring that all parents have the education, resources, and support to nurture new life in their families.

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COVID-19 Infection and Simultaneous Worsening of Pre-Existing Neurologic Conditions: A Case Report Series

Kaitlynn Zitek, OMS III; and Deepak Manmohan Goyal, MD

Abstract

Viral infection commonly causes exacerbation of chronic conditions. However, this is not yet well reported in patients with a SARS-CoV2-infection and a history of a chronic neurologic disorder. At our institute, we had a patient presenting with more definitive upper respiratory symptoms and no history of vaccination, while the other patient was a breakthrough case with minimal pulmonary symptoms. However, both cases illustrated aggravated symptoms in otherwise stable neurologic disorders. We recommend that all patients with exacerbated neurological conditions should be tested for COVID even if they are asymptomatic. Our patients responded well to high dose steroids.

Introduction

Viral infection is a known trigger of chronic neurologic condition exacerbation. Common respiratory infections including but not limited to influenza virus, coronavirus, human metapneumovirus, and respiratory syncytial virus have been shown to manifest as altered neurologic status.¹ In particular, coronavirus infection can present as febrile seizures, encephalitis, and encephalomyelitis.^{1,2} The first case report we present is a patient with a history of multiple sclerosis (MS), presenting with symptoms of acute COVID-19 infection, who quickly develops an MS exacerbation. The second case report we present is a patient with a history of chronic inflammatory demyelinating polyneuropathy (CIDP), presenting with an apparent CIDP flare up with an incidental finding of breakthrough COVID-19 infection.

Details of patient clinical course with chronic neurologic disease exacerbation and acute SARS-CoV-2 infection have not yet been well documented in case report format. We hope this can contribute to earlier concern and identification of neurologic condition exacerbations in patients recently diagnosed with COVID-19.

Case Report #1

A 59-year-old African American female with a history of multiple sclerosis, diabetes mellitus, and hypertension was transferred to the emergency department due to worsening abdominal pain for three days. The abdominal pain was rated as 10/10 in severity and associated with persistent nausea and vomiting, and occasional diarrhea. She also complained of generalized weakness, fatigue, myalgia, sinus

congestion and pharyngitis. The patient denied shortness of breath, chest pain, palpitations, or dysuria. She lived with her son, daughter-in-law, and their children. She believed she may have been exposed to SARS-CoV-2 from her grandchildren as they had recently been feeling ill. The patient was diagnosed with MS in 1997, and her last reported MS relapse was eight years ago.

The patient was not vaccinated against COVID-19. Leading up to her infection, the patient persistently avoided exposure and double masked when she needed to go out. The patient explained that her distrust of the COVID-19 vaccine was due to her grandfather receiving experimental injections by the U.S. government as part of the Tuskegee experiment.

Upon initial physical examination, she had epigastric tenderness without rebound or guarding, severe, global weakness, 2+ pitting edema in the lower extremities bilaterally, and diffuse tenderness of her upper back. There were no heart arrhythmias appreciated, or abnormal heart or breath sounds present on examination. The patient's vital signs in the ED were: temperature of 103.1 F, HR 84, RR 22, BP 144/94, O2 saturation 95 percent on room air.

A COVID-19 nasopharyngeal swab RT-PCR test was completed and revealed positive results indicating the presence of viral RNA of SARS-CoV-2. Influenza A, B, and respiratory syncytial virus PCR tests were also completed, the results were negative. The patient received chest X-ray, head CT without contrast, abdominal and pelvic CT with contrast, venous ultrasound of the bilateral lower extremi-



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ties, and MRI of the brain with and without contrast, which all revealed negative findings. Of note, the MRI showed mild progression of periventricular, deep, and subcortical white matter plaques, which was consistent with her history of multiple sclerosis.

The patient was hospitalized due to global weakness and persistent nausea and vomiting. Her oxygen saturation remained stable at the time of admission and for the first few days. Her weakness continued to worsen, and she was started on one gram of Solu-Medrol every day for five days to treat her multiple sclerosis exacerbation. On day three of stay, her oxygen saturation dropped to 88 percent on room air. A chest X-ray was repeated, and revealed bilateral lower lung infiltrates, compatible with pneumonia. The drop in oxygen saturation and chest X-ray findings raised concern for severe acute respiratory syndrome due to COVID-19 infection. The patient was temporarily placed on 0.5 L of oxygen via nasal cannula. The patient was started on remdesivir at this time to treat her viral infection. On day four of admission her oxygen saturation was recorded as 92 percent. The patient's oxygen saturation returned to above 94 percent on room air and her gastrointestinal complaints resolved on day six. She continued to show slow, steady improvement over the remainder of her stay. The patient was discharged to a swing bed facility to regain strength and stability prior to returning to her home on day 12 of admission. She stayed at the swing bed facility for 13 days, and then was discharged home with improved strength and ambulation.

Case Report #2

An 89-year-old Caucasian male with a history of CIDP, hypothyroidism, hypertension, and hyperlipidemia was brought to the emergency department due to persistent, generalized weakness that began earlier that day. The patient reported he was working in his garden a great deal the day prior to the weakness onset. He was unable to get out of bed and has been having marked weakness. He was fearful that he might not be able to bear weight. He needed assistance to come to the ED and was brought in via wheelchair. He denied any pain, headache, paresthesia, fever, chills, nausea, vomiting, diarrhea, bowel or bladder incontinence, or chest pain. He later reported that he had a new cough that preceded the weakness by three days. The patient reported he received the Johnson and Johnson COVID-19 vaccine in May of 2021. He also stated that he rarely left home, and that when he did he was careful to always wear a mask. He was diagnosed with CIDP in 2018, and this was his second exacerbation following initial diagnosis several years ago.

Upon physical examination, the patient had visible fasciculations present on the proximal legs bilaterally, absent deep tendon reflexes in the lower extremities bilaterally, downward going plantar reflexes bilaterally, and a wide-based, unsteady gait. There were no visible motor deficits in the patient's upper extremities, respiratory distress, dysarthria, meningismus, or edema present. The patient's vital signs in the ED were: temperature of 98.6 F, HR 104, RR 14, BP 156/71, O₂ saturation 90 percent on room air.

A COVID-19 nasopharyngeal swab RT-PCR test was completed and revealed positive results indicating a breakthrough infection of SARS-CoV-2. A respiratory panel including influenza A, B, adenovirus, respiratory syncytial virus, human metapneumovirus, parainfluenza virus 1-4, Bordetella pertussis, Chlamydia pneumoniae, and Mycoplasma pneumoniae PCR tests were also completed, the results were negative. A West Nile antibody test was ordered and results were negative. The positive COVID-19 test along with the patient's symptom of cough were supportive of a diagnosis of acute COVID-19 infection. The patient was admitted for observation due to concerns of hypoxia with O₂ saturation at 90 percent on room air and symptoms of CIDP exacerbation.

Following the positive COVID-19 PCR test, a chest X-ray was obtained. This revealed no acute abnormalities. Due to the hypercoagulable nature of SARS-CoV-2, the patient also received a head CT without contrast and a brain MRI without contrast. These imaging studies both provided no significant abnormalities. The patient was given 250 mg of Solu-Medrol every day for five days to treat his CIDP exacerbation. Over the remainder of his hospitalization, the patient's lower extremity weakness steadily improved. He remained free of any additional respiratory symptoms of COVID-19 infection, other than the initial cough found on presentation. The patient returned home upon discharge on day five of admission.

Discussion

In December of 2019, the first cases of COVID-19 pneumonia were identified. This was quickly followed by a global pandemic due to the high transmissibility of SARS-CoV-2. It is a member of the coronavirus family, which has a propensity for mutation due to an error in their protein responsible for duplicating genetic material.³ The virus is transmitted through the respiratory tract, respiratory secretions, direct contact, and droplets.³ As Dec. 6, 2021, this pandemic has resulted in 49 million infections, and more than 780,000 deaths in the U.S.⁴

COVID-19 is most well known as an acute respiratory infectious disease, with the most common mild symptoms being fever, cough, and malaise.³ However, SARS-CoV-2 also has several identified neurologic symptoms including headache, encephalopathy, dizziness, myalgia, and anosmia.² These symptoms demonstrate the impact the virus has on the nervous system. Along with mild symptoms, viral infection can also result in critical conditions including but not limited to acute respiratory distress syndrome, multiple organ failure, or death.³ Less frequently, COVID-19 is associated with the development of or exacerbation of pre-existing neurologic conditions. These have included but are not limited to seizures, status epilepticus, Guillain Barre syndrome, encephalopathy, and focal and multifocal neuropathies.^{1,2,5} These case reports discussed simultaneous COVID-19 infection and exacerbation of MS and CIDP.

The mechanism between COVID-19 infection and neurologic deficit is not entirely clear. However, our current understanding is that the coronavirus utilizes its neurotropic and neuro-invasive capabilities to enter the CNS at the olfactory bulb.¹ Here, it can begin to induce inflammation and demyelination with the stimulation of various cytokines.¹

MS is an immune-mediated inflammatory demyelinating disease of the central nervous system. It characteristically has a relapsing and remitting disease course. Infectious stimulus, including viral infection, is one potential trigger for an MS exacerbation.⁶ Many viruses have been identified as triggers to MS, the virus of most recent interest is SARS-CoV-2. Our patient discussed above is just one reported example of COVID-19 infection during the onset of a multiple sclerosis flare. There is conflicting information present in the literature regarding patients with MS and COVID-19 infection. One study noted that COVID-19 may not trigger an MS exacerbation, but hypothesized that a COVID-19 associated lymphopenia may initiate relapses through a bystander effect of infection.⁷ However, a meta-analysis reported a higher hospitalization rate among patients with MS and a simultaneous COVID-19 infection,⁸ suggesting that perhaps the infection is further intensifying the clinical course in patients with MS.

CIDP is an immune-mediated neuropathy. It affects peripheral nerves and nerve roots.⁹ Similar to MS, CIDP also shares a relapsing and remitting disease course. It is postulated that viral infection can precipitate clinical exacerbation of patients with CIDP.¹⁰ Our patient's case described above represents one case of simultaneous COVID-19 infection and CIDP exacerbation. There is very

limited information present in the literature at this time regarding the potential relationship between CIDP and COVID-19 infection. This is something that certainly requires further investigation and monitoring.

At this time, we cannot definitively say whether these exacerbations are associated with acute COVID-19 infection or are simply coincidence. This consideration is also supported in a systematic review of neurological manifestations of COVID-19. The authors discussed the interaction and mechanisms between coronavirus infections and the development of demyelinating disease. It is believed we will likely see an eventual association between chronic neurologic disease exacerbation and COVID-19, as more data is collected.²

Conclusion

Patients with multiple comorbidities and complex medical histories are at greatest risk of suffering serious complications secondary to COVID-19.¹¹ To prevent severe illness of patient's with comorbidities, medical care providers should be aware of the additional diseases that can be precipitated or exacerbated by a COVID-19 infection. Pulmonary complications, like asthma and COPD exacerbations, are frequently found in the setting of COVID-19 infection.¹¹ Even some neurologic disorders appear to have developed secondary to this infection.¹² These cases are some of the few, chronic neurologic disorder exacerbations occurring in the presence of concurrent COVID-19 infection that have been reported.

We recommend that patients newly diagnosed with a neurologic disorder or who present with a flare of a chronic neurologic condition, are subsequently tested for SARS-CoV-2.

Early diagnosis of COVID-19 infection in asymptomatic cases, like these, can make providers more cognizant of the treatment plan and also prevent unnecessary exposures.

The possibility of COVID-19 infection manifesting new neurological conditions in previously healthy patients needs to be explored further.

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Impact of Payer Status on Hospitalization Outcomes in Pediatric Diabetic Ketoacidosis

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Abstract

Background: Diabetic ketoacidosis (DKA) is a life-threatening complication seen in patients suffering from type I diabetes (T1D) with a cost burden of over \$5 billion in the U.S. annually. Often, children are first diagnosed with T1D when they present with DKA. Our study examines the impact of payer type on pediatric DKA. We hypothesize that Medicaid payer type negatively impacts costs and care outcomes in pediatric patients with DKA as compared to private payers.

Methods: We utilized the Agency for Healthcare Research and Quality (AHRQ) 2012 Kids' Inpatient Database (KID) for analysis. Our inclusion criterion included All Patient Refined Diagnosis Related Groups (APR-DRG) coding for T1D DKA admissions with a uniform severity and an identifiable payer of Medicaid or private insurance.

Results: 27,241 weighted and severity-adjusted discharges met criterion (51.6 percent Medicaid payers, 48.4 percent private). Comparing Medicaid vs. private payer status, we found: length of stay (2.24 days vs. 2.09, $p<0.001$), number of procedures received (0.13 vs. 0.12, $p<0.003$), and total charges (\$16,449 vs. \$16,107, $p=0.078$). Limiting analysis to a crude measure of bottom quartile income showed: length of stay (2.26 days vs. 2.14, $p<0.001$), number of procedures received (0.12 vs. 0.12, $p<0.596$), and total charges (\$15,393 vs. \$14,063, $p<0.001$).

Conclusions: Children admitted in DKA and covered by Medicaid had longer hospitalizations, more procedures performed, and higher total costs of care. Even after controlling for socioeconomic status, similar effects persisted. Further evaluations are warranted to reveal the causative factors behind these correlative findings which suggest DKA patients receive different care depending on their payer status.

Introduction

The number of children with type I diabetes (T1D) has been on the rise in recent years with an incidence of 21.7 cases in 100,000 youths for the period from 2011 to 2012.¹ In contrast to T2D where peripheral tissues fail to adequately respond to insulin, T1D is distinguished by the absence of insulin production due to the destruction of beta-cells in the pancreas.² One complication these patients face is diabetic ketoacidosis (DKA), a life-threatening condition caused by a lack of insulin function, resulting in overwhelming ketoacidosis.³ While DKA can occur in both types of diabetes, it more commonly presents in those suffering from T1D.^{3,4}

Unfortunately, the first time a family becomes aware that their child has T1D is often when that patient slips into a DKA emergency. At the Barbra Davis Center for Diabetes which serves more than 80 percent of Colorado pediatric patients with diabetes, almost 39 percent of new diagnosis

of T1D presented with DKA.⁵ A broader dataset from the Search for Diabetes in Youth study put the prevalence of DKA at the time T1D diagnosis at 25.5 percent.⁴

Given that DKA is often seen in children first presenting with T1D and the serious nature of the condition it is imperative that afflicted children are receiving adequate care. A potential obstacle to this goal may involve what form of insurance is being used at the time of DKA admission. The Barbra Davis Center found that children with T1D covered under a government sponsored plan had a higher incidence of DKA than those with private insurance plans.⁵ Negative outcomes can also correlate with payer status such as those seen in the setting of burns,⁶ and surgery.⁷ A common thread through these studies is that patients on government sponsored plans have more adverse outcomes compared to their counterparts on private insurance plans. It is our goal to expand the investigation on payer status for



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DKA admission in the T1D pediatric population. In line with adult studies, we hypothesize that Medicaid payer type negatively impacts resource utilization in pediatric patients with DKA as compared to private payer type.

Methods

Database

This retrospective study examined inpatient stays for pediatric patients with DKA between 2009 and 2012 using the Kids' Inpatient Database (KID), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality.⁸ The 2012 edition of the KID draws on discharges from 4,179 hospitals across 44 states. Ages of the patients range from birth up to and including 20 years of age. Data is released from the KID over three-year blocks based on administrative data—discharge abstracts created by hospitals for billing. The database does not give access to the patient's entire medical or visit history. The KID uses automated quality controls for validity and consistency of each record. At the time of analysis, the 2012 version of the KID was the most recently released KID dataset. As the KID is a deidentified database, this study received exempt status from the local Institutional Review Board at the University of South Dakota.

Inclusion Criteria

From 6,675,222 weighted discharges in the 2012 KID we included cases that met four criteria:

1. Patients with T1D and DKA associated with the admission assessed by the presence of an ICD10 code on record of either 250.11 (*Diabetes with ketoacidosis, type I [juvenile type], not stated as uncontrolled*) or 250.13 (*diabetes with ketoacidosis, type I [juvenile type], uncontrolled*). Given the administrative database extraction, we are unable to determine if this was a first-time diabetes diagnosis vs. an individual with previously diagnosed diabetes.
2. Admissions that were a result of diabetes related event determined with an All Patient Refined Diagnosis Related Group (APRDRG) of 420 signifying an admission related to "Diabetes." The APRDRG variable was developed to standardize hospital admissions considering illness and severity.
3. A primary payer of either Medicaid or private insurance
4. Discharges with a severity score of "2" out of a possible 4 for the APRDRG Severity index. This variable is a progressive scale of illness severity at the time of admission that considers both severity of the disease as well as any secondary diagnoses and comorbid conditions

associated with the patient.⁹

Analysis

All analyses were performed on weighted data with independent t-tests for group mean comparisons while relationships between Medicaid and private groups were examined with chi-square tests. Missing/blank values in the KID were omitted from analysis. All income and dollar values represent 2012 dollars. All data was examined using SPSS v25 with statistical significance set at $p < 0.05$.

Results

Groups and Descriptive

We examined 27,241 discharges that met our inclusion criterion with 14,047 (51.6 percent) Medicaid payers and 13,194 (48.4 percent) private. The Medicaid group was 55 percent ($N=14,047$, 95 percent CI 54-56 percent, Table 1) female while the private group was 53 percent ($N=14,047$, 95 percent CI 52-53 percent). The average age in years of Medicaid and private groups were 14.43 (95 percent CI 14.35-14.51) and 14.21 (95 percent CI 14.12-14.29) respectively. Confidence Intervals were calculated on all variables including gender due to the sampling approach of the weighted data set.

Outcome Measures

Mean charges for the hospitalization were \$16,449 (95 percent CI \$16,183-\$16,714, Table 1) for Medicaid plans and \$16,107 (95 percent CI \$15,889-\$16,327) for private ($p < 0.078$) while the length of stay was 2.24 (95 percent CI 2.20-2.28) days for Medicaid and 2.09 (95 percent CI 2.07-2.11) for private ($p < 0.001$). When averaged, the number of procedures was 0.13 (95 percent CI 0.12-0.13) for Medicaid and 0.12 (95 percent CI 0.11-0.12) for private ($p < 0.003$). These low procedure values reflect that only 9.4 percent of the included cases had one or more procedures during their admission. Limiting analysis to this subset with at least one procedure on file 1,408 (55 percent) were Medicaid and 1,150 (45 percent) were private plans ($p < 0.004$). None of the admissions we focused on at the APRDRG severity level of "2" resulted in mortalities.

Demographic

The average number of chronic conditions for the Medicaid group was 2.05 (95 percent CI 2.02-2.07, Table 1) vs. 1.81 (95 percent CI 1.79-1.83) for privately insured ($p < 0.001$). All discharges had at least 1 chronic condition on file which would have been T1D. The KID also reports county income data by quartiles for the zip code associated with each

Table 1. Full outcome measures and demographics.

	Medicaid		Private		p
	Mean	95% CI	Mean	95% CI	
Age, years	14.43	14.35-14.51	14.21	14.12-14.29	<0.001
Sex, % female	55	54-56	53	52-53	<0.001
# Chronic conditions	2.05	2.02-2.07	1.81	1.79-1.83	<0.001
Length of stay	2.24	2.20-2.28	2.09	2.07-2.11	<0.001
Total charges	16,449	16,183-16,714	16,107	15,889-16,327	0.078
# procedures	0.13	0.12-0.13	0.12	0.11-0.12	0.003

Table 2. Number of weighted discharges separated by income quartile.

Income Quartile by zip code	Medicaid		Private		χ ² p value
	25%	5,783 42.2%	2,804 21.6%		
50%	3,828	27.9%	3,211	24.7%	<0.001
75%	2,752	20.1%	3,404	26.2%	
100%	1,333	9.7%	3,576	27.5%	

patient's account. There was a significantly different distribution of our sample population across the different income quartiles between our two groups ($p < 0.001$, Table 2).

Bottom Quartile Income Subanalysis

Subgroup analysis of the bottom income quartile (table 3) had an average age of 14.60 (95 percent CI 14.48-14.72) for Medicaid children and 14.96 (95 percent CI 14.79-15.13) for private while 55 percent (95 percent CI 54-57 percent) of the Medicaid group was female vs. 52 percent (95 percent CI 51-54 percent) of the private group. There was a significant difference in the number of chronic conditions with Medicaid patients having an average of 2.03 (95 percent CI 1.99-2.06) and privately insured patients at 1.85 (95 percent CI 1.81-1.89, $p < 0.001$). Average length of stay for the bottom quartile was 2.26 (95 percent CI 2.22-2.30) days for Medicaid patients and 2.14 (95 percent CI 2.08-2.18) for the privately insured ($p < 0.001$). Total charges were significantly higher for Medicaid patients at \$15,393 (95 percent CI \$15,077-\$15,709) vs. privately insured at \$14,063 (95 percent CI \$13,685-\$14,441, $p < 0.001$). Finally, there was no significant difference between Medicaid and private insurance patients for the number of procedures received with each group averaging 0.12 (Medicaid 95 percent CI 0.11-0.13, private 95 percent CI 0.10-0.13) procedures ($P < 0.596$).

Table 3. Outcome measures and demographics for the bottom income quartile.

	Medicaid		Private		p
	Mean	95% CI	Mean	95% CI	
Age, years	14.60	14.48-14.72	14.96	14.79-15.13	<0.001
Sex, % female	55	54-57	52	51-54	0.052
# chronic conditions	2.03	1.99-2.06	1.85	1.81-1.89	<0.001
Length of stay	2.26	2.22-2.30	2.14	2.08-2.18	<0.001
Total charges	15,393	15,077-15,709	14,063	13,685-14,441	<0.001
# procedures	0.12	0.11-0.13	0.12	0.10-0.13	0.596

Discussion

In this study we compared the outcomes of Medicaid vs private payer status in pediatric patients admitted with DKA. We found that children admitted under Medicaid plans were hospitalized longer, utilized more procedures, but did not incurring significantly higher expenses than their private payer counterparts.

Outcome: Mortality

None of the DKA admissions we included resulted in mortalities. This is likely a result of our inclusion criterion rather than the true serious nature of DKA. Of the DKA admissions listed in the KID the vast majority (91.7 percent) were categorized with an APDRG severity of "2". We used this level as our fourth inclusion criterion as it controlled for severity of the cases. In contrast to our findings, multiple studies have shown that patients insured through Medicaid have significantly higher mortality compared to their privately insured counterparts as is the case in pediatric patients covered by Medicaid having a higher rate of postoperative mortality.⁷ Likewise, a California based study showed higher mortality in hip replacement patients covered by Medicaid.¹⁰ Similar to our results, not all study scenarios show a significant difference in Medicaid vs private payer mortality.^{11,12} However, we are unaware of any studies where Medicaid patients were at a reduced risk of mortality compared to their privately covered counterparts.

Resources: Cost, Length of Stay, Procedures

The Medicaid group had longer lengths of stay (LOS). Other groups have already shown longer LOSs being positively correlated with government sponsored plans in studies looking at postoperative bariatric surgery,¹³ pediatric dermatitis,¹⁴ and pediatric postoperative treatment for scoliosis.¹⁵ While others have shown that longer LOSs correlate with significantly higher costs,¹⁴ we did not detect a similar significant effect in our own data.

It seems paradoxical that one group would utilize more resources yet not incur more costs. However, the apparent lack of effect may be explained by a discrepancy between the DRG charges captured in the KID vs. actual reimbursements paid out by Medicaid. A 2014 study by Schousboe JT et al. showed that actual Medicare payments were approximately 20 percent higher than what was captured by the hospital's DRG charges for osteoporotic fractures.¹⁶ The increase in payments is related to several factors including geographic region and hospital teaching status. Though Medicare is a separate government program from Medicaid,

the two share many similarities which may mean the charges we report here are effectively higher due to actual payouts.

Demographics: Income, Chronic Conditions

It is likely that some of the results in our study are due to socioeconomic characteristics of the Medicaid and private populations. The Department of Health and Human Services website defines Medicaid as a program which “serves low-income people of every age.”¹⁷ By design of this program, the Medicaid group comes from a lower socioeconomic background, which has repeatedly been shown to negatively influence health factors as we found in our analysis with the Medicaid group having increased chronic conditions.¹⁸⁻²⁰ This increase in chronic conditions for the Medicaid group would make these patients more medically complex which could also be a reason this group utilized more resources.

To control for socioeconomic factors, we performed a subanalysis limited to patients living in counties where average income fell within the bottom quartile. We recognize this is by no means a perfect representation of an individual patient’s household income, but even after controlling for socioeconomic factors, similar trends to the larger dataset were observed. LOS for the Medicaid group were still significantly increased in the bottom quartile. In contrast to the full dataset, the increase in LOS was present with a concomitant significant increase in charges, though the number of procedures did not differ. Still, after controlling for a crude measure of income, the general trend of the Medicaid group utilizing more resources remained as it did for the full dataset.

Strengths, Limitations, Future Directions

This study benefited from the large sample size that the KID provided. As a result, we were able to detect very small yet significant differences between our groups. A tradeoff of this statistical power is that we saw significant results with relatively modest effect sizes of questionable clinical significance. However, even with these low effect sizes, we would point out that the Medicaid group only ever fared as well or worse to the privately insured group, but never better.

The shifting state of healthcare in the U.S. makes it difficult to generalize our interpretation of the results. The data used in our study were collected before the Affordable Healthcare Act was enacted. Looking forward, it is important to recognize that since this enactment, expansion of Medicaid has improved outcomes in participating states

which see evidence of decreased mortality and disease burden²¹ as well as shorter LOS.²² A future study would be warranted to reexamine more recent data to see if there are significant shifts from our study as a result of Medicaid expansion. Other future directions will explore causative relationships between outcomes and payor groups as well as a more thorough accounting of individual household income.

Conclusion

Any person with a life-threatening condition should receive equal care. Our study revealed disparities in care based on payer type which should prove worrisome to not only patients and providers, but also policy makers. Given the rapidly shifting landscape in healthcare delivery and payment, it is vital to understand the impact of payer status on the delivery and outcome of care. If the difference in clinical resource use is directly related to payer identification, the policy implications of expanding government payment plans without accounting for these discrepancies could potentially worsen the healthcare cost burden in the US. Ultimately, there are significant numbers of confounders that still require exploration in this study on DKA hospitalizations. Still, our study adds to others which suggest more resources are utilized on hospitalizations under Medicaid plans in the U.S.

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Looking back on 10 years of the Sanford Heart Hospital

with Bridget O'Brien-Johnson, MSN, executive director

An exciting path led Bridget O'Brien-Johnson to leadership. The wife and mother of three has been with the Sanford Heart Hospital since its beginning. Now, the hospital is celebrating 10 years of bringing compassionate heart and vascular care to the Midwest – with O'Brien-Johnson as executive director.

"My parents were the ones who influenced me to want to work in health care – and at Sanford Health. My father was a surgeon at Sanford Health for 35 years, and my mom was a Sanford Health nurse," said O'Brien-Johnson.

She continued, "I saw my mom raise six girls, and even though her passion was her children, she didn't want to give up being a nurse. Her decision to be both a mom and nurse motivated me to do the same."

After completing nursing school at Creighton University in Omaha, Nebraska, the Sioux Falls native came home to begin her career as a cardiology unit nurse at Sanford Health.

"The whole time I was a nurse I worked in some area of cardiology," she explained. "But I immediately felt a passion for taking care of those who take care of patients. That is when I decided to move into a leadership role, and after seven years of nursing, I became a director."

Right as O'Brien-Johnson became the director of the cardiology unit, Sanford Health was beginning to discuss building a new, state-of-the-art heart hospital in Sioux Falls.

"I was involved in the creation of the Sanford Heart Hospital since the very beginning, from early planning to the announcement and all the way to when we opened the doors 10 years ago," said O'Brien-Johnson.

Attached directly to the Sanford USD Medical Center, the Sanford Heart Hospital ensures patients in and around South Dakota have access to all heart services under one roof. A team of more than 750 experienced heart experts deliver care in cardiology, electrophysiology,

cardiovascular surgery, interventional cardiology, nuclear medicine, thoracic surgery, vascular care, rehabilitation and other specialties.

"The physicians who I have the opportunity to work with are incredibly motivated to learn and provide our community with the latest and greatest," explained O'Brien-Johnson. "It seems like every year or so we're celebrating a new technology, and it's so exciting."

A year and a half ago, Bridget was promoted to executive director of Heart and Vascular, a position that allows her to utilize her strengths and spearhead the care experience for both her team and patients.

"My proudest moments over the last decade are always when my team reaches milestones – when we performed the first cardiac PET stress test, or when the team celebrated reaching 500 TAVR procedures," she said. "I am extremely proud anytime a team member is promoted, accepted to graduate school or achieves a lifelong goal."

Though ten years have passed, this is only the beginning for the Sanford Heart team.



"My vision is to continue bringing innovative care models and talented physicians and staff to our community. Hopefully, we can keep the program growing and advancing into new areas of heart care that we aren't offering our patients yet."

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Brief Provider Opioid Education Is Associated with Decreased Super-Utilization in a Rural Emergency Department

Natalie Walter, MD; and Benjamin Aaker, MD

Abstract

Background: Patients who suffer chronic pain may seek the emergency department for opioids. There is no consensus on what constitutes an ED super-utilizer, so our definition is anyone who presented to the ED more than once for the same painful complaint. We sought to assess the effect of opioid guideline education for providers on super-utilizer visits for pain.

Methods: We performed a retrospective review of visits for chief complaints of pain one year before (phase one) and one year after (phase two) educating ED providers. The educational intervention consisted of a 20-minute explanation of the American Academy of Emergency Medicine's Model ED Pain Treatment Guidelines. McNemar's test was applied to the resultant data.

Results: Phase one identified 218 super-utilizers accounting for 660 ED visits. Phase two identified 190 super-utilizers accounting for 604 ED visits. Both groups were stratified into those using the ED more than once, more than twice, and more than three times. There was a statistically significant difference in patients visiting the ED more than once ($p=0.01$) and more than three times ($p=0.027$), but not for those visiting more than twice ($p=0.18$). There was no statistically significant difference in total patient ED visits in any subgroup.

Conclusion: The total number of super-utilizers significantly decreased after the educational intervention. This educational intervention required minimal monetary and time investment. Further research is needed to determine if the educational intervention resulted in decreased opioid prescriptions and decreased number of people utilizing these drugs for non-medical purposes.

Introduction

Patients afflicted by a wide variety of painful conditions commonly seek the emergency department (ED) for treatment. In fact, 21.4 percent of all ED visits were for a non-traumatic, painful complaint.¹ Some of these patients have a recurrent painful complaint and seek the ED frequently. We term these patients super-utilizers. There is not a consensus on what constitutes an ED super-utilizer, so our definition is anyone who presented to the ED more than once for the same painful complaint. One study found that ED super-utilizers only account for a small number of patients (2.6-6.1 percent), but account for 10.5-26.2 percent of all ED visits.²

Super-utilizers tend to seek the ED for a relatively small number of painful complaints. Of the total first-listed diagnoses, chest pain accounts for 10-16 percent, abdominal pain for 15-34 percent, back pain for 13-29 percent, and

headache for 19-25 percent.¹ While some super-utilizers may ultimately be suffering from a life-threatening condition, most are simply in need of pain control. These repeat ED visits are costly, at \$2,300 to \$5,000 per visit.²

Opioids have commonly been prescribed to treat painful conditions in the ED. Increases in opioid prescriptions have correlated with increased non-medical use of opioids.³ That increase in overall opioid use also increases the number of people affected by the side effects, such as vomiting and constipation, gait instability, and opioid-induced hyperalgesia.⁴ While a clinic may be a more appropriate place to treat chronic pain, chronic pain is not always readily distinguishable from acute pain. ED providers may have a fear of misdiagnosing a life-threatening illness, and over-utilize expensive imaging (CT and MRI) and invasive testing such as lumbar punctures. Increased testing is also utilized to justify not prescribing opiates.

ED providers have a wide variability in prescribing practices. Among 23 ED providers treating low back pain, they utilized opioids 3.7-88.1 percent of the time.⁸ In the ED, where a patient may see a different provider with each visit, treatment variability can cause intermittent reinforcement that leads to confusion and doctor-shopping. A patient may seek the ED for treatment and if the treatment isn't what was desired, return to the ED when another provider is on duty.

Opioid overdose related deaths have also increased dramatically.⁵ There was a 153 percent increase in ED visits involving prescription opioid misuse or abuse between 2004 and 2011.⁶ It was also shown that heroin use was more likely in people misusing prescription opioids. This was coupled with an increase in heroin overdose deaths between 2000 and 2014.⁶ The state of South Dakota saw the highest percentage increase in opioid deaths in the U.S. from December 2018 to December 2019 with a 54.4 percent increase.⁷

Emergency medicine providers have sought to create guidelines for the management of pain and appropriate prescribing practices.⁹ Implementation of patient education in pain management has also been linked to decreases in ED utilization when opioids were not utilized for treatment in the ED.¹⁰ Providing education to both the health care team and the patients would create a more standardized approach to and perspective of pain management. Patient education needs to be addressed in this topic; however, we must first investigate educating the providers.

Variability among providers may be a cause of increased ED utilization. If this variability is decreased, there may be a reduction in visits to the ED by super-utilizers. We hypothesize that if ED providers are trained in an accepted method to evaluate and treat pain, this would result in decreased utilization of the ED by super-utilizers for painful complaints.

Materials and Methods

Super-utilizers from the ED at Sacred Heart Hospital in Yankton, South Dakota, were studied. Sacred Heart Hospital ED is in a rural city and sees approximately 9,000 patients per year. After obtaining approval from the Avera Health System's Institutional Review Board, a de-identified list of patients was obtained from the electronic medical record system. Only pain diagnoses limited to certain body parts were queried. Each diagnosis was entered by the provider at the time of discharge. Many diagnoses affected the same body part, but the names differed, such as

Figure 1. Body areas into which discharge diagnoses were reconciled.

Abdomen
Chest
Dental
Ear
Eye
GU
Head
Limb
Nerve
Other
Spine
Throat

'headache' and 'migraine'. The principal investigator generalized the chief complaint to pain in an individual body part. For instance, 'headache' and 'migraine' were reconciled to 'head pain', and 'lower abdominal pain' was reconciled to 'abdominal pain'. The pain diagnosis was required to be for the same body part; if a patient visited the ED and was diagnosed with arm pain and later for leg pain, this would have been categorized as a single visit for each complaint. A list of complaints is shown in Figure 1. If a painful complaint was generalized, it was placed into the 'Other' category. These body locations and reconciliations were generated by us prior to data analysis.

Phase one consisted of retrospectively reviewing charts of patient visits between July 2013 and June 2014. Once the baseline data were gathered, the principal investigator performed an educational intervention on April 7, 2015 with the ED providers (EPs). The EPs included physician assistants, family practice board certified/board eligible physicians, and emergency medicine board certified/board eligible physicians. The investigator presented the educational materials at an ED section meeting.

The educational intervention consisted of a review of 2013's American Academy of Emergency Medicine's Model ED Pain Treatment Guidelines.⁹ The educator discussed the guidelines' use of opioid pain medications and recommendations for treatment. No visual aids were utilized. The intervention lasted approximately 20 minutes. Some providers attended the meeting telephonically, and a summary of the education was emailed to two EPs who were not present for the meeting.

Figure 2 shows the guidelines.⁶ They are summarized for

Figure 2. AAEM Model ED Pain Treatment Guidelines (summarized).⁹

Narcotics are appropriate to treat acute illness and should not exceed 7 days.

The patient should not receive narcotic prescriptions from multiple doctors.

Patients with chronic non-cancer pain should not receive injections of narcotics in the ED.

EPs should not prescribe long acting narcotics.

EPs should not replace lost or stolen controlled substances

EPs should not fill prescriptions for patients who have run out of pain medications.

Narcotics are discouraged for back pain, routine dental pain, migraine, chronic abdominal or pelvic pain.

Patients with suspected substance abuse should be referred to appropriate resources.

EPs should consider accessing their state's prescription monitoring data base.

Patients with multiple ED visits for pain, problematic or dishonest behavior, or use of multiple hospitals for pain should be reviewed by the ED physician leadership team.

publication, but the full guidelines were used for the educational intervention. The attendees could ask questions and offer comments. The guidelines were presented as informational and the attendees were informed that utilization of the guidelines was not mandatory. No attempt was made to assess for comprehension or intention to use the guidelines. A copy of the guidelines was also given to each attendee physically present at the meeting.

Phase two began one day after implementation of the educational intervention. At this time, a list of patients who visited the ED between April 8, 2015 and April 7, 2016 was obtained. The Avera Health System switched from ICD 9 to ICD 10 utilization on Oct. 1, 2015. Prior to this date, ICD 9 codes were returned, and later, ICD 10 codes were returned. Investigators reconciled codes with their corresponding textual diagnoses.

Medical record numbers (MRN) were returned from our Health Information Management Department for the criteria listed above. These were placed into a Microsoft Excel spreadsheet. Each visit was reported with the chief complaint and MRN. Chief complaints were then categorized. This allowed us to simply count the MRN to find the total visit count and remove duplicate MRN to find the total patient count. The list of patients who visited after the intervention was compared to the list who visited before, and if a match was found, it was counted. In this way, we

were able to generate a count of the total patients who visited both before and after the intervention. These data were placed in a contingency table to allow us to calculate the number of patients and total visits that were documented before but not after the intervention; and, after but not before the intervention.

Since a consensus on what constitutes an ED super-utilizer does not exist, the tables were divided into three groups: those that used the ED more than once, those that used the ED more than twice, and those that used the ED more than three times for the same painful complaint within the year. Note that patients with a greater than two visits were counted in the greater than one visit group as well. Similarly, the greater than three visits were also counted in the greater than one visit and greater than two visits groups.

McNemar's test was run separately on the three groups to compare the data before and after intervention. Probability values equal to or lower than 0.05 were considered statistically significant.

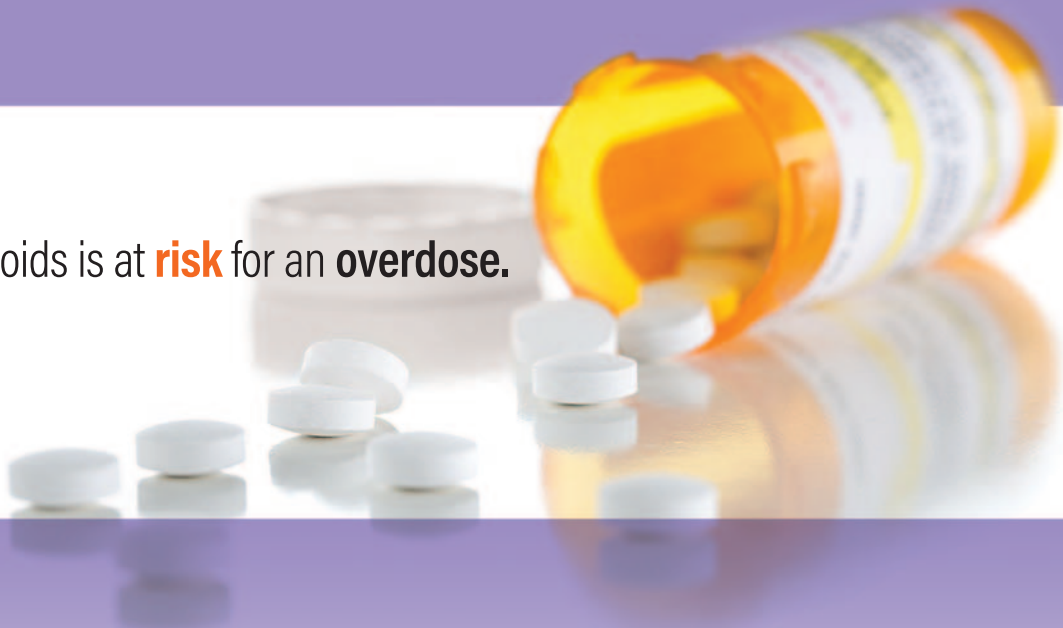
Results

The data from Phase One were divided into three groups, those that used the ED more than once (n=218; visits=660; Table 1), more than twice (n=85; visits=398; Table 2), and more than three times (n=42; visits=269; Table 3) for the same complaint. Mean age was 44.2. Similarly, the data from Phase Two was divided into three groups, those that used the ED more than once (n=191; visits=604; Table 1), more than twice (n=81; visits=385; Table 2), and more than three times (n=30; visits=232; Table 3). Mean age was 44.2. Note that patients with a greater number of visits will be accounted for more than once, hence, a patient with three visits in a year would be counted in Table 1 and Table 2.

We found a significant decrease in number of visits for patients seeking the ED more than once (p=0.01) and more than three times (p=0.03), but not for visits for patients seeking the ED more than twice (p=0.18). Total super-utilizers did not significantly decrease for those seeking the ED for more than once (p=0.14), twice (p=0.71), and three times (p=0.11).

Discussion

After educating providers, we found a statistically significant decrease in visits by super-utilizers with greater than one visit and greater than three visits in the year after the intervention. There was no statistically significant decrease in total super-utilizer visits after the intervention, but there was



Anyone taking opioids is at **risk** for an **overdose**.

Help your patients recognize the symptoms of an opioid **overdose**.

Most opioid overdoses in South Dakota are *accidental*. If your patients have opioids in their homes, *remind them* of what to look for if an overdose is suspected.

What to watch for:

- Small, constricted “pinpoint pupils”
- Falling asleep or loss of consciousness
- Slow, shallow breathing
- Pale, blue, or cold skin or fingernails
- No response when they rub the middle of the chest with knuckles
- Vomiting, choking, or gurgling sounds

What can be done:

Suggest to patients that they keep naloxone on hand.

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Table 1a-c. Pre and post intervention data. Top of table shows the total visits for which these super-utilizers accounted over the same year. Bottom of table shows total number of super-utilizers visiting over a one-year period. Table 1a. Patient count and visit count for more than one visit per year. Table 2b. Patient count and visit count for more than two visits per year. Table 3c. Patient count and visit count for more than three visits per year. Yes = visited the ED; No = did not visit the ED.

Table 1a >1 visit		Number of visits after		
		Visited after	Didn't visit after	Total
Number of visits before	Visited before	184	476	660
	Didn't visit before	420		
	Total	604	p = 0.01	
		Number of super-utilizers after intervention		
		Visited after	Didn't visit after	Total
Number of super-utilizers before	Visited before	41	177	218
	Didn't visit before	150		
	Total	191	p = 0.14	

Table 1b >2 visit		Number of visits after		
		Visited after	Didn't visit after	Total
Number of visits before	Visited before	136	262	398
	Didn't visit before	249		
	Total	385	p = 0.18	
		Number of super-utilizers after intervention		
		Visited after	Didn't visit after	Total
Number of super-utilizers before	Visited before	23	62	85
	Didn't visit before	58		
	Total	81	p = 0.72	

Table 1c >3 visit		Number of visits after		
		Visited after	Didn't visit after	Total
Number of visits before	Visited before	77	192	269
	Didn't visit before	151		
	Total	232	p = 0.03	
		Number of super-utilizers after intervention		
		Visited after	Didn't visit after	Total
Number of super-utilizers before	Visited before	8	34	42
	Didn't visit before	22		
	Total	30	p = 0.11	

a trend showing a decrease. An increase in number of patients may have allowed for a statistically significant difference. A distinction must be made between patients utilizing the ED and total visits by these patients. The total number of unique super-utilizers tells us whether the patient sought care at our ED, whereas the data looking at the number of visits identifies if the intervention has had an impact on the community and ED. A decrease in total super-utilizers means that some of them no longer chose to visit our ED. We do not know if they sought care at some other ED. If the super-utilizer remained a patient but decreased the total visits, we might assume that we had a positive impact on the health of the patient, as the patient did not need to seek the ED as often. However, looking at total visits introduces some error, as multiple patients sought the ED much more frequently than others. As this study was performed at a rural facility and patients had less access to other medical institutions, we argue that the intervention caused decreased visits rather than caused patients to divert to other EDs due to the great travel distance.

From an ED's financial perspective, if we find a decrease in total visits, we can link that directly to a decreased cost of care. On a patient level, however, our study may not have benefited individual super-utilizers. They may have simply sought care from another ED or may have sought the ED for a different painful complaint.

Limitations

Our hospital is a rural site and sees around 9,000 patients per year lowering our sample size. We did not have enough power to make solid conclusions about education of EPs. The opioid prescribing patterns and if the education resulted in a change in these patterns were not assessed in this study. This would be a good area for future study. It is conceivable that some providers made a change, but others did not. Super-utilizers may have then simply sought care from a provider that gave them their preferred treatment. If these patients found a way to determine what EP was on duty, they may have avoided other EPs, thus decreasing total visits yet still utilizing the ED for their care.

The diagnosis was made by the provider who attended to the patient. Providers may have variability in their choice of diagnoses. We attempted to minimize this by reconciling diagnoses into localized body areas. Doing this, we introduce the possibility for error in assigning a diagnosis to a body area. For instance, we chose to utilize a separate category for dentalgia rather than placing dentalgia into the category 'head.' A patient who visited the ED twice in a year, for

'headache' and later for 'dentalgia' would have not been considered a super-utilizer due to this. On the other hand, a patient who visited twice in one year, for pain from an avulsed tooth due to trauma and later for a dental caries, would have been considered a super-utilizer, even though the pathologies were distinct.

The Avera Health System switched from utilizing ICD 9 to ICD 10 codes halfway through Phase Two. While most codes did not change, error may have been introduced. Our choice of painful complaints utilized may have missed some painful complaints.

Certain patients had an abnormally large number of visits. They might have skewed the number of visits results. Patients were counted in more than one table. A subset analysis may have revealed a significant difference among total visits, but we feel that further stratifying (e.g. equal to two visits, equal to three visits) would be clinically meaningless.

Conclusions

Opioid addiction is a large issue in our society today. While it is less in the media recently, opioid deaths continue to increase. Also, the methods and means of chronic pain management in the ED is another issue for debate. One way of combating this is through educating providers. Providers must already complete education requirements for their workplaces and to maintain their licenses. Integrating an education program into the already established educational framework may be relatively easy.

A set of guidelines may be quickly learned and applied to patient care. This would require minimal monetary and time investment. Educating providers on guidelines may

have the result of decreasing treatment variability, although we did not directly test for this. After educating the EPs in our department, the total visits by super-utilizers decreased by 13.3 percent. This amounted to 106 fewer visits and savings of up to \$530,000 – utilizing \$5,000 as an average cost of an ED visit.² This brief intervention was associated with a significant savings to the hospital. Further, we found an absolute decrease in super-utilizers of 28. These individuals no longer needed to seek our ED for their care. Further research is required to discern the reasons for this decrease.

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Left Atrial Appendage Mass in a Patient with COVID-19: Identification and Operative Management

Brian Duxbury, DO; Shannon Gallagher, MD, MPH; Jim Wudel, MD; and Orvar Jonsson, MD

Abstract

Atrial myxoma is the most common primary left atrial tumor. Here we present a case report of a COVID-19 positive patient who was found to have an incidental left atrial appendage mass, concerning for thrombus. Further workup of the mass was suspicious for myxoma, warranting surgical resection.

Introduction

Myxomas are the most common primary tumors occurring in the left atrium. However, it is rare for them to originate from the left atrial appendage (LAA). Thrombus is a more common etiology of LAA mass.¹ However, radiographic similarities on CT imaging and TEE can pose a diagnostic dilemma. When identified all atrial myxomas should be resected due to risk of embolic shower.²

Case Report

A 54-year-old woman with no prior history of cardiovascular disease presented to emergency department for evaluation of sudden onset, left-sided, chest and neck pain that was non-positional and worse with exertion. She was hemodynamically stable and oxygenating well on room air. In the setting of a normal EKG and troponin level, CT angiography of the chest was obtained showing no acute aortic or pulmonary arterial pathology. However, a 2x2 cm round

hypodensity within the left atrial appendage suspicious for thrombus was noted (Figure 1). Transthoracic echocardiography demonstrated mild left ventricular hypertrophy with preserved LV ejection fraction and normal sized left atrium, but the left atrial appendage was not well visualized. Transesophageal echocardiogram (TEE) was planned for further evaluation; however, the patient tested positive for COVID-19 and TEE was deferred. She was subsequently treated with rivaroxaban for presumed left atrial thrombus. She remained afebrile without hypoxia and was later discharged to home.

Approximately one month later, the patient underwent outpatient TEE which revealed a persistent 2x2 cm mobile, pedunculated echodensity arising from the lateral wall of the left atrial appendage (Figure 2). Given the unchanged size of the mass despite anticoagulation, the lack of pre-existing functional or structural cardiac issues, and the specific

Figure 1. CTA of the chest demonstrating a 2 x 2 cm round hypodensity within the left atrial appendage.

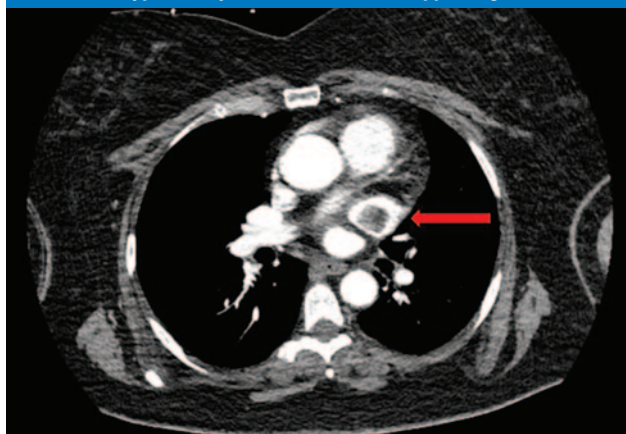
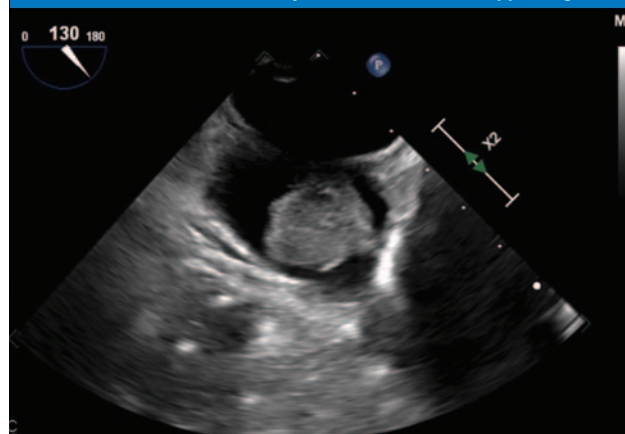


Figure 2. Follow-up transesophageal echocardiogram exhibiting a 2 x 2 cm mobile echodensity within the left atrial appendage.





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TEE finding of a mobile mass attached to the endocardial surface by a stalk, a presumed diagnosis of left atrial appendage myxoma was made and resection was recommended.

Two months following her initial presentation, the patient was taken to the operating room for operative resection of the myxoma. Access to the heart was obtained through median sternotomy and standard cardiopulmonary bypass. The left atrium was opened through Sondergaard's groove and videography of the endocardial left atrium showed a fleshy, gelatinous mass emanating from the orifice of the left atrial appendage (Figure 3). Complete excision was performed including a thin layer of endocardium (Figure 4). To eliminate any potential for future diagnostic dilemma, the LAA was completely excised and closed epicardially in multiple layers with fine suture (Figures 5 and 6). Her postoperative course was uncomplicated. Final pathology confirmed benign myxoma, and she was discharged home on the fourth postoperative day.

Discussion

Thrombus is by far the most common mass in the LAA with cardiac tumors being rare³. Left atrial myxomas are the most common benign cardiac tumors occurring in 0.2 to 0.3% of the population, but only a few cases have been reported in the left atrial appendage.⁴ Differentiation of masses within the left atrial appendage can be optimized using transesophageal echocardiography, while some advocate contrast enhanced transthoracic echocardiography and MRI.⁵ Challenges to the diagnosis occur when the attachment site to the atrium is poorly defined, the mass is small, or the clinical scenario does not favor thrombus.^{6,7} Left atrial appendage thrombus tends to be broad based, layering, and moves synchronously with the adjacent wall during the cardiac cycle.¹ Conversely, left atrial myxomas are typically larger, mobile, pedunculated, and often prolapse.⁵ The site of attachment commonly is at the border of the fossa ovalis.⁶ Utilization of imaging techniques combined with the patient's history optimizes clinical diagnosis and decision making.

Figure 3. Videography within the left atrium. (*) Left atrial appendage myxoma, (arrow) os of the pulmonary veins, (arrowhead) mitral valve.

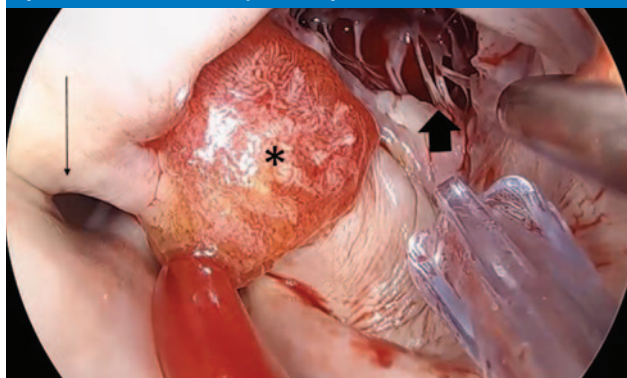


Figure 4. Videography within the left atrium showing a non-obstructed left atrial appendage after complete resection of the myxoma.



Figure 5. Epicardial closure after complete excision of the left atrial appendage.



Figure 6. Videography within the left atrium following complete excision of the left atrial appendage and epicardial closure.



This patient's diagnosis of COVID-19 raised the possibility that this mass was an atrial thrombus secondary to a systemic hypercoagulable state and, therefore, warranted early initiation of anticoagulation.⁸ However, the location of the mass within the left atrial appendage was unusual being there was no history of atrial fibrillation or valvular heart disease to suggest the mass was thrombus, nor any other evidence of systemic thrombus with her COVID-19 diagnosis.

Historically, the clinical presentation of atrial myxomas is described as a triad of mitral valve obstruction, symptoms of embolization, and constitutional symptoms. However, in reality, the clinical manifestations vary significantly based on myxoma size and histopathologic characteristics (i.e. pedunculated vs. sessile and mobile). The diagnosis is not uncommonly made during workup of cardiac symptoms, such as unexplained heart murmurs or exertional dyspnea.⁹ In addition to generalized intracardiac obstruction potential, embolization of fragments from any left atrial myxoma to cerebral and peripheral arteries is not uncommon, and thus resection is warranted once the diagnosis is confirmed.²

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Pfizer-BioNTech's COVID-19 Vaccine for Children 5 to 11 Years of Age

Kathryn Brumels, PharmD; and Wendy Jensen-Bender, PharmD

As of Nov. 11, 2021, over 6.6 million children have tested positive for COVID-19.¹ Children may experience severe illness from COVID-19, including development of respiratory failure, myocarditis, shock, acute renal failure, coagulopathy, and multi-organ system failure.² Recent CDC surveillance ranks COVID-19 as one of the top 10 causes of death in children 5-11 years of age.³ In addition to severe complications, more mild complications such as smell and taste dysfunction can occur, and long-term complications of the virus are not yet known. The delta mutation is more contagious and causes more infections than previous forms of the virus.⁴ As the virus continues to mutate, the best way to slow emergence of new mutations is to slow the spread of the virus, which can be achieved through vaccination. The continued spread of COVID-19 among unvaccinated individuals is a major factor in the recent resurgence of the virus leading to increased morbidity and mortality. In addition to the health concerns associated with contracting the virus, the uncontrolled spread of the virus also leads to additional challenges in children's lives, including social isolation due to disruption of school, sports, and social gatherings. Combating the spread of COVID-19 in all ages remains a top priority in the public health sector.

On Oct. 29, 2021, the U.S. Food and Drug Administration (FDA) granted Emergency Use Authorization for Pfizer-BioNTech's COVID-19 vaccine for children aged 5 to 11 years old. On Nov. 2, 2021, the Centers for Disease Control and Prevention (CDC) Director Rochelle P. Walensky endorsed the CDC Advisory Committee on Immunization Practices' recommendation that children 5 to 11 years old be vaccinated against COVID-19 with the Pfizer pediatric vaccine.⁵ The Pfizer pediatric vaccine contains the same active ingredient as the adult vaccine, but the dose varies based on age at time of vaccination. Adolescents aged 12 years and older receive the same 30 mcg dose of the Pfizer vaccine as adults, while children aged 5 through 11 years old receive a 10 mcg dose. The dose should be repeated three weeks after the initial dose to complete the series. The Pfizer vaccine is the only COVID-19 vaccine approved for patients between the ages

of 5 and 17 years old. Currently, there is no COVID-19 approved vaccine for those 4 years of age and younger.

Clinical trials had promising results demonstrating the efficacy of the vaccine in children aged 5 through 11 years old. In Pfizer's trial, of the 2,268 children enrolled, 1,518 received the 2-dose vaccine series, and 750 received a placebo vaccine.⁶ There were 16 COVID-19 cases in the unvaccinated group, and three cases among the vaccinated group, conferring an efficacy rate of 91 percent against symptomatic COVID-19. The three vaccinated children who developed COVID-19 reported milder symptoms than their unvaccinated counterparts, demonstrating that in addition to decreased transmission rates, vaccinated individuals experience milder symptoms. None of the infected individuals met criteria for severe COVID-19. Common side effects of the vaccine include pain at the injection site, fatigue, and headache. There were no reports of myocarditis or anaphylaxis to the vaccine.

One concern that parents may have with the vaccine is its effect on fertility. Unsubstantiated claims linking COVID-19 vaccination to infertility have been scientifically disproven time and time again. Professional medical organizations, including the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, and the American Society for Reproductive Medicine stress there is no evidence that COVID-19 vaccination causes a loss of fertility for males or females. Another concern parents may have is the data showing a small increase in the development of myocarditis and pericarditis in males between the ages of 16 and 29 years old after COVID-19 vaccination. It's important to note that the majority of cases of myocarditis and pericarditis were mild and resolved on their own. The FDA conducted an analysis specifically evaluating this risk in children aged 5 to 11 years old, and conservatively assumed the risk of myocarditis development was the same as the estimated risk in children aged 12 to 15 years old. The risk versus benefit model is highly dependent on the incidence of COVID-19, which was estimated using six different incidence scenarios. All scenarios predicted zero excess myocarditis deaths in

relation to the vaccine. Ultimately, the overall analysis predicted that the number of clinically significant COVID-19 related outcomes prevented would “clearly outweigh the number of vaccine-associated excess myocarditis cases over a range of assumptions for COVID-19 incidence.”⁶ Additionally, Pfizer is in the process of conducting post-marketing studies and will submit myocarditis incidence reports, periodic safety reports, and adverse event reporting.

The CDC recommends all eligible children aged 5 to 11 years old be vaccinated against COVID-19 with the Pfizer pediatric vaccine.⁵ The vaccine has demonstrated efficacy in reducing the risk of symptomatic COVID-19 and shows a propensity toward more mild symptoms in vaccinated individuals who become infected compared to unvaccinated individuals. As the virus continues to mutate, it is important for as many eligible individuals to be vaccinated as possible. This will help limit the spread of the virus and prevent new variants from emerging.

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Thank you for your membership in the SDSMA. Physician membership for those who have not yet renewed will expire on Dec. 31. If you haven't renewed yet, please do so soon to ensure your benefits are not interrupted.

If you have yet to visit the SDSMA's new website, your old password will no longer work. Click Log In, enter your email address, and select Forgot Password to create a new one, then renew your membership for 2022.

When you renew, you can choose to renew your AMA dues and sponsor a student's SDSMA membership dues for four years of medical school with one, easy transaction.

The SDSMA works hard to create value for your membership. As the association strives to improve health care in South Dakota, your involvement and advocacy strengthens physician voices, and provides a strong avenue for physicians to be advocates for patients.

Have you recently retired? Please let us know by contacting the SDSMA office at membership@sdsma.org or 605-336-1965.

Please note: if you are a life member, your membership is continuous. You do not need to take any steps to renew.

SDSMA Doctor of the Day Program - Volunteers Needed For Remaining Dates

The SDSMA is seeking physician volunteers to serve as a Doctor of the Day during the session. We still have dates left that we need filled and hope you will consider volunteering.

During the legislative session, the SDSMA commits to providing a physician member to serve as Doctor of the Day for the State Legislature in Pierre. This volunteer commitment involves one day of services at the State Capitol by providing basic medical assistance to legislators and staff as needed.

As Doctor of the Day, you will have the unique opportunity to interact with legislators on the House and Senate floors and get a first-hand look at the legislative process and how it affects the practice of medicine. Your presence at the Capitol shows legislators not only your expertise, but also your concern for the health of South Dakotans.

The 2022 session opens Jan. 11 and continues through March 10.

See a listing of available dates at sdsma.org. To reserve your day, contact Mark East at 605.336.1965 or meast@sdsma.org.

Legal Brief Highlight: Complaint Investigations and Hearings

Every state has an agency or board that registers and licenses physicians. The South Dakota Board of Medical and Osteopathic Examiners (SDBMOE), made up of nine members appointed by the governor, grants licenses to physicians as well as various other health care professionals in South Dakota, and has oversight and regulatory power over physicians, including the power to cancel, suspend, revoke or limit a physician's license after a hearing. SDBMOE membership is made up of six MD's, one DO and two lay members. The results of disciplinary proceedings by the SDBMOE are made public and are required to be reported to the National Practitioner Data Bank.

Disciplinary proceedings generally start with the filing of a complaint with the board. Anyone can file a complaint against a physician; however, complaints are typically filed by a patient, a patient's family, a member of a physician's staff or another physician. If the problem appears to be a violation of the law, the SDBMOE will investigate it and, if a violation is confirmed, take legal action against the licensee.

Responding to a complaint – It is always advisable to obtain the advice of counsel before responding to any patient complaint, even one that seems simple or completely unfounded. Practitioners are encouraged to engage counsel with experience dealing with administrative licensing proceedings as soon as possible if a notice is given of a pending proceeding before the SDBMOE. SDBMOE decisions can be appealed to the Circuit Court, where the court may affirm the decision of the SDBMOE, overturn it or send it back to the SDBMOE for further proceedings. From there, it may be appealed to the South Dakota Supreme Court.

More information is available in the SDSMA legal brief *Complaint Investigations and Hearings of the SDBMOE* at sdsma.org. Through the SDSMA Center for Physician Resources, the SDSMA has developed more than 50 legal briefs that are available to members. In addition, the Center develops and delivers programs for members in the areas of practice management, leadership and health and wellness.

Noem Announces State Budget Proposals

Gov. Kristi Noem delivered her 2021 Budget Address to the state legislature on Dec. 7. The address included her recommendations for Fiscal Year 2023. The governor announced that total general fund receipts are up 11.4% over last year's numbers. She advised the legislature that there are \$215.5 million in one-time dollars for fiscal year 2022 and \$157.6 million in ongoing general funds. The state also has American Rescue Plan dollars from the federal government available.

Funding initiatives that Noem requested of the legislature include a 6 percent inflationary increase to healthcare providers, state employees and education. Some additional budget recommendations that have the

potential to impact healthcare include: \$69.6 million toward remodeling the state Public Health Lab, \$15 million for construction of mental health regional facilities statewide, and \$24 million to fund a comprehensive reform proposal from the state Department of Health and Department of Public Safety to improve EMS services.

For legislative updates from the SDSMA during session, watch your email for SDSMA's newsletter, *InSession*. This weekly newsletter keeps members informed about SDSMA's legislative activities and key health-related bills and action alerts, providing a timely look at the actions of the state legislature.

**Don't forget to send in your favorite scenic photo for
South Dakota Medicine front cover consideration.
Send photos to ereiss@sdsma.org.**

AMA Delegate Report

Mary S. Carpenter, MD, SDSMA Delegate to the AMA; Robert L. Allison, MD, SDSMA Delegate to the AMA; Robert Summerer, DO, SDSMA Alternate Delegate to the AMA; Kara Dahl, MD, SDSMA President and Acting SDSMA Alternate Delegate to the AMA.

The AMA held its Special Meeting of the House of Delegates Nov. 12-16, 2021. The virtual session was in lieu of the Interim Meeting which was originally scheduled in Orlando and canceled due to the pandemic. During the meeting, nearly 700 physicians, resident and medical students considered proposals across a wide range of clinical practice, payment, medical education and public health topics.

Some policies adopted and issues addressed include the following:

Physicians are leading “an army against the virus” – A former career officer in the U.S. Air Force and the Air National Guard, AMA President Gerald E. Harmon, MD, recognized the strained looks he saw in the hospital, working with young physicians and residents as COVID-19 ravaged his community hospital in Georgetown County, South Carolina. “The fear and weariness in young clinicians’ faces was not unlike what I witnessed in the medical arena in Iraqi Freedom and Enduring Freedom after 9/11 — I’d call it battle fatigue,” Dr. Harmon said at the meeting’s opening session.

End the spread of public health misinformation – A resolution presented by the AMA Young Physicians Section addressed ongoing concern over the harmful effects of disinformation being disseminated by a small number of health professionals. Such falsehoods have been directly linked to vaccine hesitancy and have also contributed to the disregard for proper prevention practices. The AMA will work with relevant health-professional societies and other stakeholders to combat health disinformation disseminated by health professionals, and to address disinformation that undermines public health initiatives.

Nearly 29 million remain uninsured – Additional steps should be taken to make affordable health insurance available to many more of the estimated 28.9 million who remain uninsured. By closing the coverage gap, fixing the family glitch, and helping workers and their families who are facing unaffordable employer coverage, most of the nation’s uninsured will be eligible for ACA financial assistance, either in the form of premium tax credits or Medicaid/CHIP.

Maternal health care inequalities – Improving maternal health care among those from historically marginalized communities means raising awareness about the health impacts of racial and ethnic inequities, extending public health care programs to cover new mothers for 12 months after the end of pregnancy, and investing in research and outreach. Two key steps are expanding access to affordable health insurance and eliminating racial and ethnic inequities in care and outcomes, says a report that delegates adopted.

Rural medicine – One of in five Americans lives in a rural community, areas that face physician shortages across medical specialties. The AMA adopted policy to, among other things, encourage the Accreditation Council for Graduate Medical Education to consider adding exposure to rural medicine to encourage the development of rural program tracks in training programs and increase physician awareness of the conditions that pose challenges and lack of resources in rural areas.

Home and community-based services – Home and community-based services (HCBS) offer a safer alternative for patients with certain conditions, avoiding the risks that come with inpatient admission and care. That is especially true amid the COVID-19 pandemic. An AMA Council on Medical Service report adopted pushes for state and federal reforms to strengthen financing of long-term services and supports for home and community-based services.

MDs, DOs should decide medical vaccine exemptions – The pandemic makes it timely and urgent that only licensed physicians be allowed to decide who qualifies for vaccine exemptions for medical reasons, says an AMA Medical Student Section resolution adopted. Vaccine hesitancy has played an unfortunate role in extending the COVID-19 public emergency; failing to get vaccinated has resulted in tragic and unnecessary deaths. Trained, licensed physicians are the most qualified to be making the judgment on whether someone actually warrants an exemption. Currently, all medical contraindication exemptions to vaccine mandates differ from state to state. Some states allow any health professional to supply a patient with a medical exemption. That could allow, for example, naturopaths to provide exemptions, the resolution says. The House of Delegates amended existing policy to “limit medical vaccine exemption authority to only licensed physicians.”

Residency application scores – By May 2022, both the United States Medical Licensing Examination (USMLE) Step 1 exam and Comprehensive Osteopathic Medical Licensing Examination of the United States (COMLEX USA) Level 1 will have moved to pass-fail scoring from a numerical format. That creates the potential for upcoming residency selection cycles in which some candidates will have a numerical exam score and others will have only an indication that they passed, says a resolution the AMA Medical Student Section. Residency programs and applicants could benefit from clarity in how those indicators will be reviewed and assessed, the resolution says. To that end, the AMA will work to release guidance for residency and fellowship program directors on equitably comparing students who received three-digit USMLE Step 1 or COMLEX Level 1 scores and students who received pass-fail scores.

Medicare patients’ end-of-life needs – Except under very limited circumstances, Medicare patients in need of custodial care at the end of their lives are prohibited by Medicare from electing skilled nursing facility (SNF) and hospice benefits at the same time for the same condition. Physicians are regularly challenged to find placements for terminally ill patients who need more care than can be provided at home but cannot afford the costs of nursing care or stays at a care facility. Research has suggested that — of the large numbers of patients enrolled in the SNF benefit at the end of their lives — many would have elected hospice if they had not needed room and board coverage,” says an AMA Council on Medical Service report. The report recognizes the need for supportive care services among many end-of-life patients and the importance of discharging these patients to appropriate settings with necessary, affordable supports. The costs and benefits of care models incorporating elements of SNF and hospice care are worthy of further study.

In Memoriam 2021

Honoring physician members of the SDSMA who passed away in 2021.



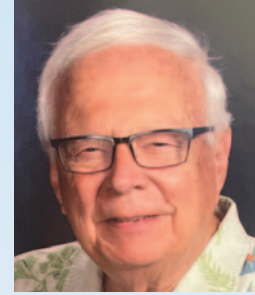
A. Byford Anderson, MD



Courtney W. Anderson, MD



Jerome A. Eckrich, Jr., MD
(Passed away in 2020)



Allan J. Hartzell, MD



Keith "Al" A. Kelts, MD, PhD



James A. Kunz, MD



Robert J. Neumayr, MD



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Jorge E. Sanmartin, MD



Thomas C. White, MD

Welcome to the SDSMA!

NEW MEMBERS WHO JOINED IN 2021

NAME	SPECIALTY	CITY	NAME	SPECIALTY	CITY
Fawzi M. Ameer, MD	Cardiology, Cardiovascular Disease	Rapid City	Brett S. Mathers, DO	Internal Medicine	Huron
Vivek Anand, MD	Child and Adolescent Psychiatry	Sioux Falls	Keegan L. Maxwell, MD	Urology	Watertown
Kathryn M. Anderson, MD	Neonatal	Sioux Falls	Abbie J. Metzler, DO	Family Medicine	Rapid City
Esperanza S. Argenziano, MD	Rheumatology	Rapid City	Rachel L. Michael, MD	Orthopedic Surgery	Rapid City
Thomas A. Barrett, MD	Family Medicine	Whitewood	Christopher E. Milnes, MD	Diagnostic Radiology	Spearfish
Clint L. Benge, MD	Orthopedics, Surgery	Sioux Falls	Prasuna Muppa, MD	Anatomic & Clinical Pathology	Sioux Falls
Jonathan M. Bigwood, MD	Pediatrics	Spearfish	Charles W. Murphy, MD	Radiation Oncology	Sioux Falls
Michael S. Bohlman, MD	Family Medicine	Hot Springs	Natalie A. Mushitz, MD	Pediatrics	Mitchell
Teresa J. Bormann, MD	Family Medicine	Pierre	Robert G. Nicholas, MD	Otolaryngology	Yankton
Sherrie M. Brooks, DO	Cardiology, Cardiovascular Disease	Sioux Falls	Elizabeth L. Nicholas, MD	Family Medicine	Albuquerque
Derek S. Buck, MD	Physical Medicine & Rehabilitation	Rapid City	Conrad C. Nievera, MD	Neurology	Rapid City
Monica T. Bullock, DO	Family Medicine, Hospice & Palliative	Sioux Falls	Vincent Hallum-Thomas Oyler, MD	Family Medicine	Huron
Jennifer R. Callahan, MD	Family Medicine	Box Elder	Alicia M. Palmer Hooten, MD	Pediatrics	Rapid City
Alexandra J. Chase, DO	Family Medicine	Chamberlain	Steven F. Powell, MD	Oncology	Sioux Falls
Katherine M. Croft, MD	Gynecological Oncology	Rapid City	Tyler A. Ptacek, MD	Pain Management	Rapid City
Tao Guo, MD	Anatomic & Clinical Pathology	Sioux Falls	Lisa A. Scheppers, MD	Internal Medicine	Rapid City
Hollan A. Harper, DO	Family Medicine	Rapid City	Ashwani K. Singal, MD	Gastroenterology	Sioux Falls
James B. Hellekson, MD	Psychiatry	Rapid City	Na L. Smith, MD, PhD	Radiation Oncology	Sioux Falls
Luis A. Hernandez Mejia, MD	Cardiology, Cardiovascular Disease	Rapid City	Heather A. Spain, MD	Psychiatry	Rapid City
Kirstin A. Hockhausen, MD	Dermatology	Rapid City	Spencer M. Steffen, MD	Family Medicine	Rapid City
Roland D.E. Holcomb, MD	Diagnostic Radiology	Rapid City	Daniel S. Sutton, MD	Orthopedic Surgery	Aberdeen
Kristen L. Hughes, MD	Internal Medicine	Huron	Joseph Swedzinski, MD	Family Medicine	Pierre
Kimberly L. Hushagen, MD	Pediatrics	Rapid City	Eric M. Thompson, MD	Family Medicine	Bismarck
Luke J. Hushagen, MD	Internal Medicine	Rapid City	Brent R. Thurness, MD	Anesthesiology	Rapid City
Matthew D. Jahraus, DO	Hospitalist	Garretson	Dominick J. Trombetta, MD	Psychiatry	Hot Springs
Cliff R. Janikowski, MD	Pulmonary Disease	Rapid City	John K. Tronnes, MD	Family Medicine	Lead
Zachariah J. Jensen, DO	Neurology, Physical Medicine & Rehabilitation	Sioux Falls	Lalith C. Uragoda, MD	Pulmonary Disease & Critical Care Med	Rapid City
Joshua D. Johnson, MD	Orthopedics, Adult Reconstructive Surgery	Tea	Jeffrey P. Wilson, MD	Cardiology, Cardiovascular Disease	Rapid City
Matthew S. Johnson, MD	Anatomic & Clinical Pathology	Sioux Falls	James H. Wudel, MD	Thoracic Surgery	Walton
Andrew G. Kelts, DO	Gastroenterology	Rapid City			
Kay Y. Kelts, DO	Family Medicine	Rapid City			
Kristin A. Kinsman, MD	Radiology, Interventional-Integrated	Rapid City			
Hao Li, MD	Hand Surgery (Orthopedics)	Sioux Falls			

This list includes new members from December 2020 through December 10, 2021.



PATIENT EDUCATION:

The Palm of Your Hand

Andrew Ellsworth, MD

As a family physician living on the upper Great Plains, I have many patients of Norwegian and German descent. Thus, I am familiar with some diseases that are prone to affect people of northern European ancestry. One such example is Dupuytren's contracture.

Dupuytren's contracture is a gradual thickening of the connective tissue of the palm of the hand. It may begin innocently as a nodule in the palm or joint stiffness, which are common for anyone. However, with Dupuytren's contracture, over time the fingers curl inwards and cannot be straightened. Cords can become visible in the palm of the hand. This is often a slow progression over several years and may or may not become painful. It can make it harder to grasp objects and use the hand in general.

Sometimes called the "Viking Disease," Dupuytren's contracture most often affects men of northern European descent over the age of 50. Other risk factors making a person susceptible to this disease can include smoking, alcohol, manual labor, and being thinner. It would seem being a fan of the Minnesota Vikings may be a risk factor, but that is probably just coincidence.

The condition is named after Guillaume Dupuytren, a French military surgeon who was skilled in anatomy. He described the condition well and was the first to perform a successful operation for it in 1831. Interestingly, Dupuytren gained prominence from treating Napoleon Bonaparte's hemorrhoids.

Although a steroid injection or physical therapy may be helpful, in general, Dupuytren's contracture cannot be cured, only treated. For a long time, surgery was the mainstay treatment, especially for more advanced cases.



Surgery can involve cutting the fascia, the affected layer of connective tissue. A less invasive procedure involves using needles to weaken the thickened cords of fascia.

In the last decade a new treatment became available. Injecting the enzyme collagenase weakens the bonds in the collagen of the fascia, releasing the contractures. Extracted from the bacteria *Clostridium histolyticum*, the collagenase offers an effective nonsurgical option for treatment.

I am not sure what my Norwegian and German ancestors would have thought about injecting an enzyme from a bacterium into their hands. However, patients today appreciate regaining the use of their hands for daily activities and to clap and cheer for their favorite football team.



Andrew Ellsworth, MD, is part of The Prairie Doc® team of physicians and currently practices family medicine in Brookings, South Dakota. Follow The Prairie Doc® at www.prairiedoc.org and on Facebook featuring On Call with the Prairie Doc® a medical Q&A show celebrating its twentieth season of truthful, tested, and timely medical information, broadcast on SDPB and streaming live on Facebook most Thursdays at 7 p.m. central.

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Avery D. Franzen

Your SDSMA PAC membership is very important in order to elect political candidates who understand the practice of organized medicine in South Dakota. To contribute to SDSMA PAC, please visit sdsma.org.

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State Capitol, 500 E Capitol, Pierre, SD 57501

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Listed below are the SDSMA district medical societies and the state legislative districts contained within each medical society for the elected representatives listed in this directory. The next term will reflect redistricting.

SDSMA District	Legislative Districts
1	1, 2, 3, 23
2	2, 4, 5
3	4, 7, 8, 22
4	23, 24, 26B, 27, 28A
5	22, 23
6	8, 19, 20, 26B
7	6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 25
8	16, 17, 18, 19, 21
9	27, 28B, 29, 30, 31, 32, 33, 34, 35
10	21, 26A
11	23, 28A, 28B
12	1, 4



SOUTH DAKOTA
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