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Our June 3, 2016 South Dakota State Medical Association (SDSMA) Annual Leadership Conference was a great success. Thanks to all of you and your families for participating and sharing in the events of that day; we were especially honored to have American Medical Association (AMA) President Steve Stack, MD, attend and address the membership, and articulate the AMA’s ongoing advocacy efforts.

The morning program included a panel discussion on the medical benefits of cannabis and it was received with great interest. We also held our first ever Membership Open Forum in which members had the opportunity to bring issues to the SDSMA, to discuss issues submitted by fellow physicians, and to get perspective on issues from fellow physicians across the state. The topics presented at the Membership Open Forum we discussed again later that day at the SDSMA Council of Physicians meeting, and will serve as a guide for future priorities of the SDSMA.

I would be remiss if I didn’t mention the SDSMA PAC luncheon in which South Dakota Assistant U.S. Attorney Kevin Kolinear spoke on human and sex trafficking cases in South Dakota. Mr. Kolinear, who was the first male ever to be honored by Women in Federal Law Enforcement with its Top Prosecutor award, given to one federal prosecutor annually for their efforts to protect women and children, certainly gave an eye-opening presentation. Human trafficking is a serious issue and one that is more prevalent in our state than many of us realize.

And we wrapped up our Annual Conference with a meeting of the SDSMA Council of Physicians – where we received updates and discussed multiple important issues – and the Presidential Inauguration and Awards Banquet. The 2016 banquet honored some of our finest physicians for their achievements in medicine and gave much deserved recognition to those who have practiced medicine for over 50 years – we were honored to welcome past presidents, new members and the enthusiasm of our medical students.

As your 135th president of the SDSMA, I am excited to lead our team as we strive to empower physicians to be the voice of medicine for our state. What an amazing team our SDSMA leadership has and I welcome our newly elected Executive Committee members and incoming district councilors.

I am also grateful for the guidance the AMA provided nationally – providing strong advocacy for the welfare of our patients, commitment to promoting access and improving quality of care, and the democratic formulation of policy that guides the practice of medicine across our nation.

In my 29 years as a family physician in the small town of Sturgis, my role has involved not just caring for patients during the annual Sturgis Motorcycle Rally but all year long in the hospital, emergency room, nursing home and clinic. Often I have had the privilege to share these experiences with our medical students, as have many of you in our own practice settings. I am forever indebted to our state of South Dakota for creating and continuing to support our medical school and to my teachers for instilling in me the tradition of excellence and compassion that was the heart of my medical school experience. Our SDSMA’s continued support of medical education helps create and educate the physicians of tomorrow.

By our participation in our district societies, ad hoc committees, Council and executive leadership, and in our organized advocacy efforts, we represent physicians all across our state who are involved in private practice, clinic practice, urgent care, hospital settings, and hospital systems. My goal is that our SDSMA and AMA, continue to speak for physicians in medical practices across the whole continuum of care. There is strength in our collective voice – one that promotes the value of physicians and their leadership in guiding the future of medical practice. Let us listen and talk to each other. Let us work together to address problems, find the solutions, create change by serving our communities and protecting the welfare of our patients. I have and continue to be inspired by the relationships and respect we have for each other, and our ability to come to know and appreciate each other, not just as physicians, but as passionate, talented, and committed people. I believe this is the real value of our organization.

By recalling our past and envisioning our future I am confident that whatever issues, challenges, or changes come before us, we will successfully guide the best care of our patients and promote our profession. Thank you for supporting our SDSMA as we carry on the tradition into the 135th year of service to our people.
Spacing Pregnancies Appropriately: Long-Acting Reversible Contraception in the Immediate Postpartum Period

By Kelly Landeen, MS3; and Ashley Briggs, MD

In the modern age of family planning and contraceptive options, it seems as though every pregnancy can be scheduled and accommodated to best ensure the health of both mother and baby. Yet the plethora of family planning methods is not always available to those families that most need these options, and women are still facing difficulty in planning and spacing their pregnancies appropriately. Nearly half of all pregnancies in the U.S. are unintended, and all too often we see mothers returning to their obstetrician just months after the birth of their baby, already pregnant with another. While this should be exciting news about a precious new little one, it is often overshadowed by the risks associated with closely spaced pregnancies. By taking simple steps to place an intrauterine device (IUD) or an implanted contraceptive device in the immediate postpartum period, pregnancies can be safely spaced and a woman can be healthy physically, mentally, and emotionally by the time she is ready to have her next baby.

Ask any mother – pregnancy takes a lot out of a woman. The adverse outcomes associated with short interpregnancy intervals are likely due to maternal nutrition depletion and a woman’s inability to return to the normal, pre-pregnancy metabolic state in such a short time. The damage to a woman’s reproductive system that occurs during pregnancy and birth, as well as the postpartum stress of raising a child, can adversely affect her health and her ability to undergo another healthy pregnancy. One meta-analysis of interpregnancy intervals and adverse outcomes found that the best time to conceive a child is 18 to 23 months after a live birth; any conception within less than 18 months of a live birth is a short interpregnancy interval, and is associated with a significantly increased risk of adverse perinatal outcomes. Unfortunately, nearly 30 percent of interpregnancy intervals meet these criteria.

When babies are born to mothers whose bodies are not yet ready to repeat the hardships of pregnancy and labor, they often go through preterm labor, and are at increased risk of complications such as preterm birth, stillbirth, and low birthweight. There is also a higher risk of infant death due to unintentional injuries, including a 55 percent increased risk of infant death due to SIDS. In addition, mothers who go through pregnancy shortly after a previous delivery have a 50 percent chance of becoming anemic, compared to a 21 percent chance for women who wait 18 months before becoming pregnant again. That’s not to mention the financial and emotional stresses of short interpregnancy intervals – parents also have another child to feed, diaper, and clothe. The average cost of raising a child to age 18 for a middle-income family in the U.S. has climbed to over $245,000 and that doesn’t even include the cost of college or young adulthood. The risks of short interpregnancy intervals are not just medical, but also economic, mental, and social.

So how can a mother and father successfully space their pregnancies and avoid all of these negative outcomes? Abstinence for one to two months postpartum, breastfeeding your baby, and using some form of birth control are excellent options, but one of the easiest and most reliable methods to avoid short interpregnancy intervals are LARC – long-acting reversible contraception. LARCs are forms of birth control that work for an extended period of time without requiring action by the user. Examples include IUDs and subdermal contraceptive implants, which can be effective for three, five, and 10 years; they can, however, be removed at any time when a woman decides she is ready to become pregnant again. These methods have proven to be twenty times more effective than traditional pills, patches, or rings, and they work in women of all ages and backgrounds.

One of the best ways to ensure that a woman has control over her pregnancy intervals is to give her the option for immediate postpartum LARC insertion. This means that the LARC is inserted after birth and prior to discharge from the hospital. This has been deemed safe and effective by both the Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists, and can be done in both breastfeeding and non-breastfeeding women. The expulsion rate of IUDs is higher when placed within 10 minutes of placental
separation (9 to 16 percent) compared to when it is placed after four weeks postpartum (3 percent), but early postpartum placement also provides assurance that the woman will not become pregnant between delivery and the next (potentially missed) appointment.\textsuperscript{15}

In the time between delivery and follow up appointments, women can have unprotected intercourse, miss their appointment, and potentially get pregnant again – and the benefits of preventing unintended early repeat pregnancy far outweigh the risk of expulsion.\textsuperscript{16} Unfortunately, the women whom LARC would most benefit are at increased risk for missing the six-week postpartum appointment, and may not return to their provider until weeks or months later, when they are pregnant once again.\textsuperscript{17} LARC has been linked to longer contraceptive coverage, fewer rapid repeat pregnancies, and cost savings. Unmet demand for postpartum LARC is high, as only 54 to 60 percent of women who request LARC postpartum actually receive it, often due to failure to return for outpatient postpartum care or early repeat pregnancy.\textsuperscript{1-13,18}

Yet it isn’t just patient noncompliance that leads to short pregnancy spacing. Many physicians do not realize that their patients are candidates for immediate postpartum LARC insertion, and so do not have a conversation with the patient about these options before they go into labor. Insurance coverage is also a huge deterrent. LARC is currently covered by most insurance if it is placed in the clinic setting, but it is not often covered in the hospital setting. Since the IUD should be placed within 10 minutes of placental separation, insurance may force women to wait until six weeks postpartum to have this placed. The Nexplanon can be placed any time after delivery, which would allow the patient to be discharged from the hospital and come to the clinic anytime for placement; but there are barriers to this as well. Is the patient discharged after clinic hours or on the weekend? Will the patient’s ride not wait for her to come to the clinic for this procedure? These devices are currently not being placed in the hospital because pregnancy is billed as a global package, and if the cost of the device cannot be billed separately from the delivery, the hospital could potentially lose money on the delivery. However, if LARC is placed in the clinic, the cost of the device would be covered by the patient’s insurance, usually at 100 percent.\textsuperscript{19}

One of the best ways to illustrate the huge barriers to immediate postpartum LARC placement is with the story of an actual patient – we’ll call her Sara to protect her identity. Sara is a 27-year-old who delivered a healthy baby, her second child, and was discharged from the hospital. She desired some form of LARC and decided that Nexplanon was the best choice for her; she was told to go to the women’s clinic before leaving the medical campus because her insurance would not cover Nexplanon, or other LARCs, to be placed at the hospital. However, Sara does not own a car, and her ride would not wait for her to go to her clinic appointment, so she was forced to leave. She called the clinic asking for birth control, and an appointment was set up – which she missed. When the clinic called to reschedule, she also missed that appointment. Within a few months of her baby’s birth, Sara called her provider again – this time with a pregnancy scare. Luckily for Sara, her scare was just that – she was not actually pregnant and did not have to worry about having a second baby in such a short time period.

The same cannot be said for others. Let’s take a look at another patient; we’ll call her Nancy. Nancy is a 29-year-old who just had her fourth baby. Her first baby died at three months of age, and she did not have her second baby until a few years later, an appropriate pregnancy interval. After her second baby was born, however, she was pregnant within six months. After her third baby was born, she wanted some form of birth control but missed her postpartum visit and so did not receive any. She was pregnant with her fourth child within five months. This pregnancy, however, was riddled with complications and she was considered high-risk. Nancy was severely anemic and received blood transfusions as well as weekly iron transfusions. During her delivery, fetal heart tones notably decelerated. When her baby was finally born, he was taken immediately to the NICU for evaluation and treatment of sepsis. The baby later passed away due to SIDS at about seven months of age.

Nancy’s story is one of potentially preventable adverse outcomes. We could go on all day discussing different patients who have had short interpregnancy intervals due to lack of contraceptive access. There’s the 20-year-old who wanted LARC, but the hospital said she must go to the clinic – she delivered on a Saturday and the clinic was not open until Monday, by which time she had been discharged. Then there’s the 25-year-old with four children, who missed her postpartum appointment and IUD insertion and is now considering elective abortion because she is simply not ready for a fifth child. The list goes on.

These tragedies are just the tip of the iceberg, but they help illustrate the need to keep mothers and their children healthy by spacing pregnancies appropriately. Sara’s and Nancy’s stories ended somewhat happily – Sara finally
received LARC at a clinic appointment, and Nancy was able to get Nexplanon while still in the hospital after delivery of her fourth child. LARCs helped these families by preventing a recurrent pregnancy within a short time, and hopefully avoiding the trauma of high-risk pregnancy.

So how can providers make sure their patients get the help they need and have healthy outcomes? The answer is simple — education. Educate yourselves, educate your patients, and educate your practicing institutions. In a recent study of over 800 family planning care providers, only 33.1 percent of clinicians considered immediate postpartum patients to be candidates for intrauterine contraception.26 In reality, nearly all women are candidates and can benefit from immediate LARC placement after birth.

When educating your patients, it's important to discuss the different kinds of LARC. How much does each cost? What is the insurance coverage? Is an IUD or an implanted device a better fit? The fact of the matter is, when a patient has high cholesterol you don’t give them a chart of different medications comparing statins, fibrins, and bile acid sequestrants. You don’t ask the patient to choose which one they would prefer to use. You make a recommendation based on what is most effective, and modify from there based on the patient’s insurance and preference. Similarly, the CDC classifies birth control methods based on their effectiveness.21 LARC should be the first-line treatment for unintended pregnancy, just as statins are first-line for high cholesterol. If cost is an issue, remember that immediate postpartum LARCs offset the higher initial cost of placement by dramatically reducing the costs of subsequent pregnancies that can occur in the interim between delivery and delayed placement.22

Published financial analyses suggest that immediate postpartum LARC is cost-effective, with one study estimating savings of $2.3 million over two years per every 1,000 Medicaid-eligible woman.6,26,27,29

The next step in getting your patients immediate postpartum LARCs is access to care, which is not so easily accomplished. Most insurers, including publically funded programs like Medicaid, will not reimburse the providers or facility separately for the cost of the LARC device or procedure outside of the global fee for delivery. This can hinder a physician’s and a hospital’s ability to provide this service without reimbursement.21,24,25

Currently, only 12 state Medicaid agencies offer immediate postpartum LARC coverage, and South Dakota is not yet among them; these state models demonstrate that modification of billing policies to reimburse for the provision of immediate postpartum LARC in addition to the global fee is feasible, and is an important first step in improving access.15

In June of this year, the American Medical Association took a stance on this issue. The House of Delegates voted on a resolution that was brought forth from the Medical Student Section, entitled Increasing Availability and Coverage for Immediate Postpartum LARC Placement. The AMA voted to adopt this policy, which asks the following:

(1) That our American Medical Association recognizes the practice of immediate postpartum and post pregnancy LARC placement to be a safe and cost effective way of reducing future unintended pregnancies

(2) That our AMA support the coverage by Medicaid, Medicare, and private insurers for immediate postpartum LARC devices and placement, and that these be billed separately from the obstetrical global fee

(3) That our AMA encourage relevant specialty organizations to provide training for physicians regarding (1) patients who are eligible for immediate postpartum LARC, and (2) immediate postpartum LARC placement protocols and procedures.

This policy has the potential to change the practice of obstetrics by increasing patients’ access to care in all states. In implementing such reform, we as providers can aim to foster healthier pregnancies.

Physicians devote themselves to health and improving outcomes for their patients. What better way to promote healthy outcomes than with preventive medicine? Pregnancies spaced less than 18 months apart carry incredible risks for both mother and child, and are easily preventable. It has been proven time and again that LARCs are the most effective form of reversible contraception, and with them we can empower patients to space their pregnancies appropriately. Providers must be informed about the options for LARC and for immediate postpartum LARC placement so that they can in turn inform their patients. By educating yourselves, your patients, and your institutions, and by supporting and implementing policy changes that will improve access and coverage for immediate postpartum LARC, physicians can fulfill their oaths to uphold the health of their patients. Immediate postpartum LARCs are an easy solution to a tragic, preventable problem, and access to this care can save mothers, babies, and families.

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.
## Effectiveness of Family Planning Methods

<table>
<thead>
<tr>
<th>Most Effective</th>
<th>Reversible</th>
<th>Permanent</th>
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<tbody>
<tr>
<td>Implant</td>
<td>LNG - 0.2%</td>
<td>Female Sterilization (Abdominal, Laparoscopic, Hysterosopic)</td>
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<tr>
<td>0.05%*</td>
<td>0.15%</td>
<td>0.5%</td>
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<tr>
<td>Intrauterine Device (IUD)</td>
<td>Copper T - 0.8%</td>
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<tr>
<td>9%</td>
<td>9%</td>
<td>12%</td>
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### Injectable
- Injectable: Get repeat injections on time.
- 6% pregnancies per 100 women in a year

### Pill
- Pills: Take a pill each day.
- 9% pregnancies per 100 women in a year

### Patch
- Patch, Ring: Keep in place, change on time.
- 9% pregnancies per 100 women in a year

### Ring
- 9% pregnancies per 100 women in a year

### Diaphragm
- Diaphragm: Use correctly every time you have sex.
- 12% pregnancies per 100 women in a year

### Male Condom
- 18% pregnancies per 100 women in a year

### Female Condom
- 21% pregnancies per 100 women in a year

### Withdrawal
- 22% pregnancies per 100 women in a year

### Sponge
- 24% parous women
- 12% nulliparous women

### Least Effective

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<thead>
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<th>Fertility-Awareness Based Methods</th>
<th>Spermicide</th>
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<tbody>
<tr>
<td>Fertility-Awareness Based Methods</td>
<td>24%</td>
</tr>
<tr>
<td>Spermicide</td>
<td>28%</td>
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* The percentages indicate the number out of every 100 women who experienced an unintended pregnancy within the first year of typical use of each contraceptive method.

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Introduction

Amyloidosis is a diverse group of diseases that share a common pathogenesis of deposition of fibrillar sheets of misfolded, insoluble, aggregate proteins into one or many different tissues of the body. These diseases are the result of excess production of precursor proteins or of synthesis of abnormal proteins due to specific gene mutations. Although the proteins involved with the pathogenesis of amyloidosis are diverse, the amyloid fibrillar deposits share the common characteristic of apple-green birefringence in polarized light microscopy after Congo red stain. Another common characteristic is beta sheet fibrillar material when viewed by electron microscopy. Accumulation of amyloid in the heart leads to the loss of the cardiac architecture with impairment of diastolic and systolic functions.

Cardiac amyloid deposition can occur as a process limited to the heart or as part of a systemic disease.

The etiology of cardiac amyloidosis is most commonly due to primary forms: amyloid light chain (AL), hereditary mutations of the transthyretin protein, and senile deposition of wild type transthyretin protein. Overproduction of light chain or fragment of light chain proteins (kappa or lambda) and accumulation in various organs causes light chain amyloidosis. Specifically, AL usually is caused by plasma cell dyscrasia, which also can cause multiple myeloma. It has been shown that 10 to 15 percent of multiple myeloma patients develop AL amyloidosis.

This case details the presentation of a 60-year-old male with AL cardiac amyloidosis due to kappa light chains and multiple myeloma. It highlights the systemic manifestations, diagnostic evaluation, course of illness, and treatment.

Case Report

A 60-year-old male farmer presented for evaluation of progressive fatigue, dyspnea, weight loss, and chest pain. He and his wife felt that the decline began around three months prior to this evaluation. At that time, he presented for chest pain at his local emergency department after finishing the fall harvest. He underwent cardiac evaluation, with positive stress test leading cardiac catheterization. He was diagnosed with coronary artery disease, which resulted in placement of a drug eluting stent in the left anterior descending coronary artery.
In spite of this intervention, the patient felt like he continued to experience general functional decline in addition to reduced appetite, change in taste, fatigue, weight loss, difficulty speaking and swallowing. Two months after coronary stenting, he returned for evaluation of palpitations and was found to be in atrial fibrillation. He underwent electric cardioversion and was started on anticoagulation. Due to anorexia, rivaroxaban was changed to warfarin; however, the patient continued to decline.

The patient continued to have severe exercise intolerance and exertional chest pains with walking 20 yards. He had lost 25 pounds in three months. Eventually dyspnea has progressed to being present at rest. Physical exam showed normal heart rate and blood pressure of 100/60 mmHg. He appeared chronically ill, gaunt, and fatigued. His exam was notable for enlarged tongue without scalloping. He used accessory muscles of respiration at rest and there were fine crackles throughout both lung fields without wheezing. Jugular veins were estimated at 7 cm with negative Kussmaul sign. Heart sounds were regular and there were no murmurs or gallops. The apical impulse was not displaced. There was symmetrical weakness of proximal muscles, with difficulty sitting up in bed or rising from seated position. Neurological exam showed symmetrically diminished sensation at extremities, and blunted reflexes.

Initial laboratory evaluation was notable for troponin I of 0.3 ng/ml (0.00-0.03 ng/ml normal range). Following this trend, troponin remained at this low, but stable, elevation. Brain natriuretic peptide was also elevated at 3100 pg/ml (0-100 pg/ml normal range). The patient’s ECG (Figure 1) demonstrated low voltage in limb leads, left atrial enlargement, borderline intraventricular defect, nonspecific T wave changes, and left anterior hemiblock. Echocardiogram showed severe bialtrial enlargement, severe symmetrical thickening of left ventricular myocardium with increased echogenicity (“speckling pattern”), and a small pericardial effusion (Figure 2). CT of chest was notable for pulmonary interstitial edema, small pleural effusions, cardiomegaly with bialtrial enlargement (Figure 3). Due to dysphagia and weight loss, CT abdomen was completed and demonstrated non-specific thickening of the colon, CT of the pelvis uncovered a lytic lesion of the right ischium. This lesion was further evaluated with MRI of the pelvis, elucidating a benign lesion most consistent with fibrous dysplasia. However, this MRI also revealed diffuse osteopenia and heterogeneity of the marrow. EMG confirmed diffuse denervation with greater effect on the proximal muscles, consistent with amyloidosis. Serum protein electrophoresis revealed Kappa free light chain elevation at 467 mg/dl, with the upper limit of normal at 1.94 mg/dl. Kappa/lamba ratio
was 3,891.67. Urine protein electrophoresis also demonstrated this protein spike. Colonoscopy was completed with ileum and colon biopsies stained with Congo red demonstrated apple green birefringence with polarized light, consistent with amyloid. Biceps and rectus femoris muscle biopsies demonstrated amyloid deposits with Congo red staining as well. Bone marrow aspirate was analyzed and found 20 to 30 percent plasma cells, confirming both multiple myeloma and amyloidosis.

Thus, the diagnostic evaluation confirmed AL amyloidosis from kappa light chains and multiple myeloma. Due to the patient’s significant cardiac involvement, he was not a candidate for hematopoietic stem cell transplantation. He was initiated on a regimen of cyclophosphamide, bortezomib, and dexamethasone, planned for weekly treatment with six cycles. He received his first cycle of chemotherapy; however, he passed away at home a week later.

**Discussion**

The management of amyloidosis begins with classification and staging. Determining the etiology of the production of amyloid is a crucial step. Tissue diagnosis can be achieved by abdominal fat aspirate, salivary gland or rectal biopsy, or biopsy of organs suspected of involvement. Deciphering the nature of amyloid depositions can be completed by immunohistochemistry, mass spectrometry, and possibly DNA analysis.\(^{10,11}\) Biopsies from the terminal ileum, colon, rectum, biceps, and rectus femoris muscle all were diagnostic of amyloidosis. Assessment of the serum free light chain in the blood and urine resulted in elevated level of Kappa light chain spike. Finally, bone marrow biopsy revealed the presence of multiple myeloma responsible for the elevated kappa light chain level for the AL amyloidosis (Figure 4).

Cardiac amyloidosis generally portends a poor prognosis for most patients.\(^{12}\) Poor prognostic indicators noted in this case include the stable troponin elevation, pleural effusion, pericardial effusions, biatrial enlargement, and multisystem involvement. Mayo Clinic group, using N-terminal pro-B-type natriuretic peptide, troponin I, found that the median survival is 26.4 months with no abnormalities, 10.5 with one abnormal lab, and 3.5 months with both labs being abnormal.\(^{13}\) This very limited survival is consistent with that seen in this case. An average of 40 percent of patients with cardiac amyloidosis have an overall survival of less than one year. However, patients that survive beyond one year tend to have a more favorable prognosis.
The degree of systemic involvement is important in prognosis and may also limit the treatment options available to the patient. Evaluation of cardiac, renal, nervous, gastrointestinal, liver, lung, and soft tissue involvement should be assessed and evaluated if suspected. The presence of weakness and denervation of the proximal muscles was consistent with axonal injury that can occur in amyloidosis. Although it is not pathognomonic, this finding is consistent with amyloid deposition. This case also demonstrates gastrointestinal, soft tissue, and cardiac involvement. Comprehensive evaluation of all systems guides management and treatment options.

Treatment options for AL amyloidosis are relative to the severity and degree of system involvement. Autologous stem cell transplantation (ASCIT) is an option that can offer lasting cure for multiple myeloma and halt the production of amyloid, but the advanced cardiac disease demonstrated in this patient by elevated BNP, troponin and poor functional status disqualified this patient from ASCIT, which carries significant mortality that limits patient selection. Furthermore, chemotherapeutic treatments for multiple myeloma with certain side effects must be avoided, like vincristine due to neurotoxicity or adriamycin due to cardiotoxicity. Cyclophosphamide, bortezomib, and dexamethasone is a well-tolerated chemotherapy regimen that may stabilize disease, and following a three-month treatment, patients can be reassessed for candidacy for autologous stem cell transplantation. This is the option that was selected for management in this case. In patients with isolated cardiac amyloidosis, which occurs in about 5 percent of cases, cardiac transplantation may be an option. However, systemic disease is contraindication to this transplantation and disqualifies most patients. An important paradigm in the treatment of AL amyloidosis is that the treatment should not present greater mortality and morbidity than the disease itself, which ultimately limits therapeutic options.

Conclusion
This case characterizes the devastating course of AL amyloidosis. The patient transformed from virile to infirm in the course of four months, passing away within six months of the onset of illness. Appreciation of his disease process as multisystem are clues to the pathophysiology. Cardiac AL amyloidosis has a poor prognosis; improved treatment options are available. Patients benefit from evaluation at amyloidosis clinic where experts in this field can tailor treatment plans after thorough evaluation of the disease state.

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Wolf in Sheep’s Clothing
Subdural Empyema: A Rare Complication of Acute Sinusitis

By Mir H. Ali, MD, FAAP; and Chandra L. Miller, BS, BSN, RN

Abstract
The intent of this paper is to raise awareness to primary care and pediatric colleagues of how a clinically insignificant appearing condition like sinusitis can lead to a major complication. Subdural empyema is a rare but life-threatening complication of paranasal sinusitis, otitis media, or mastoid disease. We report a case of a 12-year-old male patient who originally presented with clinically insignificant symptoms and later developed intracranial abscess requiring aggressive neurosurgical intervention. We hope that this article will raise awareness among colleagues who can educate parents on high-alert symptoms to watch out for if the patient is discharged home after initial presentation.

Introduction
Subdural empyema is a rare but life-threatening complication of paranasal sinusitis, otitis media, or mastoid disease. This collection of purulent material between the dura mater and the arachnoid space presents as a classic clinical syndrome characterized by acute febrile illness leading to rapid, progressive neurological deterioration and potentially fatal outcome. Early recognition and management of subdural empyema is crucial to reduce morbidity and prevent mortality. We report a case of a 12-year-old male patient who originally presented with clinically insignificant symptoms and later developed intracranial abscess requiring aggressive neurosurgical intervention.

Presentation
A 12-year-old Caucasian male presented with altered mental status and left hemiparesis to a local emergency department (ED). Approximately 10 days prior to admission, the patient had presented to a local primary care physician with complaints of a few day history of rhinorrhea, cough and fevers up to 102 degrees Fahrenheit (F). It was also noted that the patient had not received a flu vaccine that year. He was diagnosed with influenza A and treated symptomatically. Two days prior to admission, he continued to have fever, poor oral intake and lethargy, and had also developed frontal headaches. The following day (one day prior to his ED admission) he returned with new complaints of sore throat, productive cough, nausea, recurrent vomiting with inability to tolerate oral fluids, and irritability. He was again sent home with symptomatic care recommendations and was prescribed oral rehydration and antiemetic therapy. However, during the night and the following morning, his parents noticed worsening mental status to include slurred speech, and left upper and lower extremity weakness. The patient reported to his mother that he was fine and did not seem cognizant of his neurological deficits.

At this point in time, approximately mid-morning of the day of the admission to the local ED, the family called 911 and the patient was transported via ambulance. Upon arrival, the ED nurse noted that the patient answered questions both slowly and inappropriately. He had left-sided weakness and a fever of 102 degrees F.

Routine laboratory tests were ordered (Table 1a), and an emergent diagnostic lumbar tap (Table 1b) and computed tomography (CT) scan was performed (please see next section for results discussion). Lab results showed clinically
significant hyponatremia and leukocytosis (Table 1a). The patient then received 1 gram of ceftriaxone and 1 gram of fosphenytoin. At this point in time air ambulance transfer was arranged to a nearby tertiary care center. Prior to transport, elective endotracheal (ET) intubation was performed for airway protection due to the patient’s relative bradycardia, mild hypertension and concern for evolving CNS process.

Hospitalization Course

The patient was directly admitted to the pediatric intensive care unit. Admission vital signs showed a temperature of 101.7 degrees F, heart rate of 102 beats per minute, blood pressure of 96/52 mmHg, respiratory rate of 18 on ventilator support, oxygen saturations of 97 percent on 30 percent FiO2 (fractional inspired oxygen content), and a weight of 42.8 kilograms. Initial physical examination revealed both a nasogastric and an ET tube were in place, and the patient was sedated and muscle relaxed. A complete neurological exam could not be performed due to the sedation and ventilator support. However, initial physical examination revealed that the patient’s head was atraumatic and normocephalic. His pupils were equal, round, reactive to light, 4 mm in size and briskly reacting. Disc margins could not be visualized with fundoscopy. Additional physical exam findings were negative. At this point in time, appropriate cultures (Table 2) were requested.

Preliminary results of the CT scan performed in the local ED showed acute sinusitis, specifically sphenoid, right maxillary, anterior ethmoid disease, and frontal sinusitis disease bilaterally. A chest X-ray showed a well-positioned ET tube with no pulmonary infiltrates, pneumothorax or pleural effusions. A continuous electroencephalogram (EEG) showed no seizure activity.

The patient was noted to have clinically significant hyponatremia requiring intravenous 3 percent hypertonic saline along with aggressive rehydration therapy. Empiric intravenous antibiotic therapy with ceftriaxone and vancomycin was initiated to cover for meningitis. The patient received fosphenytoin for seizure prophylaxis. Brain magnetic resonance imaging (MRI) and magnetic resonance venogram (MRV) studies were obtained and pediatric neurology was consulted.

The MRI study (Figure 1A-C) showed inflammation of the right frontal and lower frontal lobe with intradural extension and fluid collection. These findings were suggestive of meningitis, pansinusitis (right more than left) involving frontal, ethmoid and maxillary sinuses with air-fluid levels and mucocele thickening, right frontal lobe cerebritis versus ischemic changes, and right frontal subdural effusion or empyema. The MRV revealed no evidence of sinus thrombosis. At this point in time, the pediatric neurologist reviewed the scans with a pediatric neurosurgeon and both concurred with the diagnosis of cerebral edema along with subdural empyema, and recommended emergent surgery. Per the neurosurgeon’s request, 10 milligrams of intravenous dexamethasone was given and a multi-disciplinary team including a pediatric otolaryngology (ENT) surgeon was consulted to participate in the surgery to reduce the sinusitis.

Bifrontal craniotomy and intradural exploration with evacuation of subdural empyema was performed by the neurosurgeon. He noted extensive intradural purulent material and cultures (Table 3) were obtained. The most

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concerning culture results were positive for *Streptococcus*. The ENT surgeon performed a concurrent maxillary antrostomy, bilateral ethmoidectomy, and bilateral sphenoidotomy with bilateral sinus cranialization. A LICOX (brain oxygenation) and ICP monitor were also inserted to monitor brain tissue oxygenation and intracranial pressure. An infectious disease consult was obtained and metronidazole was added to provide anaerobic coverage.

Over the next few days, the patients' hospital course was complicated by refractory intracranial hypertension (ICH) despite aggressive therapy (osmolar therapy, sedation, muscle relaxation, pyrexia and seizure control) and he was placed into a pentobarbital coma. A repeat MRI showed signs of extensive meningeal enhancement with intermittent scattered subdural fluid along the right frontal and parietal convexities suggestive of additional areas of subdural empyema. This required a follow-up stereotactic fronto-parietal craniectomy with aspiration of the empyema again 10 days after the initial surgery. Subsequent bifrontal cranioplasty with autologous bone flap, right parietal cranioplasty with autologous bone flap, subfrontal, subgaleal and pericranial graft was performed after resolution of his ICH.

Six days after the final surgery, the patient was transferred to the pediatric floor under the care of the pediatric hospitalist team. He continued to receive inpatient occupational, physical and speech therapy. He was prescribed six weeks of outpatient intravenous antibiotic therapy with ceftriaxone and metronidazole through a peripherally inserted central line (PICC). At the time of discharge, he was noted to have residual dysphagia and dysarthria but was able to ambulate with assistance with improvement in his left sided weakness.

Follow-up with his local primary care physician two days after discharge showed some progress. He was alert and interactive but did appear to be having occasional word finding difficulties and his affect seemed flat. He continued to have some generalized weakness and mild balance issues. His vision and hearing were normal. At his initial infectious disease follow-up, eight days after hospital discharge, there were no focal neurological deficits noted and he had only minimally decreased strength in his left arm compared to his right arm. At his neurology follow-up, 14 days after discharge, he was noted to have some attention problems but no significant neurological deficits and seizure prophylaxis was discontinued. ENT follow-up showed no evidence of recurrent sinus disease. A repeat MRI showed no residual subdural abscess. Within one month of his inpatient stay, he was discharged from all therapy services and had his PICC line removed. The patient has since rejoined his school and resumed normal activity.

**Figure 1. MRI brain obtained at presentation. Impression indicates: A) Coronal post-contrast image demonstrates leptomeningeal enhancement along the surface of the right frontal cortex (orange arrows). There is also dural enhancement (green arrow) and small extra-axial fluid collection between the dura and cortex. B) Diffusion weighted image demonstrates restricted diffusion involving the right frontal cortex (orange arrow), suggesting cerebritis or ischemic change. The thin extra-axial fluid collection also restricts (green arrow) compatible with subdural empyema. C) Axial T2 image demonstrates right frontal sinus mucosal disease with an air-fluid level suggesting acute sinusitis.**
Discussion
Subdural empyema can occur as a complication of acute sinus infections, otitis media and mastoiditis, cranial trauma or surgery.1-3 Review of the literature confirms that adolescent children, and most often males, are at highest risk for developing sinusitis-induced subdural empyema.4-6 The most common presenting symptoms are non-specific and include sinusitis, fever, headache, and malaise.5,4 Often the pathologic development of this process can go undetected until more severe symptoms present such as worsening headache, seizures, slowed speech or changes in cognition, and hemiparesis.4 Fever and headaches specifically were the most common presenting symptoms and most patients have a normal neurologic examination.5 However, of those who did present with abnormal neurological exams, the most common manifestations were altered mental status, seizures, and hemiparesis.6,10 It is also important to note that patients were predominantly previously healthy in all studies. An epidemiological study by Piatt4 further implicated a seasonal pattern where mostly African American children, and those with asthma, are at higher risk for developing sinogenic intracranial abscesses. Socioeconomic status was not shown to have any effect on risk.4

Early imaging studies and follow-up should be encouraged as disease of at least eight days duration could be visualized radiologically.11 Although CT scans can facilitate diagnosis, MRI is considered the gold standard test for diagnosis of subdural empyema due to the increased sensitivity when compared to contrast CT scan.9,12

All articles were in agreement that the most common causative pathogens were from the Streptococcus species. Less prevalent culture findings included the Staphylococcus species, Enterobacteriaceae and Haemophilus.6,9,11 Staphylococcus aureus (including methicillin-resistant S. aureus, or MRSA) is also emerging as a cause of acute sinusitis and its complications in children.14 In regards to antibiotic treatment, the most commonly utilized therapy included the combination of a third generation cephalosporin (i.e., ceftriaxone), metronidazole and in some cases vancomycin.7,9,12,14,15 If MRSA is suspected than it is recommended to use vancomycin.14

It is important to be aware that almost all patients with sinusitis-induced subdural empyema will require some form of aggressive surgical intervention. The two most common procedures that have been reported are craniotomy and burr holes.2,6,8,12 Anti-seizure prophylaxis is recommended in all cases of subdural empyema.11

According to the literature, morbidity and mortality rates have improved in the last few decades. This is primarily due to effective antimicrobial therapy and the advent of advanced imaging modalities leading to earlier diagnosis.10 Previously, mortality rates as high as 41 percent had been reported.6,10 Recent articles, however, have reported mortality rates of less than 11 percent, and multiple studies had no patient deaths.5,8 Older age and neurological deficits at presentation are indicators of poor prognosis and residual deficits still remain a cause of significant disability in these patients.9,13,15 Long-term neurologic deficits reported include hemiparesis, cognitive deficits, cranial nerve palsy, aphasia, epilepsy, hydrocephalus, visual deficits and hearing loss. Early surgery performed within 72 hours of presentation was noted to have less disability and morbidity at discharge.5

Due to the high risk of complications and intensive management required by these patients, it is recommended that they be transferred to a multi-disciplinary health care center where, ideally, a team of pediatric neurosurgeons, neurologists, intensivists, ENT surgeons and infectious disease specialists are available to provide timely and comprehensive patient care.5,6,7,13,16

Conclusion
Our case report highlights the importance of early diagnosis and aggressive measures required to manage this life-threatening complication of sinus infection. We recommend early neuroimaging in all patients who have altered mental status with upper airway infections to facilitate prompt diagnosis and reduce morbidity and mortality. If intracranial infection is suspected, the patient should be transferred and managed by a multi-disciplinary team at a tertiary medical center.

The association of adolescent males being at highest risk remains unclear, and also indicates that the increase in recent cases may be due to either increased incidence or increased awareness.11 Further research, particularly epidemiological studies, is thus needed.

Acknowledgment
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REFERENCES


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Metastatic Adenocarcinoma of the Prostate Diagnosed in a Colon Polyp: A Unique Clinicopathologic Scenario

By Brian Joel Tjarks, MD; and DesiRae Muirhead, MD

Abstract
Adenocarcinoma of the prostate is the second most common cause of cancer-related deaths among males in the U.S. Metastatic disease commonly involves the bones, lymph nodes, lungs, liver, and brain. Rarely, colonic involvement is seen and it is generally due to direct extension to the rectum. It is exceedingly uncommon for distant metastasis to occur in the right colon and small bowel. We present a case of prostatic adenocarcinoma metastasizing to the appendiceal orifice in a 78-year-old male.

Our patient had a history of adenocarcinoma of the prostate diagnosed four years prior to presentation. He also had a history of adenocarcinoma of the distal colon 30 years prior which resulted in a partial colectomy and permanent diverting colostomy. Prior to his presentation, follow-up colonoscopies failed to reveal disease progression or additional malignancy.

During routine colonoscopy, he was found to have a 2.5 cm polyp near the appendiceal orifice. Histologically the polyp demonstrated colonic mucosa with an infiltration of the lamina propria by individual cells with abundant cytoplasm and round nuclei with prominent nucleoli. The neoplastic cells were strongly positive for PSA and negative for CK7, CK20, and CDX2 supporting a diagnosis of metastatic prostatic adenocarcinoma.

Metastatic disease of extracolonic origin arising in a polyp is extremely uncommon, but metastases have been reported to involve breast, ovary, stomach, esophagus, and kidney. This case contributes to the scarce information available regarding metastatic spread of prostate cancer to the ascending colon and enlightens the community of pathologists, surgeons, gastroenterologists, and urologists about this unusual presentation of a common carcinoma.

Introduction
Screening colonoscopy has significantly reduced the incidence and mortality of colorectal cancer. Rarely, endoscopy reveals metastatic cancer from extracolonic sites including the esophagus, stomach, lung, breast, kidney, ovary, and melanoma, to name a few. This can be an unpleasant surprise to both the patient and the provider. Involvement of the colon by metastatic adenocarcinoma of the prostate is a relatively uncommon finding. Generally speaking, colonic involvement by prostatic adenocarcinoma is confined to the rectum and is secondary to direct extension. Metastatic spread to the ascending colon and small bowel by prostate cancer has been reported in a handful of cases. We present a rare case of a 78-year-old male with metastatic adenocarcinoma of the prostate which was diagnosed in a colon polyp.

Case Report
A 78-year-old male presented to a surgeon for a routine screening colonoscopy. The patient had a history of adenocarcinoma of the distal colon diagnosed approximately 30 years prior to his presentation. This required an abdominoperineal resection and permanent diverting colostomy. The patient most recently underwent a colonoscopy nine years ago and no polyps were found. His past medical history is significant for high-grade adenocarcinoma of the prostate (Gleason’s grade 5+5=10), coronary artery disease, diabetes mellitus, and hypertension.
Records of the histologic specimen from the patient's adenocarcinoma of the distal colon were unavailable. Bilateral prostate biopsies were available for review. The left prostate needle biopsy showed mostly skeletal muscle tissue with focal infiltration by predominantly single cell prostatic adenocarcinoma with minimal glandular formation. Given the small size of the tumor within the specimen (less than 5 percent of the core) Gleason's grading was not performed; however, the lack of glandular formation and the presence of a single cell pattern was suggestive of a high-grade adenocarcinoma. Biopsies from the right side of the prostate showed a similar pattern of poorly-differentiated adenocarcinoma within the prostatic tissue characterized by infiltrative single tumor cells without gland formation. The tumor involved approximately 50 percent of one core and was given the Gleason's grade of 5+5=10 (Figure 1A).

During colonoscopy the colonoscope was passed through his right lower quadrant stoma to the cecum. He was found to have a 2.5 cm sessile polyp near the appendiceal orifice (Figure 2). At that time, the surgeon felt this was mostly likely a benign process and took biopsies with cold biopsy forceps. Three other small (less than 1 cm) polyps were found in the cecum and transverse colon. The three small polyps were diagnosed as tubular adenomas and a sessile serrated adenoma. Histologically the larger polyp demonstrated colonic mucosa with an infiltration of the lamina propria by individual cells with abundant cytoplasm and round nuclei with prominent nucleoli. The
neoplastic cells were strongly positive for PSA and negative for CK7, CK20, and CDX2. CK20 and CDX2 highlighted the benign colonic epithelium (Figure 1B-D). CK7 was negative. The lesion was compared to his prostate biopsy from four years earlier and the tumor cells were cytologically similar. Based on the patient’s history, and the histomorphology, and immunohistochemical profile of the tumor, a diagnosis of metastatic adenocarcinoma of the prostate was rendered. To our knowledge, this is only the second case of metastatic prostate cancer diagnosed in a cecal polyp. 13

Discussion
Adenocarcinoma of the prostate is the second most common cause of cancer-related deaths among males in the U.S. Over 240,000 new cases are diagnosed each year in the U.S. and up to 17 percent of patients will be found to have metastatic disease at the time of presentation. 17 The histopathologic diagnosis of acinar-type adenocarcinoma of the prostate is based on a pattern of features including architectural changes, nuclear abnormalities, cytoplasmic features, as well as findings within the lumen of the malignant acini. High grade tumors are characterized by either comedocarcinoma, or a single-celled cancer which may have vacuoles or signet rings, and does not form a glandular lumen. As one would expect, high-grade adenocarcinoma has a stronger association with metastatic spread than its low-grade counterpart. Specifically, histologic grade and tumor stage are strongly linked to hematogenous metastatic spread. 18 Before a tumor metastasizes, it will typically dedifferentiate to a moderate to poorly differentiated form and in general, will be at least 1 cm³ in size. Low-grade tumors rarely metastasize and metastatic disease is rarely described as being low-grade. Experts claim that metastatic lesions of unknown origin should not be ascribed to the prostate if the patient does not have a history of adenocarcinoma of the prostate with high-grade features. 19

The most common site for metastatic disease is bone (84 percent), followed by lymph nodes (11 percent), liver (10 percent), thorax (9 percent), and brain (3 percent). 18 Uncommon reports have shown prostate metastasizing to unusual sites such as the larynx, paranasal sinuses, oral cavity, kidneys, and adrenal glands. 20 The large majority (84 percent) of patients with lymphatic metastasis also have concurrent hematogenous metastatic spread (most commonly to the bone). Approximately one of five patients will present with multiple metastatic lesions. 18 Of those diagnosed with metastatic prostate carcinoma, up to 15 percent will present with atypical metastases or visceral involvement. The presence of visceral metastasis with or without bone involvement confers a worse survival compared with metastasis to the bone alone. 21 Proposed routes of spread for non-bone metastases include hematogenous “cava-type spread,” lymphatic spread, and direct infiltration. Given the rich lymphatic drainage of the prostate, many feel metastatic disease to the gastrointestinal tract most likely occurs via lymphatic channels. Direct invasion of the rectum and rectal seeding by prostate cancer have been previously described. 12 Relatively few cases, however, have reported metastatic spread to the distant bowel (small bowel, cecum, and rectosigmoid). Making the correct diagnosis of a metastatic process is crucial because it alters the treatment modalities utilized by urology and impacts the patient’s prognosis. This case contributes to the scarce information available regarding metastatic spread of prostate cancer to the ascending colon and enlightens the community of pathologists, surgeons, gastroenterologists, and urologists about this unusual presentation of a common carcinoma. The prognosis of our patient, given the visceral metastatic spread of his disease, is poor. Nevertheless, limited follow-up with the patient has revealed no obvious increase in morbidity secondary to his disease progression over 12 months later.

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.

About the Authors:
Brian Joel Tjarks, MD, Department of Pathology, University of South Dakota Sanford School of Medicine.
DesRae Murhead, MD, Department of Pathology, University of South Dakota Sanford School of Medicine.
### 10 Leading causes of death by year, South Dakota, 1994 – 2015

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Heart: Heart disease
Cancer: Malignant neoplasms
CLRD: Chronic lower respiratory disease, also as COPD chronic obstructive pulmonary disease
Liver: Chronic liver disease and cirrhosis
Kidney: Nephritis, nephrotic syndrome and nephrosis
Senility: Senile and presenile organic psychotic conditions
EHPID: Essential (primary) Hypertension & Hypertensive Renal Disease
Mental: Organic, including symptomatic, mental disorders

*2015 population estimates by age group needed to calculate age-adjusted rates are not available at this time.

Local physicians or coroners assign and document causes of death, and then submit death certificates to the South Dakota Department of Health. Over the past 22 years, 1994-2015, the two most common causes of death were heart disease and cancer. During these years heart disease deaths have dramatically decreased, whereas cancer deaths increased slightly. Stroke deaths declined and were the sixth leading cause of death in 2015. Deaths due to accidents, chronic lower respiratory disease, Alzheimer’s, diabetes, suicide, and liver disease have increased during these years.

Age-grouped deaths during the 5-year period, 2011-2015, show accidental deaths as the leading cause of death in children and young adults in the 1-44 year age groups, cancer death is most common in the 45-84 year age groups, and heart disease death is most common in the elderly 85 years and older.

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Top 5 causes of death are highlighted.

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body in Motion

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Physicians’ Use of Compliance Gaining

By Kayla Pochop Riswod, MS II; and Jill Tyler, PhD

Abstract
A qualitative analysis was conducted exploring physicians’ use of compliance gaining strategies used in attempts to change patient behaviors. Analysis revealed six sets of perceptions that describe the ways physicians manage the difficult task of compliance gaining – recognition of failure, tolerance of outside credibility, labeling the “art of medicine,” assigning patient responsibility, placing patients on “their journey,” and acknowledging “the event.” Analysis also identified three key sets of strategies that physicians use in compliance gaining: 1) message strategies (which include direct and strategic attempts to manage interactions about behavior change); 2) relational strategies (which emerge from the relationship shared by the physician and the patient); and 3) personal strategies (which include the individual physician’s approaches to compliance gaining). Eight message strategies, three relational strategies, and two personal strategies are identified and described.

Introduction
Improving patient health outcomes is of critical importance in today’s health care environment. Successful treatments and preventative efforts are directly related to patient compliance with a therapeutic plan or recommended behavior change. Gaining compliance from patients, however, is a difficult and complex endeavor for physicians. Physicians use a variety of strategies to both manage the task of compliance gaining as well as to elicit better compliance from patients. The specific strategies that physicians use reveal much about the way physicians view, feel, and handle the difficulties of patient compliance gaining. The links between physician communication behaviors and strategies and patient outcomes is well-established. An exhaustive meta-analysis found that effective physician-patient communication is highly correlated with better patient adherence, as well as patients’ satisfaction, health status, and recall of information. Communication, then, can play a critical role in overall patient health outcomes, but previous research has proven that the nature of that communication is complex and contested. Researchers explored the verbal aggressiveness of physician compliance-gaining strategies from the perspective of the patient, demonstrating that patient satisfaction is positively related to physicians’ use of non-aggressive strategies. However, the researchers point out that because most patients are in mid-range loci of control, physicians can likely gain more compliance by using more verbally aggressive strategies. Subsequent studies have shown that patients are more satisfied when physicians use relationally-oriented messages, or use compliance-gaining strategies that manipulate the consequences of a certain action. Further, messages that link compliance with patient values were able to increase patient adherence to treatment initiatives. Health care workers’ use of reciprocity in dealing with patients referenced the idea of commitment – letting patients know how they, as healthcare workers, are committed to the patients, encourages patients, in turn, to reciprocate this commitment in some way. Other research has found that the greater a physician’s humor orientation, the more likely the physician will use a variety of compliance-gaining strategies. As this review demonstrates, previous research on compliance gaining in the physician-patient relationship is limited and has focused on patient satisfaction and self-report, lacking the personal perspective of practicing physicians.
Method
The present study involved qualitative research, which consisted of open interviews with primary care providers and specialists in South Dakota. This research involved self-report interviews in which physicians reflected on the ways they interact with and attempt to persuade their patients to adopt healthy behavior changes. This study provided a unique glimpse into the way that physicians think and talk about their interactions with patients over time.

In order to conduct this research, approval was granted by The University of South Dakota Institutional Review Board. Physicians were contacted via email and asked to participate in a semi-structured interview about their use of persuasion to gain patient compliance. Physicians were not given any incentive to participate. Physicians signed an informed consent prior to their participation in the study. The interview protocol consisted of questions regarding changing patient behavior (i.e., “Do you consider part of your job to involve changing patients’ behavior?”). Specifically, questions solicited descriptions of successful and unsuccessful attempts on the physician's part to change patient behavior (i.e., “Can you tell me about a time that you were successful at changing a patient’s behavior?”) as well as strategies physicians used in an attempt to gain compliance (i.e., “Do you do anything special in an attempt to ensure your patients follow your treatment instructions?”). Interviews were audio recorded and transcribed for analysis. The formal analysis process involved several readings and re-readings of the transcriptions, and an iterative process of categorization and comparison. Through repeated readings, themes and physician strategies emerged and were tested.

Twenty-four participants were included in this study. All 24 were practicing physicians throughout the state of South Dakota. Ages of participants ranged from 30 to 65. One physician was semi-retired and working only part time. The participants consisted of 13 specialists (four surgeons, one anesthesiologist, four emergency room doctors, two obstetrician gynecologists, one podiatrist, and one physical medicine and rehab) and 11 primary care physicians (two hospitalists, one pediatrician, five family practitioners, and three internists). Interviews were conducted by the primary researcher, and lasted from 20 to 45 minutes in length. Participants were all Caucasian and included eight women and 16 men. Pseudonyms are used in exemplars to conceal physicians’ identities. Several perceptions that physicians share about their approaches to compliance-gaining were identified, along with a taxonomy of compliance gaining strategies.

Results
The results of this study informed two important areas of physician-patient interaction and behavior change. The first focused on the personal perceptions, reflections, and roles the physicians navigated as they sought to secure their patients’ health. The second focused on specific strategies physicians use when attempting to gain compliance from patients. Illustrative examples of physician responses, identified with pseudonyms, are included to illustrate physician thoughts, opinions, and feelings.

Physician Perceptions
Perceptions were identified as overarching thoughts and feelings acknowledged by the physicians as they reflected on compliance gaining attempts with patients. Often, these perceptions involve an attempt by physicians to explain the difficulties associated with compliance gaining and to offer accounts to explain successes and failures. These perceptions reveal how physicians make sense of the compliance gaining aspect of their jobs and provide insight into the ways physicians manage the task of compliance gaining. These physician perceptions provide a sort of justification for physicians themselves of the finesse, frustration, and mystery of compliance gaining. Analysis revealed six physician perceptions – recognizing failure, tolerating outside credibility, seeing the “art of medicine,” assigning patient responsibility, placing patients within “their journey,” and experiencing “the event.” These sets of perceptions, and accompanying exemplars, illustrate ways that physicians negotiate and manage the difficult task of compliance gaining.

Recognizing failure. Simply recognizing one’s failure to gain compliance from patients was expressed frequently with disappointment and even regret. The recognition of failure also served as a way for physicians to deal with the difficulty of compliance gaining through admissions of their own inadequacy or defeat in one way or another. In addition, the recognition of failure functioned as a way of coping with frustration or validating the fact that not every patient will be successful. Many of the physicians were hard on themselves and described failures with frustration (Mark: And so you have to suck it up and go, “ok, you know, you can’t win them all…”).

Tolerating outside credibility. Physicians described their realization of the inadequacy of their own credibility with patients. Physicians often relayed their frustration with
the fact that patients would take the suggestions of outsiders (family, friends, and neighbors) over those of the physician. Physicians also expressed frustration with patients’ reliance on the media for opinions on health issues. Patients experience all kinds of influences and pressures outside of the exam room, and physicians know that these influences have a strong impact on patients’ beliefs and behaviors. (Brandon: Oh sure. Yeah and sometimes they have their neighbors. “Well my neighbor said I can do this…” I say, “Is he a doctor?” “Well, no. He’s a farmer.” I say, “Why are you listening to him?”)

Seeing the “art of medicine.” This perception stems from physicians’ feelings that medicine involves much more than just book smarts and medical knowledge, and that there is a sort of mysterious, instinctive ability to successfully care for patients. Physicians described the art of medicine as something enigmatic that can only be learned through time and experience. The perception of the “art of medicine” provides a way for physicians to justify the complexity and difficulty of compliance gaining but also places it outside the realm of learned skills or abilities. (Mark: And, uh, that’s something that took a career to learn how to do. Nobody teaches you that one because there’s nothing scientific. (laughs) It’s all art).

Assigning patient responsibility. Many physicians shared the perception that health care has to be a team effort, and neither physicians nor patients can achieve success alone. Physicians point out that it is ultimately the patient’s decision to change, and that the patient is the one who makes or breaks a successful treatment plan. Some physicians use the perception of patient responsibility as a way to define their place in patient behavior change. Physicians relieve some of the pressure on themselves as the sole catalyst for changes in patient outcomes. Physicians talk about the patient’s journey as a factor out of the physician’s control, as if the timing can serve as a sort of push in one direction or the other for the patient. (Jenny: Sometimes, the patient just needs to be at the point they are willing to accept help and ready to make a change to make their life better).

Experiencing “the event.” The event is described as a dramatic occurrence that happens outside of the physician-patient interaction that causes the patient to change his or her behavior. Behavior change occurs after an event because the patient is somehow convinced of the frailty of his or her health or realizes the importance of behavior change for his or her health. The event serves as a sort of push for the patient to make behavior changes. As one physician described, the event is a sign of failure that is significant enough to cause the patient to change his or her behavior. The event can be anything from a heart attack, to a visit to the emergency room, to a lab result. Many physicians feel that the occurrence of an event is the most reliable way of soliciting compliance from a patient. (Howard: You can try to send them to, you know, to get educated, but until they have that moment where all of a sudden they realize, “Gee! This is serious!” they’re probably not going to change, in my experience).

Physician Strategies

The second area informed by this study is the actual strategies constructed, created, and used by physicians when attempting to encourage patient behavior change. These insights include three key sets of strategies: 1) message strategies (which include direct and strategic attempts to manage interactions about behavior change); 2) relational strategies (which emerge from the relationship shared by the physician and the patient); and 3) personal strategies (which include the individual physician’s intentional approaches to compliance gaining). Analysis revealed eight message strategies, three relational strategies, and two personal strategies. These strategies provide a glimpse of the tactics physicians use and provide insight into effective strategies.

Message strategies. Message strategies involve direct and strategic attempts to manage interactions about behavior change and include family, fear, creation of the event, humor, narratives, options/involvement, small goals, and forewarning. Each of these strategies focus specifically on how physicians structure messages when attempting to gain compliance from patients.
Family – The family message strategy involves the physician’s focus on the patient’s family as a persuasive tool. Physicians often strategically bring up the patient’s family as a way of gaining compliance. The family message strategy is characterized by the physician using the patient’s family as leverage to convince the patient to improve health. Physicians also use a patient’s family as a way to increase the patient’s commitment to behavior change, realizing that they are soliciting the family’s support as well as the patient’s. (Jenny: We also try to engage the patient’s family to try to help convince a patient to change).

Fear – Although they were reluctant to admit it, physicians often strategically use fear in their messages to patients as a way of gaining compliance. The fear strategy is categorized by the physicians constructing a message that frightens the patient in one way or another, usually by constructing a threatening future consequence of the patient’s failure to adhere to treatment and behavior changes. I started referring to these strategies as the use of “casual fear” as coined by one physician because physicians expressed discomfort with the idea that they were overtly instilling fear in their patients. (Shari: A little bit of fear… That seems to sometimes, unfortunately, be your best tactic).

Creation of “the event” – As described in the physicians’ perceptions, many physicians also use a calculated message strategy in which they create an “event.” These strategies are characterized by the physician either pointing out or “creating” an event that convinces the patient to comply with the requested behavior change. The event is some sort of startling, defining moment for the patient that with the requested behavior change. The event serves as evidence of the necessity of behavior change in the patient. Physicians were so aware of the power of the event, in fact, that they were sometimes willing to “create” an event in order to convince their patients to comply. In the creation of an event, physicians would construct a message that attempted to give patients the feeling of an event, creating a convincing reason for patients to comply. Some physicians, for instance, talked about wanting to have a bad test result or symptom to be able to use as evidence in an attempt to convince the patient to comply. The creation of the event involves giving the patient some sort of “proof” that behavior change is necessary. (Sheila: If there’s something I can visually show them, or if it’s their saturations, or a number or something concrete that I can give them, I think that’s more effective with people than just saying, “Oh yeah, smoking’s going to kill you someday.” Or those types of things).

Humor – Many physicians use humor as a message strategy to convince patients to comply with the requested behavior change or treatment plan. Physicians use humor as a way to relate to and judge the demeanor of their patients. Some physicians felt that creating humorous messages gave them a better chance at gaining compliance from certain patients. (Steven: I like to joke around with them too. So that always helps).

Narratives – These strategies involve the physician’s construction of a message that has some sort of story used as a way to gain compliance. Often these narratives are stories about previous patients’ successes or failures. Many physicians feel that creating a message with a narrative helps make the conversation more personal and allows patients to think about the suggested behavior change in a new or different way. Sometimes the physician’s use of a story can help a patient look at the bigger picture and affect a change in his or her thinking. (Bill: I’ll give them reasons why they should change, or, you know, success stories from people in their peer group who have made these changes and here are the benefits they saw).

Options/Involvement – This strategy featured the physician’s messages focusing on making the patient feel involved in the treatment decision as a way of gaining compliance from that patient. Physicians described using messages that make patients active participants in their healthcare. Framing medical advice as options that are then chosen by the patient might make the patient more committed to behavior change. Physicians create messages that utilize options and involvement in decisions as a way to help the patient focus on his or her goal, identify obstacles, and vocalize what they want out of their health care. To elude resistance to suggested behavior change, physicians avoid constructing messages that lack options or involvement for the patient. (Candice: I try to make them realize what the benefits are and really get them on board with the plan… You try to make them an active participant in it).

Small goals – This strategy involves the framing of messages in a way that presents a treatment plan as a series of small steps toward a larger goal, rather than a comprehensive behavior change. As some physicians point out, setting smaller goals is beneficial for compliance gaining because patients will start to see results with the small goals, and these results will bolster commitment to the
behavior change. Setting small goals also keeps patients from feeling overwhelmed with a desired health behavior change which will keep them from rejecting the treatment plan altogether. In addition, small goals are important because they remind patients that even little steps can make a difference toward overall behavior and health change. (Debra: If you can pick one little thing that they can start to work on and then you whittle away at it and little lifestyle changes over time make a big difference so I try to pinpoint something by taking their history that I can narrow in on and then each time try to add to it).

**Forewarning** – The final message strategy identified is forewarning, which is characterized by the physician’s subtle mention of a subject that would be discussed with the patient at a later visit. Some physicians talked about using this strategy as a way of warning patients of their future prognosis. Some physicians also talked about using the forewarning message strategy as a way to prepare patients for setbacks by giving them more realistic expectations for their attempted behavior change. Finally, physicians constructed messages using forewarning as a way of preparing patients for future conversations. By bringing up a topic that will need to be broached in the future, physicians give patients a chance to start getting used to the idea before the compliance-seeking conversation actually occurs. (Rick: And then I might say, “And don’t worry. We’re not gonna do it today, but somewhere down the road, Tom. Somewhere down the road, we’re gonna talk about this other stuff”).

**Relational strategies.** Relational strategies are messages which emerge from the relationship shared between the physician and the patient and include rapport/trust, values, and roles. Each of these strategies involves the physician’s influence on the physician-patient relationship and the emotional feeling of that interaction. In addition, relational strategies involve the creation of the right environment for gaining compliance.

**Rapport/trust** – These strategies originate from the idea that it is hard to convince someone to change their behavior unless you have a positive relationship with that person. As physicians note, it is much easier to gain compliance from a patient if the physician has established rapport and trust with that patient, thereby creating the ideal context for compliance. As one physician notes, gaining compliance from a patient is all about making the patient feel comfortable and creating a caring and trustworthy relationship. (Kim: A lot of times...the more they’ve come to trust you and value your judgment, and your guidance, the more compliant they will be. When they don’t really know you, you know, they may not put as much weight into what you say).

**Values** – These strategies are used when physicians try to relate to the patient’s principles, motivation, or autonomy. Appealing to a patient’s value system is derived from the general idea that a patient will comply with a treatment plan that is consistent with what the patient already believes. Patients will only comply with behavior change if they are invested in that change. As many physicians noted, patients have different levels of motivations for taking action, and what motivates a given patient differs as well. In order to gain compliance, physicians need to ensure that they are appealing to what motivates each individual patient. (Debra: They have to, they have to decide, you know, independently and autonomously, that they’re going to change their behavior, otherwise it’s just not going to happen).

**Roles** – Physicians use a variety of different roles as a form of relational strategy, characterized by the shared expectations and adaptations that emerge in interactions. Physicians play roles as a way of creating the best relationship for each physician-patient interaction. Physicians may describe themselves as a coach, a teacher, a parent, or even a friend, for example, while the patient would be a player, a student, a child, or a friend as the complement. Role-defining allows physicians to be more self-aware in their interactions with a patient. Physicians often use this as an attempt to break down the barrier created by stereotypical depictions of the doctor-patient relationship. Using the strategy of roles also allows physicians to better classify, define, and understand their relationship with patients. Reflection on the appropriate or inappropriate use of roles also allows physicians to be more aware of what type of relationship is best for compliance gaining attempts with each patient. (Jodi: I mean it’s just like having a personal trainer – you know it, but you need someone to keep helping you and coaching you).

**Personal strategies.** Personal strategies involve the individual physician’s approaches to compliance gaining and include persistence/repetition and characterization of patients. These strategies take place within the physicians themselves.

**Persistence/repetition** – This strategy involves the physician’s internal vow to keep working for behavior change in a
patient even when it is difficult or seems futile. Using this strategy, physicians approach compliance gaining through persistence with patients and repeating the guidance and advice over several visits. Many physicians use persistence and repetition as a way of breaking down the defenses a patient has established against behavior change. Physicians stress the importance of the persistence and repetition strategy because behavior change is neither easy nor quick. It takes many attempts to be successful, and thus physicians should expect many attempts to gain compliance as well. Often repeating the message just one way doesn’t work; the patient might reject the treatment plan. Instead, physicians often have to repeat a message in several different forms before it resonates with the patient. (Bill: I just kind of keep chipping away at the defenses until sometimes they’re going to capitulate, sometimes they won’t. But that would be my biggest recommendation, is just be persistent).

Characterizing patients – Physicians use the strategy of privately characterizing patients to help them approach each interaction differently and appropriately. This categorizing, labeling patients according to similar types based on previous experiences with other patients, allows physicians to better judge how to treat each patient. It also provides physicians an avenue to justify, rationalize, and better understand their successes and failures with certain patients. (Mark: It’s that he’s a tough nut to crack).

Discussion

The purpose of this study was to identify the ways physicians perceive and manage the difficult task of compliance gaining in physician-patient interactions. It is clear that physicians use many different means to manage the difficulties and accomplish the objectives of patient compliance. Overall, this study advanced understandings of how physicians approach the task of compliance gaining, and revealed how compliance-gaining strategies are selected and enacted in contemporary physician-patient interactions. These findings confirmed some previous research, but reflected changes in how physicians perceive their relationships with patients, revealing much more personal investments and connections with their patients and with their patients’ health outcomes.

Physician sense-making was a key foundational finding of this study. No other published research has centralized the voices and experiences of practicing physicians in regard to compliance gaining. Every respondent acknowledged that patient behavior change was a key function of their role as physicians, and that gaining patient adherence to advice and treatment plans was a very difficult part of their job. Participants often voiced the realization that the challenges they faced in changing patient behavior were not unique to their experience or practice, but that this task, and the attendant frustrations, were shared by other physicians as well. Further, to demonstrate the value of this study for the communication discipline, physicians revealed that they had not understood this issue to be a communication issue and did not typically think about how critical communication is to their job. The first and primary result of this study was the physician perceptions of their management of the task of compliance. These perceptions inform the ways the physician explains and justifies the difficulties and finesse that compliance gaining entails. The ways that physicians make sense of their personal goals and expectations must inform ongoing research on physician stress and well-being, as well as research into the effectiveness of physician strategies.

The strategies revealed in this study are divided into message strategies, reflecting the techniques used in interactions; relational strategies, reflecting the dimensions of satisfaction and partnership-building that take place between the physician and the patient; and personal strategies, reflecting the health care professionals’ orientation to the communicative tasks of compliance gaining. Physicians use message strategies as a way to tailor their messages in an attempt to persuade patients to comply. These strategies involve the strategic construction of messages that will serve to convince patients to comply with medical instructions. It is clear that physicians are mindful of selecting and enacting these strategies but admit their lack of knowledge or preparation for these sophisticated and imperative communicative dimensions of patient care. Relational strategies are characterized by the physician’s attempts to manage the interaction with the patient as a way to create the proper relational environment for the patient to be compliant. The physician’s use of these relational strategies uses the idea of reciprocity. The relational strategies allow physicians to monitor their interaction with patients in a way that creates an environment conducive to eliciting compliance from patients. Physicians use personal strategies in their actual approach to compliance gaining in order to be more successful in doing so.

The findings of this study do, however, support some of the propositions advanced in more recent research. A
similar study found that manipulating the consequences of a certain action, what I referenced as the message strategy of “creating an event,” resulted in both increased compliance and increased patient satisfaction. The present study also supports arguments about the efficacy of persuasive messages that build on a physician’s use of humor, and those that link compliance with patient values.

The use of fear appeals presents an interesting contradiction in this study. While physicians were reluctant to admit that they utilized simple appeals to fear, many of the persuasive messages they shared contained covert or even obvious threats, what one physician felt more comfortable naming “casual threats.” Physicians use messages of fear as another way to convince patients to be compliant, although their reluctance to acknowledge fear-inducing strategies reveals yet another complexity in physician-patient interaction.

The results of this study of actual physician perceptions and strategies have strong implications. The physician perceptions provide a glimpse into the practicing physicians’ lived experiences and illuminate the ways physicians think about, manage, and strategically negotiate compliance gaining with patients. These findings have profound implications for future research as noncompliance is becoming a critical problem in today’s health care system, and effective physician-patient communication is correlated with improved adherence, satisfaction, and health outcomes. While the physician participants were able to offer rich and varied descriptions, this study is somewhat limited by a homogenous sample, in terms of geographic, racial, and ethnic diversity. Further, while the number of participants is adequate to reach saturation, the generalizability of the findings is limited. Little is known about the effectiveness of each strategy used by physicians, and the strategies identified here enable further research to explore these questions. We recognize that physician perspectives lack comparison with patient perspectives and behavior, and future research should compare the perceptions of physicians with the perceptions of patients, to discern if the intentions of the physicians are interpreted accurately by the patients.

The study shows that physicians spend a great deal of their time engaged in persuading patients, and generally agree first, that managing patient adherence and behavior is a key element of their job as physicians, and then, that compliance gaining is complex and difficult. It is important for physicians to understand that they are not alone in their frustrations and difficulties with compliance gaining. Further, physicians can better understand how to manage the task of compliance gaining, how to tailor their messages in order to gain more compliance, how to create a relationship that fosters compliance, and how to approach compliance gaining as a whole. These results lend different strategies as tools for physicians to elicit better compliance from their patients.

Conclusion

This study examined the strategies that physicians use in compliance-gaining attempts with their patients. A variety of meaningful strategies and the justification for their use were identified, which help physicians better understand their use of compliance gaining. The study shows that physicians spend a great deal of their time engaged in persuading their patients, and generally agree that compliance gaining is complex and difficult. It is important for physicians to understand that they are not alone in their frustrations and difficulties with compliance gaining. Further, physicians can better understand how to manage the task of compliance gaining, how to tailor their messages in order to gain more compliance, how to create a relationship that fosters compliance, and how to approach compliance gaining as a whole. These results identify a variety of strategies used by physicians to elicit better compliance from their patients. If physicians can use these strategies to improve their attempts at compliance-gaining, they will see better health outcomes for their patients and greater job satisfaction.

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Introduction

For over 200 years, digoxin has been utilized in clinical practice for atrial fibrillation (AF). Despite a very long clinical history, there are currently no randomized-placebo controlled studies supporting the use of digoxin in AF patients, and the best available evidence is from observational studies or post-hoc analyses of randomized controlled trials. Of equal importance, digoxin is associated with serious adverse events of atrioventricular block, ventricular arrhythmias, and aggravation of sinus node dysfunction. The national database surveillance project estimated that digoxin leads to more hospitalizations due to adverse effects than any other cardiovascular medication, besides anticoagulants or antiplatelets. Thus, the current American Heart Association/American College of Cardiology/Heart Rhythm Society AF guideline does not recommend digoxin as a first-line agent. Several post-hoc analyses and observational studies have investigated the association of digoxin with increased mortality rates. Two studies showed the association but the other two studies reported the opposite conclusions. It remains controversial whether digoxin use should be completely reserved for the specific patient group who cannot be on a first-line therapy.

The Mortality Debate

Two post-hoc studies of the landmark Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) have investigated the association of digoxin use with the increased mortality rates in patients with AF. The first post-hoc analysis of the AFFIRM trial, published in 2012, found that digoxin was associated with an increased all-cause mortality (adjusted HR 1.41, 95 percent CI 1.19-1.67, p<0.001) and cardiovascular mortality (adjusted HR 1.35, 95 percent CI 1.06-1.71, p=0.016). There was no significant difference between genders, and increased mortality was seen regardless of concomitant HF. This analysis was limited by the fact that it is a retrospective study and unknown or unmeasured confounders may have overestimated mortality.

A second post-hoc analysis of the AFFIRM trial, published in 2013, examined the same cohort data but utilized propensity-matched cohorts to assess digoxin’s association with increased mortality. The results of this analysis indicated that digoxin use was not associated with increased mortality (HR 1.06, CI 0.37-2.23, p=0.827). This retrospective analysis was limited by the lower total mortality observed in the matched cohort (13.8 versus 16.4 percent in the original AFFIRM result). Also, the rigorous matching process may have excluded patients with higher digoxin doses and limited application of results to patients dissimilar to the matched cohort.

The Retrospective Evaluation and Assessment of Therapies in AF (TREAT-AF) study analyzed 122,465 newly diagnosed non-valvular AF patients within the U.S. Veterans Administration Healthcare System to assess the association of digoxin with mortality. The cohort was 98.6 percent male with a mean age of 72.1 ± 10.3 years old, and 36.8 percent had an eGFR less than 60 mL/min/1.73m.2 The study found a significant association with mortality based on digoxin use in multivariate Cox regression analysis (HR 1.26, 95 percent CI 1.23-1.29, p<0.001). As applied in the second AFFIRM analysis, a propensity-matched cohort was also studied, and digoxin remained associated with an increased mortality (HR 1.21, 95 percent CI 1.17-1.25, p<0.001). In comparison to the previous AFFIRM post-hoc analyses, the TREAT-AF study was restricted to new diagnoses of AF and had a much larger sample size. Potential limitations to these results include its non-randomized design, predominately male cohort, and no assessments of heart failure (HF) functional class or measurements of left ventricular ejection fraction.

The Outcomes Registry for Better Informed Treatment of Atrial Fibrillation (ORBIT-AF) study was a prospective outpatient registry aimed to describe digoxin use in patients with AF. Patients were eligible if they were 18 years of age or older and had EKG confirmed AF. Three
groups were formed from the cohort based on when or if digoxin was started during observation. They were divided as follows; those taking digoxin at study enrollment (prevalent digoxin use), those initiated on digoxin during follow-up (incident digoxin use), and those not on any digoxin at any time during the study. A final cohort of 9,619 patients was followed for a mean follow-up time of 22 months. Prevalent digoxin use regardless of HF status and incident use with HF was not significantly associated with increased mortality (prevalent digoxin with HF: adjusted HR 1.04, 95 percent CI 0.86-1.27; prevalent digoxin without HF: adjusted HR 1.22, 95 percent CI 0.95-1.58; incident digoxin with HF: adjusted HR 1.05, 95 percent CI 0.66-1.65). Interestingly, incident digoxin users without HF (n=1,167) did have a significant increased association with mortality (adjusted HR 1.99, 95 percent CI 1.12-3.56). 7

Finally, a meta-analysis of full size articles published in peer-reviewed journals from 1993 through 2014 investigated the effects of digoxin on all-cause-mortality in AF or HF patients. 1 A total of 235,047 AF patients were included with an average observation period of 2.57 ± 1.13 years. There were no randomized controlled AF trials and all were either retrospective or prospective observational studies. Overall, digoxin use was significantly associated with increased mortality risk in the AF subgroup (HR 1.29, 95 percent CI 1.21-1.39, p<0.01). 4 This was a large analysis of over 300,000 patients with a relatively consistent finding. It should be emphasized that meta-analyses are unable to access the individual patient data in the studies and rely only on the published information. Also, even though all of the studies attempt to reduce potential confounding of results, outstanding confounders cannot be completely excluded.

Conclusion

The use of digoxin remains controversial because of the conflicted conclusions with post-hoc analyses and observational studies and the lack of randomized controlled trials for digoxin use in AF. The use of digoxin should be evaluated strictly and reserved for patients with AF who cannot be on first-line rate control agents mainly due to hypotension.

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As promised, this month we will be examining the cost of care for diabetes, both nationally and regionally. Why focus on this condition? There is no valid debate within our profession anymore that our country is in the midst of an obesity epidemic, but let’s start with these sobering facts from the American Diabetes Association (ADA) – the estimated total economic cost of diagnosed diabetes in 2012 (the most recent year statistics are available) is $245 billion, a 41 percent increase from the previous estimate in 2007. In addition, also from the ADA: Nearly 30 million Americans have diabetes; 86 million Americans have prediabetes; $1 in $3 Medicare dollars is spent caring for people with diabetes; and $1 in $5 over health care dollars in the U.S. is spent caring for people with diabetes.

Along with asthma/emphysema and heart disease, it’s one of the areas DAKOTACARE has long been focusing on in our Disease Management (AKA, population health) programs. According to the CDC, individuals in the U.S. with chronic medical conditions drive more than 75 percent of health care spending! If their condition(s) is poorly managed, this leads to higher costs and lower clinical outcomes: higher rates of emergency and inpatient hospital rates are the most commonly tracked indicators here. In addition, three out of four of your patients are not on optimal medication therapy, including inadequate adherence to your prescribed therapy(s). Obviously those with diabetes oftentimes have co-morbidities, which increase the clinical challenges of managing their care: more complex drug regimens and adverse effects of multiple medications.

Specifically for diabetes, non-adherent individuals can cost up to $4,260 per member per year (PMPY) more than adherent members. It therefore behooves us all to work closer together to monitor, engage, and motivate patients to follow recommended therapies.

Now, more on cost trends here within our DAKOTACARE network. Before I begin, please realize that the figures I am about to show are considered “total cost of care” (of allowed charges, not billed) for all services incurred by individuals covered by us with either type 1 or type 2 diabetes in a one year period of time; including pharmacy, ancillary supplies, laboratory services, imaging, inpatient/outpatient facility charges, physician fees:

Roughly 42 percent of our fully-insured (i.e., HMO or Individual) member’s “episodes” over the last two to three years were at the lowest severity level of diabetes, meaning they had no co-morbidities or complications (at least from what we could tell from claims data). They incurred an average of $2,500 per year of services.

If an individual with diabetes has at least one co-morbidity (56 percent of our volume), their annual costs increase to roughly $3,000 per year, unless they require some type of surgery. You can then tack on around $8 to $10,000 per year.

A diabetic with a known complication (nephropathy, neuropathy, etc.) averages $12,000 per year, plus another $8 to $10,000 for any required surgery. Interestingly, this subgroup accounts for only 1.5 percent of our episode volume but with a nearly five-fold increase in annual health care costs. We implore you to do everything in your power to aggressively manage your known at-risk diabetic population in order to minimize the potential for their condition to progress to this level.

Our company is blessed to have strong data analytic capabilities. Like me, some of you may be more “visual learners.” For us I have compiled the data in a little different format below, utilizing additional grouping software which stratifies members not by complications, co-morbidity or whether they had surgery, but one of four severity levels based upon proprietary algorithms. I suspect we all knew more complex patients consumed more health care resources, but below is the hard numbers for one commercial managed care company. Again, keeping these people healthy can mitigate much of the excess costs.
associated with this demographic.

A few final words regarding what we’re seeing with diabetic medication trending, which is what first prompted me to choose this as our initial “cost transparency” topic; In 2015, antidiabetic agents consumed 11.1 percent of our pharmacy spend (which includes only oral or self-administered agents, not infused products). This is second only to rheumatoid arthritis drugs (think Humira/Enbrel) which are heavy on very high cost specialty drugs and a 17.3 percent increase in class spend from 2014. The primary driver of this trend is newer high cost branded agents coming to market, along with marked (15 to 20 percent) increases in average wholesale prices (AWP) by their manufacturers for the top agents, notably Novolog, Lantus, and Invokana. Our country’s Consumer Price Index rose 2 to 2.5 percent last year while the health care CPI rises approximately 5 percent per year. How can this be justified and what are we getting for this significant increase in annual medication cost? Are your patients now 15 to 20 percent healthier, or their A1c levels markedly improved across the board?

Good questions to ponder over the summer while you’re relaxing somewhere in the sun. Please have a great and safe summer, and don’t forget to wear your sunscreen (and a wide-brimmed hat, says my wife) when you are outside enjoying this great state!
Quality Focus: The Evolving World of Nursing Home Care

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

The Centers for Medicare and Medicaid Services (CMS) has proposed, established, and instituted a significant amount of change in long-term care for Medicare beneficiaries. Nationwide, there are 1.4 million residents in the nation’s 15,600 nursing homes. The Great Plains Quality Innovation Network (QIN) is helping to provide support for the facilities in our four states to promote reliable, compassionate quality care.

South Dakota facilities have been very active in signing on to our collaborative efforts in large numbers. This effort involves sharing tools, knowledge, and experience as well as promoting patient safety and reducing preventable conditions. Long-term care needs to be a part of the total care of patients as they are frequently discharged from the acute care setting to sub-acute or long-term care facilities with complicated conditions and ongoing treatment. These may include multiple medications and intensive services such as wound care or respiratory support. Providers in hospital inpatient settings have a responsibility to be aware of the long-term care facility’s capabilities and to assure that transfers are accomplished in a safe and timely manner.

In our 11th Scope of Work contract with CMS, Great Plains QIN has been working to increase awareness of adverse drug events and efforts to reduce their number. We also promote care transition across many venues to try and reduce avoidable readmissions and encourage appropriate transfer information. Collaborative groups are being formed and used in some of our larger communities to address medication safety and timely transfer. Specifically among medications there is an effort to reduce antipsychotic drug use for non-indicated conditions such as difficult behavior. Multiple providers in long-term care settings share their experience and offer alternative treatment methods for this difficult problem in these nursing home residents.

Other areas of concern include the safe use of such medications as opiates, oral diabetic agents, and anticoagulants. A significant and crucial area of concern is antibiotic stewardship. While important in all aspects of health care, it is truly a challenge in long-term care facilities. Great Plains QIN will soon institute a project for selected facilities to monitor and report on clostridium difficile or C diff infections. This will likely become more widespread and mandatory in the future as this problem grows.

Another upcoming factor to be aware of is the Improving Medicare Post-Acute Care Transformation Act of 2014, also known as the IMPACT Act. All of the details have not been fully implemented but a simple summary would be that this act has a goal of standardizing the assessment of patient data to help improve and coordinate care in these post-acute settings. The escalating cost of this care will require reimbursement rates according to the individual characteristics of the patient not merely the care setting. The timeline of this act takes place over the next few years as data is collected and payment reform takes place.

The QAPI or Quality Assurance Performance Improvement program is a tool that long-term care facilities can use to both assess quality (QA) and gain performance improvement (PI). It contains problem assessment strategies and improvement plans to assist all of the staff members of a facility and allow them to be involved in performance improvement. Those who provide care in these settings, including clinicians and medical directors, should be aware of the efforts of these collaborations and assist their projects whenever possible.

All of these projects involve the ever changing environment in nursing home care. The number of available facilities, beds, and staffing will become very demanding as our population ages. Rural states such as ours offer an additional challenge due to distance and sparse population. I encourage those interested in any of these efforts to become a member of the Great Plains Learning and Action Network available on our website at www.greatplainsqin.org. Please feel free to contact me for more information at stephan.schroeder@area-a.hcqis.org.
Ms. Z, a widow of 15 years and living alone, was reaching for something in a top cupboard, turned too fast, fell hitting her hip, and couldn't get up by herself. She lay on that cold linoleum floor for most of the night until she was finally able to crawl to a phone and call for help. In the emergency room we saw the tell-tale signs of an outward turned and shortened leg, and the suspected fractured hip was confirmed on X-ray.

Lifetime risk for hip fracture is 6 percent in men and 14 percent in women. After reparative surgery, 40 percent of people will require living in a nursing home for at least a period of time during recovery and 50 percent will permanently require a walker. The risk of death following hip fracture, even with the best of care, is about 10 percent at one month and up to 40 percent at one year. In 2011, hip fractures resulted in about 30 percent of all U.S. hospitalizations, costing about $5 billion and untold amount of suffering.

Prior to the development of a surgical repair for hip fracture, treatment involved six weeks of traction and bed rest, with something like an 80 percent death rate from blood clots or pneumonia. Pinning the hip with ivory pins was first tried in 1899, but it was in World War II that a German surgeon began regularly using metal rods to stabilize bone fractures. From that point on, hip pinning became popular, allowing patients to stand up and start walking within days of surgery, remarkably reducing death rate following hip fracture. Presently, the surgical repair of a fractured hip involves a new artificial ball and sometimes socket replacing the fractured hip in about a third of the cases. Pinning still works in most cases, however, and is quicker, easier, cheaper, and sometimes safer than the more invasive total hip surgery.

Ninety percent of hip fractures happen after falling, most often the result of inactivity and poor physical conditioning. Say it again, inactivity is the most important risk factor for hip fracture. Although advanced age, poor eyesight, blood pressure medicines, soft bones, neurological and cardiac conditions are also risk factors, the big danger comes from a lifetime of inactivity.

Physical activity and conditioning at any age, hardens bones, enhances strength, and helps avoid falls and fractured hips. So, unless you want to end up on a cold linoleum floor someday, get out and get walking.
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“For Your Benefit” is the SDSMA’s monthly update on programs and services available to physicians through their affiliation with the SDSMA.

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**SDSMA Leaders Announced at Annual Leadership Conference**

H. Thomas Hermann, Jr., MD, became the 135th president of the SDSMA on June 3 at the association’s annual banquet at the Hilton Garden Inn, Downtown Sioux Falls. Dr. Hermann has been a member of the SDSMA since 1986. Other officers announced at the banquet during the SDSMA Annual Leadership Conference are:

- President-elect – Robert E. Van Demark, Jr., MD, of Sioux Falls
- Vice President – Christopher T. Dietrich, MD, of Rapid City
- Treasurer – Michelle L. Baack, MD, of Sioux Falls
- Secretary – Robert J. Summerer, DO, of Madison
- At-Large Executive Committee Member – Benjamin Aaker, MD, of Brandon
- At-Large Executive Committee member – Kara L. Dahl, MD, of Aberdeen
- SDSMA Delegate to the American Medical Association – Mary S. Carpenter, MD, of Winner
- SDSMA Alternate Delegate to the American Medical Association – Robert L. Allison, MD, of Pierre

Congratulations to all officers elected!

Source: SDSMA staff
Scholarship Recipients Recognized at Annual Banquet

The SDSMA Foundation announced medical student scholarship recipients for the upcoming school year at the banquet during the SDSMA Annual Leadership Conference on June 3, and thanked donors for making a difference by supporting the next generation of physicians.

- SDSMA Freshman Scholarship – Erin Sternhagen
- Howard and Mary Ann Saylor Scholarships – Brendan P. Feehan, Max D. Fuller, and Garett J. Steers
- J. Michael McMillin Scholarship – Matthew Bell and Anthony Rauschenbach
- J. Michael McMillin Renewal Scholarships – Eric D. Habbe, Kathryn A. Kroeger, and Ethan Young
- Gov. George S. Mickelson Memorial Scholarship – Collin T. Michels
- Surgical Associates, Ltd. Scholarship – Kristin A. Wempe
- T.H. Sattler Scholarship – Benjamin D. Meyerink
- Wulbers Memorial Scholarship – Ryan Buse

Congratulations to all scholarship recipients.

Source: SDSMA staff

Proposed Rule on Advanced Practice Nurses

The Veterans Administration (VA) has published in the Federal Register a proposed rule that would allow advanced practice nurses (APRNs) (nurse anesthetist, nurse practitioner, nurse midwife, clinical nurse specialist) to practice independently within the VA health system. Pursuant to the proposed rule, APRNs would still have to follow applicable state licensure restrictions on the authority to prescribe and administer controlled substances. The proposed rule would also not change state law on APRN practice outside of VA facilities.

Through written communication and meetings with VA physician leadership on this issue, the American Medical Association (AMA) has encouraged the VA to maintain physician leadership of the health care team, and has submitted comments in opposition to the proposal. In addition, the AMA issued the following statement:

“The AMA is disappointed by the VA’s unprecedented proposal to allow APRNs within the VA to practice independently of a physician’s clinical oversight, regardless of individual state law. While the AMA supports the VA in addressing the challenges that exist within the VA health system, we believe that providing physician-led, patient-centered, team-based patient care is the best approach to improving quality care for our country’s veterans. We feel this proposal will significantly undermine the delivery of care within the VA. With over 10,000 hours of education and training, physicians bring tremendous value to the health care team. All patients deserve access to physician expertise, whether for primary care, chronic health management, anesthesia, or pain medicine. There are many examples from across the nation demonstrating that physician-led team-based care results in improved access to high-quality, cost-effective health care. From patient-centered medical homes to some of the nation’s largest health care systems, physician-led interprofessional team-based health care has proven to be a successful model in the delivery of health care. The nation’s top health care systems rely on physician-led teams to achieve improved care and patient health, while reducing costs. We expect the same for our country’s veterans, and look to these systems as evidence that physician-led, team-based models of care are the future of American health care. The AMA urges the VA to maintain the physician-led model within the VA health system to ensure greater integration and coordination of care for veterans and improve health outcomes.”
SDSMA Honors Members with Awards

The SDSMA honored South Dakota physicians on June 3 at the association’s annual banquet at the Hilton Garden Inn, Downtown Sioux Falls.

The SDSMA’s Distinguished Service Award recognizes a physician or lay person who has been of outstanding service to the medical profession in South Dakota. This year’s Distinguished Service Award was presented to John R. Oliphant, MD.

The Outstanding Young Physician Award was presented to Jennifer J. Tinguely, MD. This award is given to a young physician under 40 or within the first eight years of professional practice after residency and fellowship training. This physician is recognized for outstanding achievements, dedication and service to the community and the SDSMA at the local, state and national levels.

The SDSMA’s Community Service Award is presented each year to a physician who separates himself or herself through outstanding work in the area of community affairs. This year the award was given to two recipients: Mark L. Harlow, MD, and Patricia A. Peters, MD.

Keith A. Hansen, MD, received the SDSMA’s Media Award. The Media Award recognizes an individual who has helped promote the medical field and medical issues.

The Young at Heart Award is presented to a physician who has inspired young physicians as a mentor, role model and leader. This year’s recipient is David W. Bean, Sr., MD.

Mary J. Milroy, MD, of Yankton received the SDSMA’s Past President’s Award. This award is presented each year to the immediate past president of the SDSMA in recognition of their many years of work and dedication to organized medicine.

Nine physicians were recognized with the SDSMA’s 50-Year Award for medical practice in South Dakota. Physicians who received that award were: Frederick R. Entwistle, MD, of Sioux Falls, James A. Kunz, MD, of Rapid City, Charles M. Loos, MD, of Rapid City, Martin F. Petereit, MD, of Sioux Falls, Barry T. Pitt-Hart, MD, of Sioux Falls, Morris L. Radack, MD, of Yankton, Richard D. Schultz, MD, of Sioux Falls, Lonnie L. Waltner, MD, of Bridgewater, and Ronald O. Wyatt, MD, of Big Stone City. These physicians have been practicing medicine for a half-century and have contributed greatly to the medical profession.

Source: SDSMA staff
The Issue Is... Changes to the 835 Electronic Remittance Advice

South Dakota Medicaid has announced it is working to enhance and expand the information provided on the Accredited Standards Committee (ASC) X12N 835 electronic remittance advice (ERA or 835 transaction) with the intent of eliminating production of the state’s paper remittance advice (RA). There are two major changes the agency is encouraging physicians to be aware of:

- South Dakota Medicaid is expanding its use of the nationally accepted Claim Status Codes (CSC), Claim Adjustment Reason Codes (CARC), and Remittance Advice Remark Codes (RARC) to provide more detail and actionable information on pended or denied claims in the 835 transaction.

- For all claims submitted, either paper or electronic, South Dakota Medicaid will return an 835 transaction with paid or denied claims information and an Unsolicited 277U transaction with pended claims information, as required by HIPAA regulations. The 277U is not yet in production. Please review future listserv announcements regarding this addition.

The agency is asking providers to increase their acceptance and full use of the ERAs. South Dakota Medicaid stated it would like to understand the state of readiness in the provider community to move to only ERAs. Once the expanded use of the code sets is incorporated and tested with select providers, production of the paper RAs will stop for those providers who are ready to move to only ERAs. Providers will be sent a survey from South Dakota Medicaid that will be structured to assess the amount of time needed for providers to work with clearinghouses, revise internal systems, and determine their readiness to accept only the ERAs.

For those providers who submit paper claims, South Dakota Medicaid is building a secure, online portal from which you may access a printable version of your remittance advice. More information about the portal will be made available at a later date.

Those with questions may email medical@state.sd.us.

Source: South Dakota DDS

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

Legal Brief Highlight: Peer Review

The Health Care Quality Improvement Act of 1986 sets out standards for professional peer review actions. If a professional review body meets these standards, then neither the professional review body, nor any person acting as a member or staff to the body, will be liable in damages under most federal or state laws arising out of their peer review activities.

The proceedings, records and reports of peer review committees relating to peer review activities are confidential, not subject to discovery and generally are not admissible as evidence in any court or arbitration proceeding. Similarly, no member of the peer review committee or any other person in attendance at a meeting of the committee may be required to testify as to what transpired at such meeting. Members of a peer review committee who act in good faith are immune from claims for monetary damages arising out of their peer review activities. This immunity does not, however, extend to professional societies or hospitals acting in a peer review capacity.

For more information, download the SDSMA legal brief Peer Review at www.sdsm.org. Through the SDSMA Center for Physician Resources, the SDSMA has developed more than 40 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
South Dakota Medicine Special Issue

The 2016 special issue of *South Dakota Medicine* “is being published and sent to SDSMA members and all licensed facilities that offer care to patients. The special issue is dedicated to prescription drug abuse and diversion.

Copies have also been made available to mid-level providers to include physician assistants and nurse practitioners, as well as state agencies and policymakers.

If you would like to order additional copies of the 2016 special issue, contact the SDSMA office at 605.336.1965.

Source: SDSMA staff

SDSMA 2017 Member Directory – Great Advertising Opportunity!

The SDSMA is in final development of the 2017 Member Directory. This is a great opportunity for organizations of all sizes to reach physicians and health care facilities through the nearly 3,000 directories printed and distributed across the region. These directories are widely used and often-referenced throughout the entire year giving your organization continuous exposure.

Advertisers receive a copy of the directory which includes photographs of our more than 2,500 members as well as their office addresses, telephone and fax numbers, and their medical specialties. Directories are distributed in early January.

Maximize your advertising dollars for 2017. Contact Laura Olson at lolson@sdsm.org or 605.336.1965 today to secure a place for your organization’s advertisement. Camera ready ad copy is due Sept. 2. Call or email today for advertising rates, deadlines and to obtain a contract – take advantage of this opportunity!

Source: SDSMA staff

CME Events

Continuing Medical Education events which are being held throughout the United States (Category 1 CME credit available as listed)

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<th>July 2016</th>
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- Pulmonary hemorrhage
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- Respiratory failure
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