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The Good That We Can Do Depends on You

By Tom Hermann, MD

This new year brings with it new leadership as President-elect Donald Trump and the Republican party assume control in the U.S. Senate and House of Representatives. And while the details and/or means by which it will be accomplished have yet to be shared, President-elect Trump and his team have vowed to repeal the Affordable Care Act and the provisions by which Medicaid has been expanded.

At the same time, we in medicine face new rules and reporting requirements passed by Congress when they replaced the SGR with MACRA and its emphasis on health care quality and measurable metrics, evolving EHRs, and new Medicare payment provisions. Some would say much is lost, while others, much is gained. The case for health care reform is undeniable as we continue to see growth in the rise of health care costs and the many who remain without insurance coverage. As advocates for patients and physicians of South Dakota, the SDSMA believes in a health care system that provides the greatest possible access to basic quality health care that is affordable for all South Dakota citizens; cost management by all stakeholders – patients, providers, and payers – to ensure a workable, affordable, and sustainable health care system; and the development of a health care system that can provide effective, efficient, and appropriate health care without administrative barriers and unreasonable overhead costs. Lastly, let’s not forget our belief in the role that we as physicians must play in determining health care policy. As providers of health care, we must fulfill our role in medicine as protector and advocate for the health of our patients. In doing so we thereby also protect what we envision as the profession of medicine. We must continue to speak out for those ideals, and remember, together we are stronger.

Our own American Medical Association (AMA) delegate Mary Carpenter, MD, and alternate delegate Rob Allison, MD, along with many of our SDSMA Executive Committee members can share with you specific examples of how our national AMA advocacy efforts have stood for the principles of our profession and by their efforts have made a difference in our executive and legislative branches of government in Washington. I am proud to say that our Executive team and SDSMA staff have excellent relationships with our congressional delegation.

We have a significant impact at the state level as well. Over the years, our SDSMA Executive, Council and district members have voiced concerns, provided guidance, and demonstrated leadership in promoting the art and science of medicine, and protecting and improving the health of the public. I am confident that just about every physician within our state can think of a patient care or administrative issue in which advocacy efforts of the SDSMA have had a positive impact. While you as a member may not always agree with each and every decision of the Association, I assure you that we listen, try to understand and try to represent our membership as well as our profession.

For fiscal year 2018 Gov. Dennis Daugaard has proposed a 1 percent increase in Medicaid provider reimbursement and a continuation of funding for his Provider Enhancement Program (PEP). The PEP is a three-year initiative that aims to increase Medicaid provider reimbursement to a minimum of 90 percent of provider cost. While we appreciate the governor’s ongoing efforts to increase Medicaid provider reimbursement, the bottom line is that an overwhelming number of physicians in South Dakota lose money when providing care to Medicaid patients and their inability to meet overhead costs has a negative effect on the provider community and their ability to meet the health care needs of the public. We are also concerned about the individuals who remain without health insurance coverage because our legislature has yet to expand Medicaid eligibility. I reassure you, your SDSMA will again be proactive and vigilant in advocating for medicine as the legislature reconvenes this month.

Our service to our profession begins will you, our members. We as an organization are only as strong as your participation in this organization allows us to be. Therefore, I encourage you to continue to be a part of the SDSMA and to renew your membership if you haven’t already done so. Remember, the good that we can do depends on you.
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Imagine having diabetes, hypertension, asthma, or an infection, but financially treatment is out of reach. While Falls Community Health (FCH) provides a safety net to evaluate these folks, financial barriers still prevent some patients from filling needed prescriptions. Even with low- or no-cost medical services, some patient encounters therefore remain unproductive. Ninety-seven percent of FCH’s patients are at 1 to 2 times poverty or below, so it’s easy to understand why this happens. While volunteering at FCH six years, it was humbling to see health care providers purchase medications for these patients.

What if there was a tax-deductible, charitable program where over 99 percent of your donation provides medications to help treat these people in Sioux Falls? A dedicated team from FCH, Sioux Falls Area Community Foundation (SFACF), Lewis Drug, and volunteers established the FCH Medication Assistance Fund to help these patients obtain medications and diabetic supplies. The work-flow diagram illustrates how this program operates. There are two important arms to this program – the patient side and the donor side.

Since most patients presenting to FCH are uninsured, their team screens patients for financial need. During the patient encounter, if other resources are exhausted or unavailable for necessary treatment, the provider may issue a medication voucher. The patient may then redeem the voucher(s) for medication at a designated Lewis Drug.

On the donor side, SFACF, a 501(c)(3) public charity, accepts tax-deductible donations to the FCH Medication Assistance Fund. Available funds from this account are used to reimburse Lewis Drug for redeemed medication vouchers. Lewis Drug provides a pharmacist at FCH to assist providers with the program. Utilizing current staff at FCH, SFACF, Lewis Drug, and volunteers allows this charitable program to operate with virtually no overhead. The Medication Assistance fund helps initiate treatment and promote wellness, and is not intended to provide medications long term for all patients.

Many of these patients can and will work at least part-time when healthy. FCH ran a trial voucher program in the past and found it a very useful tool for patients without other options. Success of this program largely depends on support from the medical community. At times, some of my past patients and likely some of yours, have sought care from FCH. Over the past year, guidelines for issuing vouchers appropriately have been established, stipulating FCH providers issue the vouchers. Electronic prescribing tracks the vouchers to Lewis Drug. HIPAA-compliant accounting is shared with SFACF for reimbursement. Federal guidelines make discounted 340B drugs available to indigent patients. Typically, these medications are used as alternatives when $4 generics are not tolerated, unavailable, or prove ineffective. Even with substantial discounts, 340B “tier” drugs can be out of reach for indigent patients. Medication vouchers can provide the missing link here as well.

Now imagine receiving medications in spite of financial barriers. This program, using a combination of community resources, efficiently helps secure medications for those in need. We can reasonably expect improved care and compliance, reducing emergency care and hospitalizations, in a population unable to afford treatment otherwise.

Contributions should be made to the Sioux Falls Area Community Foundation/Falls Community Health Medication Assistance Fund, 200 N. Cherapa Place, Sioux Falls, SD 57103. Contributions are deductible to the maximum extent allowable for federal income tax purposes.

There’s something universal in the expression of gratitude for both the donor and recipient - and uniquely special when giving the gift of wellness. Help us promote wellness for these patients, their families, and our community. Thank you in advance for making the Medication Assistance Fund a reality. Your donation now will promote wellness and reduce human suffering in Sioux Falls. Should you desire more details about this program, please contact me at gburrish@gmail.com.
Fiduciary is a major buzz word in the financial industry that is now being talked about in consumer circles. So, let's get this word defined and decide if it really matters. An investment fiduciary is simply a person or company that has a duty to act for someone else's benefit, while subordinating one's personal interests to that of the other person. The highest standard of duty implied by law. So, does this really matter? Well, if you work with a fiduciary, the following are the fiduciary's non-negotiables:

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So, now you can decide - Does a fiduciary matter? We think it does, and it's a very simple question to ask any advisor – Are you a Fiduciary?
State of South Dakota’s Child: 2016

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

I extend my warmest greetings to you as the year 2017 begins. This annual report keeps us informed about our state’s youngest citizens and this year focuses our attention on an increase in sudden unexpected infant death in 2015. Assuring “safe sleep” for infants must be a mission for all who care for infants in a health care setting as well as everyone involved in the lives of babies. Infants must sleep prone and alone on a firm horizontal surface devoid of other materials. Let’s make it a mission for all of us to convey this message to protect fragile young lives in all of our communities.

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Abstract

In 2015, there was an increase in the number of births in South Dakota compared to the previous year. Further, the state’s 2014 birth rate (14.4) exceeded the 12.5 rate observed nationally for this year. Similar to national trends, one-quarter of South Dakota newborns represent minority populations. The infant mortality rate of 7.3 for the state in 2015 was 24 percent higher than the 2014 rate. Analyses of factors that contributed to this increase show that twice as many infants died of sudden unexpected infant death (SUID) in 2015 as has been observed in previous years. SUID was the cause of 30 percent of the state’s infant deaths in 2015 versus 19 percent in 2014. Between 2011 and 2015, the SUID rate has been four times higher for minority than white infants. A discussion of strategies for the prevention of these deaths is presented.

Natality

The year 2015 brought a slight increase in the number of newborns becoming citizens of South Dakota. Figure 1 shows the 2015 uptick of 42 births from 2014 with 12,323 live births for this year.1 Also noted in Figure 1 is how the low point in total number of births in the late 1990s is not appearing to be replicated in the subsequent current generation. Overall, there has been a 12 percent increase in the number of live births in the state between 1990 and 2015. Noted in Figure 2 is the increase in the numbers of minority births. Between 1990 and 2015, there was a 1 percent decrease in white births contrasting with the 64 percent increase in total minority births that included a 20 percent increase of American Indian births. Currently, similar to the nation, one-quarter of the state’s newborns are minorities. The state’s rate of birth for 2014 (14.4) has remained above the 12.5 rate for the nation.2

Figure 1. South Dakota Live Births, Total Population, 1965-2015

[Graph showing live births from 1965 to 2015 with notable upticks in 2015 and a peak in 2015 with a decrease in the 1990s and a slight increase from 2014 to 2015.]
Another trend noted in births in the state has been the geographic shift in their residence. In 1990, 64 percent of newborns were residents of the state’s East River counties. Today that is true of 70 percent of the new babies. Further, in 2015, 54 percent of the newborns are residents of the state’s six counties with more than 350 births (Minnehaha, Pennington, Lincoln, Brown, Brookings andCodington). Five of these six counties are located east of the Missouri River. In 1990, live births in these six counties comprised 46 percent of all the state’s newborns. This shift reflects waning populations of children in the central rural and frontier counties of the state.

Vital to understanding perinatal outcomes is the birth weight for a cohort of annual births. Figure 3 reveals trends showing that the state’s cohort of white and minority mid low birth weight (MLBW=1,500 to 2,499 grams) newborns is typically lower than that noted nationally for all newborns. This also has generally been true for the state’s white but not minority very low birth weight (VLBW=less than 1,500 grams) newborns. In 2015, data show a decrease from the previous year in MLBW and essentially stable rates of VLBW. While these are positive findings, a 2015 spike is noted in the sub-group of less than 500 gram newborns with an equal percent of these births among the white and minority populations. This spike is apparent in Figure 4 showing that the 2015 percent of less than 500 gram newborns (n=24) is the highest observed over the past 50 years. Though this group of newborns comprised only 0.2 percent of the 2015 birth cohort, as will be seen in the next section of this article, its near total mortality has an impact on the state’s rate of neonatal and infant mortality.

In recent years, there has been growing attention given to the role that multiple births may play in affecting perinatal outcomes. Figure 5 shows the absolute number of these multiple births in the state and those that are VLBW and MLBW. Currently, approximately 3 percent of all South Dakota births are multiple and data from 2015 do not indicate a shift from recent trends in this observation that may have contributed to the increase in infant mortality.

Prenatal care is frequently identified as a
preventive health service associated with improved postpartum outcomes. Its utilization during the first trimester of pregnancy is promoted by public health campaigns as a cost effective service. The Office of Disease Prevention and Health Promotion’s Healthy People 2020 goal is for 77.9 percent of pregnant women to begin prenatal care in the first trimester. Data in Figure 6 show 2015 utilization rates of prenatal care for South Dakota. Seventy-three percent of the total population of pregnant women accessed prenatal care in the first three months of their pregnancies with notable racial disparities observed. While 77 percent of white women used this service during their first three months of pregnancy, this was true of only 54 percent of minority women. State data presented in this figure also show the association of prenatal care with survival during the first year of life. The infant mortality rate is 10 times higher for infants whose mothers received no prenatal care compared to those who received this service during the first trimester of pregnancy. To be recognized is that prenatal care is one of many variables impacting the outcome of pregnancy. Reasons for not seeking or receiving this care are complex and undoubtedly include financial, logistic, and psychosocial variables impacting personal decision making. Nonetheless, the data reveal the significance of care and personal investment in promoting the health of a pregnancy that in turn is associated with health both during gestation and through the first year of an infant’s life.

**Infant Mortality**

The infant mortality rate represents the number of deaths of live born infants that occur during the first 365 days of life per 1,000 live births. Data presented in Figure 7 show that this rate in South Dakota increased in 2015 to 7.3 from its previous 2014 rate of 5.9. In 2015, 90 infants died compared to 73 the previous year. To further understand rates of infant mortality, essential are examinations of rates of death during the first 27 days of life, the neonatal mortality rate (NMR), and the post neonatal mortality rates (PNMR) for deaths occurring between 28 and 365 days of life. These rates are presented in Figures 8 and 9. Noted in these figures is how the South Dakota NMR for 2015 (4.8) increased for both the white and minority populations and that the PNMR (2.5) decreased for the minority population but slightly increased for the white population.

Noted in Figure 4 was the 2015 increase in South Dakota’s newborns weighing less than 500 grams. Data from this year show that nearly all of these newborns died...
contributing to 39 percent of the neonatal deaths compared to 28 percent for the previous three years.1 Overall, 70 percent of the state’s 2015 neonatal deaths (n= 59) were low birth weight newborns with 58 percent VLBW and 12 percent MLBW. Data in Figure 9 show that in 2015 the trend continues with the state’s minority post neonatal death rate remaining higher that that observed nationally, though it decreased from the previous year. The state’s white post neonatal mortality tends to be comparable to national rates and slightly increased in 2015. Unlike neonatal mortality, in 2015 only 13 percent of the post neonatal deaths (n=31) during this period of time were LBW infants.

Figure 10 presents data on birth weight specific mortality for South Dakota infants with births weights of 500 to 1,499 grams. Between 2012 and 2014, the mortality among the cohort of 500 to 999 gram infants was increased (although the trend decreased during that period).4 It is positive that the 2015 mortality rate for that cohort is the lowest for the last six years. South Dakota’s five-year mean mortality (2011-2015) for the entire VLBW cohort (27 percent), however, is significantly higher than the 2013 national rate of 22 percent (p<.05).1 Further, the state’s mortality rate for MLBW (1.5 percent) is higher than the 2013 national rate of 1.3 percent, but this difference is not significant. Caution must always be exercised in examining data with small numbers. Minor shifts can express themselves as notable changes in calculated rates. Further, data on the gestational age and causes of death would be helpful to interpret birth weight specific infant mortality.

Data on the cause of death for all infants are available and provide helpful insights to perinatal outcome and reasons for year to year variations in South Dakota’s infant mortality. The striking finding apparent in the 2015 state data is the increase in the number of deaths attributed this year to sudden unexpected infant death (SUID).1 The term SUID is used to describe causes of death coded as unknown, accidental suffocation and strangulation in bed, and sudden infant death syndrome.6 Between 2010 and 2014, there was an average of 12 SUID deaths in the state.1 In 2015, there were 27 SUID deaths yielding a rate of 2.2 per 1,000 live births, compared to a 2014 rate of 0.88 noted nationally.1,7 Further, as presented in Figure 11, the 2015 SUID deaths accounted for 30 percent of all infant deaths (24 percent white and 44 percent minority), which is much higher than the 15 percent of all infant deaths caused by SUID observed nationally in 2014.6 Nationally, in 2014, 88 percent of SUIDS occurred in the post neonatal period while this was true of 77 percent (85 percent white, 71 percent minority) of the 2015 SUID deaths in South Dakota.1,5

As is often the case with data from South Dakota, the current spike in the number of SUID deaths may well be a unique event that the small total birth cohort accentuates. Hopefully, what was observed in 2015 will not persist. Further, if the typical number of SUID deaths that has been observed in recent years in South Dakota had occurred in 2015, the state’s infant mortality would have been comparable to that noted in 2014.

Table 1 presents data on all causes of South Dakota infant death for its white and minority populations. These data in Table 1 are calculated using mean rates per 1,000 live births for the years 2011 through 2015. Apparent in these data is the finding that the rate of infant death is significantly higher (p<0.01), for the state’s minority population versus the white population. This is true for all causes of infant death except congenital anomalies. Compared to the U.S., in 2014, the state’s 2011 through 2015 mean rate of infant death is also significantly higher (p<0.01) for congenital anomalies, SUID, and accidental/homicidal causes of death.

**Discussion**

The year 2015 brought an increase in South Dakota’s rate of infant mortality. Among the factors that contributed to this increase appear to be this year’s higher than usual number of newborns with birth weights of less than 500 grams, nearly all of whom died. The reasons for this increase in less than 500 gram births are unknown.
The spike in SUID deaths in 2015 clearly contributed to the increase in this year’s rate of infant mortality. This observation can be addressed with knowledge about their circumstances and strategies that could have potentially prevented them. Data from the Regional Infant and Child Mortality Review Committee (RICMRC) that reviews deaths occurring in the 10 south eastern counties of South Dakota also showed a 2015 increase in SUID deaths from previous years. Reviews of these deaths show that not one of them occurred when the baby was sleeping in a supine position or in a safe sleep environment. In the RICMRC region the past several years, rarely has a SUID occurred in an infant crib. Rather, these deaths have occurred on adult beds, sofas, infant seats, worn and damaged play yards, or spaces cluttered with soft bedding. Further, a number of these deaths occurred when the baby was in the same bed as a sleeping adult, sometimes an impaired parent. The hazards present at the time of these deaths could have been prevented highlighting the need for ongoing effective education on “safe sleep” for infants.

As has been described in the RICMRC’s annual report, a safe sleep environment for an infant appears spartan and “un-cozy” to adult eyes. It includes an infant alone wearing a one-piece sleeper, on a flat horizontal firm surface covered with a tight sheet and no other materials in the environment. The 2016 updated American Academy of Pediatrics (AAP) recommendations on safe sleep also advise room sharing without bed sharing. Specifically, the AAP now recommends that “infants sleep in the parents’ room, close to the parents’ bed, but on a separate surface designed for infants, ideally for the first year of life, but at least for the first six months.”

Though naïve to its role in assuring the prevention of SUIDS, Red Cross manuals from many decades ago describe how “pasteboard boxes” may be made into baby beds that today we know should not include pillows or other soft materials. Indeed, for generations in Finland, cardboard boxes are given to mothers of newborns. The boxes serve as locations for infant sleep in a country that experiences a very low infant mortality rate.

South Dakota’s First Lady Linda Daugaard’s public service announcements have conveyed the message of the importance of safe sleep and provide images of what it should include. Those who provide education to families as they leave the hospital with their newborns and who provide well baby care must remain diligent in sharing the message of safe sleep. To augment this message, more direct approaches that promote safe sleep for babies are also encouraged. When one sees an exhausted parent sleeping on a sofa with a baby, does one respond to prevent this dangerous observation? When one sees a crib with attractive cuddly soft bumper pads, quilts, and toys, does one comment on its lack of safety for a baby? When one sees broken, worn or damaged play yards at a rummage sale, does one request that they not be sold as they pose serious risks for babies? When a family typically provides for the safe sleep for their baby at home, but when visiting others and the possibility of bed sharing or other unsafe sleeping practices arise, is a safer place provided? There is likely agreement that the response to each of these questions should be “yes,” but is the needed response apparent? Such responses require courage, gracious tact, and community commitment that will protect our infants.

For many years, these annual reports describe how it is not
until the sixth decade of life that death is as likely as it is during the first year of life. The well-being of a community can be measured by the survival of its infants. We must recognize that every member of a community plays a role in promoting the safety of its youngest and most vulnerable citizens.

REFERENCES


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Point-Counterpoint: CYP2C19 Genotyping for Clopidogrel

By Eric A. Larson, MD; and Nathan J. Miller, MD

Genes that Predict Drug Response

The U.S. Food and Drug Administration (FDA) now requires that genetic information be included in the product label (i.e., package insert) for nearly 200 prescription medications. Many of these drug-gene relationships are moving into routine clinical practice, driven in part by funding opportunities that have been established in Washington, DC. In some cases, these drug-gene relationships allow clinicians to optimize efficacy and avoid severe adverse drug reactions.

The Clinical Pharmacogenomics Implementation Consortium (CPIC) regularly publishes guidelines for the use of clinically actionable drug-gene relationships. Examples include blood thinners, cancer drugs, and psychotropic agents. Automated decision support, deployed through electronic medical records, can assist clinicians in modifying therapy for patients with gene variants that influence drug response. Biomedical informatics and translational genomics are therefore changing the way we practice.

There are a variety of pros and cons to gene-based drug selection. In order to help our practice community strike up a dialogue about when this type of information is (and is not) clinically useful, South Dakota Medicine has decided to publish a series of point-counterpoint articles reviewing the pros and cons of this approach written by local content experts. We will begin with a point-counterpoint argument about the utility of gene-based selection for antiplatelet agents, in this pair of articles written by Dr. Larson and Dr. Miller.

While the expansion of gene-based drug selection seems inevitable, several key questions remain unanswered. Rigorous longitudinal analyses are needed to define the impact of this approach on medication adherence, quality of care, and cost in an overburdened health care infrastructure. Watch for articles exploring these questions, drug-by-drug, in future issues of this journal.

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REFERENCES


Eric A. Larson, MD – “CYP2C19 Genotyping Reduces Cardiovascular Events”

Automated decision support in electronic medical records (EMRs) may enhance our ability to prescribe medications safely. Best practice advisories (BPAs) may help physicians avoid drug-drug interactions with otherwise lethal consequences (e.g., drug-induced long QT, ventricular arrhythmia). BPAs also hold the potential to help physicians avoid drug-gene interactions. The Food and Drug Administration (FDA) now requires genetic
information in the package inserts for more than 150 prescription drugs, and for many of these drugs, guidelines have been published showing clinicians how to use this genetic information in routine practice.\(^1\)

Genes influencing drug response either influence a drug’s mechanism of action (i.e., pharmacodynamic gene variants), or they influence a drug’s absorption, distribution, metabolism, and elimination (i.e., pharmacokinetic gene variants).\(^2\) Many initial successes in gene-based drug selection were realized within the context of pharmacokinetic genes encoding the cytochromes P450 (CYP enzymes).\(^3\) A classic example of this is CYP2C19, a gene which bioactivates the pro-drug clopidogrel to its more biologically active form. Clopidogrel is an antiplatelet agent, and polymorphisms in CYP2C19 known to decrease the in vivo bioactivation of clopidogrel are associated with therapeutic failure in the form of major adverse cardiovascular events (MACE).\(^4,6\) Clinical trial data initially suggested that patients with an abnormal copy of the CYP2C19 gene had a 3-fold increase in risk for coronary artery stent thrombosis, and a 1.5-fold increase in the frequency of MACE.\(^7\) Data from huge observational cohorts suggest that the risk is even greater.\(^8,9\) The National Human Genome Research Institute recently developed a large multi-institutional consortium called IGNITE (Implementing GeNomics In pracTicE) to quantify the clinical impact of important drug-gene relationships like CYP2C19 and cardiovascular events using aggregate analyses of observational datasets combined at the national level.\(^6,9\) Data emerging from IGNITE clearly indicate that patients with an abnormal copy of the CYP2C19 gene have a greater than 2-fold increase in risk for MACE if they are given clopidogrel after coronary intervention.\(^6,10\)

While this increase in risk can be partly normalized if patients with CYP2C19 gene variants are given a higher dose of clopidogrel,\(^11\) the overall increase in risk for MACE can be completely normalized if they are switched to an alternate antiplatelet agent.\(^10\) Clearly this is an actionable drug-gene relationship. The question becomes when to order it. Because pre-emptive screening has the potential to identify patients that will benefit from the utilization of alternative antiplatelet agents even before they are diagnosed with cardiovascular disease, we now routinely order genotyping ahead of time in patients with multiple vascular risk factors.\(^12\) However, even in cases where genotyping is done reactively (after a coronary artery stent has been placed), the result is typically available within a week. Since the increased risk for MACE in non-responders is present for up to a year\(^6,9,10\) reactive genotyping followed by genotype-guided drug selection still leads to considerable risk reduction. Neurovascular data further indicate that the situation may be similar with clopidogrel and stroke.\(^13\)

For many medical centers participating in the IGNITE network, automated BPA’s now routinely redirect clinicians to alternate anti-platelet agents in patients carrying a deleterious CYP2C19 gene variant.\(^8\) These BPA’s alert providers to the expected decreased efficacy of clopidogrel, and they suggest an alternative therapy which can easily be ordered by the clinician using a single “click” within the BPA.\(^7,8\) Alternate antiplatelet agents of similar efficacy are available, and gene-based drug selection holds the potential to reduce preventable cardiovascular events (e.g., recurrent myocardial infarction).\(^7\)

Nathan J. Miller, MD – “CYP2C19 Genotyping Needs Further Study”

Precision medicine promises to optimize clinical outcomes for a few specific prescription medications. Because CYP2C19 bioactivates clopidogrel, genotyping in patients who need antiplatelet therapy may provide us with a way to improve the care in our patients post percutaneous coronary intervention.\(^4,5\) However, prior to widespread implementation of this approach, we need to consider the overall risks and benefits of gene-based drug selection. What are its costs,\(^14\) both to the individual patient and to society? Since CYP2C19 gene polymorphisms are influenced by ancestry,\(^9\) should patients of all races be screened? Should the clinical community simply engineer around CYP2C19 genotyping by prescribing alternate agents like prasugrel or ticagrelor to all patients needing antiplatelet therapy? These important questions need to be answered before we uniformly incorporate CYP2C19 genotyping into our daily clinical routines. The following issues will guide us, as we determine how to proceed.

Issue #1: Jargon

Clinicians familiar with genetics often use the following terms: single nucleotide polymorphisms (SNPs); cytochrome P450 enzyme subtypes (CYPs); gene-gene interaction (epistasis); and overlapping gene-drug interaction (pleiotropy). However, many clinicians are not yet conversant with these terms. For them, the process
of learning the jargon and probabilistic nature of genetics will take time and effort. All of this occurs during a time when the demand to remain current in medical knowledge is greater than ever. There certainly is much promise with genetic testing, however we need to consider what will be pushed aside as this is incorporated. Moving too rapidly may lead to a continued decrease in time devoted to physician-patient interaction, adding further pressure to the workday of busy clinicians. Therefore, as discussed by Dr. Larson, the Clinical Pharmacogenetics Implementation Consortium currently only provides guidelines on what to do with genetic information when it exists, rather than advocating for (or against) genotyping for any given drug-gene relationship.

Issue #2: Alert fatigue
With the implementation of EMRs, clinicians encounter multiple alerts on a daily basis. At present, nearly 3,000 alerts are generated for every single adverse drug event prevented. Incorporating CYP2C19 genotyping for clopidogrel into a clinician’s daily workflow therefore increases the chance it will be lost in a sea of alerts. BPAs can certainly help mitigate this risk, and are currently being incorporated into clinical practice. Perhaps the workflow activating these automated decision support prompts needs to be further refined (optimizing efficiency) based upon patient demographics. As noted, CYP2C19 polymorphisms do not occur in a uniform manner in patients of all races; e.g., the prevalence of the nonfunctional CYP2C19*2 allele varies from one in five patients of European ancestry to one in three patients of Asian ancestry. Given this knowledge, will all groups need to be screened in a similar manner? Further, will these BPAs apply to only new users of clopidogrel, or will they alert providers to patients who have successfully been treated with clopidogrel for years?

Issue #3: Cost implications
The costs of health care accounted for 17.5 percent of our nation’s gross domestic product in 2014. The cost effectiveness and the impact of gene-based drug selection on patient adherence therefore need to be more deeply understood before we are ready to proceed. Because CYP2C19 genotyping costs currently range from $200 (SNP genotyping) to $800 (sequencing), uniform implementation of routine testing for CYP2C19 polymorphisms will increase health care expenditures. In patients with an abnormal genotype, switching from an affordable generic medication to a more expensive trade name alternative will further drive cost up. Although event reduction may recover some of the cost (i.e., by avoiding recurrent cardiac events and lowering hospital readmission rates), it is unknown whether this recovery will offset the cost of genotyping for entire populations. The field would benefit from rigorous unbiased economic analyses, but those analyses must not be funded by industry sponsors developing genotyping tests or the alternate trade name medications.

In general, while CYP2C19 genotyping is promising, it may not be ready for prime time. It is our hope that this point-counterpoint discussion leads to a spirited dialogue among all stakeholders (patients, providers, and third party payers) as our community defines when gene-based prescribing is beneficial.

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REFERENCES

Please note: Due to limited space, we are unable to list all references. You may contact South Dakota Medicine at 605.336.1965 for a complete listing.
Early Hearing Loss Detection and Intervention in South Dakota

By Katherine Awoyinka, BA; Jessica J. Messersmith, PhD, CCC-A, FAAA; and Laura Davis-Keppen, MD

Introduction
Hearing loss is the most common congenital condition in the U.S., affecting two to three of every 1,000 children at birth and another 4,000 to 6,000 by school age. Hearing loss may result in delayed development in language, speech, and learning. Early hearing detection and intervention programs (EHDI) have been developed to maximize language and learning for children who are deaf or hard of hearing. It is important that physicians caring for children be familiar with and follow best practice guidelines for identification and timely intervention for hearing loss.

Universal newborn hearing screenings, as other newborn screenings, are designed to detect those who have potential indicators for the disorder (hearing loss), and are in need of further evaluation to determine the presence or absence of the disorder. Newborn hearing screenings are only the first step in the process of identifying and providing intervention for infants with hearing loss. EHDI programs utilize a more comprehensive approach through their 1-3-6 guidelines: initial and rescreening no later than one month of age, diagnosis of hearing loss no later than 3 months of age, and entry into early intervention services no later than 6 months of age. The following will describe the effects of hearing loss, the importance of early identification and intervention, the recommended timeline for the identification of, and intervention for, children with hearing loss, and the role physicians play in ensuring the goals of these recommendations are met and documented.

Effects of Hearing Loss
Auditory input at an early age is needed for speech and language development as well as social and cognitive development. Early identification is crucial for the development of spoken language, reading, and auditory learning, because hearing is required for neural connections to grow throughout the brain. Also, if the auditory nerve, or “hearing nerve,” is not stimulated for a period of time, the brain starts to reorganize and other senses begin to take over the area typically designated to hearing.

Additionally, children with untreated hearing loss are at risk for isolation and withdrawal from social situations due to the negative effects untreated hearing loss can have on social, cognitive, and psychosocial abilities. Health care providers can help to change the course of these individual’s lives by referring for an audiological evaluation when an infant does not pass their newborn hearing screening.

Impact on Speech and Language
If a child’s hearing loss is identified by 6 months of age they are more likely to have better developmental outcomes than children identified later. This means better expressive and receptive language and higher vocabulary and verbal reasoning than children who begin intervention later. A child’s ability to accurately extract information from an auditory signal is directly related to language and reading development. If the auditory signal an infant is receiving is affected due to hearing loss, he or she can have difficulty discriminating between different sounds, such as vowels. Infants with higher levels of vowel discrimination at 6 months have larger vocabularies at 18 and 24 months. This early vocabulary is a predictor of overall school-age language ability.

Cross-Modal Reorganization
Speech and language development, as well as social development, require early auditory input. Without auditory input, specific neural connections in the brain do not form. These neural connections are critical for the learning of verbal language, reading, and auditory skills. If the child faces a complete absence of sound, cross-modal reorganization can occur. This reorganization translates to other senses taking over the areas of the brain that were originally dedicated to the auditory system. When cross-modal reorganization occurs, auditory neural capacity is reduced.
Importance of Early Identification and Intervention

As previously described, early auditory input is important for language and auditory skill development and without early input, cross-modal reorganization can occur. This is why it is important to provide a child with hearing loss with auditory input, through an amplification device and/or cochlear implant (CI), as soon as possible, if the child’s family desires to use spoken communication with their child. If auditory input can be provided before reorganization begins, or at least at the initial stages of the process, the child has a better chance of maintaining their auditory neural capacity, which will lead to better speech and language. To provide a child with the means to obtain auditory input at a young age, the hearing loss must be identified as early as possible. Because plasticity is greater at an early age, children who receive treatment for their hearing loss at a younger age, such as a cochlear implant, are more likely to have better speech and language development than those who receive treatment at an older age. For example, when a child is appropriately fit with a cochlear implant at a young age, they can actually develop an auditory system similar to their normally hearing peers.12

Early diagnosis can lead to early intervention, which greatly benefits the child’s development. The benefits of early intervention, which can only be possible with early identification and diagnosis, support the importance of health care professionals being aware of the recommended steps to take with a child who may have a hearing loss. Even children with less severe hearing loss will face difficulties. It has been shown that these children have more difficulty on educational testing as compared to normal hearing peers13 and generally reach one to four grade levels below their normally hearing peers.13,14 In children with untreated unilateral hearing loss, it has been found that approximately 35 percent had repeated at least one grade and that these children were often identified by their teachers as being distracted or as displaying disruptive behaviors.15 Even children with mild and/or unilateral losses can be fit with amplification and benefit from early intervention.

Recommended Guidelines

The Joint Committee on Infant Hearing (JCIH) and the American Academy of Pediatrics (AAP) recommend that children have their hearing screened using a physiologic measure no later than 1 month of age, receive a diagnosis of hearing loss no later than 3 months of age, are fit with amplification (if desired by the family) within one month of diagnosis, and be enrolled in early intervention no later than 6 months of age (see Figure 1).16,17 It is important to keep in mind that the ages set forth by the JCIH guidelines are not intended to indicate the minimum age the child must be for each step of the process to occur. Rather these ages represent the maximum acceptable age for the completion of each step. It is ideal for each step in the EHDI process to occur as

![Figure 1. Recommended EHDI Guidelines](image-url)
quickly as possible. The earlier the hearing loss can be diagnosed, the sooner interventions can be put in place. Even newborn infants can be fit with hearing aids. Additionally, it should be noted that the screening measure should only be completed twice. Repeating the screen more than that increases the likelihood of obtaining a pass outcome by chance along, in turn increasing the likelihood of a false negative or a child with hearing loss passing the screening.\(^1\) Repeating the screen more than that increases the likelihood of false negatives (i.e., missing a child with hearing loss). If the equipment indicates a refer, this does not mean that the equipment is malfunctioning. It means that the baby should be referred on to the next step in the EHDI protocol. EHDI state programs are meant to help children meet the steps of this recommended timeline, in turn helping to improve the quality of life for these children.

**Implementing Recommended Guidelines for Identification and Intervention**

For those babies who receive a refer on the rescreening, diagnostic audiologic testing should be completed no later than 3 months of age.\(^{16,17}\) Children under 3 years of age undergoing diagnostic audiologic evaluation should have at least one diagnostic auditory brainstem response (ABR) testing as part of the diagnostic audiology assessment to be used in conjunction with other assessment measures (behavioral testing). Even if an infant is only referred because of one ear not passing the screening, the rescreen and/or audiologic evaluation should be conducted for both ears.

If an infant is found to have normal hearing through the diagnostic audiologic evaluation, they should continue to be monitored and receive follow-up audiology evaluations within 30 months if risk factor(s) are present. A list of risk indicators for late-onset hearing loss can be found at www.infanthearing.org/ehdi-ebook/index.html in chapter 10\(^{19}\) and are demonstrated in Table 1. Infants with any degree of permanent hearing loss, whether parents pursue amplification or sign, should be referred for early intervention services immediately. Early intervention services should be family-child services that target communication skills.

Children referred to an audiologist for further testing should be referred specifically to a pediatric audiologist. It is imperative that a child goes to a pediatric audiologist as these audiologists hold specialized knowledge and training in testing the hearing of children, which requires procedures that differ from those used when testing adults. The responsibility of the pediatric audiologist is to diagnose hearing loss and monitor the loss over time, monitor children with risk factors of hearing loss, evaluate a child’s speech perception and auditory behaviors, and identifying additional auditory anomalies. Pediatric audiologists are also responsible for letting families know all of the intervention options available to them, which include hearing aids, cochlear implants, and sign language. These treatment options are most successful when implemented at a young age.\(^{2-4,6}\) The selection, fitting, and verification of amplification devices, cochlear implants, and other assistive technology also fall under the pediatric audiologist’s role when a family chooses this path of intervention. The audiologist should ensure these devices are providing appropriate benefit to the child over time.

Early intervention services should be offered to all families of infants with hearing loss, early intervention is most commonly provided by birth-to-3 programs. For children in South Dakota, the South Dakota School for the Deaf (SDSD) should also be involved. The SDSD is a state-supported school that provides services to meet the educational needs of children who are deaf or hard-of-hearing who reside in South Dakota. A range of communication options should be offered in an unbiased fashion. Additionally, parents should be offered opportunities to interact with other parents of children with hearing loss and opportunities to interact with individuals who are deaf or hard of hearing.\(^{17}\)

### Table 1. Risk Indicators for Delayed Onset or Progressive Hearing Loss in Childhood

<table>
<thead>
<tr>
<th>Risk Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Caregiver concerns about hearing, speech, language, or developmental delay</td>
<td></td>
</tr>
<tr>
<td>2. Family history of permanent childhood hearing loss</td>
<td></td>
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<tr>
<td>3. NICU stay of more than five days or any of the following regardless of stay: ECMO, assisted ventilation, exposure to ototoxic medication such as gentamycin, loop diuretics, or hyperbilirubinemia requiring an exchange transfusion</td>
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<tr>
<td>4. In utero infections such as CMV</td>
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<tr>
<td>5. Craniofacial anomalies, especially those involving the ear</td>
<td></td>
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<tr>
<td>6. Physical findings that are associated with a syndrome known to include hearing loss</td>
<td></td>
</tr>
<tr>
<td>7. Syndromes associated with hearing loss</td>
<td></td>
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<tr>
<td>8. Neurodegenerative disorders</td>
<td></td>
</tr>
<tr>
<td>9. Culture-positive postnatal infections associated with hearing loss including meningitis</td>
<td></td>
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<tr>
<td>10. Chemotherapy</td>
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</tr>
</tbody>
</table>
Support of Newborn Hearing Screenings

Hearing screenings are appropriate for inclusion in the newborn screening process because, like conditions that are screened for via blood-spot tests, the signs and symptoms of hearing loss are invisible at birth. South Dakota is only one of six states that do not have legislation for an EHDI program. This means that South Dakota providers need to assume responsibility to ensure that audiological assessment is conducted on infants who do not pass screening and initiate referral for medical specialty evaluations necessary to determine the etiology of the hearing loss.

Currently, there are many children who are lost to follow-up or lost to documentation and/or do not enter early intervention by the recommended age. It is estimated that in the U.S., approximately 50 percent of infants who do not pass their newborn hearing screening are lost to follow-up or lost to documentation. Further, of those who do pass through the 1-3-6 stages of the EHDI program, only 36 percent of these children passed through within the recommended timeline. As of 2012, about 98 percent of infants born in South Dakota were screened for hearing loss. The majority of which were screened before 1 month of age (1.8 percent were screened later than 1 month of age). Although the majority of infants born in South Dakota are being screened at birth, goals associated with the rest of the recommended timeline are not being met. Of the infants that did not pass their screening, only 10.7 percent of these children are documented to have received diagnostic audiologic testing prior to 3 months of age. About 3 percent of these children received diagnostic testing later than 3 months of age and the remainder of the children, approximately 86 percent, were lost to follow-up and/or lost to documentation, which means the status of their hearing following their newborn screening is unknown.

This overwhelming majority of children who are lost to follow-up and/or documentation after not passing their newborn hearing screening, lands South Dakota the title of “the highest percentage of infants with ‘loss to follow-up/loss to documentation’ in the country.” Of the small number of children who received documented audiological diagnostic testing, it was confirmed that 73 percent of these children did have hearing loss, which leads one to wonder how many of the children who were lost to follow-up/documentation also have hearing loss. In addition to the less than ideal diagnostic data, data regarding early intervention for children with hearing loss in South Dakota is not available, so it is unknown whether or not the goal of early intervention by 6 months of age is being reached.

Looking at the numbers just described, it is clear that all EHDI stakeholders can do better to ensure the children of South Dakota are making it through the recommended process and are doing so in a timely manner. Physicians play a major role in improving these statistics, particularly because they are the medical provider most likely to have immediate, consistent, and long-term interactions with the baby and family. Physicians can help to reduce the number of children who are lost to follow-up and/or lost to documentation and remove South Dakota from the title of “highest percentage of infants with ‘loss to follow-up/loss to documentation’ in the country.”

The Physician’s Role and the Medical Home

In regards to the EHDI process, the role of the physician typically begins after a child has a newborn hearing screening at the hospital. If the child receives a “no pass” from the initial screening, the physician has the responsibility of discussing what the results mean with the family and setting up a rescreen for the child before they are 1 month of age. It is important that physicians adopt the more recently accepted terms “no pass” or “refer” rather than “fail,” as “fail” has a negative connotation for many caregivers. It is also important to reassure the family that a “refer” does not confirm a hearing loss, while at the same time stressing the importance of following up on this result in a timely manner. A no pass can be obtained in cases of equipment error, cerumen impaction, middle ear effusion, patient noncompliance, and a true hearing loss.

If a child does pass the initial screen in the hospital, the physician or primary care provider should still be involved with the child’s hearing health and status. Following a “pass,” the physician should explain results to the family, and that they should monitor their child’s responses to sound and speech and language development. Further, the physician should encourage the family to voice any concerns they may have about their child’s hearing and/or speech and language development.

If a child’s hearing is rescreened and again does not pass, the primary care provider is responsible for connecting the infant and their family with a pediatric audiologist for diagnostic follow-up. It is important that the physician makes sure the family gets the child to the diagnostic assessment promptly. Early Hearing Detection and Intervention- Pediatric Audiology Links to Service
After a child has a diagnostic evaluation completed by a pediatric audiologist and is found to have a hearing loss, the physician is involved in discussing results again with the family. The physician should refer the infant for intervention services if this was not done by the audiologist. In addition, the medical home should refer the infant to an otolaryngologist, geneticist, and ophthalmologist. The otolaryngologist medically and surgically manages hearing disorders. The otolaryngologist may be able to identify a correctable cause of the underlying hearing loss. If there is evidence of a persistent/permanent hearing loss then a genetic evaluation is recommended. A genetic evaluation is recommended because there are numerous genetic syndromes and over 125 genes associated with hearing loss. An ophthalmology exam is recommended to document visual acuity and to rule out a vision disorder.

Additional resources for physicians and the medical home can be found on the AAP webpage, specifically addressing EHDI programs, and the National Center for Hearing Assessment and Management’s (NCHAM’s) webpage regarding the medical home. A summary of the physician’s role in the EHDI process is provided in Table 2.

Table 2. Summary of Physician’s Role when Working with Families in the EHDI System

- Help child and family navigate EHDI process
- Coordinate child’s comprehensive health care
- Ensure assessments and intervention occur at appropriate times
- Following initial screening:
  - No pass result: discuss results with family and set up rescreen before 1 month of age
  - Pass result: explain results and indicate pass does not guarantee child will always have normal hearing; monitor overall health and development, including auditory skills
- If risk factors: ensure child receives dx audiology assessment no later than 2 years of age
- Following rescreen:
  - No pass result: connect family with pediatric audiologist for dx follow-up
- Following dx evaluation:
  - Confirmed hearing loss: discuss results with family, re-examine child, refer to otolaryngologist/otologist, medical geneticist, ophthalmologist, and early intervention (birth-to-3)

Conclusion

Current guidelines recommend children are screened as soon as possible after birth and, when necessary, rescreened no later than 1 month of age, diagnosis of hearing loss should occur no later than 3 months of age, and early intervention should begin no later than 6 months of age. Early diagnosis of hearing loss and early intervention are critical for a child’s development. It is important to provide families with appropriate resources and referrals to ensure their children do not become lost to follow-up.

A strong EHDI program is important, because it serves to identify children with hearing loss at an early age and ensure these children begin early intervention at an early age as well. This is important for multiple aspects of a child’s life and can greatly impact their academic performance and social and professional success. It is important that children with hearing loss are provided the opportunity to reach the same educational, and personal goals as their peers with normal hearing and have the same quality of life as every other child, which can be made possible with the help of a strong EHDI program and support from the medical home model by physicians, audiologists, and other health professionals. It is important that medical professionals and state leaders work to support these children and that they are not allowed to slip through the cracks, but instead are provided with the opportunity to live up to their full potential by taking advantage of all of the great resources available at this time.

REFERENCES


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As medical professionals, you already know that tobacco use can be a tough habit to kick. And, it can be even harder for your postpartum patients.

About half of the women who quit smoking during pregnancy relapse in the first 6 months after delivery. That’s a big number and that’s why the South Dakota QuitLine is offering additional services to pregnant women enrolled in the QuitLine phone coaching program.

When your pregnant patients enroll in the QuitLine phone coaching program they will receive:

- **Individualized counseling** intended to help them quit and stay quit during this exciting and often stressful time
- **4 additional relapse prevention calls** which are an extension of the standard QuitLine phone coaching program services
- **Special incentives** – pregnant women who enroll in the program may be eligible for gift card incentives

Encourage your pregnant patients to enroll in the QuitLine phone coaching program by calling 1.866.SD-QUITS or better yet, fill out the Referral Form (SDQuitLine.com/providers) and fax it to us.

Together we can help pregnant & postpartum women quit & stay quit.
A Rare Case of Pulmonary Lymphomatoid Granulomatosis

By Ukamaka Nwakife Nwadibia, MD; Kalyan Chakravarthy Potu, MD; Eric A. Larson, MD, FACP; and Galal Ahmed, MD

Abstract

In this report, we discuss an unusual case of pulmonary lymphomatoid granulomatosis (LYG), a rare form of angiocentric and angiodestructive lymphoproliferative disorder. This disease is thought to be caused by Epstein-Barr virus-induced lymphoproliferation.

A 39-year-old male with no significant past medical history presented with flu-like symptoms. Upon further evaluation, laboratory studies noted pancytopenia, and a chest X-ray showed bilateral nodular densities. A computerized tomography (CT) scan demonstrated bilateral pulmonary nodules and splenomegaly. A biopsy of the pulmonary nodules revealed polymorphous, CD3-positive, lymphohistiocytic, inflammatory infiltrate within the walls of the arterioles and venules with associated necrosis. This histopathology is consistent with LYG. The patient was started on a regimen of rituximab, and he significantly improved within a few weeks after the initiation of therapy, including resolution of the pancytopenia. A repeat CT scan showed the decreased size of the lung nodules.

This case was histopathologically consistent with LYG but negative for Epstein-Barr virus ribonucleic acid. This demonstrates the potential for diagnostic difficulty in a case presentation of multiple pulmonary nodules. Extensive work-up for neoplastic, infectious, inflammatory, and autoimmune etiologies needs to be done in such cases. A prompt diagnosis of LYG is necessary for optimal management and improved patient outcomes.

Introduction

Lymphomatoid granulomatosis (LYG) is a rare form of angiocentric and angiodestructive lymphoproliferative disorder.1-3 LYG predominantly affects the lungs but can also involve the skin, kidneys, central and peripheral nervous systems, and, less commonly, the upper respiratory tract and liver.4-6 Epstein-Barr virus-induced lymphocytic proliferation is hypothesized to be the cause of this disease. Histopathology usually displays Epstein-Barr virus ribonucleic acid (EBER) positivity, which can aid in the diagnosis.7-9 LYG can develop at any age but more often occurs after the fifth decade of life. Males are affected about twice as often as females.10-11 In this report, we discuss a case histopathologically consistent with LYG but negative for EBER.

Case Presentation

A 39-year-old man with no significant past medical history presented with complaints of fatigue, chest pain, poor appetite, fever, and malaise. He had been treated empirically for a presumed viral infection. Because of his persistent symptoms, though, further evaluation included laboratory studies, which revealed pancytopenia. A chest X-ray showed bilateral nodular densities. A computerized tomography (CT) scan demonstrated bilateral pulmonary nodules and splenomegaly. A CT-guided needle lung biopsy was inconclusive, and, ultimately, an open lung biopsy was performed. This showed a lymphohistiocytic, inflammatory infiltrate with small and polymorphous, CD3-positive lymphocytes. A lymphocytic infiltrate was seen within the walls of the arterioles and venules with associated necrosis. This histopathology is consistent with LYG. In situ hybridization for EBER was negative, although the Epstein-Barr virus serology was positive. A bone marrow biopsy was then performed, resulting in no evidence of malignancy. Flow cytometric immunopheno-
typing on both the bone marrow and the splenic specimens was unremarkable. Diagnostic studies for Histoplasma capsulatum, Blastomyces dermatitidis, Coccidioides immitis, tuberculosis, human immunodeficiency virus, sarcoidosis, and autoimmune disease were negative. Based on these findings, a final diagnosis of LYG was made, and the patient was started on rituximab. He significantly improved within a few weeks after the initiation of therapy, and there was resolution of the pancytopenia. The patient completed eight cycles of rituximab. Repeat CT scanning showed the decreased size of the lung nodules, and positron emission tomography (PET) scanning showed a substantial response to the treatment. The patient was discharged home without incident and instructed to go for serial PET outpatient scans every six months for disease-monitoring.

Discussion

Lymphomatoid granulomatosis was first described in 1972 by Liebow et al. as a rare, Epstein-Barr virus-associated lymphoproliferative disorder. It commonly affects the lungs, skin, central nervous system, and, less commonly, the upper respiratory system and liver. It rarely affects the spleen and lymph nodes. Clinical manifestations range from indolent, asymptomatic courses to constitutional symptoms such as fatigue, weight loss, sweating, and fever/chills. Other reported symptoms include cough, chest pain, shortness of breath, confusion, ataxia, cranial nerve palsies, peripheral polyneuropathy, and other neurological symptoms in cases of central nervous system or cutaneous involvement. Histology is essential in diagnosis, and it typically shows characteristic inflammatory, angiocentric infiltrate with small, reactive, CD3-positive T lymphocytes and histiocytes in the background of a varying number of large, atypical, CD20-positive B lymphocytes. In situ hybridization often reveals EBER within these atypical B cells. Differential diagnoses include other forms of angiocentric granulomatosis such as large B-cell lymphomas, T/NK lymphomas, post-immunodepression lymphoproliferative disorders, granulomatosis with polyangiitis (Churg-Strauss syndrome), primary lung malignancy, sarcoidosis, tuberculosis, and fungal infections. The disease is classified into three grades (I-III) based on the proportion of large, atypical, Epstein-Barr virus-positive B lymphocytes and necrosis in relation to the reactive background of T lymphocytes for treatment and prognostic value. There is no standardized treatment regimen, but varying usages of steroids, interferon-alpha, cyclophosphamide,
Adriamycin, Oncovin, and Prednisone (CHOP); and rituximab have been documented with varying responses. Prognosis is variable, ranging from extremely good in cases of spontaneous resolution to rapidly fatal. The medical survival time ranges from 14 months to four years, and the five-year mortality average is 60 to 90 percent.

**Conclusion**

LYG is a rare form of angiocentric and angiodestructive lymphoproliferative disorder. Histopathology usually displays EBER positivity, which can aid in the diagnosis. In this paper, we have reported a case histopathologically consistent with LYG but negative for EBER. This case demonstrates the potential for diagnostic difficulty with a patient presenting with multiple pulmonary nodules. Extensive work-up for neoplastic, infectious, inflammatory, and autoimmune etiologies needs to be done in such cases. Prompt diagnosis of LYG is essential for early initiation of treatment and improved patient outcomes.

**REFERENCES**


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Childhood Vision Screening in Western South Dakota: Examining Barriers to Post-Vision Screening Follow-up Referral

By Taylor J. Slingsby, MS IV; Paul Mallory, MS IV; and Terry Spencer, MD

Abstract

Background: Poor follow-up after post-screening referral is a challenge faced by vision screening organizations. This study examines barriers to follow-up eye care in children who were referred for a comprehensive eye exam following a vision screening event in western South Dakota.

Methods: Children referred for a comprehensive eye exam following a screening event by Northern Plains Eye Foundation Western South Dakota Lions Children’s Vision Screening Initiative (CVSI) from September 2014 to February 2015 were identified for a telephone survey. Parents/guardians of these children were contacted and asked a series of questions aimed at assessing the barriers to obtaining eye care.

Results: Of the 282 children identified, parents/guardians of 63 were successfully surveyed (22.3 percent), 38 had attended an appointment (60.3 percent), and 19 (30.2 percent) brought the CVSI referral form when they attended the appointment. When parents/guardians of the 25 children who had not attended an appointment were surveyed, 12 (19 percent) were not aware the screening results indicated a full eye exam was recommended, 10 (15.9 percent) identified barriers to scheduling an appointment, and three (4.8 percent) had an appointment scheduled in the future or forgot a scheduled appointment.

Conclusion: The majority of surveyed parents/guardians reported their children having seen an eye care provider. Appropriate documentation has been limited due to reliance on parents/guardians to give referral forms to eye care providers and subsequent dependence on providers to forward completed referral forms to CVSI. Improved documentation is needed to assess the accuracy of the screening, support screening prevalence data, and evaluate the impact of CVSI.

Introduction

Amblyopia is a major cause of vision loss in children that can result in lifelong visual impairment and significant developmental dysfunction if left untreated. Childhood vision screening has been established as an important means of identifying children who are at-risk for developing amblyopia and can help prevent vision loss by referring them for evaluation and treatment. The U.S. Preventative Services Task Force makes a grade B recommendation in regards to vision screening “for all children at least once between the ages of 3 and 5 years, to detect the presence of amblyopia or its risk factors.” Additionally, the American Academy of Pediatrics has published guidelines concerning pediatric vision screening that includes recommendations for screening beginning at 3 years of age.

The primary goal of vision screening is to effectively refer at-risk children to an eye care professional to receive a comprehensive eye exam and treatment if needed. Poor follow-up rates after post-screening referral is an established limitation of vision screening programs. Several studies have evaluated potential barriers to follow-up referral after a failed vision screening. Previously identified barriers include: inability to contact families, unawareness of need for follow-up, forgetting appointment, conflicts in scheduling, concerns about cost of an eye exam, and expecting a follow-up call to help schedule an appointment. The significance of any one of these barriers varies.
depending on the design of the screening program and local population. The population of western South Dakota is one of the many groups that has not been evaluated for these barriers.

South Dakota is one of eight states that does not mandate childhood vision screening.\textsuperscript{14} A comprehensive proposal has never been brought forward in the state legislature. A previous study reported a referral rate of 11.9 percent for children participating in a screening event carried out by Northern Plains Eye Foundation Western South Dakota Lions Children’s Vision Screening Initiative (CVSI).\textsuperscript{15} This study cited lack of follow-up data and demographic data as a major limitation and theorized about an association between post screening referral rate and the distinct “racial/ethnic makeup of the Black Hills of South Dakota.” CVSI estimates follow-up rates after screening referral to be as low as 12 percent. Our study examined barriers to follow-up eye care in this population and analyzed potential demographic associations. Our study also evaluated the usefulness of an online response form as an alternative to a telephone-based survey. We hope the results of this study lend insight to help local vision screening programs improve their follow-up rates and better understand the western South Dakota population.

### Methods

Vision screenings were carried out by CVSI. CVSI has an established process for administering the screenings. A detailed description of the CVSI screening process can be found in Table 1.

The creation of a dataset from CVSI vision screening records and a survey methodology was approved by the University of South Dakota Institutional Review Board (IRB) and is in compliance with the U.S. Health Insurance Portability and Accountability Act of 1996. This dataset included children who underwent vision screening per CVSI protocol from September 2014 through February 2015 and were referred for a comprehensive eye exam. This dataset included parent/guardian contact and demographic information for 282 children ages 3 through 11. A phone survey of the parents/guardians in the dataset was conducted following a telephone script and using an electronic web-based data entry form. Failed attempts to contact the parents/guardians of these children via telephone resulted in either leaving a voicemail referring the parents/guardians to a website to complete the survey or documentation of why the call could not be completed. The survey was conducted six months after the screening was completed.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent</td>
<td>In a pre-school (ages 6 months through 6 years) or elementary school (kindergarten, first and third grades) setting, standardized consent forms provided by CVSI are sent home to parents/guardians by the school in a folder routinely used by the school to deliver information to parents/guardians. The consent form includes sections for reporting the child’s age, gender, and race/ethnicity as well as contact information such as phone number, e-mail address, and mailing address. Completed, signed, and dated consent forms are returned to the school by parents/guardians, collected, and returned to CVSI before the screening event. In a setting other than pre-school or elementary school, where parents/guardians may be in attendance with their child/children, parents/guardians complete, sign, and date consent forms on-site.</td>
</tr>
<tr>
<td>Screening</td>
<td>Only children with completed, signed, and dated consent forms are screened. Screenings are carried out by CVSI in conjunction with local Lions Club volunteers, who have undergone CVSI background checks and CVSI training on how to administer screenings using the Spot Vision Screener (PediaVision, Welch Allyn, Skaneateles Falls, NY). The device analyzes a child’s vision and determines whether he or she should be recommended for a comprehensive eye exam. Studies have shown the Spot device to have a sensitivity of 87.7 percent and the specificity was 75.9 percent in the detection of amblyopia risk factors.\textsuperscript{18} Details about CVSI’s application of the Spot device are documented in a previously published study.\textsuperscript{15}</td>
</tr>
<tr>
<td>Results processing/referral</td>
<td>The CVSI vision screening results are compiled and information packets inclusive of the CVSI screening result are mailed to the addresses provided by the parents/guardians on consent forms. Children whose results indicate they would benefit from a comprehensive eye exam receive an expanded information packet including a list of area eye care providers, list of area resources, a referral evaluation form parents/guardians can give to their eye care provider, and instructions on scheduling an appointment.</td>
</tr>
<tr>
<td>Eye exam/follow-up</td>
<td>Parents/guardians bring the referral evaluation form with them to the appointment with their child’s eye care provider. After a child is seen by an eye care provider, the provider is encouraged to fill out the referral evaluation form and forward it to CVSI. Evaluation of completed referral evaluation forms is the primary means of assessing follow-up after screening.</td>
</tr>
</tbody>
</table>

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\textsuperscript{14} A comprehensive proposal has never been brought forward in the state legislature.

\textsuperscript{15} This study cited lack of follow-up data and demographic data as a major limitation and theorized about an association between post screening referral rate and the distinct “racial/ethnic makeup of the Black Hills of South Dakota.”

\textsuperscript{16} Details about CVSI’s application of the Spot device are documented in a previously published study.

\textsuperscript{18} Studies have shown the Spot device to have a sensitivity of 87.7 percent and the specificity was 75.9 percent in the detection of amblyopia risk factors.
The parents/guardians who answered the phone were read an IRB-approved script explaining the study and were asked to give verbal consent.

Parents/guardians were asked six to eight questions depending on stepwise patient responses. The survey took approximately five minutes to complete. Survey questions assessed parental/guardian awareness of the screening event, awareness of the results of the screening, potential barriers to follow-up, personal view on the child’s eye care, and insurance status of the child. When open-ended questions were used, the caller took special consideration to not prompt a parent/guardian response. If the parent/guardian had difficulty answering the questions, pre-determined prompts were provided. An online response form was used by callers to record telephone-based parent/guardian survey responses.

Parents/guardians who were unable to be reached on the phone, but had working voicemails, were left a message. The message notified the parents/guardians about the study and gave them the option to complete an online survey that mirrored the telephone-based survey. Web-based participants were linked to a unique identifier to assist in documentation of survey status. Potential participants were not given the option to participate in the online survey until after a telephone-based survey had been attempted. This was done to ensure information collected online did not interfere with the caller response rate. The online survey was powered by Google Forms and was redirected by a domain name service to a dedicated URL (www.visionstudysd.com).

Statistics
Data analysis was performed using MedCalc (MedCalc Software bvba, Belgium). The Fisher exact test of independence was used to test for association between follow-up rate and categorical variables with two possible values. Categorical variables with three or more possible values were evaluated for association with follow-up rate using chi-square test of independence. A P value of < 0.05 was considered significant. An experiment-wise error rate of 33.7 percent was calculated based on a total of eight comparisons. This must be considered when interpreting the results.

Results
Attempts were made to contact the parents/guardians of 282 children in the dataset. Of these, 89 (31.6 percent) had disconnected/incorrect phone numbers. 117 (41.5 percent) did not respond to calls and voicemails were left. Seventy-six (26.9 percent) were successfully contacted and 63 (22.3 percent) agreed to participate in the survey. This data was further analyzed based on self-reported ethnicity. Using chi-square test of independence, ethnicity was not a factor with regard to willingness to complete the survey (P = 0.88) in instances in which the parent/guardian was reachable via phone. Ethnicity was also not a factor in regard to calls that resulted in voicemails (P = 0.75). It was determined that overall response rates (P = 0.0024) and percentage of invalid numbers (P = 0.003) were associated with ethnicity. Parents/guardians who did not specify ethnicity on the consent form had a lower response rate than average (14 versus 22.3 percent) and had a higher percentage of invalid phone numbers (44 versus 31.6 percent). In comparison, response rates amongst American Indian and white participants were 17.3 and 37.8 percent, respectively. Percentage of invalid phone numbers was 37.3 percent for American Indians and 12.2 percent for white participants.

Demographic data of the 63 surveyed participants is detailed in Table 2. The results of the survey can be found in Table 3. Of the 63 survey participants, 38 had already attended an appointment (60.3 percent). Half of this group (n=19) remembered to bring the CVS I referral evaluation form with them when they attended the appointment with their eye care provider. When the parents/guardians of the 25 children who had not attended an appointment were surveyed, 12 (19 percent) were not aware their child needed to see an eye care provider, 10 (15.9 percent) identified barriers to scheduling an appointment, and an additional three (4.8 percent) either had an appointment scheduled in the future or forgot to

<table>
<thead>
<tr>
<th>Table 2. Demographic (completed surveys)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Child’s sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Child’s ethnicity</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>American Indian</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Not specified</td>
</tr>
<tr>
<td>Child’s health insurance</td>
</tr>
<tr>
<td>Medicaid</td>
</tr>
<tr>
<td>Private</td>
</tr>
<tr>
<td>Self-pay</td>
</tr>
</tbody>
</table>
attend a scheduled appointment. Of the 12 who were not aware their child needed to see an eye care doctor, six (9.5 percent) were not aware their child was screened, four (6.3 percent) did not remember receiving results, and two (3.2 percent) did not understand the results.

Follow-up status was evaluated based on history of a previous eye exam, health insurance status of the child, parental suspicion of vision abnormality prior to screening, and self-reported ethnicity. None of these factors showed a statistically significant association with likelihood of receiving a follow-up eye care exam. The results of this analysis are listed in Table 4.

Multiple barriers (more than one was allowed per participant) were identified by the 10 participants who did not schedule an appointment including: faced higher-priority family issues such as disability, illness, conflicts, or difficulty obtaining housing or food (n=3); forgot to schedule an appointment (n=2); concern they would not be able to schedule an appointment around their work schedule (n=2); expected follow-up calls to help schedule an appointment (n=2); confusion about which eye care provider to contact (n=2); concerns about cost/Medicaid coverage (n=2); perceived difficulty in arranging transportation to see an eye care provider (n=1). One parent/guardian believed their child’s vision was sufficient despite the results of the survey and did not feel their child needed eye care. Another parent/guardian felt their child’s disability prevented them from being evaluated by an eye care provider. One of the parents brought the referral evaluation form to their pediatrician and was told the degree of astigmatism was too minor to be corrected.

The effectiveness of a web-based survey was evaluated. None of the 117 voicemails referring potential participants to an online version of the study resulted in a completed survey.

**Discussion**

Results pertaining to the availability of potential survey subjects were comparable to other published studies. The percentage of disconnected phone numbers (31.6 percent) was consistent with a comparable study (32.3 percent) as well as the percentage of voicemails left (41.5 versus 30.2 percent), completed surveys (22.3 versus 29.1 percent), and unwillingness to take a survey (4.6 versus 8 percent).

Our results showed the percentage of disconnected phone numbers varying by ethnicity, with American Indians and participants who did not specify an ethnicity being more likely to have disconnected phone numbers. The percentage of participants who completed surveys also varied by ethnicity. White participants were more likely to complete surveys than other ethnic groups.

The most common reason for unknown follow-up status was inefficient communication between parents/guardians,

### Table 3. Results of Follow-up Survey

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total interviewed</td>
<td>63</td>
<td>100.0%</td>
</tr>
<tr>
<td>Appointment attended</td>
<td>38</td>
<td>60.3%</td>
</tr>
<tr>
<td>Gave referral form to provider</td>
<td>19</td>
<td>30.2%</td>
</tr>
<tr>
<td>Forgot to give referral form to provider</td>
<td>19</td>
<td>30.2%</td>
</tr>
<tr>
<td>Appointment not attended</td>
<td>25</td>
<td>39.7%</td>
</tr>
<tr>
<td>Obstacles to scheduling an appointment</td>
<td>10</td>
<td>15.9%</td>
</tr>
<tr>
<td>Not aware of screening results</td>
<td>12</td>
<td>19.0%</td>
</tr>
<tr>
<td>Not aware that child was screened</td>
<td>6</td>
<td>9.5%</td>
</tr>
<tr>
<td>Do not remember receiving results</td>
<td>4</td>
<td>6.3%</td>
</tr>
<tr>
<td>Did not understand results</td>
<td>2</td>
<td>3.2%</td>
</tr>
<tr>
<td>Appointment scheduled in the future</td>
<td>2</td>
<td>3.2%</td>
</tr>
<tr>
<td>Missed appointment</td>
<td>1</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

### Table 4. Patient Characteristics and Likelihood of Receiving Follow-up Eye Care

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Receipt of Follow-up</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The child had prior eye exams?</td>
<td></td>
<td>0.99*</td>
</tr>
<tr>
<td>Yes</td>
<td>63.2% (12/19)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>59.0% (26/44)</td>
<td></td>
</tr>
<tr>
<td>Child’s health insurance</td>
<td></td>
<td>0.99*</td>
</tr>
<tr>
<td>None/self-pay</td>
<td>75.0% (3/4)</td>
<td></td>
</tr>
<tr>
<td>Insurance (private or Medicaid)</td>
<td>59.3% (35/59)</td>
<td></td>
</tr>
<tr>
<td>Suspicious of vision problems</td>
<td></td>
<td>0.07*</td>
</tr>
<tr>
<td>Yes</td>
<td>50.0% (18/36)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>74.1% (20/27)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td>0.10*</td>
</tr>
<tr>
<td>American Indian</td>
<td>50.0% (13/26)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>73.3% (22/30)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>100.0% (3/3)</td>
<td></td>
</tr>
<tr>
<td>Not specified</td>
<td>0.0% (0/4)</td>
<td></td>
</tr>
</tbody>
</table>

*Statistical significance calculated using Fisher’s Exact test.

b Statistical significance calculated using Chi-Squared test (“Not specified” not included).
P < 0.05 was considered statistically significant.
eye care providers, and CVSI. The most common miscommunication occurred when a child received a comprehensive eye exam, yet referral evaluation documentation of the results was not sent to CVSI. In fact, the majority of children who are recommended to receive a comprehensive eye exam (n=38, 60.3 percent) following a post-screening referral by CVSI are being seen by an eye care provider. This figure is higher than results from similar studies. Su Zhuo et al. saw 47 percent of contacted guardians reporting that their child had already attended a follow-up appointment and Mark et al reported 25 percent. Variations in follow-up procedures may account for this difference. For example, only one attempt was made to contact participants in our study compared to five in the Su Zhuo paper. A potential association between availability of parent/guardian and follow-up rate may account for the difference. Overall, this value may overstate the actual follow-up rate because the population surveyed (parents who are willing to receive a call and participate in a study) may be more likely to prioritize their child’s health and vision and secure a follow-up appointment.

This study has shown appropriate documentation of follow-up status is limited due to reliance on parents to give a referral evaluation form to their eye care provider and reliance on eye care providers to forward the completed referral evaluation form to CVSI. Based on these findings, it is worth examining ways to ensure parents/guardians bring the referral evaluation form with them when they attend an appointment with their eye care provider. Many of the respondents reported having given the referral evaluation form to their provider. Considering this finding, an effort to increase program awareness amongst local eye care providers is advisable. The offices of these eye care providers may not be aware of the need to forward completed referral evaluation forms to CVSI. Exam records are commonly transmitted via fax between the offices of ophthalmologists and referring optometrists. CVSI may benefit from encouraging a similar system of communication with these eye care offices.

A large portion of children who had not been scheduled to see an eye care provider would likely have benefitted from improved follow-up coordination. We attribute this to the nature of the barriers that prevented them from scheduling an appointment and lack of awareness about screening results. A common cause of follow-up failure was parent/guardian unawareness of need for follow-up care (19 percent). This is comparable to the results of previous studies, which have cited 29 percent and 10 percent. In the screening model analyzed in this study, it is also feasible the packet of results was either lost or not received by the parent/guardian. This could be due to a change in address of parent/guardian or an inaccurate address provided on the consent form. In comparison, prior studies have shown a letter with screening results led to over 90 percent of parental awareness of screening failure. The higher percentage of parental unawareness might be attributed to a survey population more likely to have moved or provided an inaccurate address. However, this was not tested in this study.

Parental awareness of the screening result might be improved by implementing a signature verification step (a signature on the form with the results indicating the parent has seen the form) or by note of a school or screening representative who affirms they have spoken with the parent of a child who has been referred for a comprehensive eye exam. However, these ideas may not be feasible under CVSI’s protocol. A lack of understanding of the results may arise when incomprehensible materials are sent to the parents/guardians. It is our belief that the materials provided by CVSI are appropriate in amount and content and do not hinder parents/guardians from pursing an eye care appointment. Although quality and readability of the results and materials provided by CVSI appear to be exceptional, there may be value in assessing the opinions and perceptions of the study population by conducting a focus group centered on the materials provided in the results packet.

The inconsistent nature of reported barriers to scheduling an appointment by participants (n=10) makes it difficult to propose a recommendation for screening improvement. However, we believe many of these barriers could be addressed through improved education about childhood vision conditions and routine follow-up calls. For example, improved education may benefit three participants (out of 10 who listed barriers to scheduling an appointment) who stated higher priorities/family related issues were more important than their child’s vision concerns or the participant who stated they did not believe their child required further eye care. Routine follow-up calls may benefit the two participants who forgot to schedule an appointment, the two who did not know which eye doctor to call, or the two who expected a call to schedule an appointment.

In one instance, parents brought the results of the
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screening to their pediatrician for review. The pediatrician did not feel the magnitude of astigmatism warranted an eye exam. This scenario depicts a common misconception about the screening process in which non-eye care providers treat screening results as equivalent to a comprehensive eye exam. The screening test in itself does not diagnose eye conditions and the positive predictive value (PPV) for the detection of amblyopia risk factors using automated vision screening devices such as the Spot device has been found to be between 73 and 78 percent for screening in preschool age children without unusual suspicion for amblyopia.17-19 The purpose of screening is to identify at-risk children and provide an appropriate referral rather than make a diagnosis. It is conceivable the child had greater or lesser astigmatism than indicated by the screening test. Interpretation of screening results without a corresponding evaluation by an eye care provider can result in false parental assurance.

A previous study suggested the unique racial makeup of western South Dakota may impact the vision screening process.15 Our study features four ethnic categories: white (47.6 percent) American Indian (41.3 percent), other (4.8 percent), and not specified (6.3 percent). Our results indicated ethnicity was not a statistically significant factor in children receiving a follow-up exam (P = 0.10). We believe that all groups would benefit from receiving additional education and follow-up coordination and it is unknown whether any ethnicity group would benefit from added attention. We also determined parents/guardians who did not specify ethnicity on the consent form were less likely to complete the survey and had a higher percentage of invalid phone numbers. This association may suggest a trend towards generalized noncompliance in this group.

It is unlikely a web-based follow-up would be successful given the absence of any responses on the vision study website. However, it remains unknown whether follow-up phone calls are the best way to reach the referred screening population due to the low percentage of parents/guardians who were accessible via phone.

This study was subject to several limitations. It is of note that 77.7 percent of parents/guardians remained unreachable. Of these, 40.8 percent were without a working phone number. Due to time and resource constraints, only one attempt was made to reach most of the 282 potential participants. Also, all calls were made between 5:00 p.m. and 7:30 p.m. in the local time zone, so subjects that are unavailable during that period were excluded from the study by design. We believe there may be a relationship between the people that were more likely to participate by phone as opposed to those that were unlikely to answer a call from an unknown number. This study also had a relatively large experiment-wise error rate and all comparisons must be interpreted with this in mind.

Because it is not possible to measure post-screening outcomes of children who have guardians unable to be contacted (disconnected listed phone number, change of address), our study lacks the ability to follow up on what we believe is the largest potential population in need to follow-up barrier analysis. Possible solutions to this would most likely have be related to gathering information from guardians through the child’s currently enrolled school.

Although it is encouraging many of the surveyed parents/guardians had children already seen by an eye care provider, documentation, in the form of the completed referral evaluation form, from these comprehensive eye exams is needed to adequately assess the accuracy of the screening (including accuracy of Spot Vision Screening device). This data is also needed to ensure reliable reporting on the prevalence of vision disorders, as well as to assess the impact of the CVSI screening initiative. Improved documentation of follow-up eye care and a corresponding reduction in the number of children with unknown follow-up status would assist CVSI in appropriately targeting parents/guardians of children who face barriers to obtaining follow-up eye care. We hope the results of this study will help vision screening programs increase follow-up rates amongst at-risk children and improve the documentation of children who have already been seen by an eye care provider.

The authors would like to thank Northern Plains Eye Foundation for their assistance with this publication.

REFERENCES


Please note. Due to limited space, we are unable to list all references. You may contact South Dakota Medicine at 605.336.1965 for a complete listing.

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Abstract
This is a case report of a 61-year-old female who presented with acute lower gastrointestinal bleeding resulting from a schwannoma involving the ascending colon. The patient was successfully treated with laparoscopic hemicolectomy. Schwannoma involving the large bowel is a rare entity; only around 90 cases of colonic schwannomas are reported in world literature. Although the vast majority of these tumors demonstrate a slow growing and benign profile, recurrence and malignant transformation can occur. Given the exceptional rarity of this pathological process, much of what is currently understood about this disease comes from case studies. Continued reporting of this pathology will be essential for further development and understanding its clinical and pathologic presentation.

Introduction
Schwannomas are a rare pathological finding within the gastrointestinal (GI) system. Such neoplasms are most often found at other locations such as the head, neck, and upper limbs.\(^1\) Within the GI system, schwannomas of the colon are extremely rare and compose only around 3 percent of alimentary mesenchymal tumors.\(^2\) It is currently estimated that there are only around 90 cases of colonic schwannomas reported in the world literature.\(^3\)

Fortunately, the vast majority of these tumors demonstrate a slow growing and benign profile. Local recurrence from retained tissue can occur along with risk for eventual metastatic transformation over time. The definitive treatment for these tumors is by complete surgical resection. Follow-up with histologic immunophenotyping is critical for the differentiation of this neoplasm from other GI submucosal tumors (SMT).\(^4\) In this article, we are presenting a case of acute lower gastrointestinal bleeding from schwannoma of the ascending colon in an otherwise healthy 61-year-old female.

Case Report
A 61-year-old otherwise healthy female with unremarkable past medical or surgical history initially presented to the emergency department with the chief complaint of bright red blood in her stool of one-day duration. Associated symptoms included lightheadedness with some abdominal cramping; no prior history of altered bowel habits or weight loss were elicited. Pertinent medication history included the patient taking 600 mg of ibuprofen daily for two weeks prior to the onset of hematochezia. The patient reported her last colonoscopy was roughly 10 years prior to her time of presentation and it was essentially normal. The patient denied smoking history, use of alcohol, or illicit substances. Family history was negative for colon cancer, inflammatory bowel disease or neurofibromatosis. Vital signs in the emergency department were within normal limits. Her physical exam was notable for mild pallor and some epigastric tenderness, otherwise unremarkable for other findings including Café au lait spots, axillary freckling, abdominal tenderness, inguinal adenopathy, or abdominal masses. Her laboratory workup included a CBC which demonstrated anemia with hemoglobin of 10.5 g/dL and hematocrit of 30.1 percent.

The patient received both EGD and colonoscopy studies on the following day. Remarkable findings consisted of identifying a 4 cm moderately friable polyp in the ascending colon proximal to the cecum. Biopsy demonstrated benign colonic mucosa. Deeper sections of the tissue blocks revealed no adenomatous changes or carcinoma.
Subsequent imaging studies utilizing CT with contrast (Figure 1) demonstrated a 4.1 x 3.0 x 2.5 cm mass in the ascending colon without invasion of adjacent structures, enlarged lymph nodes, or evidence of obstruction. The patient also received a chest CT as part of her workup. Her hemoglobin continued to drop and right laparoscopic hemicolecction was recommended.

**Operative Description**

After obtaining informed consent, the patient was taken to the operating room for laparoscopic right hemicolecction. She was placed supine on the operating room table, pneumoperitoneum was established using Veress needle technique. Following adequate insufflation, 4 trocars were placed under direct visualization, (Figure 3 shows the trocars’ configuration we used in this case). Thorough exploration of the abdominal cavity revealed normal anatomy with no evidence of metastatic disease. A medial to lateral mobilization of the right colon was performed using a Harmonic scalpel. The hepatic flexure was mobilized by both blunt and sharp dissection with ensuing sharp dissection along the white line of Toldt for full mobilization of the ascending colon. The ileocolic pedicle was controlled using a vascular load Endo GIA stapler. Once the ascending colon was freed from its mesenteric attachments, the 10 mm trocar site was enlarged to about 5 cm and wound protector was placed to facilitate extraction of the specimen. Extracorporeal division was performed at the terminal ileum and hepatic flexure using Endo GIA stapler. A stapled side-to-side functional anastomosis was created between the residual parts of the terminal ileum and hepatic flexure. A total of 19 regional lymph nodes were also dissected for analysis with an inclination that the patient had colon cancer.

The patient tolerated the procedure well. Estimated blood loss during procedure was 10 mL. The pathology report indicated findings of a 5.5 cm neural spindle cell neoplasm consistent with schwannoma.
Immunohistochemical staining provided further confirmation being positive for S-100 and negative for CD 117, DOG-1 and SMA. Regional lymph node dissections from the procedure demonstrated benign findings.

The patient’s postoperative course was uneventful; her diet was advanced on POD1, her pain was minimal, and the patient was discharged on POD 4. The patient was reported to be doing well after two-week follow-up from discharge.

**Discussion**

The presence of schwannomas in the alimentary tract is exceedingly rare. For the small percentage of schwannomas found within the alimentary tract, they are more common in either the gastric or small intestinal submucosa, than in the colon. Although these neoplasms can present clinically with signs of GI bleeding, as in this case, or obstruction if they become large enough, most often they are asymptomatic. In the infrequent instance when symptoms are present, they tend to be more generalized such as fever, pain, and fatigue. Cases of GI schwannoma both in isolation and in the presence of other disease processes such as ulcerative colitis and ganglioneuromatosis have been recorded. An explicit association has yet to be elucidated and requires a greater number of cases to assess than are currently available. There is an equal predisposition for tumor occurrence between sexes and the majority of tumors tend to be found in individuals after the sixth decade of life.

Curative treatment for gastrointestinal schwannoma is by surgical resection obtained with free margins. The decision to involve lymph node dissection is largely based on individual surgeon judgment and preference. The use of radiotherapy and adjuvant chemotherapy have been attempted with conflicting results and are not commonly utilized or recommended for schwannoma treatment.

In the process of tumor identification, it is notably difficult to obtain accurate diagnosis through screening and mucosal biopsies by preoperative modalities such as colonoscopy. A list of alternative diagnosis for ascending colonic mass has been provided in Table 1. The accuracy of schwannoma diagnosis has been found to be only around 15 percent when performed through colonoscopic mucosal biopsy. Some progress has been made to increase the accuracy of preoperative diagnosis with the use of endoscopic ultrasound guided needle biopsy which permits immunohistochemical analysis. Yet, assessing the malignant potential of this tumor continues to be poor.
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A variety of immunohistochemical markers help differentiate schwannomas from other more common mesenchymal tumors which have more aggressive clinical courses such as gastrointestinal stromal tumors (GIST). A more in-depth review of an advanced classification system for immunohistochemical testing criteria in mesenchymal tumors of the gastrointestinal tract has been recently discussed by Terada. The presence of S100 is a key positive marker for schwannoma that is distinguishingly absent for other tumor types in the differential such as GIST. Other important markers include CD 117 and CD 34 that are commonly negative in schwannomas; positive findings would be typical for GIST.

Given the immense rarity of colonic schwannoma, the majority of our understanding for this pathology comes through case studies. In the review of the literature, the authors did identify a recent retrospective assessment within the last decade by Hou et al. on 33 cases of gastrointestinal schwannoma elucidating clinical and pathologic disease features. Currently, it does not appear that any such study exists in the literature for strictly assessing features of colonic schwannomas. Due to the infrequent presentation of schwannomas of the colon continued reporting will be essential to further understand this rare pathology.

REFERENCES


About the Author:
Hassan Turaihi, MD, General Surgery Resident, PGY3, Department of Surgery, University of South Dakota Sanford School of Medicine.
Jed H. Assam BS, MS III, University of South Dakota Sanford School of Medicine.
Mathew Sorrell, MD, Department of Surgery, University of South Dakota Sanford School of Medicine.
Introduction

Controlled substances historically have the highest rate of drug abuse. However, not all drugs of abuse are controlled substances. Recently, other prescription medications and even over-the-counter medications have come to be potential drugs of abuse. The use of the medications discussed below may warrant concern and require deeper evaluation by health care providers.

Loperamide

As an over-the-counter antidiarrheal, loperamide (Imodium) works as an agonist on opioid receptors. Abuse potential was thought to be limited due to low bioavailability and minimal central nervous system effects. However, at doses 10 times the over-the-counter recommended dose of 8 mg/day, patients are using loperamide to lessen opioid withdrawal symptoms or to achieve a high comparable to opioids or heroin. Additional medications may be taken with loperamide to attempt to enhance its effect, such as those that inhibit P-glycoprotein, CYP3A4 and CYP2C8 (Table 1). Throughout the 39 years since FDA approval, serious cardiac complications have been reported in 48 cases and over half of these cases have occurred since 2010. Patients have reported self-treating with dosages of 70 mg to 1,600 mg per day. Loperamide overdose has been associated with respiratory depression, central nervous system depression, QT interval prolongation, Torsades de Pointes or other ventricular dysrhythmias, syncope, and cardiac arrest. Antiarrhythmic medications have often been ineffective, and use of electrical pacing or cardioversion may be required for management of the arrhythmias.

Quetiapine

Of emergency department visits involving antipsychotics, quetiapine (Seroquel) is responsible for greater than 50 percent of the visits related to misuse and abuse. As a second generation antipsychotic, quetiapine is used to treat schizophrenia, bipolar disorder, and depression. Additionally, it has been used to promote abstinence and manage withdrawal symptoms related to alcohol, opioids and benzodiazepines. A known adverse effect of quetiapine is somnolence which has led to its misuse for self-management of insomnia and anxiety, and to counteract stimulant medication effects. The desired sedative effect is achieved with oral ingestion, inhalation, intranasal, and intravenous routes. Street names for quetiapine include Quell, Susie Q, Baby Heroin, and Squirrel, and the reported street value is $3 to $8 for a single 25 mg dose.

Gabapentin and Pregabalin

Gabapentin (Neurontin), an anti-epileptic, is commonly prescribed for numerous off-label indications. Some reported reasons for abuse or misuse of gabapentin are substitution for an opioid, to potentiate the opioid high or to relieve withdrawal symptoms associated with opioids. Gabapentin misuse was found to occur in 22 percent of patients with an opioid use disorder. The doses used ranged from 3,600 mg to 7,200 mg of gabapentin per day with oral, intranasal and intravenous administration. Withdrawal symptoms related to gabapentin include confusion, disorientation, diaphoresis, tremor, tachycardia, hypertension and insomnia. Benzodiazepines do not seem to alleviate withdrawal symptoms. Pregabalin (Lyrica) is also a concern due to reports of recreational use in order to achieve euphoric and dissociative effects. These reports also suggest an abuse potential due to reported doses exceeding the normal dosing limits and the use of unconventional routes, such as nasal inhalation or intravenous injection.

Dextromethorphan

Dextromethorphan, an over-the-counter antitussive, is readily available as an active ingredient in over 140 cough and cold products. Dextromethorphan’s mechanism of action is stimulation of sigma opioid receptors leading to inhibition of the cough reflex. Additionally, dextromethorphan and its active metabolite, dextrophan, have an antagonist effect at the N-methyl-D-aspartate
receptor which can produce dissociation and hallucinations. 10 Consumption of excessive quantities may produce a dissociative state that parallels phencyclidine (PCP) and ketamine, which can be achieved by increasing the dose through four “plateaus” (Table 2). 11 Abuse can lead to violent behavior and has resulted in assault and suicide. 12 Street names for dextromethorphan include, Red Devils, Robo, Robo-Tripping, Skittles, Triple C’s, Dex, and DX. 10 The treatment for dextromethorphan toxicity is symptomatic management and most patients’ symptoms resolve in two to five days. 10 Another important aspect to consider when treating a dextromethorphan toxicity is identifying and monitoring for adverse effects related to the other active ingredients commonly found in cough and cold products such as acetaminophen, chlorpheniramine, and phenylephrine. 11,12

### Conclusion

Health care providers should be aware of misuse and abuse of numerous prescription and over-the-counter medications, particularly in those with a history of substance abuse. Recognition of signs and symptoms of toxicity and withdrawal of these medications is essential in providing emergency care.

### Table 1. Loperamide Drug Interactions1-4

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<tr>
<th>P-glycoprotein inhibitors</th>
<th>Amiodarone, clarithromycin, cyclosporine, erythromycin, ketoconazole, quinidine, verapamil</th>
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<tr>
<td>CYP3A4 inhibitors</td>
<td>Clarithromycin, ketoconazole, omeprazole, verapamil</td>
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<td>CYP2C8 inhibitors</td>
<td>Gemfibrozil, montelukast, pioglitazone, rosiglitazone, trimethoprim</td>
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### Table 2. Reported Dextromethorphan Plateaus and Effects11,12

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<tr>
<td>1st</td>
<td>1.5-2.5 mg/kg</td>
<td>Mild stimulant and perceptual effects</td>
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<td>8-13 capsules</td>
<td>Similar to MDMA (Ecstasy)</td>
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<td>37.5-62.5 ml of syrup</td>
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<tr>
<td>2nd</td>
<td>2.5-7.5 mg/kg</td>
<td>Similar to co-ingestion of marijuana and ethanol</td>
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<td></td>
<td>13-38 capsules</td>
<td>More profound impairment of perceptual, cognitive and motor functions than either drug alone</td>
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<tr>
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<td>62.5-187.5 ml of syrup</td>
<td>Mild hallucinations</td>
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<tr>
<td>3rd</td>
<td>7.5-15 mg/kg</td>
<td>Strong hallucinations</td>
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<tr>
<td></td>
<td>38-75 capsules</td>
<td>Similar to low doses of ketamine</td>
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<tr>
<td></td>
<td>187.5-375 ml of syrup</td>
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<tr>
<td>4th</td>
<td>&gt; 15 mg/kg</td>
<td>Similar to high doses of ketamine</td>
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<tr>
<td></td>
<td>&gt; 75 capsules</td>
<td>Complete mind/body dissociation</td>
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<td></td>
<td>&gt; 375 ml of syrup</td>
<td>Amount of medication is based on a 75 kg person (15 mg capsules and 3 mg/ml of syrup).</td>
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</table>

Amount of medication is based on a 75 kg person (15 mg capsules and 3 mg/ml of syrup).

### REFERENCES


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Debra Farver, PharmD, College of Pharmacy, South Dakota State University.
Board News

By Margaret B. Hansen, PA-C, MPAS, Executive Director, South Dakota Board of Medical and Osteopathic Examiners

SDBMOE Announces New Administrative Rules Affecting the Practice of Medicine

• The medical documentation rules are provided in this article and can be viewed on the Board website using the New Rules link on the homepage, or by clicking on the Statutes and Rules tab in the right hand menu on the homepage.
• Medical Documentation Rules (commonly referred to as the “opioid prescriber rules”). However, this documentation rule covers more than just opioids in that it is for any controlled substances (including tramadol).
• More accurately described as the medical documentation rules “when prescribing controlled substances for the treatment of chronic, non-cancer pain”
  ○ When treating chronic, non-cancer pain as defined in the second rule
  ○ Provides a definition of chronic pain

The South Dakota State Medical Association (SDSMA) provided input and recommendations
• The SDSMA created an ad hoc committee to study the issue.
• Board member Dr. Laurie Landeen was the Board’s liaison to the ad hoc committee.

Dr. Landeen would like to provide this guidance on the new rules:

• The intent of this rule is for providers to have a sense of what is expected in the medical chart.
• This will be a tool for investigators to use when there is a complaint about over-prescribing controlled substances.
• The board will not be utilizing this new rule to randomly screen the medical records of providers who prescribe controlled substances.
• Please remember that this rule applies to the use of controlled substances for chronic, non-cancer pain, and does not apply when treating acute or post-operative pain!

The New Administrative Rules

20:47:07:01. Standards for medical records when prescribing controlled substances for the treatment of chronic, non-cancer pain. The standards for medical records when a physician prescribes controlled substances for the treatment of chronic non-cancer pain include each of the following listed items:
(1) Copies of the signed informed consent and any treatment agreement required by the physician;
(2) The patient’s medical and psychosocial history;
(3) The results of all physical examinations and all laboratory tests;
(4) Confirmation that the appropriate state prescription drug monitoring programs have been accessed, and the date of that access, or an explanation why they were not accessed;
(5) The results of all risk assessments, including results of any screening instruments used;
(6) A description of the treatments provided, including all medications prescribed or administered, with the date of prescription or administration, the name and type of the medication, and the dosage and quantity of medication prescribed or administered. The medical records must include all prescription orders for opioid analgesics and other controlled substances, whether written, telephoned, faxed, or electronically transmitted;
(7) Instructions to the patient, including discussions with the patient and, if appropriate, significant others of the risks and benefits of opioid analgesics, including the risks of addiction, overdose, and death; proper use and storage of medication; proper disposal of unused medications; and the use of naloxone products to reverse overdose;
(8) Results of ongoing assessments, including, when appropriate, urine drug tests, of patient progress or lack of progress in terms of pain management and functional improvement;
(9) Notes on any evaluations by and consultations with specialists;
(10) Any other information used to support the initiation, continuation, revision, or termination of treatment. Any steps taken in response to aberrant medication use by a patient and aberrant behaviors related to a prescription for an opioid analgesic;
(11) Medical records of past hospitalizations or treatments by other providers, to the extent obtained by the physician;
(12) Authorization for release of information to other treatment providers; and
(13) Name, address, and telephone number of the patient’s pharmacy.

General Authority: SDCL 36-4-35.
Law Implemented: SDCL 36-4-29, 36-4-30.
References: Federation of State Medical Boards Model Policy for the Use of Opioid Analgesics in the Treatment of Chronic Pain; Federation of State Medical Boards Model Policy on Data 2000 and Treatment of Opioid Addiction in the Medical Office.
20:47:07:02. Definition of chronic pain. For the purposes of section 20:47:07:01, the term, chronic pain, means ongoing, recurrent, or persistent pain lasting beyond the usual course of an acute illness or injury or that is three months or longer in duration.
General Authority: SDCL 36-4-35.
Law Implemented: SDCL 36-4-29, 36-4-30.
Physician Reimbursement Changes: An Update

By Stephan D. Schroeder, MD
Medical Director, South Dakota Foundation for Medical Care

Since the last article on physician provider payment one year ago, the final rules of the MACRA legislation of 2015 have been established. The program, now referred to as the Quality Payment Program (QPP), changes the way Medicare incorporates quality measurement into provider payment and develops new policies addressing other payment models offering an option for clinicians. Those providers, most of whom are physicians that bill Medicare Part B, will have a choice of two payment mechanisms. They include the Merit-based Incentive Payment System (MIPS) or Advanced Alternative Payment Models (APM). As MACRA undergoes implementation there will be emphasis on quality improvement and outcomes. Further, the desire is to lessen burden on participating clinicians and ensure flexible, transparent and adaptable changes. The diversity of clinician practices in their experience with quality-based payment will require an evolving program allowing transformation to take place with limited interruption to clinical encounters.

Those providers who bill Medicare Part B will need to begin measuring their performance in 2017 or face possible negative payment adjustments in 2019. There are four options ranging from minimum reporting to avoid a penalty all the way to advanced payment models that may involve some financial risk on the part of clinical providers. The final rule allows choices for physician practices wishing to enter this new model of reimbursement at a slower rate or using a partial-year reporting period. Most will likely start with MIPS which has four categories of clinician performance contributing to an annual MIPS score. The categories include quality, advancing care information, improvement activities and cost. Each eligible clinician or reporting group will have their annual score released to the public by the Centers for Medicare and Medicaid Services (CMS). The potential impact on future Part B payments will be significant penalties or rewards depending on the degree of reporting and quality reporting outcomes. New or low-volume providers, those who bill for services outside of Part B Medicare, and those participating in an Advanced APM are excluded from MIPS. These could include rural health clinics, Federally Qualified Health Centers and those using provider-based billing.

The alternative payment model provides added incentives to clinicians to provide high-quality and cost-efficient care. This may apply to a specific condition, care episode or defined population. Some using the APM will receive a MIPS adjustment plus a specific reward while others will receive a 5 percent lump sum bonus and higher fee schedule adjustment in coming years. The criteria to participate in these assorted models involve numerous factors including certified EHR technology and some degree of financial risk.

MACRA evolves the existing CMS programs such as the Physician Quality Reporting System, Value Based Modifier and Meaningful Use into a single payment structure that involves fee payment for value over fee payment for service. These are short-term imperatives that prepare for long-term transformation in the method by which physicians are reimbursed for Part B. This is an attempt to streamline the existing legacy programs, help control increasing medical costs and strive to sustain the present Medicare payment program. There is little doubt that physicians, no matter their specialty, location, or employment status, need to be aware of these changes.

Recognizing this need, CMS has charged the Quality Innovation Network-Quality Improvement Organizations (QIN-QIO) including the Great Plains QIN with the task of supporting facilities and physicians through the payment program transition. Leading the efforts for the Transforming Clinical Practice Initiative (TCPIs) and engaging Practice Transformation Networks (PTNs) and Support and Alignment Networks (SANs), Great Plains QIN staff provide technical assistance for clinics in adapting to quality reporting. This assistance and expertise will expand with the upcoming Quality Payment Program for Small/Underserved and Rural Support (QPP SURS) project specially designed to offer assistance to numerous smaller clinics in rural areas of our state.

The Great Plains Quality Innovation Network recognizes the challenges of this payment change and can provide tools and resources to assist with the transition. For more information, please review the www.greatplainsqin.org web site or contact Stephan Schroeder, MD, (Stephan.schroeder@area-a.hcqis.org) or Holly Arends, CHSP, (Holly.Arends@area-a.hcqis.org).

https://qpp.cms.gov

This material was prepared the Great Plains Quality Innovation Network, the Medicare Quality Improvement Organization for Kansas, Nebraska, North Dakota and South Dakota, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. 11SW-GPQIN-SD-D1-1880117

“Quality Focus” is a monthly feature sponsored by SDFMC, South Dakota’s Quality Improvement Organization. For more information about the SDFMC, visit their website at www.sdfmc.org.
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## South Dakota Governor

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## South Dakota Lieutenant Governor

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## South Dakota Representatives

All representatives can be reached during the Legislative Session by calling the house lobby at 605-773-3851. Email forms can be found at legis.sd.gov.

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<tr>
<td>Lee Qualm</td>
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</table>

## Special Features

- All senators can be reached during the Legislative Session by calling the senate lobby at 605-773-3821. Email forms can be found at legis.sd.gov.
2017 South Dakota Legislative Directory

### Asst. Majority Leader
- Rep. Kent Peterson (R)

### Majority Whips
- Rep. Arch Beal (R)
- Rep. Lynn DiSanto (R)
- Rep. Leslie Heinemann (R)
- Rep. Isaac Latterell (R)
- Rep. Larry Rhoden (R)

### Minority Leader
- Rep. Spence Hawley (D)

### Asst. Minority Leader
- Rep. Julie Bartling (D)

### Minority Whips
- Rep. Karen Soli (D)
- Rep. Susan Wismer (D)

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<th>Name</th>
<th>Dist.</th>
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<tr>
<td>Ahlers, Dan</td>
<td>25</td>
<td>Dell Rapids</td>
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<td>Anderson, David L</td>
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<td>Bartels, Hugh M</td>
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<td>Brunner, Blaine &quot;Chip&quot;</td>
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<td>Clark, Michael</td>
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| Latterell, Isaac      | 6     | Tea          | 605-368-1002 |
| Lesmeister, Oren L    | 28A   | Parade       | 605-964-3023 |
| Livermont, Steve      | 27    | Martin       | 605-685-6998 |
| Lust, David           | 34    | Rapid City   | 605-343-8261 |
| Marty, Sam            | 28B   | Prairie City | 605-866-447 |
| May, Elizabeth        | 27    | Kyle         | 605-455-2588 |
| McCleerey, Steven D   | 1     | Sisseton     | 605-698-7478 |
| McPherson, Sean       | 32    | Rapid City   | 605-390-1887 |
| Mickelson, G. Mark    | 13    | Sioux Falls  | 605-951-7690 |
| Mills, John           | 4     | Volga        | 605-826-4290 |
| Otten, Herman         | 6     | Tea          | 605-498-546 |
| Peterson, Kent        | 19    | Salem        | 605-425-3299 |
| Peterson, Sue         | 13    | Sioux Falls  | 605-371-1668 |
| Pischke, Tom          | 25    | Dell Rapids  | 605-999-2948 |
| Qualm, Lee            | 21    | Platte       | 605-337-3682 |
| Rasmussen, Nancy      | 17    | Hurley       | 605-238-5321 |
| Reed, Tim             | 7     | Brookings    | 605-697-6774 |
| Rhoden, Larry         | 29    | Union Center | 605-985-5461 |
| Ring, Ray             | 17    | Vermillion   | 605-675-9379 |
| Rounds, Tim           | 24    | Pierre       | 605-224-6588 |
| Rozum, Tona           | 20    | Mitchell     | 605-996-8440 |
| Schafer, James        | 26B   | Kennebec     | 605-869-2357 |
| Schoenfish, Kyle      | 19    | Scotland     | 605-660-6468 |
| Smith, Jamie          | 15    | Sioux Falls  | 605-338-5934 |
| Soli, Karen           | 15    | Sioux Falls  | 605-338-5934 |
| Steinhauser, Wayne    | 9     | Hartford     | 605-526-4269 |
| Stevens, Mike         | 18    | Yankton      | 605-661-0057 |
| Tieszen, Craig        | 34    | Rapid City   | 605-348-4990 |
| Tuls, Burt            | 2     | Lake Norden  | 605-785-3480 |
| Turbiville, Charles M | 31    | Deadwood     | 605-578-2082 |
| Willadsen, Mark       | 11    | Sioux Falls  | 605-361-6104 |
| Wismer, Susan         | 1     | Britton      | 605-448-5189 |
| Wollmann, Mathew      | 8     | Madison      | 605-480-3038 |
| York, Nancy           | 5     | Watertown    | 605-753-661 |
| Zikmund, Larry P      | 14    | Sioux Falls  | 605-373-0975 |

Listed below are the SDSMA district medical societies and the state legislative districts contained within each medical society.

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In Memoriam 2016
Honoring physician members of the SDSMA who passed away in 2016

Karl J. Blessinger, MD
Lambert W. Holland, MD
Richard Allen Jaqua, MD
Mark A. Reynen, DO
Alvin R. Scheffel, MD
Robert C. Talley, MD
Surprise Balance Billing

A number of state legislatures are taking up the issue of “surprise balance billing” with proposals aimed at limiting a patient’s financial obligation to no more than what he or she would have owed if a provider had been in network, if a patient sees an out-of-network provider at an in-network facility.

Surprise medical bill is a term used to describe charges arising when an insured individual inadvertently receives care from an out-of-network provider. This situation could arise in an emergency when the patient has no ability to select the emergency department, treating physicians, or ambulance service providers. Surprise medical bills might also arise when a patient receives planned care from an in-network provider, but other treating providers brought in to participate in the patient’s care are not in the same network. These can include anesthesiologists, radiologists, pathologists, surgical assistants, and others. In some cases, entire departments within an in-network facility may be operated by subcontractors who don’t participate in the same network – a common example is an emergency department in a rural community that is staffed by contract providers.

While legislation has yet to be proposed in South Dakota, the issue has received considerable attention at the national level. If legislation were to arise in South Dakota this legislative session, the SDSMA will conduct a thorough evaluation to determine any proposals’ impact on patients, as well as the cost and administrative complications for providers, before taking a position.

Source: Kaiser Foundation and SDSMA staff

“The Issue Is” is the SDSMA’s monthly update on key policy issues of importance to physicians.

Nominate a Physician or Supporter for SDSMA Awards

Nominations for the 2017 SDSMA Awards are now being accepted. Each year the SDSMA recognizes physician members and supporters for their work to improve the practice of medicine in South Dakota by presenting five distinguished awards.

Please consider nominating a colleague or supporter who is deserving of recognition for his or her work. They may work right alongside of you, or serve on a committee with you, or volunteer in your organization or community, or maybe they are your mentor. Through these awards, the SDSMA strives to encourage and recognize the highest standards of service, and give recognition to the accomplishments and dedication of our members and supporters to the medical profession and citizens of South Dakota.

The SDSMA is seeking nominations for the following awards:

- Distinguished Service Award
- Community Service Award
- Young at Heart Award
- Outstanding Young Physician Award
- Media Award

Visit sdsma.org for a nomination form, and to review the award categories and past recipients. Those with questions may contact Laura Olson at 605.336.1965 or lolson@sdsma.org.

Nominate someone today and help your colleagues and supporters get the recognition they deserve!

Source: SDSMA staff

MACRA Resources and Guidance

The SDSMA Center for Physician Resources brings you a presentation on Medicare payment reform:

**MACRA: Performance Categories and Scoring January 12**

This webinar will cover MIPS payment adjustment, APM scoring standard, category scoring, CPS calculation, CPS comparison with CPS performance threshold, payment adjustment and scaling, and payment adjustment application.

The webinar is at 7 p.m. CT and is free for SDSMA and SDMGMA members. Find a link to register at www.sdsma.org.

Source: SDSMA staff
Members of the South Dakota State Medical Association (SDSMA) and the SDSMA Medical Student Section attended the American Medical Association (AMA) Interim Meeting in Orlando in November with hundreds of others from across the country. The gathering was filled with activities and policy debate that will help shape the future of health care in the nation. Some policies adopted by the AMA House of Delegates include the following:

**Health Care Reform**
Delegates adopted a resolution voicing “firm commitment” to current AMA policy on health care reform. In its discussions with the Trump administration and Congress, the AMA will continue efforts to cover the uninsured and work to assure that future proposals do not result in loss of coverage for patients currently insured.

**Advertising**
A resolution was adopted that defines rules for direct-to-consumer advertising for prescription drugs: the AMA opposes allowing costs for direct-to-consumer advertising of prescription medications, medical devices and controlled drugs to be considered deductible business expenses for tax purposes.

**Value-based Drug Pricing**
Value-based pricing has the potential to reduce prescription drug spending in the U.S. With recent spikes in drug prices, delegates looked to address increases by adopting new guiding principles to support value-based prescription drug pricing.

**Easing Student Loan Debt**
Delegates adopted several policies aimed at alleviating medical student loan debt, integrating mental illness and addiction treatment into training programs, and giving physicians in training more leadership and community health work opportunities.

**Maintenance of Certification**
Delegates adopted resolution that supports not requiring maintenance of certification to be included on insurance panels, and resolutions that try to prevent any credentialing requiring maintenance of certification.

**PDMP Programs**
A resolution was adopted that supports universal access to all prescription drug monitoring programs across state lines.

**Care Team Leaders**
New policy was adopted that lays out the ethical obligations that physicians have to lead and participate in the team-based care model that research shows can improve health care quality and patient outcomes, enhance care access and slow the rate of medical spending while reducing burnout among health professionals.

**Compounded Treatments**
A resolution was adopted that removes physician offices from the definition of a compounding facility so that physicians can continue to provide “compounded” treatments to patients.

**Infertility Benefits for Wounded Veterans**
The Veterans Health Administration doesn’t cover assisted-reproductive technology benefits, including IVF, even though war injuries can cause infertility. Newly adopted AMA policy says that should change.

**Public Health Concerns**
Delegates adopted policies to promote the health of the nation. Public health issues addressed include distracted driving and smoking among youth.

**Gun Violence**
The AMA has joined an advocacy effort, started by leading organizations representing physicians, public health professionals and attorneys, aimed at reducing gun-related deaths and injuries. The document seeks universal background checks on gun purchases, restrictions on the sale of military-style weapons and large-capacity magazines to civilians and more research on how to cut morbidity and mortality involving firearms.

Respectfully Submitted,
Mary S. Carpenter, MD, SDSMA Delegate to the AMA
Robert L. Allison, MD, Alternate Delegate to AMA
The U.S. Department of Health and Human Services (HHS) has announced new steps aimed at expanding access to medication-assisted treatment for patients with opioid use disorders. Starting in February 2017, nurse practitioners (NPs) and physician assistants (PAs) will be allowed to prescribe buprenorphine, a medication typically used to treat opioid use disorders. Previously, only physicians were allowed to provide this treatment. Once training requirements are met, NPs and PAs can apply for a waiver to treat up to 30 patients.

HHS also announced that it will initiate a new regulation raising the cap, from 30 to 100, on the number of patients NPs and PAs can treat with the opioid replacement therapy after they have prescribed the treatment for a year. In July, HHS increased the cap, from 100 to 275, on the number of patients that physicians can treat with buprenorphine.

Source: SDSMA staff

Legal Brief Highlight: Informed Consent

A physician has a duty to obtain a patient’s informed consent to medical treatment before the physician provides the treatment. A patient must be informed of the nature of proposed treatment and the risks and benefits associated with that procedure and give consent. In emergency situations where the patient’s life or health are at risk and it is not possible to obtain express consent, the physician may provide treatment on the basis of the patient’s implied consent. Special rules apply to consent to organ donation, abortions, and investigational treatments.

For more information, download the SDSMA legal brief Informed Consent at www.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 area of practice management, leadership and health and wellness.

Source: SDSMA staff

“For Your Benefit” is the SDSMA’s monthly update on programs and services available to physicians through their affiliation with the SDSMA.

CONTACT:
Elizabeth Reiss, South Dakota Medicine
PO Box 7406, 2600 W. 49th Street, Suite 200
Sioux Falls, SD 57117-7406
605.336.1965
E-mail: ereiss@sdsma.org
We understand the art of healing and the science of avoiding risk.

Medical liability and more.

At MMIC, medical liability is just the beginning. For more than 35 years, we’ve worked directly with physicians and developed a deep understanding of the risks involved with practicing medicine. We’re there for those who are always there, drawing on a wide range of clinical data, insights and best practices from medical experts to help care teams deliver better care. To learn more visit MMICgroup.com.
Every trained specialist, every innovative piece of technology, every room within the Sanford Heart Hospital is here for one very important reason: your patient.

Regardless of what your patient’s heart needs may be, you can rely on our team to find the best solution to keep them safe, healthy and strong.

At Sanford Heart Hospital we guarantee same day appointments for referring physicians.

For more information or to refer a patient, call Sanford Heart Hospital at (605) 312-2200 or (877) 220-2929.