Four-Dimensional Breast Care

You’re multidimensional — a wife, boss, soccer coach, grandmother — and so is your body. Avera has added 3D technology to its suite of breast care services because sometimes we need to look at a different angle. Our fourth dimension of care encompasses a mind, body, spirit approach to working with you. This is in line with our health ministry and the entire breast care program, which tackles breast cancer diagnosis, treatment and support with the belief that every woman is unique. Avera — breast care that’s as multidimensional as you. Talk to your primary care provider to see if a 3D mammogram is right for you.

Avera

Schedule your mammogram today.

Avera.org/mammo
SPECIALIZED NEUROLOGY CARE for kids

TRUST YOUR PATIENTS’ CARE TO THE EXPERTS AT SANFORD CHILDREN’S

With the largest team of specially trained pediatric experts in the region, our advanced care options allow us to deliver the best quality of care from newborns to young adults.

Our pediatric neurologists are specially trained in treating various neurological conditions including:
- Headaches
- Epilepsy
- Movement disorders
- Neuromuscular disease
- A range of neurological illnesses

Call (605) 312-1050 to refer a patient today.

childrens.sanfordhealth.org
## Contents

**President’s Comments**
383 Continuing Professional Development – Tim Ridgway, MD, FACP

**Editorial**
385 2015 Sanford Scholars Day Abstracts – Scott Killian, PhD, MPH; Valeriy Kozenko, MD; Paul Thompson, PhD; Candace Zeigler, MD
385 Letter to the Editor

**The Journal**
386 Telemedicine Reduces Time to ECG in Rural Emergency Care Settings – Courtney Backer, MSIV; Donald Kosiak, MD; Sarah Kappel, RN; Brad Uhing, PhD, MHA
387 Localization of Orofacial Motor Representation in the Corona Radiata, Internal Capsule, and Cerebral Peduncle in the Non-Human Primate – Adam Binnebose, MSIV; Robert J. Morecraft, PhD
389 Correlation Between BMI and the Need for Orthopedic Surgery of the Upper and Lower Extremities – Joseph Carada, MSIV; Edward Simanton, PhD
391 Paclitaxel Infusion Post-low Extremity Revascularization to Prevent Restenosis and Target Lesion Revascularization--Preclinical and Clinical Update – Laura Danielson, MSIV; Patrick Kelly, MD, FACS
392 Science Achievement in Secondary Schools Across Rural and Urban South Dakota – Teresa Maas, MSIV; Peter Vitiello, PhD
393 Examination of Opiates Prescribed for Surgical Procedures at Discharge – Jeremy Pepin, MSIV; Craig Utthe, MD
394 Health Education in Rural South Dakota – Nichole Gilbert Schafer, MSIV; Susan Anderson, MD
396 The Impact of Insurance Status on Hospital Resource Utilization in Pediatric Ophthalmic Inpatients – Daniel Terveen, MSIV; Benson Hsu, MD, MBA, FAAP; Geoffrey T. Tufty, MD
397 Partial Analysis of Ibuprofen vs. Acetaminophen for the Prevention of Acute Mountain Sickness: A Double-Blind, Randomized Controlled Trial – Jared Velgensky, MSIV; Buddhika Basnyat, MD
399 Common Presenting Features of Parkinson’s Disease and the Utility of Brain Imaging in its Diagnosis – Brian Wosterhuis, MSIV; Jerome Freeman, MD
401 Evaluating Symptom Distress in Cancer Patients – Vanessa Wookey, MSIV; Heidi McKeen, MD

**Primers in Medicine**
403 Heart Failure – Maheedhar Gedela, MD; Muhammad Khan, MD; Orvar Jonsson, MD

**Pharmacology Focus**
410 Medication Therapy Management – An Opportunity to Collaborate – Alex Middendorf, PharmD, MBA

**Special Features**
415 Extenuating Circumstances: Tobacco Cessation – E. Paul Amundson, MD
417 Patient Education: Baby – Joanie Holm, CMP; Richard P. Holm, MD
419 Quality Focus: Improving Health with Immunizations – Stephan D. Schroeder, MD
420 DAKOTACARE Update: Healthcare Quality Part 3: Cancer Screenings – E. Paul Amundson, MD, FAAP
422 SDMBOE Board News: South Dakota Law Regarding Ethics for Physicians – Margaret B. Hansen, PA-C, MPAS

**Member News**
423 The Issue Is...Majority of Hospitals Hit with Medicare Readmission Penalties
Legal Brief Highlight: Standing Orders for Immunizations
Support Medical Student Scholarships
424 For Your Benefit: Shaping Your Profession
SDSMA 2016 Dues Renewal
SDSMA Center for Physician Resources Webinar – Avoid a Malpractice Claim
425 South Dakota Interstate Medical Licensure Compact Commissioners Appointed
SDSMA Center for Physician Resources Health Leadership Institute Receives Grant

**For the Record**
426 CME Events

**Advertisers In This Issue**
427 Physician Directory
428 Classified Ads
Physicians are facing increasing pressure in regard to the multiple tasks and responsibilities required of them. First and foremost, we are responsible for the care of our patients, and are held to a standard that this care be personable, competent, and safe. To do this, we are required to stay current with the advances in medicine to provide optimal care. Staying current in the medical field with the rapid advances in knowledge and technology is not for the faint of heart. We are required to provide appropriate access to care for our patients, stay current on all the advances in medicine to provide high quality care, and yes, try to maintain some type of personal life to stay balanced. Wow! It sounds daunting, indeed.

For years, physicians would be required to obtain so many continuing medical education (CME) credits yearly to be in good standing with their clinic, hospital, and other regulatory agencies. Credits could be obtained by attending three to seven day conferences in nice locations, attending grand rounds or other short seminars, or participating in events that may not offer tremendous educational value. Academic departments or hospital education committees providing CME would frequently ask someone to speak, simply because they were willing and had a “canned” talk ready to go.

CME delivered by accrediting organizations has evolved substantially in the past 15 years. Even the name of departments responsible for this task has changed. For example, what used to be called the Office of CME at the University of South Dakota Sanford School of Medicine is now called the Office of Continuing Professional Development. This change reflects, in my opinion, the true mission of CME. In essence, CME should meaningfully change attitude, knowledge, skills, and performance of the individual. In other words, enhance the professional development of the people involved. Often, and historically, CME was felt to consist only of lectures and knowledge attainment, but now increasingly is designed to improve skills and performance, with the ultimate aim of affecting patient outcomes. This may seem like a tall order, but if one thinks about it, that is truly an admirable goal. We need to think of our continuing professional development not as a requirement, but rather as an opportunity to improve the care we deliver to our patients.

So how has CME evolved? To achieve accreditation for an event, the institution delivering the content must ensure the CME is built around “the educational needs (knowledge, competence, or performance) that underlie the professional practice gaps of their own learners.” The Accreditation Council for Continuing Medical Education (ACCME) defines the professional practice gap as “the difference between health care processes and outcomes observed in practice, and those potentially achievable on the basis of current professional knowledge.” Identifying this gap is not as difficult as it sounds, and does make sense. For example, your hospital pharmacy may have received many requests regarding the use of Dabigatran, a medication approved for the prophylaxis against thromboembolism in patients with atrial fibrillation. A learning gap regarding the appropriate use of this drug is established, and a grand rounds or seminar can be developed to inform physicians on its use.

There is now a wide choice of approaches and content areas to meet the CME needs of physicians where they live. Online delivery or self-assessment activities can be very convenient, but perhaps could be complemented by other more interactive methods. For example, some of the most meaningful learning can occur when small groups of providers meet and participate in a panel discussion, where two or three content experts lead the discussion. Case-based topics are ideal for this. These live activities tend to be well received and very informative, and allow physicians to learn from each other. While difficult to arrange, this approach appears to be extremely effective as well as promising to affect patient outcomes. I sincerely believe we need to look at creative ways to deliver more of them.

Physicians expect high-quality, relevant, and effective education to ensure it meets the variety of expectations of the state licensing boards, their specialty certification, hospital credentialing, and other regulatory requirements. We need to continue to strive to ensure the continuing professional development we seek will meet all these requirements and that there is cooperation between these agencies. The ultimate goal is to simply ensure we are continuing to learn and grow as professionals, which enables us to deliver the highest quality care to our patients. An unanticipated side effect just might be more professional satisfaction! I welcome any comments or suggestions you have to affect this change. Have a good month.

REFERENCES
Take the next step to financial freedom.
Medical student education continues to change as evidenced by the replacement of traditional didactic lectures with problem-based learning and interactive modalities. An increasingly prominent component of the curriculum in most U.S. medical schools is a research experience for medical students.

The Scholarship Pathways Program, now in its eighth year, functions to promote the research experiences of medical students at the Sanford School of Medicine at the University of South Dakota. To date, nearly 100 medical students have participated in this program. Ultimately, the experiences of these students can enrich their medical careers, especially in the areas of translational research and evidence-based medicine.

To achieve the goal of enabling a meaningful experience in the areas of research, education, or service, the Scholarship Pathways Program operates by bridging the roles of medical students, basic researchers, clinical mentors and program administrators. Medical students enter the program through a voluntary competitive application process. Program administrators assist applicants with identifying project mentors during this application process and then oversee the completion of the projects during the three year activity period. Participants are required to prepare an abstract, poster and formal narrative of their research or scholarly activities. Approximately two-thirds of past participants in the program have presented their projects at conferences and/or published their works in peer-reviewed journals.

The capstone of the Scholarship Pathways Program is the annual Sanford Scholars Day event where senior students present their projects in abstract and poster format. This year's abstracts are highlighted by those from two senior students (Laura Danielson and Daniel Terveen) who were recognized for their outstanding efforts and were selected to give oral presentations of their work to an audience of faculty and students.

Laura Danielson, mentored by Patrick Kelly, MD, evaluated the data from clinical trial of a novel procedure to treat peripheral artery disease. She found that infusion of the cytostatic drug paclitaxel appears to be both safe and effective in preventing restenosis and target lesion revascularization.

Daniel Terveen, mentored by Benson Hsu, MD, researched the potential impact of the Affordable Care Act on select economic and hospital resource utilization factors. In comparison to privately insured pediatric inpatients, he found that Medicaid pediatric inpatients had increased numbers of procedures, longer hospital stays and higher total treatment costs.

We are pleased to share this year's Sanford Scholars Day abstracts and thank South Dakota Medicine for giving us this opportunity. If you would like to mentor a Scholarship Pathways student, please contact Dr. Candace Zeigler at candace.zeigler@usd.edu.

---

LETTER TO THE EDITOR

Dear Editor:

Each month the Board of Medical and Osteopathic Examiners (Board) submits a column to South Dakota Medicine to inform physicians and other licensees about various topics of interest that come to the Board. This column is an effort to disseminate important regulatory information in an open and transparent fashion.

Last month, the column generated some questions regarding the role of medical directors and South Dakota statutes and administrative rules regulating medical practice. Those questions are in quotations followed by the answers.

Specifically, I was asked the following: “The title of the article ‘South Dakota Law Regarding Ethics for Physicians’ would indicate the two sections of the article (Opinion 8.021 and ARSD 20:47:08) are in South Dakota law.” The answer to this question is yes, both ARSD 20:47:08 and Opinion 8.021 (which is referenced within ARSD 20:47:08) are in South Dakota law. The South Dakota statutes and administrative rules along with the state constitution collectively compile South Dakota law.

A second question asked: “… the AMA opinion indicates ‘issued in December 1999 and adopted June 1999’ but doesn’t indicate who adopted it.” The response to this question is that Opinion 8.021 was adopted by the AMA in 1999 and is contained within the AMA Code of Medical Ethics.

For additional clarification, please see the Board’s column in this issue of South Dakota Medicine.

Margaret B. Hansen, PA-C, MPAS, CMBE
Executive Director, South Dakota Board of Medical & Osteopathic Examiners
Background: Timeliness of care in emergent cardiac conditions is crucial for reducing morbidity and mortality. Recent literature has concluded that patients with emergent conditions presenting to critical access hospitals (CAHs) may not be receiving adequate and timely treatment, mainly due to poor access to specialty resources. Avera’s eEmergency began in 2009 as a telemedicine pilot program to offer specialty clinical support to CAHs. Since more than 25 percent of eEmergency consultations involved cardiac concerns, the Chest Pain Project was formed, which included 34 rural sites agreeing to activate the eEmergency system for adults presenting to the emergency department with chest pain. The purpose of this study is to determine the impact of Avera’s eEmergency services on median time to ECG in a rural setting for patients presenting with chest pain.

Methods: This was a non-randomized control trial measuring median time to ECG in 34 rural sites, which were CAHs defined as hospitals with 25 or fewer beds, a distance of 35 miles from a larger hospital, or designated as a “necessary provider” per the Centers for Medicare and Medicaid Services. Control data was obtained via a report from the electronic record system, and included encounters between Aug. 21, 2010 and Sept. 1, 2011. Time of ECG was obtained by viewing the scanned ECG image in the medical record, or the documented time of order completion when a scanned image was not available. Intervention data included encounters between Sept. 1, 2011 and June 30, 2013. Time of ECG was obtained by reviewing a process of care documentation form completed by an eEmergency nurse at the time of the encounter, which was then verified against the electronic medical record. Analyses were conducted using both Kolmogrov-Smirnov and Shapiro-Wilks tests for normality, followed by the Mann Whitney U test. A p value of <0.05 was considered statistically significant.

Results: A total of 582 patients were included in the analysis. The eEmergency intervention group included 343 patients, and the control group receiving typical rural care included 239 patients. Results indicated that the eEmergency intervention group had a median time of 10 minutes to ECG, while the control group had a median time of 17 minutes to ECG. A significant difference was found between the groups (z -4.15, p<0.001).

Conclusions: Telemedicine offers many benefits contributing to the statistically significant improvement in the outcome measure of median time to ECG. The Chest Pain Project emphasized the use of protocols, evidenced based practices, and collaboration with emergency trained clinicians to assist in improving time-sensitive care for rural patients. Limitations of this study include the following: the consistency of activation of eEmergency services for patients presenting with chest pain; the use of non-randomized control and intervention groups; and the use of a convenience control sample due to a lack of publicly reported quality data for CAHs. Further studies are necessary to explore the potential benefits of telemedicine. However, this technology holds great promise to improve support to rural clinicians, and may be the answer to the important question of how to improve access to health care in rural settings.
Localization of Orofacial Motor Representation in the Corona Radiata, Internal Capsule, and Cerebral Peduncle in the Non-Human Primate

By Adam Binneboese, MSIV; and Robert J. Morecraft, PhD

Background: Nearly 800,000 Americans suffer from stroke each year and this disorder is the leading cause of long-term disability. The most common form of stroke is middle cerebral artery (MCA) occlusion which often results in compromised circulation and damage to the subcortical white matter forming the corona radiata (CR) and internal capsule (IC). Although the general anatomical regions subject to damage in this area have been elucidated, much less is known about the subtle organization of descending orofacial motor pathways through this territory. Common symptoms following damage to the CR and IC often include facial paresis, dysarthria, and dysphagia. However, these sets of symptoms occur following injury to different parts of the CR and IC and their severity and time course of recovery are varied indicating a more widespread distribution of orofacial pathway organization than currently recognized. Thus, the frequency of occurrence of orofacial dysfunction following MCA stroke may correlate well with the existence of a potentially dispersed distribution of multiple orofacial pathways. Additionally, examining orofacial representation in the CR and IC may assist in interpreting adverse motor consequences in the aftermath of neurosurgical procedures such as deep brain stimulation and subcortical leucotomies aimed to treat retractable psychiatric and movement disorders.

Methods: Using nine rhesus monkeys, we studied the trajectories of five corticobulbar pathways through the CR, IC and cerebral peduncle (CP). The pathways studied originated from the head region of the primary motor cortex (M1), ventral lateral premotor cortex (LPMcV), supplementary motor cortex (M2), rostral cingulate motor cortex (M3) and caudal cingulate motor cortex (M4). Each monkey was anesthetized and these head regions were injected with anterograde tracers. The tissue was fixed and processed using immunohistochemical methods. The location of each descending orofacial motor pathway was charted using an Olympus BX51 microscope interfaced with Neurolucida data collection software.

Results: In the CR, pathways originating from M2, M3 and M4 arched over the caudate and pathways originating from M1 and LPMcV arched over the putamen. In the IC, pathways were found to be widespread, partially overlapping and topographically organized. M3, M2, LPMcV, M4, and M1 occupied anterior to posterior positions respectively. As each fiber system progressed inferiorly in the IC, they shifted posteriorly to lie within the posterior limb of the IC and overlap increased. In the CP, pathways occupied the medial half from superior to inferior levels, and overlap increased inferiorly.

Conclusions: Our finding of dispersed orofacial pathways in the CR and superior IC correlate well with the frequent occurrence of orofacial dysfunction following MCA infarction. On the other hand, this widespread organization may correlate with favorable levels of recovery. In contrast, more severe orofacial motor deficits are likely to arise from lesions that occupy more inferior levels of the IC and throughout the CP due to the progressive and extensive overlap of fibers traversing this brain region. The dispersed pathway distribution superiorly may correlate with acute orofacial dysfunction, followed by motor recovery from spared fiber pathways. In contrast, the gradually commixed nature of fiber representation inferiorly in the IC and CP may correlate with more severe and prolonged orofacial deficits following inferior subcortical injury. These findings may assist in interpreting orofacial movements evoked during deep brain stimulation, and non-invasive neuroimaging efforts to localize descending orofacial pathways in the human brain.
THE STRENGTH TO HEAL

and stand by those who stand up for me.

Learn the latest treatments and play an important role in the care of Soldiers and their families. As a physician on the U.S. Army Reserve health care team, you’ll continue to practice in your community and serve when needed. You’ll work with the most advanced technology and distinguish yourself while working with dedicated professionals. You’ll make a difference.

To learn more about the U.S. Army Reserve health care team, visit healthcare.goarmy.com/mafpr or call 800-235-8159.
Correlation Between BMI and the Need for Orthopedic Surgery of the Upper and Lower Extremities

By Joseph Carda, MSIV; and Edward Simanton, PhD

Background: Each year millions of patients undergo orthopedic surgery to repair weight bearing joints. These procedures are extremely costly and involve extensive rehabilitation resources. Thus, it is important to understand the underlying factors that increase the occurrence of joint damage. One of these factors is obesity. Approximately one in every three Americans is now considered obese based on the Body Mass Index (BMI) scale (BMI greater than 30). As the average person increases in size, weight bearing joints must endure a greater work load, and thus, the risk for injury increases.

Methods: The goal of this study was to analyze the typical lower extremity orthopedic surgery patient based on BMI and physical activity level. Subjects in this study included both male and female patients ages 18-65. Following a preoperative examination for lower extremity surgery, 49 patients completed a survey containing the following: age, sex, height, weight, location of injury, how the injury occurred, previous injuries, minutes of daily exercise, exercise days per week, and form of exercise. This data was then compared to a group comprised of 50 patients who required surgery of the upper extremity. Due to time constraints, the data for the upper extremity group was gathered by retrospective chart review. Thus, no information about physical activity was available for comparison. The groups were compared using ANOVA.

Results: Upper extremity patients: The mean BMI was 29.6, median 28.8, and mode 25.5. The mean age was 53.0. Based on the BMI scale, 22 out of 50 patients were obese, 19 out of 50 were overweight, and nine out of 50 were within the healthy range. Lower extremity patients: The mean BMI was 30.0, median 29, and mode 25.7. The mean age was 46.1. According to the BMI scale, 19 out of 49 patients were obese, 24 out of 49 were overweight, and 6 out of 49 were in the healthy range. Physical activity: Based on survey responses, patients exercised an average of 2.7 days a week for 33 minutes, 29 seconds each day. The most common form of exercise was walking. There is no significant difference between BMI of the upper and lower extremity patients.

Conclusion: As there is no statistical significant BMI difference between the upper and lower extremity surgical patients, the null hypothesis could not be rejected. However, there does appear to be a statistical difference based on age. Lower extremity injuries tend to occur in a slightly younger population. Runners also have an increased risk of ankle injury. The strength of the study is limited by low numbers. In the future we hope to compare the mean BMI of the general population to the mean BMI of upper and lower extremity orthopaedic surgery patients.
Your body is a remarkable network of bone, tissue and joints working in perfect harmony. But when injuries occur, that process can be interrupted. At Orthopedic Institute, orthopedic medicine is all we do. We work to get you up and moving again, recreating that perfect harmony, whatever that may be for you. OrthopedicInstituteSF.com | 605.331.5890

The desire to help patients live healthier just runs in our veins.

If your patients are complaining of symptoms associated with vein disease, the problems may be deeper than they realize. Venous insufficiency reduces a person’s quality of life and only worsens over time. Physicians Vein Clinics provides a free vein screening to detect possible vein disease and determine treatment. Minimally invasive outpatient procedures will eliminate or reduce vein problems with no vein stripping or downtime.

Dr. Hansen and Dr. Heier are both Board-Certified by the American Board of Venous and Lymphatic Medicine.

Treatment covered by most insurances.

Welcome
CHRISTOPHER S. HUOT, M.D.
Ophthalmologist

SLINGSBY & WRIGHT EYE CARE
J. Geoffrey Slingsby, M.D., F.C.
240 Minnesota Street • Rapid City SD

For appointments regarding
Comprehensive Ophthalmology including:
- Cataract and Implant Surgery
- Retinal Management and Laser/Injections
- Plastic Surgery of the Eyelids
- Glaucoma Management

Call 605-719-9499
Paclitaxel Infusion Post-lower Extremity Revascularization to Prevent Restenosis and Target Lesion Revascularization-Preclinical and Clinical Update

By Laura Danielson, MSIV; and Patrick Kelly, MD, FACS

Background: Peripheral artery disease (PAD) affects approximately ten million individuals in the United States causing significant morbidity and mortality. Endovascular intervention for PAD involves the use of stents (which can be drug-eluting), stent-grafts, balloon angioplasty and plaque de-bulking procedures to re-open the blood vessels. This study was done to evaluate the safety and efficacy of a one-time infusion of paclitaxel, an anti-proliferative agent, through an Atrium ClearWay balloon catheter in infrainguinal de novo peripheral blood vessel lesions.

Methods: This was a single-center prospective study of the treatment of 50 limbs. Patients were included if they were able to provide informed consent, were between the ages of 18-90, if their baseline Rutherford score was between 1 and 6, and if they had an occlusion or stenosis in the infrainguinal vessel. Patients were excluded if the operator was unable to cross the lesion, if the patient was pregnant or lactating, or if the limb had been previously treated with an endovascular intervention. Treatment included standard infrainguinal endovascular revascularization followed by a pre-prescribed infusion of paclitaxel. Patients were followed at one, four and 10 months with ankle-brachial index (ABI) and arterial duplex of the treated limb. Rutherford classification stages were measured before and after procedures and at each follow-up visit. Binary restenosis was tracked with duplex ultrasound, and target lesion revascularization (TLR) was also tracked.

Results: Average ABI for above the knee (ATK) increased from about 0.7 to about 0.9 at 10 months and below the knee (BTK) average ABI increased from about 0.65 to 0.95 at 10 months. Rutherford Classification stage improved to 0 for the majority in ATK and was either 0 or 1 for the majority for BTK at 10 months. ATK lesions had a freedom from binary restenosis rate of 90 percent and freedom from TLR of 93.3 percent at 10 months. BTK lesions had a freedom from binary restenosis rate of 65 percent and freedom from TLR of 75 percent at 10 months. There were no amputations, open bypass revascularizations, or hypersensitivity reactions observed.

Conclusion: Infusion of paclitaxel appears to be both safe and effective in preventing restenosis and target lesion revascularization. Future studies are needed to evaluate alternative excipients for clinical feasibility.
Science Achievement in Secondary Schools Across Rural and Urban South Dakota

By Teresa Maas, MSIV; and Peter Vitiello, PhD

Background: There has been little work to identify educational gaps between rural and urban high school communities. In 2006, The National Center for Education Statistics (NCES) created the urban-centric locale code system to classify school communities based on both population size and distance from an urban area. Since then, 28 school districts in South Dakota have either dissolved or consolidated. The ACT is an achievement and college admissions exam typically taken by students before completing grade 12. A composite score is provided, as well as scores in each of four subject areas: science, math, English, and reading. The Dakota State Test of Educational Progress (DSTEP) is used to test students in grades three through eight, grade 11 in reading and math, and in grades five, eight, and 11 in science. Every South Dakota public high school is required to report both the ACT and DSTEP scores of their students.

Methods: Exam scores from 2008-2011 were collected from the South Dakota Department of Education and analyzed using the weighted mean, according to student population, and the standard error of the mean values, according to urban-centric locale. ANOVA models were used to examine the relationship between scores and locales. Fisher's procedure post hoc was utilized to determine statistical significance. The correlation between standardized test scores and future achievement was examined. Composite ACT scores and course grade point averages (GPA) from 1,568 students, as well as withdrawal rates from an introductory biology course, were obtained from the biology department at Augustana College. ANOVA and linear regression models, with Fischer's procedure post hoc were used to examine the relationships. Data regarding the high school locale of recent University of South Dakota Sanford School of Medicine (SSOM) students (excluding out-of-state) were also analyzed to determine if similar geographic discrepancies exist. Localities were classified as “city,” “town,” or “rural” based on population.

Results: In the case of ACT scores, both science and composite, a 1-point difference in mean scores was found between city and rural NCES designations (considered substantial) on a consistent basis, with town NCES designation scores falling approximately halfway between these two values. DSTEP science scores followed a similar trend, with mean values being separated by almost 10 points between city and rural designations, with town scores falling in line with city scores. A direct correlation between ACT scores and student GPAs in a general introductory biology course was found. Starting with an ACT score of 25, a 5.4 percent improvement translates to a nearly 0.3 point increase in final GPA with reduced course withdrawal rates. When looking at the demographics in the student representation at SSOM, a locale discrepancy exists. For the 2014-2017 graduating classes, 28 percent graduated from a high school in a rural town, although secondary students from rural schools comprise 40 percent of the South Dakota student population.

Conclusions: When ACT and DSTEP scores were using a measure of location size, a statistically significant difference was found between all general locales on all measures. The demand for excellent physicians in rural South Dakota is expected to steadily increase. In order to meet this demand, weaknesses in science education need to be addressed before the post-graduate level, including the retention of qualified teachers, student motivation, access to advanced courses, and limited professional development opportunities for teachers. While many of these issues likely derive from financial constraints, it is important that they be addressed.
Examination of Opiates Prescribed for Surgical Procedures at Discharge

By Jeremy Pepin, MS IV; and Craig Uthe, MD

Background: Hysterectomies are the most common female non-obstetric surgical procedure and the second most common surgery performed on women overall in the U.S. Opiate pain relievers are frequently used in postoperative pain management for this condition. Interestingly, deaths caused by opiate overdoses have increased in women by 400 percent since 1999, compared to 265 percent in men. Physicians are concerned about misuse and abuse of opiates in the outpatient setting. According to the Center of Disease Control (CDC), there were approximately 12 million people abusing pain relievers in 2010. The National Institute on Drug Abuse (NIDA) estimated that 20 percent of people aged 12 and older had at least once in their lifetime used prescription drugs with the intent of misuse or abuse. Thus, guidelines on postoperative opiate prescriptions may help reduce the number of unused pills available for misuse and abuse. The aim of this study is to identify discharge opiate prescribing patterns following hysterectomies.

Methods: All adult patients who underwent a hysterectomy at Sanford Hospital, a tertiary care facility, during 2012 were analyzed in a retrospective cohort study. Patients under age 18, those not receiving discharge opiates and those who received an unspecified quantity of opiates at discharge were excluded from the study. Data pertaining to hysterectomies were divided into the different approach types. The specific opiate, dosage, and quantity in each prescription were tabulated and compared. Comparisons were made between opiate prescription patterns for hysterectomies, other gynecological surgeries, and other non-gynecological surgeries with tests of proportions.

Results: Prescriptions were made for the following drugs: oxycodone-acetaminophen (O-A), hydrocodone-acetaminophen (HC-A), tramadol (T), and hydromorphone (HM) among others. Dosage for acetaminophen is 325 mg unless otherwise indicated. Five hundred ten hysterectomies were reviewed.

- Abdominal (n=36) O-A 5mg (55.6 percent), HC-A 5 mg (16.7 percent), HC-A 7.5 mg (8.3 percent)
- Laparoscopic (n=68) O-A 5mg (73.5 percent), HC-A 5 mg (8.8 percent) and HM 50 mg (4.4 percent)
- Robotic (n=275) O-A 5mg (78.9 percent), HC-A 5 mg (6.5 percent) and T 50 mg (2.9 percent)
- Vaginal (n=131) O-A 5mg (69.5 percent), HC-A 5 mg (14.5 percent) and T 50 mg (4.6 percent)

Comparing hysterectomies, other gynecological (non-hysterectomy) surgeries, and general non-gynecological surgeries, the top two medications were used. 2,224 gynecological and 22,068 non-gynecological all-other surgeries were reviewed, respectively.

- Total hysterectomy (n=797) O-A 5mg (74.1 percent), HC-A 5 mg (9.6 percent)
- Other gynecological (n=1414) O-A 5mg (67.5 percent), HC-A 5 mg (12.1 percent)
- Other non-gynecological (n=16405) O-A 5mg (5.6 percent), HC-A 5 mg (36.1 percent)

Comparing hysterectomy to other gynecological surgeries, there is a significant difference in proportions of O-A (p=0.0018), but not for HC-A (p=0.15). The other non-gynecological opiate proportions are different in both drugs (p≤0.001).

Conclusions: O-A 5 mg tablets were the most common opiate prescription at discharge for hysterectomy procedures, regardless of the approach type, followed by HC-A 5 mg and T 50 mg. There was a statistically significant increase in the proportion of O-A 5 mg tablets prescribed at discharge for hysterectomies when compared to other gynecological and other non-gynecological surgical procedures. While there was no statistical significance between hysterectomy and other gynecological HC-A 5 mg prescribing frequencies, there was a statistically significant increase in the proportion of HC-A 5 mg prescribed for other non-gynecological when compared to hysterectomies.
Background: In 2007, the Centers for Disease Control and Prevention (CDC) reported that 81 percent of adults eat an inadequate diet and 53 percent do not get adequate physical activity. An unhealthy lifestyle increases patients’ risk for heart disease, hypertension, and diabetes. Health education in community clinics is a key component of the treatment and control of these chronic conditions. In rural South Dakota, clinics work hard to implement diabetes and health education for their patients. They are faced with challenges of funding and lack of staff. Small towns also lack access to fresh food, exercise facilities, and commercial diet and exercise programs. Independent clinics in particular lack the manpower and time to provide organized, long term support. By linking these clinics to larger institutions and low cost resources, we can improve diabetes care in rural communities.

Methods: Methods of healthy lifestyle and diabetic education utilized throughout the country were researched and evaluated for ease of use and cost. Issues unique to South Dakota were evaluated from the patient and rural clinic perspective. Patient perspective was observed using an inexpensive eight-week lifestyle change challenge. This program implemented healthy habits incrementally from four categories; nutrition, mental wellness, exercise and personal goals. Success was based on long-term sustainability and ease of use. Secondly, 31 clinics in rural South Dakota were contacted to create a picture of health education in the remote parts of our state. Through collaboration with state health counselors and diabetic educators, useful curriculums and resources were collected and organized. The eight-week lifestyle challenge and the educational resources were offered to independent rural clinics throughout South Dakota as a means to facilitate education and alleviate the financial burden.

Results: Participants in the eight-week lifestyle challenge described roadblocks including lack of time or motivation. Uniquely rural challenges include lack of workout facilities, limited fresh food during the winter, and the inflexibility of farming and ranching lifestyles. Patients desire continued support and follow up to increase accountability. Collaboration with education coordinators in rural clinics highlighted lack of staff or funding as well as isolation from large-scale programs. It is clear that affiliation with a major hospital provides the support, funding and resources that many community clinics need.

Conclusions: The eight-week lifestyle challenge provides an inexpensive, flexible option for patient controlled lifestyle change. The program highlights the struggles that real South Dakotans face with diet and exercise. Rural clinics work hard to provide the programs and support that patients need. Independent clinics in particular face a lack of organized programs and allotted time and manpower. A list of low-cost national education curriculums, reputable sources, and available South Dakota programs was compiled for easy access and use. These resources, along with the eight-week lifestyle change challenge were offered to clinics to supplement and facilitate patient centered lifestyle change. Hopefully, the resources supplied will allow clinics with limited time and funding to provide basic diabetic and health education. The next steps include obtaining grants and establishing permanent education staff in independent clinics.
Your direct referral makes a difference.

Recent South Dakota QuitLine reports indicate that when you make direct referrals, it results in better outcomes. Data from 2008 to 2013 shows 39.8% of patients who signed up for our services found out about the QuitLine from a healthcare provider. Only 1.4% were direct referrals.

So what's the difference? 45.5% of passive healthcare provider referred patients reported staying quit after 7 months. Direct-referred patient rate was over three points higher at 48.8%.

It gets even better.
In 2013 alone, the direct healthcare provider referral rate (fax or EHR) increased to 5%. Even so, given the increase in successful quit attempts, it's in everyone's best interest to do more. Because what we're all really doing is saving our patients' lives.

By all means, keep talking to your patients, and then take the extra step and make a direct referral to maximize outcomes. In the long run, both you and your patients will be glad you did!
The Impact of Insurance Status on Hospital Resource Utilization in Pediatric Ophthalmic Inpatients

By Daniel Terveen, MSIV; Benson Hsu, MD, MBA, FAAP; and Geoffrey T. Tufty, MD

Background: Health care expenditures within the U.S. are expected to rise from $2.7 trillion in 2011 to $4.7 trillion in 2021. The Patient Protection and Affordable Care Act (ACA) seeks to address cost and coverage concerns by encouraging the expansion of Medicaid. Current reforms anticipate enrolling approximately 13.4 million new members into public insurance. The current literature is unclear how shifting the payer type will impact cost and resource utilization in the pediatric population. Without this information, the policy and financial impacts of reform remain uncertain. The purpose of this study is to determine the impact of insurance status on hospital resource utilization for pediatric ophthalmic inpatients in the U.S.

Methods: We conducted a retrospective cohort study using 2009 hospital discharge data from the Healthcare Cost and Utilization Project (HCUP) Kids’ Inpatient Database (KID). Pediatric ophthalmic inpatients (n=7,796) age 0-20 were stratified by primary payer status. To assess financial burden, we used hospital charges. The Mann-Whitney rank-sum test was used to compare differences in ages, charges, length of stay, time to initial procedure and number of procedures across payers. The chi-square test was used to identify a relationship between payer types and race, chronic conditions and median household income based on ZIP code. All statistical analysis was conducted in STATA/IC 11.2. Institutional Review Board approval was obtained before performing analyses.

Results: Pediatric ophthalmic inpatients with Medicaid (n=3,932) had higher total charges than patients with private insurance (n=3,864). Total charges were $20,773 for all Medicaid patients compared to $20,586 for those with private insurance (p<0.001). When comparing Medicaid to privately insured patients, we found differences in length of stay (3.43 to 3.11 days, p<0.001), time to initial procedure (1.10 to 0.79 days, p<0.01), and number of procedures (1.01 to 1.14, p<0.001). There was no difference in number of chronic conditions (0.91 to 0.93, p=0.49).

Conclusions: Medicaid pediatric ophthalmic inpatients had longer length of stay, longer time to initial procedure, less procedures performed, and higher total charges compared to private insurance patients. Among pediatric ophthalmic inpatients, there is a significant difference in resource utilization between the payer types. Patients with Medicaid had the longest lengths of stay and total charges even when controlling for patient comorbidities. Our findings suggest that shifting privately insured patients to Medicaid as proposed through the ACA could increase costs and resource utilization in this population.
Partial Analysis of Ibuprofen vs. Acetaminophen for the Prevention of Acute Mountain Sickness: A Double-Blind, Randomized Controlled Trial

By Jared Velgersdyk, MSIV; and Buddha Basnyat, MD

Background: Travel to high altitude climates is becoming an increasingly popular tourist activity. While we do have acetazolamide as the current “gold standard” for prevention of acute mountain sickness (AMS), it is not without its drawbacks. Some are unable to take acetazolamide because of a contraindication due to sulfas allergy, intolerable side effects, or inability to obtain the medication. Therefore, research of alternative medications for the prevention of AMS is warranted. Past studies have indicated that AMS has a cyclooxygenase (COX) pathway, which may precipitate symptoms. However this theory has not been entirely supported and the exact mechanism of AMS is still unclear. The aim of this study is to compare ibuprofen vs. acetaminophen as an alternative to acetazolamide, in a head to head, double-blinded manner to determine if prevention in AMS symptoms was achieved.

Methods: Recruitment of trekkers was performed in the village of Dingboche, Nepal (altitude 4250 m). Trekkers were recruited daily by researchers who visited each trekking lodge within the village and asked for volunteers to participate. After reviewing the informed consent, inclusion, and exclusion criteria, volunteers filled out a questionnaire on the severity of their AMS via the Lake Louise Questionnaire (LLQ). Exclusion criteria (abbreviated) included pregnancy, excessive symptoms at the initial questionnaire, use of certain medications, recent overnight at higher elevations, native persons, and decreased oxygen levels. Inclusion criteria (abbreviated) included ages 18-65, persons traveling directly from Dingboche to Lobuche, and those not excluded by exclusion criteria. Each volunteer received five doses of medication (either ibuprofen or acetaminophen) and were instructed how to properly take the medication. They were also given a final questionnaire, to be filled out and turned in to the researcher at the village of Lobuche, Nepal (altitude 4900 m) upon completion of the study. The data were then uploaded to a cloud-based spreadsheet.

The data were analyzed using mixed-models repeated measures methods, using PROC MIXED in SAS V9.4. The lower and higher altitude questionnaires for each person were examined assuming that the responses were continuous values. Trekkers who did not complete the higher-altitude questionnaire were still included. The two-factor design (medication and altitude) led to three types of tests: medication, altitude, and M x A interaction. The interaction test is the most important due to this being a measure of the difference between medication groups of the change between altitude levels.

Results: The criteria evaluated were headache (yes/no and VAS), sleep (disruption of), GI (nausea, vomiting, diarrhea, upset stomach), fatigue, dizziness/lightheadedness, and SpO2. This study did not reveal any significant decrease in AMS symptoms in the interaction test for any of the criteria evaluated. Some of the criteria (sleep and GI) were approaching statistically significance, and may in fact become significant in the complete study. Although the data is not strong, there appears to be a modest advantage in AMS symptoms associated with ibuprofen.

Conclusion: The data is still in the process of being organized and what is reported in this abstract only represents about 70 percent of the expected data from the study participants. Ibuprofen decreased AMS incidence and severity of AMS by LLQ, but neither is significant. Analysis of the complete data set will produce a more definitive conclusion. We will analyze the data at a later date when we have a complete data set.
Thank You!
for adding quality to the ‘CARE’ in DAKOTACARE

In 1986, the physicians of our state created DAKOTACARE because they believed a health care plan should be locally owned and directed. Today, DAKOTACARE continues to improve on making healthcare coverage and services provided by South Dakota physicians a seamless process.

Your involvement is critical to making DAKOTACARE a success. Many South Dakota physicians are currently participating through various committees, work groups or in other capacities, helping to guide the business decisions of our organization. DAKOTACARE’s Medical Management Department, staffed with knowledgeable physicians, pharmacists and nurses work with you to provide quality health care to your patients.

Your ownership and insight puts the “care” into DAKOTACARE.

Paul Amundson, MD Chief Medical Officer
Mike Pekas, MD Associate Medical Director
James Engelbrecht, MD Associate Medical Director

DAKOTACARE
2600 West 49th Street • Sioux Falls, SD
(605) 334-4000
WWW.DAKOTACARE.COM
Common Presenting Features of Parkinson’s Disease and the Utility of Brain Imaging in its Diagnosis

By Brian Westerhuis, MS IV; and Jerome Freeman, MD

Background: We previously published a case report of a 48-year-old woman who presented with features suggestive of Parkinson’s disease. As Parkinson’s is largely a clinical diagnosis, imaging is often not performed. However, brain MRI was obtained, revealing a large meningioma, causing Parkinsonism. The tumor was resected and her symptoms dissipated quickly. This spurred us to examine the utility of imaging to rule out other entities in the diagnostic process of Parkinson’s. We aimed to determine the extent to which, if at all, findings on brain imaging were abnormal and/or altered the diagnosis or course of treatment. We were also interested in tracking common symptoms and clinical signs at presentation.

Methods: We performed a one-year retrospective data analysis of patients seen at Sanford Clinic Neurology. All patients with newly diagnosed or suspected Parkinson’s disease were included in the study, leading to 179 total patients. Of these, 135 received brain imaging, 44 did not. Of those imaged, 25 had CT imaging, and 110 had MR imaging. Patients who had imaging within the prior year were included. Patients were excluded if records of imaging or prior clinical evaluation were unavailable. In addition to imaging, we collected presenting symptoms and signs. All data were assembled and analyzed in Microsoft Excel.

Results: The mean age at the time of diagnosis was 69 years old. A majority of imaging studies returned with expected age related changes, such as atrophy and small vessel ischemic changes. Many studies were normal. Only our index patient had a mass lesion. Common presenting symptoms included gait changes, rest tremor, changes in handwriting, stiffness and difficulty arising from a seated position. Common signs and clinical findings included rigidity, rest tremor, gait changes, difficulty arising from a seated position, decreased arm swing and speech changes.

Conclusion: The diagnosis of Parkinson’s disease is largely a clinical one. The role of brain imaging in the diagnosis of is poorly characterized in the literature. There is a paucity of radiologic signs that could otherwise aid in diagnosis. As such, one could argue that imaging is not indicated in the work-up of Parkinson’s. Though imaging may rarely find intracranial mass lesion, many patients may be found to have small vessel ischemic disease or even occult prior ischemia. These findings would then indicate appropriate medical management of stroke risk as well as overall neurological well-being. Therefore, we would argue for the case of brain imaging in the work-up of Parkinson’s disease. Additionally, we determined the most common presenting symptoms and signs of Parkinson’s at our clinic to be changes in gait, tremor, changes in handwriting, stiffness/rigidity and difficulty arising from a seated position. These are some of the classical features that should raise suspicion of possible Parkinson’s disease.
Sanford Imagenetics Genomic Medicine Symposium
Applying Genomic Medicine in Clinical Practice

Friday, September 18, 2015
The Sanford Center, 2301 E 60th St N, Sioux Falls, SD

Physicians, nurses, research scientists, genetic counselors, residents and students are invited to learn from national experts in precision medicine about incorporating advances in genetics and genomics into patient care.

Topics will include: genetics and genomics of complex disorders of adult life, incidental findings in genetic testing, genetic risk assessment tools in clinical practice, applying next generation sequencing in cancer care, ethical issues in genetic testing, the role of genetic counselors and nurses in the primary care healthcare workforce.

Joe G. N. “Skip” Garcia, MD, Senior VP for Health Sciences, Martin K. DuVal, MD, Endowed Chair for Leadership and Innovation, Professor of Medicine, University of Arizona College of Medicine, Tucson

James P. Evans, MD, PhD, Bryson Distinguished Professor of Genetics and Medicine, University of North Carolina School of Medicine, Chapel Hill

Catherine A. Hajek, MD, Internal Medicine Physician, Sanford Imagenetics, Senior Resident, University of California, Los Angeles, Medical Genetics Residency Program

Lincoln Nadauld, MD, Medical Director of Cancer Genomics, Intermountain Healthcare, St. George, Utah

Cinnamon Bloss, PhD, Medical Ethicist, Assistant Professor, Department of Psychiatry, University of California, San Diego, School of Medicine

Quinn Stein, MS, CGC, Director, Augustana-Sanford Genetic Counseling Graduate Program, Associate Professor, Augustana College, Sioux Falls

Laurie Badzek, BSN, JD, Professor and Director, University of North Carolina Wilmington School of Nursing

Contact Dana Carr at dana.carr@sanfordhealth.org or (605) 312-6094 with questions.
Evaluating Symptom Distress in Cancer Patients

By Vanessa Wookey, MS IV; and Heidi McKea, MD

Background: Distress can be caused by a variety of physical, social or psychological/emotional factors and manifests itself in various ways in cancer patients. It negatively affects emotions, coping abilities and cancer treatments. It can reduce adherence to treatments, quality of life and patient survival rates. Therefore, routine screening for distress is now recommended in oncology clinics so patients can receive the necessary interventions and referrals to reduce distress and improve their quality of life. The prevalence of distress in cancer patients has been reported at 35.1 percent, but is frequently undiagnosed. Distress is unrecognized in more than half of cancer patients with distress, meaning these patients do not get the necessary referrals or interventions. This study aims to help health care providers identify symptoms correlated with distress to improve recognition and treatment.

Methods: A retrospective chart review was conducted. Information was collected about demographics, cancer diagnosis and responses to distress management surveys completed between January 2012 and December 2012 at the Avera Cancer Institute. Forty adult cancer patients completed the Distress Management survey on their first visit to their oncologist after their first chemotherapy session. Patients ranked their overall distress using a 0-10 scale, and identified specific symptoms causing distress. Responses were compared across demographic groups, cancer type, and cancer stage at diagnosis using Pearson’s chi-square test. A t-test was used to compare mean distress for patients endorsing versus not endorsing each symptom. A p value of < 0.05 was used as a threshold for statistical significance.

Results: The average age of participants was 56.75 ± 12.03. Breast cancer was the most common cancer type (65 percent of participants). The mean overall distress for the 38 participants reporting an overall distress was 4.6 ± 2.7 (95 percent CI 3.7 – 5.5), and the median was 5. Twenty-four patients (60 percent) reported clinically significant distress, defined by the NCCN as an overall distress level of four or greater. Females were more likely to report sadness (p = 0.022). Specific symptoms with a statistically significant association with a higher mean overall distress included: fears (t = -4.32, p < 0.001), depression (t = -3.84, p < 0.001), sleep (t = -3.56, p = 0.001), worry (t = -3.14, p = 0.003), fatigue (t = -2.92, p = 0.006), nervousness (t = -2.53, p = 0.016), eating (t = -2.35, p = 0.025), and loss of interest in normal activities (t = -2.26, p = 0.003). There were no other statistically significant differences in overall distress or specific symptoms compared across gender, age groups, marital status, cancer stage, or cancer type.

Conclusions: Although our sample size was small and fairly homogeneous, the results demonstrated a statistically significant association between overall distress and the symptoms of fears, depression, sleep, worry, fatigue, nervousness, eating, and loss of interest in normal activities. These findings can increase awareness of symptoms associated with distress and allow clinicians to recommend specific interventions. Though many oncology clinics already screen for distress in their patients, distress remains an important factor affecting quality of life and warrants further investigation.
INNOVATIVE SURGICAL WEIGHT LOSS SOLUTIONS
For your patients with a BMI over 35 combined with comorbidities, Sanford Health offers a unique option in weight loss surgery that has delivered impressive success rates.

Curtis Peery, MD, is the region’s first surgeon to offer robotic-assisted bariatric bypass surgery. He has surpassed several national laparoscopic bypass averages set by the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP).

<table>
<thead>
<tr>
<th>Testing Areas</th>
<th>Dr. Peery</th>
<th>MBSAQIP Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission</td>
<td>6.6%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Length of stay</td>
<td>1.6 days</td>
<td>2.4 days</td>
</tr>
<tr>
<td>Anastomotic leak</td>
<td>0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Stricture</td>
<td>0%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Mean % weight loss (1 year after surgery)</td>
<td>71%</td>
<td>70%</td>
</tr>
<tr>
<td>Reduction in one or more comorbidities (1 year after surgery)</td>
<td>92.3%</td>
<td>85.1%</td>
</tr>
</tbody>
</table>

CALL (605) 328-3840 FOR A REFERRAL OR MORE INFORMATION.
SANFORDHEALTH.ORG, KEYWORD: ROBOTIC WEIGHT LOSS SURGERY
Heart Failure

By Maheedhar Gedela, MD; Muhammad Khan, MD; and Orvar Jonsson, MD

Abstract
Heart failure is a major public health concern. It is the most common reason for hospitalization. It commonly affects older population and given the increasing life expectancy coupled with improved management of chronic medical conditions, the number of patients with heart failure is expected to increase. Heart failure has been recently categorized into heart failure with reduced and preserved ejection fraction. Despite differences in the two types, mortality remains high and similar in both conditions. Over the past few decades, numerous medical and device based therapies have been developed for the management of heart failure. These therapies have improved outcomes for the patients both in terms of morbidity and mortality. The objective of this review is to provide an overview of management of heart failure, specifically heart failure with reduced ejection fraction. It is of paramount importance for all health care providers to be aware of therapies for management of heart failure. We will also briefly discuss the role of mechanical circulatory support as an emerging new therapy for patients with advanced heart failure.

Introduction
Heart failure (HF) is a clinical syndrome resulting either from poor relaxation of the myocardium, impaired ejection or a combination of both. It can be the result of a structural abnormality of the heart, e.g., ischemic cardiomyopathy or a functional impairment, e.g., high output states. In the U.S., the prevalence of HF continues to rise. The reason for this rising prevalence is multifactorial. An aging population with improved management of chronic diseases, improved therapies for acute coronary syndrome, and better care of HF patients resulting in improved outcomes are a few possibilities leading to the rising statistic. The lifetime risk of acquiring HF is 20 percent for Americans over 40 years of age. HF incidence rises with age from about 20 per 1,000 from ages 60-65 to more than 80 per 1,000 individuals among those over 85 years of age. This is specifically concerning considering the fact that one out of five people will be older than 65 years of age in 2050. African Americans have the highest risk for HF and greater five-year mortality than the white population.

Even though survival has improved over time, possibly due to the numerous treatment modalities introduced over the past few decades, the absolute mortality rates for HF have remained at 50 percent within five years of diagnosis. HF is the number one diagnosis among all hospitalizations. The economic burden of HF care in the U.S. exceeds $30 billion annually, with most of the cost spent on hospitalizations as these HF patients are at highest risk for all-cause readmission to hospital. The chances of re-hospitalization and mortality strongly increase if there is a lack of improvement in quality of life and functional status after hospital discharge.

Classification of HF
A number of classification schemes can be used for HF. These can be based on anatomic findings, such as HF with reduced versus preserved ejection fraction (EF), involved chamber of the heart, e.g., right or left chamber of the heart or functional, based on symptoms of the patient. Presentation, treatment and prognosis can differ greatly based on above classification schemes and it is important for all providers to clearly classify their patients into one of the categories. The terms “systolic” and “diastolic” HF have been used previously but currently the recommended nomenclature is HF with preserved or reduced ejection fraction.

(i) HF with Reduced EF (HFrEF): Patients with a clinical diagnosis of HF and EF less than or equal to 40 percent.
(ii) HF with Preserved EF (HFpEF): These patients
Primers in Medicine

usually have EF greater than or equal to 50 percent. Patients with EF between 41 to 49 percent are subcategorized as borderline HFpEF.

In addition to anatomic classification of HF for each patient, every patient should be classified based on ACCF/AHA stages of HF (listed below) and assigned a New York Heart Association (NYHA) functional classification (listed below).8

ACCF/AHA Stages of HF
A: At high risk for HF but without structural heart disease or symptoms of HF.
B: Structural heart disease but without signs or symptoms of HF.
C: Structural heart disease with prior or current symptoms of HF.
D: Refractory HF requiring specialized interventions.

NYHA Functional Classification
I: No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
II: Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
III: Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.
IV: Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.

For the purpose of this article, we will discuss the management of heart failure with reduced ejection fraction (HFrEF).

Risk Factors for HF
Like many other non-communicable diseases, HF is a preventable disease. This important concept led to the new ACC/AHA classification scheme where patients without any structural abnormality or functional impairment are classified in stage A if risk factors for the development of HF are recognized.8 Previously, symptoms of HF or a structural abnormality would lead to treatment strategies for a particular patient. Given the newer classification scheme, it is paramount for health care providers to recognize patients at risk for the development of HF and initiate prevention strategies.

Treating both systolic and diastolic hypertension in the long run according to contemporary guidelines reduces the risk of HF by approximately 50 percent.9 Diabetes mellitus (DM) is an independent risk factor for the development of HF irrespective of age, hypertension, obesity or coronary artery disease (CAD) and has an adverse impact on the outcomes of patients with established HF.10 Women with DM are at high risk for developing HF.11 Although there may be uncertainty in the quantity of alcohol ingested and the probability of developing HF, heavy use of alcohol has been associated with increased risk for development of HF.12 Patients with metabolic syndrome should be evaluated and get treated for their underlying abnormalities such as lipid disorders and fasting hyperglycemia.

Etiology of HF
There are numerous etiologies of HFrEF. By far, the most common etiology in the U.S. is CAD. This fact underlines the above mentioned concept of stage A HF again. Apart from a few special circumstances, treatment strategies for HFrEF are the same for most patients. Some of the other possible etiologies have been listed below:

- Hypertension;
- Valvular heart disease;
- Metabolic causes such as obesity;
- Endocrine disorders such as DM and hyper/hypothyroidism;
- Medications such as anthracyclines, trastuzumab, amphetamines, and anabolic steroids;
- Toxins such as alcohol, cocaine, cobalt, iron secondary to transfusion;
- Nutritional deficiency such as thiamine and L-carnitine deficiency;
- High-output conditions such as anemia and Paget disease;
- Tachycardia induced cardiomyopathy;
- Myocarditis due to viruses, HIV/AIDS, medications such as antibiotics, chlorthalidone and methyldopa;
- Connective tissue disorders such as SLE, rheumatoid arthritis, and scleroderma;
- Infiltrative disorders such as amyloidosis, sarcoidosis, and hemochromatosis;
- Peripartum cardiomyopathy; and
- Stress (takotsubo) cardiomyopathy especially in post-menopausal women.

Presentation of HF
HF is mainly a clinical diagnosis based on history and
The key manifestations of HF are dyspnea and fatigue, which may contribute to exercise intolerance and fluid retention, which may present as pulmonary edema and/or ascites and/or peripheral edema. But the presentation may vary from one patient to another.

Clinical Assessment of Heart Failure

(1) Clinical Evaluation: History and Physical Examination

A thorough focused history and physical examination is recommended in patients presenting with HF to identify cardiac/non-cardiac etiology and assess the severity of illness. Jugular venous pressure is a very useful finding on physical evaluation to identify congestion. Markers of volume overload such as hepatomegaly and/or ascites, rales, and peripheral edema should be assessed. In advanced HF, rales are often absent despite severe pulmonary congestion. Severity and triggering factors of dyspnea and fatigue, presence of chest pain, exercise tolerance, physical activity should be obtained to determine NYHA class and to identify potential symptoms of coronary ischemia. Cardiac cachexia, ICD shocks, recent or frequent prior hospitalizations for HF, and S3 gallop are associated with adverse prognosis. Symptoms suggesting TIA and thromboembolism should be obtained to assess the requirement for anticoagulation.

(2) Diagnostic Tests

Basic laboratory workup including complete blood count, serum electrolytes, blood urea nitrogen, serum creatinine, glucose, fasting lipid profile, liver function tests, thyroid-stimulating hormone and urinalysis should be performed in every patient. A 12 lead EKG should be completed in every patient presenting with HF. Apart from these basic tests, etiology specific tests can be ordered based on clinical suspicion, e.g., based on suspicion of hemochromatosis further investigation can be performed. Multiple tests in every patient presenting with HF should be avoided.

(3) Biomarkers

Biomarkers have considerable value in diagnosis, prognosis, and treatment of acute and chronic HF as they provide valuable information about pathophysiological aspects of HF. Measurement of B-type natriuretic peptide (BNP) or N-terminal pro-B-type natriuretic peptide (NT-proBNP) is recommended in ambulatory/outpatients or Hospitalized/ acutely decompensated patients with dyspnea, to support making the diagnosis of HF and establishing prognosis in chronic/acute HF.

(4) Noninvasive Cardiac Imaging

Chest X-ray: Patients with suspected, acute, or new-onset HF should get a chest X-ray to assess heart size and pulmonary edema and to reveal other cardiopulmonary causes that may contribute to patient’s symptoms.

2D-echo: A 2D echocardiogram with Doppler studies should be obtained during initial evaluation to assess all structural and functional components of the heart. Serial echocardiographic evaluations for EF and severity of myocardial remodeling are useful in patients with HF who have had a noticeable change in clinical status, received treatment that might alter cardiac function, or to consider device therapy. Otherwise, routine repeat assessment of left ventricle function should be avoided.

(5) Invasive Modalities

Right-heart catheterization (RHC): Apart from a few specific scenarios where invasive testing might be of some value, hemodynamic assessment with RHC in every patient with HF should be avoided. A few areas where a RHC might be beneficial include patients with signs of systemic hypoperfusion where the etiology of poor perfusion is unclear after a thorough clinical assessment. Another area where RHC might be helpful is in patients being evaluated for advanced heart failure therapies. It is important to understand that the treatment goal for HF is to improve symptoms and reduce mortality and not to improve a certain hemodynamic parameter.

Left-heart catheterization (coronary angiography): It is reasonable to perform left heart catheterization or coronary angiography when ischemia may be a contributing factor to HF.

Endomyocardial biopsy: Routine endomyocardial biopsy is not recommended unless a specific diagnosis is suspected that would influence therapy.

Recommendations for Management of Stages A to D

Stage A: Long term treatment of both systolic and diastolic hypertension according to the published guidelines has been beneficial for patients who are at risk and who already have established heart disease such as MI, to reduce the incidence of HF. Choice of antihypertensive agent should be tailored to concomitant medical conditions like DM. Optimal control of blood pressure should be the main goal of therapy. Patients with dyslipidemia who are at risk should be aggressively treated with statins. Hyperglycemia (HbA1c greater than 10.5 percent) in
Register Now

33rd Annual North Central Heart Cardiac Symposium

Friday, Sept. 18, 2015
8 a.m. – 5 p.m.
Sioux Falls Convention Center
Sioux Falls, S.D.

Register at:
Avera.org/cardiology-symposium

Learn the latest trends in the diagnosis and treatment of cardiac disease during this daylong symposium.

Featured Speakers:
- Jonathan Adams, MD, North Central Heart, Sioux Falls, S.D.
- Paul Carpenter, MD, North Central Heart, Sioux Falls, S.D.
- Rebecca Cogswell, MD, University of Minnesota Heart Care, Minneapolis, Minn.
- Steven Feldhaus, MD, North Central Heart, Sioux Falls, S.D.
- Elden Rand, MD, North Central Heart, Sioux Falls, S.D.
- Tommy Reynolds, MD, North Central Heart, Sioux Falls, S.D.
- Thenappen Thenappen, MD, University of Minnesota Heart Care, Minneapolis, Minn.

2016 Dues Renewal Made Easy

Go to www.sdsma.org
Select Member Login
Click on Pay my Dues

Your username is the email address used for SDSMA communication.
- If you do not remember your password, you may have a new one emailed to you. Follow the “forgot my password or my username” link.
- All members have an online account - do not create a new account. Creating a new account will not link to your profile and will not allow you to pay dues.

Sponsor a medical student’s membership, support the SDSMA Foundation, and contribute to SDSMA PAC during this process.

Do you have a membership or renewal question?
Call: 605.336.1965
Email: membership@sdsma.org
patients with DM adversely influences the incidence of HF and should be appropriately managed with hypoglycemic medications. Thiazolidinediones should be avoided in patients with NYHA class II through IV HF as they are associated with fluid retention. Angiotensin converting enzyme inhibitors (ACE inhibitors) or angiotensin receptor blockers (ARBs) in patients with DM has a multitude of benefits. They not only decrease the risk of developing HF but also control other factors such as renal dysfunction which ultimately contributes to HF. Patients who are on cardiotoxic chemotherapy such as anthracyclines and trastuzumab should be carefully evaluated for left ventricle dysfunction. Patients should be counselled about tobacco cessation and alcohol intake.

**Stage B:** In general, the recommendations of risk factor modification we mentioned above for patients with stage A HF can also be applied to those with stage B HF. Echocardiography should be obtained in selected patients who are at high risk of reduced left ventricular ejection fraction (LVEF) such as those with a strong family history of cardiomyopathy, long-standing hypertension and previous MI. ACE inhibitors (ARBs are reasonable alternatives in case of ACE inhibitor intolerance) and beta blockers should be used in all patients with reduced EF especially with a history of remote or recent MI or ACS to prevent symptomatic HF, to impede maladaptive LV remodeling and to improve mortality and morbidity. Statins are indicated in all patients with a history of MI to prevent symptomatic HF.

Blood pressure should be controlled in patients with structural cardiac abnormalities, including left ventricular hypertrophy (LVH) even in the absence of a history of CAD. Long term treatment of both systolic and diastolic blood pressure reduces the risk of progression from stage A or B to stage C HF. Diuretic-based antihypertensive therapy has been established to prevent HF in different populations. Spironolactone is beneficial as an additional agent in refractory hypertensive patients. The combination of eplerenone and enalapril has also shown reduction in left ventricle mass. Non-dihydropyridine calcium channel blockers, because of negative inotropic properties, should be avoided in patients with previously established structural heart disease and asymptomatic patients with low LVEF.

**Stage C**

**Nonpharmacological interventions:** Sodium restriction has been evaluated previously but with conflicting results despite the popularity of this intervention. A number of studies have been unable to give clear results, so it is difficult to make a precise recommendations about daily sodium intake. As there is a connection between sodium intake, hypertension, and LVH, restricting sodium intake to 1,500 mg/d for patients with stage A and B HF could be beneficial. However there is insufficient data to recommend any specific level of sodium intake in patients with stage C and D HF symptoms.

Sleep disorders such as central or obstructive sleep apnea are common in patients with HF. Continuous positive airway pressure can be effective to increase LVEF, to improve nocturnal oxygenation and functional status in patients with HF and sleep issues. Exercise or regular physical activity is safe and has numerous positive outcomes and is recommended for patients with HF to improve functional status. Cardiac rehabilitation is reasonable in clinically stable patients with HF to reduce mortality and hospitalizations as well as improve functional capacity.

**Pharmacological Treatment for Stage C HFrEF**

**Diuretics:** Diuretics are recommended in patients with HFrEF for symptomatic improvement if they are volume overloaded, unless contraindicated. Aside from their benefit in improving symptoms there has been no evidence that diuretics improve mortality. Loop diuretics such as furosemide are the most preferred diuretic agents for HF patients. For patients who have hypertension with HF and mild fluid retention, thiazide diuretics might be considered as they confer more persistent antihypertensive effects. In ambulatory HF patients, low dose diuretics are commonly initiated, and the dose is increased until urine output increases and weight decreases, typically by 0.5 to 1 kg daily. Once fluid retention has resolved, diuretics should be continued in some patients to prevent the recurrence of volume overload. The principal adverse effects of diuretics are hypotension, azotemia and serious cardiac arrhythmias due to electrolyte disturbances.

**ACE inhibitors and angiotensin receptor blockers (ARBs):** As mentioned in the management of stage B HF, ACE inhibitors should be prescribed to all patients with HFrEF irrespective of the presence or absence of CAD to reduce the mortality and morbidity. ARBs can be useful as first line therapy in patients who are not suitable for ACE inhibitors due to side effects such as cough. If a patient with HF is taking ARBs for indications such as hypertension, they may be continued instead of...
substituting with ACE inhibitors. ACE inhibitors should be used carefully in patients having very low blood pressures (SBP less than 80 mm Hg), markedly increased serum creatinine (less than 3 mg/dl), bilateral renal artery stenosis, or elevated levels of serum potassium (less than 5 mEq/L). Renal function and serum potassium levels should be evaluated within one to two weeks of initiation of therapy and periodically thereafter in patients who are taking ARBs or ACE inhibitors.

**Beta blockers:** Among all beta blockers, bisoprolol, carvedilol and sustained-release metoprolol have been shown to be effective in reducing mortality and morbidity in stable HF patients with or without CAD/DM. Even if the patients get minimal symptomatic benefit, they should still be treated long term with a beta blocker to reduce disease progression.

**Aldosterone receptor antagonists:** Aldosterone receptor antagonists have a beneficial role in patients with NYHA class II-IV HF who have LVEF of 35 percent or less in reducing mortality and morbidity. In order to initiate treatment with aldosterone antagonists and to minimize the risk of hyperkalemia and renal failure, serum creatinine should be 2.5 mg/dl or less in men or 2 mg/dl or less in women, and potassium should be less than 5 mEq/L and monitored closely thereafter.

**Hydralazine and isosorbide dinitrate:** Combination of hydralazine and isosorbide dinitrate has been shown to be beneficial in reducing mortality in the African American population with NYHA III-IV HFrEF. This combination should not be substituted for ACE inhibitors or ARB. Combination of hydralazine/isosorbide dinitrate can be used in African American patients who are either intolerant of ACE inhibitors/ARB or who have symptoms despite the use of above medications.

**Digoxin:** Digoxin can be used in patients with HFrEF to reduce the number of hospitalizations and in patients with persistent symptoms despite the standard HF management. Loading doses of digoxin are not required when initiating therapy in HF patients.

**Anticoagulation:** Anticoagulation should be prescribed according to the specific etiology in patients with HF. Guideline directed anticoagulation should be followed in patients with atrial fibrillation, prosthetic heart valves and other etiologies requiring treatment.

**Drugs that may cause harm or of no benefit in HF:** Statins are not indicated solely for the treatment of HF in the absence of other indications for their use. Most antiarrhythmic drugs should be avoided or withdrawn as they are associated with negative inotropic and proarhythmic properties (especially Class I and Class III antiarrhythmics). Amiodarone and dofetilide are the only drugs known to have neutral effects on mortality and hence are the preferred drugs for treating arrhythmias in patients with HF. In general, calcium channel blockers should not be used for patients with HFrEF as they are associated with myocardial depressant activity. NSAIDS can cause sodium and water retention and lead to diuretic resistance and thus should be avoided.

**Device Therapy for Stage C HFrEF**

- **Implantable cardioverter-defibrillator (ICD):** ICD is recommended for primary prevention of sudden cardiac death in the following patients who are on standard HF treatment for at least three to six months and who have reasonable expectation of survival for more than one year:
  a) Non ischemic dilated cardiomyopathy or ischemic heart disease with recent myocardial infarction (MI) (At least 40 days) with LVEF of 35 percent or less and NYHA class II or III symptoms.
  b) Recent MI (At least 40 days) with LVEF of 30 percent or less and NYHA class I symptoms.

ICDs are not indicated in HFrEF patients with class IV NYHA symptoms to prevent sudden cardiac death unless heart transplantation or mechanical circulatory support (MCS) is anticipated.

- **Cardiac resynchronization therapy (CRT):** CRT is recommended for patients who have LVEF of 35 percent or less, sinus rhythm, LBBB with QRS of 150 ms or more and NYHA class II, III, or IV symptoms on standard HF treatment.

**Stage D HF (Advanced HF)**

Patients might improve, stabilize or progressively worsen with all the above mentioned therapies. Stage D heart failure or advanced heart failure is defined by a number of variables as listed below. Patients included in this group have progressively worsening clinical status despite aggressive medical therapy. At times, patients do not tolerate medications in this stage due to hypotension or renal impairment. It is important for health care providers to recognize patients with refractory symptoms and discuss advanced therapies including mechanical circulatory support (MCS) and cardiac transplantation. It is also
important to discuss hospice or palliative care options at this stage. The following clinical information is useful in categorizing patients into advanced HF:

- Repeated (greater than or equal to two) hospitalizations or emergency department visits for HF in the past year;
- Progressive decline in renal function;
- Poor tolerance to ACE inhibitors and beta blockers;
- Frequent systolic blood pressure less than 90 mm Hg;
- Inability to carry out daily activities such as dressing or bathing and walk at least one block due to ongoing dyspnea;
- Progressive decline in serum sodium, usually to less than 133 mEq/L; and
- Frequent ICD shocks

Water restriction: Fluid intake may be limited to around 2 L/day in stage D HF patients particularly with hyponatremia to reduce congestive symptoms. Otherwise routine strict fluid restriction in all patients with HF regardless of symptoms does not appear to have an added advantage.46

Inotropic support: Temporary parenteral inotropic agents are recommended in patients who are awaiting definitive therapy such as MCS or cardiac transplantation. These might be useful in patients with severe systolic dysfunction, low blood pressure and depressed cardiac output despite standard HF management and device therapy, to maintain systemic perfusion and end organ performance.47 Despite improved hemodynamic parameters, inotropic agents increase mortality of the patients in the long run. Aside from use in patients awaiting MCS/transplantation or possibly in patients in hospice for symptomatic relief, routine use of these medications should be avoided.

Advanced Treatment Strategies

Mechanical circulatory support (MCS): MCS can be used in carefully selected patients with advanced stage D HF/REF refractory to optimal treatment and device intervention, in whom definitive management such as cardiac transplantation or recovery is expected.48 Even though cardiac transplantation offers a definitive therapy for patients with end stage HF there is a severe shortage of donor organs at present. Therefore, MCS that was initially developed as a “bridge” to transplantation can be utilized in certain patient populations as “destination therapy.”

Cardiac transplantation: Patients who have stage D HF despite optimal treatment, device and surgical management, with poor prognosis should be referred to a cardiac transplantation center for evaluation and consideration for cardiac transplant.49 People who have poor prognosis from advanced HF are benefitted most from cardiac transplantation.

Palliative care: In patients who are not suitable for either MCS or cardiac transplantation, continuous inotropes may be considered to improve quality of life. Clinicians involved in ongoing care should address symptom control, any psychosocial distress and preferences about end of life care including hospice.

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:
Mahadehar Gedela, MD, Department of Internal Medicine, University of South Dakota Sanford School of Medicine.
Muhammad Khan, MD, Division of Cardiology, Department of Internal Medicine, University of South Dakota Sanford School of Medicine.
Orvar Jonsson, MD, Division of Cardiology, Department of Internal Medicine, University of South Dakota Sanford School of Medicine.
Medication therapy management (MTM) is defined as “a distinct service or group of services that optimize therapeutic outcomes for individual patients” that are “independent of, but can occur in conjunction with, the provision of a medication product.” This consensus definition for MTM services was approved by the profession of pharmacy in 2004 in response to passing of the Medicare Prescription Drug Improvement and Modernization Act in 2003 (Medicare Part D) and thus need for clear guidance during the regulation writing process.

Eligibility for MTM
Currently with Medicare Part D, patients who meet all three of the following criteria are automatically enrolled by their insurer in MTM programs to receive MTM benefits at no extra cost. These criteria are updated on an annual basis by the Centers for Medicare and Medicaid Services (CMS). First, patients must have at least three or more chronic diseases. This may be any three chronic diseases, or three from one of the CMS-provided categories. Nine categories of chronic diseases are provided by CMS to choose from, and insurers must select at least five conditions from this list of nine as their eligibility criteria (Table 1). Second, patients must take at least eight or more medications billed through Medicare Part D. Third, Medicare Part D medications must reach or exceed the annual cost threshold of $3,507 for 2016. For comparison, this cost threshold for 2015 was $3,138 (11.76 percent increase). It is important to note that these are only the minimum MTM patient eligibility requirements by CMS for insurers. The overall impetus for and intended result of MTM services is to improve health outcomes through proper medication use and thus reduce costs. For this reason, many insurers choose to extend eligibility and provide the benefits of MTM to many more of their Medicare Part D patients than what is required. In addition, many private insurance carriers now offer MTM services as part of their benefits using similar targeting criteria as described above.

Required Components of MTM
MTM services are a comprehensive approach designed at their core to facilitate communications between patients, their pharmacists, their primary care physician, and any other members of their health care team to optimize medication use. There are three major components to MTM services including: discussion of interventions between patients and all members of the health care team, an annual comprehensive medication review (CMR), and quarterly targeted medication reviews (TMRs). These MTM services may be provided in nearly any location: the community pharmacy, the patient’s home, the primary care physician’s office, a community center, etc.

Comprehensive Medication Review (CMR) – A comprehensive medication review (CMR) is defined by CMS as “a systemic process of collecting patient-specific information, assessing medication therapies to identify medication-related problems, developing a prioritized list of medication-related problems, and creating a plan to resolve them with the patient, caregiver, and/or prescriber.” The annual CMRs are designed to be interactive and ideally face-to-face, but certain limitations may require CMRs via phone or other telehealth technology.

<table>
<thead>
<tr>
<th>Table 1. Nine Categories of Core Chronic Diseases for MTM Criteria per CMS 20162</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hypertension</td>
</tr>
<tr>
<td>• Dyslipidemia</td>
</tr>
<tr>
<td>• Diabetes</td>
</tr>
<tr>
<td>• Chronic heart failure (CHF)</td>
</tr>
<tr>
<td>• Alzheimer’s disease</td>
</tr>
<tr>
<td>• End-stage renal disease</td>
</tr>
<tr>
<td>• Respiratory disease</td>
</tr>
<tr>
<td>o Asthma</td>
</tr>
<tr>
<td>o Chronic obstructive pulmonary Disease (COPD)</td>
</tr>
<tr>
<td>o Chronic lung disorders</td>
</tr>
<tr>
<td>• Bone disease – arthritis</td>
</tr>
<tr>
<td>o Osteoporosis</td>
</tr>
<tr>
<td>o Osteoarthritis</td>
</tr>
<tr>
<td>o Rheumatoid arthritis</td>
</tr>
<tr>
<td>• Mental Health</td>
</tr>
<tr>
<td>o Depression</td>
</tr>
<tr>
<td>o Schizophrenia</td>
</tr>
<tr>
<td>o Bipolar disorder</td>
</tr>
<tr>
<td>o Chronic and disabling disorders</td>
</tr>
</tbody>
</table>
the patient population that qualifies for Medicare Part D, caregivers are invited to actively participate in the CMR as applicable and necessary.

CMR Process – Through this process outlined above, patient's actual use of and understanding of prescription and non-prescription medications (over-the-counter, vitamins, herbals, etc.) as well as therapeutic and quality of life outcomes are discussed at length. Following the CMR meeting, a detailed medication action plan is created that documents any current or potential problems with existing therapy and what changes should be considered. This medication action plan also includes an accurate medication list; both of these documents are shared with both the patient and prescriber. Prescribers then communicate any changes they plan to make based on the medication action plan to the pharmacist including any new or changed prescriptions.

Targeted Medication Review (TMR) – Targeted medication reviews (TMRS) differ from CMRs in that they are focused on one single drug therapy problem (DTP). A drug therapy problem is defined as “an event or circumstance involving a medication, or lack thereof, that actually or potentially interferes with the optimal therapeutic and/or economic outcome(s) of the medication”.1 To standardize reporting and language used in MTM services, all actual or potential issues that could result from drug therapy are organized into one of 4 categories: indications, efficacy, safety, and adherence.1 (Table 2)

<table>
<thead>
<tr>
<th>Indications</th>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs therapy</td>
<td>Adverse drug reaction</td>
</tr>
<tr>
<td>Unnecessary therapy</td>
<td>Drug interaction</td>
</tr>
<tr>
<td>Efficacy</td>
<td>Dose too high</td>
</tr>
<tr>
<td>Suboptimal drug</td>
<td>Adherence</td>
</tr>
<tr>
<td>Dose too low</td>
<td>Overuse</td>
</tr>
<tr>
<td>Cost efficacy</td>
<td>Underuse</td>
</tr>
<tr>
<td></td>
<td>Inappropriate administration</td>
</tr>
</tbody>
</table>

TMR Process – To meet the CMS standards for MTM, insurers analyze patient claims data and other health information at least quarterly to determine which actual or potential DTPs a patient needs to have addressed through MTM services. The MTM provider may use their clinical judgment to address these DTPs first with the patient or directly with the primary care provider based on the type of DTP.

MTM in Practice

Although any qualified health provider may provide MTM services, the patient’s community pharmacist is almost always the member of the health care team directing MTM services. A recent survey of Medicare Part D patients found that having a pharmacist from their usual pharmacy conducting CMRs was one of the most important factors in patients deciding whether to receive a CMR when offered.4 The same survey also found that the majority of patients agreed or strongly agreed that they were satisfied with the results of the CMRs (94.7 percent) and that they felt having the CMRs was important to their health (90.6 percent).4

However, one of the limitations community pharmacists face while providing MTM services is that many community pharmacies do not have electronic health record (EHR) access; they must rely instead on dispensing records and patient report as the basis for their clinical decision making. This limitation was demonstrated in practice with a recent pilot study where pharmacists were asked to identify DTPs first without EHR access, then with EHR access. Of the 123 DTPs initially identified without EHR access, 31 DTPs (25 percent) were confirmed as false with EHR access.5 This highlights the need for EHR access for all health care providers involved in a patient’s care to improve patient safety as well as efficiency in providing care. It should be noted that dispensing records do supply fill histories and thus medication adherence data; this is information many EHRs do not have access to which can be used to provide insight into patient medication use behaviors to empower other members of the health care team as they provide care.

The overall goal of MTM services is to optimize the therapeutic outcomes for mutual patients of providers on the health care team. Currently, the community pharmacist is the member of the health care most involved with this process by meeting with eligible patients for annual comprehensive medication reviews (CMRs) and providing recommendations to the primary care provider and others on the health care team. Individual recommendations will be categorized as one of the 11 drug therapy problems (DTPs) and generally come via facsimile, but may also require a phone call for more complex situations. Regular consultation with MTM providers regarding the results of CMRs and TMRS provides another opportunity to improve the care mutual patients receive.

REFERENCES


About the Author:
Alex Middendorf, PharmD, MBA, Assistant Professor of Pharmacy Practice, College of Pharmacy, South Dakota State University.

September 2015 411
Making Health Care Safer
Stop Spread of Antibiotic Resistance

We're at a tipping point: an increasing number of germs no longer respond to the drugs designed to kill them. Inappropriate prescribing of antibiotics and lack of infection control actions can contribute to drug resistance and put patients at risk for deadly diarrhea (caused by C. difficile). Even if one facility is following recommended infection controls, germs can be spread inside of and between health care facilities when patients are transferred from one health care facility to another without appropriate actions to stop spread. Lack of coordination between facilities can put patients at increased risk. Now more than ever is the time for public health authorities and health care facilities to work together, sharing experiences and connecting patient safety efforts happening across the state.

Health care facility CEOs/administrators can:

- Implement systems to alert receiving facilities when transferring patients who have drug-resistant germs.
- Review and perfect infection control actions within your facility.
- Get leadership commitment to join healthcare-associated infection (HAI)/antibiotic resistance prevention activities in the area.
- Connect with the public health department to share data about antibiotic resistance and other HAI.
- Make sure clinical staff have access to prompt and accurate laboratory testing for antibiotic-resistant germs.

Want to learn more? www.cdc.gov/vitalsigns/stop-spread

2 Million
Antibiotic-resistant germs cause more than 2 million illnesses and at least 23,000 deaths each year in the US.

70%
Up to 70% fewer patients will get CRE over 5 years if facilities coordinate to protect patients.

37,000
Preventing infections and improving antibiotic prescribing could save 37,000 lives from drug-resistant infections over 5 years.
What Can Be Done?

The Federal government is
- Implementing activities across all government agencies to address the National Action Plan for Combating Antibiotic-Resistant Bacteria.
  www.whitehouse.gov/sites/default/files/docs/national_action_plan_for_combating_antibiotic-resistant_bacteria.pdf
- For example, CDC is:
  - Protecting more people by tracking outbreaks, monitoring antibiotic use and resistance, improving prescribing, and preventing infections through investment in State HAIs/Antibiotic Resistance Protect Programs, as described in the President’s proposed FY16 budget.
    www.cdc.gov/drugresistance/solutions-initiative/index.html
  - Supporting health departments, health care facilities, health care networks, and professional and quality improvement organizations to track and respond to data about HAIs and antibiotic-resistant infections.

Health care facility CEOs/administrators can
- Implement systems to alert receiving facilities when transferring patients who have drug-resistant germs.
- Review and perfect infection control actions within your facility.
- Get leadership commitment to start or join HAIs/antibiotic resistance prevention activities in the area.
- Connect with the public health department to share data about antibiotic resistance and other HAIs.
- Make sure clinical staff have access to prompt and accurate laboratory testing for antibiotic-resistant germs.

Prescribers and healthcare staff can
- Prescribe antibiotics correctly. Get cultures then start the right drug promptly at the right dose for the right duration. Know when to stop antibiotics.
- Be aware of antibiotic resistance patterns in your facility and area to protect your patients.
- Ask patients if they have recently received care in another facility.
- Follow hand hygiene and other infection control measures with every patient.
  www.cdc.gov/handhygiene/

Patients and their families can
- Ask your healthcare provider what they and the facility will do to protect you and your family from an antibiotic-resistant or C. difficile infection.
- Tell your doctor if you have been hospitalized in another facility.
- Insist that everyone wash their hands before touching you, and wash your hands often.

For more information, please contact
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348
www.cdc.gov
Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 30333
Publication date: 8/4/2015
Studies show 1 in 14 doctors face a malpractice suit every year – resulting in almost every physician dealing with more than one lawsuit during their career. The SDSMA Center for Physician Resources brings you the following 5 webinars with expertise on risk protection:

- **September 8, 2015 – 7 p.m. CT**
  **Tips, Tricks and Steps to Avoid a Malpractice Lawsuit**

- **December 8, 2015 – 7 p.m. CT**
  **Protecting Yourself as an Individual: Malpractice Coverage and Limits**

- **March 8, 2016 – 7 p.m. CT**
  **“I’m Sorry:” 2 Simple Words that can Save You from a Malpractice Claim**

- **June 14, 2016 – 7 p.m. CT**
  **The Litigation Process – What to Expect and How to Prepare**

- **September 13, 2016 – 7 p.m. CT**
  **Surviving a Medical Malpractice Suit**

This series will also provide key advice on the litigation process and how to get through a malpractice claim both personally and financially.
As any health care provider knows, helping patients overcome their addiction to smoking will bring them a multitude of benefits, as well as benefits to those around them. According to the National Institute of Health, those who quit smoking lower their risk of getting various forms of cancer, including lung, and significantly reduce their chances of suffering from heart disease, stroke, emphysema, and/or a number of other serious diseases.

According to the Centers for Disease Control and Prevention, more than 16 million Americans suffer from a disease caused by smoking, and smokers have a 50 percent chance of dying from a smoking related disease.

To aid your patients in their desire to quit, the Food and Drug Administration (FDA) has approved a variety of products to include prescription medications as well as over-the-counter products such as skin patches, lozenges and gum. And while smoking cessation products are regulated by the FDA's Center for Drug Evaluation and Research to ensure the products are safe and effective, and that their benefits outweigh any known associated risks, as a health care provider, I encourage you to take some time to familiarize yourself with the products that are available, their delivery mechanisms and known side effects.

Smoking cessation products come in two primary categories – nicotine replacement products and products that do not contain nicotine.

Nicotine replacement products are designed to wean the smoker's body of cigarettes by delivering a controlled amount of tobacco over a period of time – sparing the body from the many other harmful chemicals found in tobacco products. In general, nicotine replacement products are available over the counter and come in the forms of skin patches, chewing gum and lozenges. Prescription-only nicotine replacement products are available under the name Nicotrol, and are available both as a nasal spray and oral inhaler. When recommending a nicotine replacement product for a patient, be sure to take into consideration if the patient is pregnant/breastfeeding, and/or has one of the following:

- Diabetes, heart disease, asthma, or stomach ulcers;
- Had a recent heart attack;
- High blood pressure that is not controlled with medication; or
- A history of irregular heartbeat.

Of further note, if your patient is currently taking a prescription medication for depression or asthma, the prescription dose may need to be adjusted.

Side effects of nicotine replacement products include:

- Common/less severe – mouth sores, nausea or vomiting, and sore throat; and
- Less common/more severe – dizziness, heartburn, diarrhea, blurred vision, headache, nervousness, pounding in ears, fast or irregular heartbeat, hives, itching, rash, redness, or swelling of the skin.

Products not containing nicotine include Chantix (varenicline tartrate) and Zyban (buproprion hydrochloride – both of which are available in a tablet form and a prescription basis only. I encourage you to read the products' patient medication guide in its entirety if you plan to prescribe either of these products as these guides offer important information on adverse effects, and risks that should be reviewed with the patient before use. Side effects of Zyban (buproprion hydrochloride) and Chantix (Varenicline tartrate) include:

Common/less severe – feeling anxious or unable to focus, dry mouth, excessive sweating, stomach cramps, weight loss, joint and muscle pain, nervousness, cough, head and/or chest pain, feeling dizzy and blurred vision.

Less common/more severe – feeling restless, confused and/or thoughts of suicide, abnormally high or low blood pressure, hallucinations, paranoia, delusions, aggressive behavior, and allergic reactions caused by the drug to include difficulty swallowing, hives, etc.

When prescribing a nicotine replacement product – be it nicotine or non-nicotine based, a provider should schedule a follow-up with patients within one weeks of the patient's scheduled quit date to check for progress and to assess and/or address any concerns or side effects. Of note, combination pharmacotherapy has been proven to be more effective than a single nicotine replacement therapy. Of further note, the South Dakota QuitLine does cover dual therapy for those who have used the South Dakota QuitLine service more than three times and the patient’s physician believes dual therapy is warranted for the patient to assist him/her in their effort to quit. For more information regarding the South Dakota QuitLine, I encourage you to visit www.sdquitline.com.

As a physician, you are pivotal in winning the war against tobacco and helping those who wish to quit, so please Ask, Advise and Refer.
Don’t forget to send in your favorite scenic photo for South Dakota Medicine front cover consideration.
Send photos to ereiss@sdsma.org.
It’s been said that to become a parent takes a gargantuan “leap of faith.”

First, you should think hard at what starting a family might mean. How stable is your relationship? How were the relationships between parents and children in the family you were raised? How much help would you have, or wouldn’t have, raising a child? Is this something you really want to do right now?

For some, having a baby is an easy decision and others a difficult one. It is not as if one can “try out” parenting. Yes, you can read about it, watch other people parent, rent a kid for a day, and conduct informal polls to your heart’s content, but when it is the real deal, there’s no backing out. You will need to be in 100 percent of the way. It’s a big decision.

So if this is still a go, you should be prepared. Like the run that should happen before a jump over the creek, you must get ready for the responsibilities of having a baby. It means taking care of your body before and during pregnancy, preparing the home, making financial arrangements; choosing and buying the gear needed to care for an infant, preparing your work situation for your maternity and paternity leave, and understanding your attention will be changing from yourself and your partner...to this tiny infant. Be prepared.

Then comes the leap and you become a parent. For help there are thousands of “How to parent” resources. The National Institutes of Child Health and Human Development advises: keeping them clean, fed and safe; listening and showing affection; tolerating their impatience; spending time with them; watching with interest and support as they succeed or fail; providing fair discipline and rules of society; and teaching by example.

We leaned on several other resources. A favorite book advises two things to remember: loving unconditionally while disciplining fairly. Another parenting book suggests that we only teach by example, so concentrate on loving and having fun with your spouse, and your children will be okay. We led the prayer, “Help us be kind, honest, and respect people’s choices.” And then, of course, there's the Golden Rule.

In the 2014 book entitled All Joy and No Fun: The Paradox of Modern Parenthood, author Jennifer Senior states, “Raising children is terribly hard work, often thankless and mind-numbing, and yet the most rapturous experience available to adults.”

Make a run at it, take the leap, and be aware that you will never land.
Help Shape the Future of Medicine in South Dakota

The South Dakota State Medical Association Foundation, the philanthropic arm of the South Dakota State Medical Association, is a tax-exempt 501(C)(3) non-profit corporation, was established to assist and support medical research, medical teaching and medical education at the Sanford School of Medicine.

On average, medical students graduate with $130,000 in debt. Contributions to the South Dakota State Medical Association Foundation provide financial assistance to students at the Sanford School of Medicine and are all designated for scholarships, grants and low-interest loans for students.

Any amount can be donated at any time throughout the year. If you have questions or want more information, please call Laura Olson at 605.336.1965.

Send Your Contributions Today To:
South Dakota State Medical Association Foundation
PO Box 7406, Sioux Falls, SD 57117-7406
www.sdsma.org

SOUTH DAKOTA
State Medical Association Foundation
Shaping the Future of Medicine in South Dakota
The first year of our CMS 11th Scope of Work contract is now behind us. This contract saw the restructuring of the Quality Improvement Organization (QIO) program from local, state-based organizations to regionalized entities with separate responsibilities for Medicare case review and for quality improvement.

The South Dakota Foundation for Medical Care (SDFMC) continues its quality improvement work as part of the Great Plains Quality Innovation Network (QIN). Great Plains QIN is a collaboration of the QIOs in Kansas, Nebraska, North Dakota and South Dakota working together to improve the quality and efficiency of health care in the region. Our teams have worked tirelessly on recruitment and meeting our year one targets.

Here’s a brief synopsis on our first year recruitment numbers:

- Seven home health agencies/16 clinics – improving cardiac health and reducing disparities
- Five clinics – everyone with diabetes counts
- Two critical access hospitals/39 eligible professionals – improving prevention coordination through meaningful use of HIT and collaborating with regional extension centers
- Fifteen hospitals – reducing healthcare-associated infections in hospitals
- Ninety-nine nursing homes – reducing healthcare-associated conditions in nursing homes
- One community coalition – coordination of care
- Established a patient and family advisory board, “Voices for Quality Healthcare (V4QH)”

We appreciate and thank those of you who have already had the opportunity to partner with us. Please visit our Great Plains Quality Innovation Network website at www.greatplainsqin.org to get more information on our quality initiatives, upcoming events, and to join our learning and action network (LAN).

For your convenience, below is a list of our staff if you’d like to discuss specific projects.

Again, thank you for your partnership and commitment to quality improvement and your efforts to make health in our region the best in the nation.

<table>
<thead>
<tr>
<th>Project Area</th>
<th>Staff</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician Offices, Prevention, Cardiac Health, Immunizations</td>
<td>Holly Arends, CSHP</td>
<td><a href="mailto:holly.arends@area-a.hcqis.org">holly.arends@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Diabetes</td>
<td>Sue Johannsen, PA, GNP, CDE</td>
<td><a href="mailto:susan.johannsen@area-a.hcqis.org">susan.johannsen@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Healthcare-Associated Infections, Quality Reporting</td>
<td>Nancy McDonald, RN/BSN, CPHQ</td>
<td><a href="mailto:nancy.mcdonald@area-a.hcqis.org">nancy.mcdonald@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Nursing Homes</td>
<td>Lori Hintz, RN</td>
<td><a href="mailto:lori.hintz@area-a.hcqis.org">lori.hintz@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Care Coordination, Quality Improvement</td>
<td>Linda Penisten, RNC, OTR/L</td>
<td><a href="mailto:linda.penisten@area-a.hcqis.org">linda.penisten@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Communications</td>
<td>Stephanie Jacobson</td>
<td><a href="mailto:stephanie.jacobson@area-a.hcqis.org">stephanie.jacobson@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Director of Quality Improvement</td>
<td>Nancy Beaumont</td>
<td><a href="mailto:nancy.beaumont@area-a.hcqis.org">nancy.beaumont@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Medical Director</td>
<td>Steve Schroeder, MD</td>
<td><a href="mailto:stephan.schroeder@area-a.hcqis.org">stephan.schroeder@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>Vice President</td>
<td>Ryan Sailor, MBA</td>
<td><a href="mailto:ryan.sailor@area-a.hcqis.org">ryan.sailor@area-a.hcqis.org</a></td>
</tr>
<tr>
<td>CEO</td>
<td>Jay Lewis, MBA</td>
<td><a href="mailto:jay.lewis@area-a.hcqis.org">jay.lewis@area-a.hcqis.org</a></td>
</tr>
</tbody>
</table>

“Quality Focus “ is a monthly feature sponsored by SDFMC, South Dakota’s Quality Improvement Organization. For more information about the SDFMC, visit their website at www.sdfmc.org.
### Subscription Order Form – 2015

**Date:**

**Name:**

**Company:**

**Address:**

**City, State, Zip:**

**Phone:**

**Fax:**

**E-mail:**

**Mailing Address For Publication (if different from above):**

**Name:**

**Company:**

**Address:**

**City, State, Zip:**

**Subscription Begin Date:**

**Prices:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Issue</td>
<td>$8.50</td>
</tr>
<tr>
<td>Annual Subscription Fee</td>
<td>$50.00  (U.S.)</td>
</tr>
<tr>
<td></td>
<td>$65.00  (Foreign)</td>
</tr>
<tr>
<td>Subscription Agency Fee</td>
<td>$40.00  (U.S.)</td>
</tr>
<tr>
<td></td>
<td>$50.00  (Foreign)</td>
</tr>
</tbody>
</table>

**Please return order form and payment to:**

South Dakota Medicine  
PO Box 7406  
Sioux Falls, SD 57117-7406  
Fax: 605.274.3274  
Email: ereiss@sdsm.org

**Please direct any questions to:**

Elizabeth Reiss  
Staff Editor, South Dakota Medicine  
Phone: 605.336.1965  
Fax: 605.274.3274  
Email: ereiss@sdsm.org

---

**FOR OFFICE USE ONLY**

**Received By:**

**Date:**

**Amount Paid:**

**Date Paid:**
Shared Decision Making in the Internet Age

By Daniel Weiss, PharmD
Director, Pharmacy Services

In the last few decades, there has been increased focus and encouragement related to the practice of shared decision making. There are numerous publications and studies that attribute shared decision making with improved quality, reduced costs, and increased adherence to the collaborative plan. This is not surprising, when we consider the pioneering heritage of our American culture. One can argue that our ancestors were not necessarily willing to comply, adhere, and follow paternalistic directions from any authority figure. Many chose to settle the U.S. in pursuit of the freedoms we are granted, so it is a logical deduction that the descendants of those individuals may appreciate and share these autonomous traits. This heritage lends itself to collaboration more than dictated mandates.

While the consensus remains supportive of the practice of shared decision making, a significant portion of the literature originates from more than 10 years ago. There have been several changes to our world and the healthcare profession over the last decade, and one can easily argue that not every change has been completely positive. For instance, the surging popularity of social media and unreliable internet-based information results in significant potential for misinformation. When that misinformation is limited to debate related to, let's say: the color of a dress (if you missed this, Google search the phrase “what color is the dress”), one can appreciate the entertainment value of such online applications. When misinformation is related to the treatment or care of our patients, the gravity of this issue is much more apparent.

In recent weeks, Kim Kardashian has exploited social media as she promotes Diclegis. Even if you detest “reality stars” and avoid their influence, this scenario may impact your practice. To start with, Diclegis is a prescription medication for morning sickness, which contains two over-the-counter ingredients: doxylamine and pyridoxine. Each dose has an AWP just shy of $7. When we consider that one can buy a 30-day supply of both ingredients for the cost of two to three days of this medication, the value of this “new” treatment option offers is debatable at very least. Even if we look past that aspect, another serious concern remains. The Food and Drug Administration (FDA) is pursuing action against the manufacturer as well as Mrs. Kardashian because the advertisement placed on social media was not done in compliance with the advertising rules associated with prescription products. In her promotion for this medication, the reality star did not follow the protocols of the FDA which includes mentioning side-effects on any advertisement. Additionally, many of her fans and followers may confuse the advertisement with a personal endorsement, not fully understanding that this celebrity is a paid spokesperson for this medication. The advertisement on social media had an amateur quality to it, which is assumed intentional to blur the lines between a personal recommendation and a paid advertisement.

While this story unfolds, we should recognize this same phenomenon has repeated itself through different technologies. Previous generations may have been more inclined to listen to their favorite radio announcers. I distinctly recall several patients asking for the products that they heard Paul Harvey talk about. It was as if his advertisements for various supplements were not paid endorsements, but a friendly piece of advice to help his listeners. The obvious difference here was that the radio advertisements were much more closely regulated, whereas the social media stunts have gained publicity and even magnified their effect under the controversy they stir. As social media evolves to embrace more commercialized interests, we can anticipate more activity in this space related to the medical field.

How does one practice shared decision making in a world fraught with misinformation and misdirection? We can start by resolving some of the educational gaps in our patient base. Instead of random internet research or social media posts, we should provide patients with suitable and reliable websites for their medical information. These can be larger published websites such as WebMD or drugs.com to regional clinics and specialists who publish reliable information to the public. In this circumstance, like many others, prevention is far more efficient compared to attempting to undo the damage that misinformation causes. If we educate our members on where to find valid and reliable information, we can more easily engage in challenging, yet rewarding discussions using shared decision making.

As our world evolves into more technology and information available to our patients, it is essential that our practices adapt to these changes. We must recognize that patients have more information literally at their fingertips than any other time in human history. By providing guidance and direction to our patients, we can help increase medical literacy while enhancing opportunities to practice shared decision making!

REFERENCES

Board News

By Margaret B. Hansen, PA-C, MPAS, Executive Director

Each month the South Dakota Board of Medical and Osteopathic Examiners (Board) submits a column to South Dakota Medicine to inform physicians and other licensees about various topics of interest that come to the Board. Recently the Board received questions regarding the role and responsibilities of medical directors, and the statutes and administrative rules relating to ethical standards for physicians.

South Dakota Law

The state constitution, statutes and administrative rules collectively are referred to as South Dakota law.

South Dakota administrative rules help to define the statutes known as South Dakota Codified Law (SDCL). Administrative rules and statutes have the same force and effect of law. Each state has its own set of administrative rules which are approved by the state legislature.1 South Dakota follows the Administrative Procedures Act described in SDCL 1-26. The Board holds public hearings and then submits proposed rules to an Interim Rules Committee whose members are state legislators. The Interim Rules Committee returns recommendations to the Board which then adopts the rules which become law.

South Dakota Law Regarding Ethics for Physicians

Administrative rules for physician licensure, inspections, fees, and ethics can be found in Article 20:47.2 A South Dakota licensed physician shall comply with ethical standards and conduct set forth in the 2012-2013 edition of the Code of Medical Ethics of the American Medical Association (AMA).3 A violation of any of the ethical standards and conduct are considered unprofessional conduct.

The Board may utilize the annotations and opinions included in AMA Code of Medical Ethics as guidance in determining whether a physician has violated professional ethical standards and conduct. The AMA Code of Medical Ethics in its entirety may be found on the AMA’s website at www.ama-assn.org.

South Dakota Law Regarding Ethics for Medical Directors

Medical directors and the entities using medical directors frequently query the Board staff about medical director responsibilities. A medical director for a lab, clinic, organization, or office who is a “qualified medical director” is defined in South Dakota law and required to be a South Dakota licensed physician.4 The South Dakota legal standard for medical director ethics is set forth in AMA Opinion 8.021 which was adopted by the AMA in 1999 and contained within the AMA Code of Medical Ethics.

The following opinion is provided in its entirety to assist South Dakota medical directors and the entities using medical directors:

Opinion 8.021 - Ethical Obligations of Medical Directors

Assuming a title or position that removes the physician from direct patient-physician relationships does not override professional ethical obligations. The term “medical directors,” as used here, refers to physicians who are employed by third party payers in the health care delivery system (i.e., insurance companies, managed care organizations, self-insured employers) or by entities that perform medical appropriateness determinations on behalf of payers. These types of medical directors have specific functions, such as making coverage determinations, which go beyond mere administrative responsibility. The following stem from this understanding. Whenever physicians employ professional knowledge and values gained through medical training and practice, and in so doing affect individual or group patient care, they are functioning within the professional sphere of physicians and must uphold ethical obligations, including those articulated by the AMA’s Code of Medical Ethics. Medical directors acting within the professional sphere, such as when making decisions regarding medical appropriateness, have an overriding ethical obligation to promote professional standards.

Adherence to professional medical standards includes:

1. Placing the interests of patients above other considerations, such as personal interests (e.g., financial incentives) or employer business interests (e.g., profit). This entails applying the plan parameters to each patient equally and engaging in neither discrimination nor favoritism.

2. Using fair and just criteria when making care-related determinations. This entails contributing professional expertise to help craft plan guidelines that ensure fair and equal consideration of all plan enrollees. In addition, medical directors should review plan policies and guidelines to ensure that decision-making mechanisms are objective, flexible, and consistent, and apply only ethically appropriate criteria, such as those identified by the Council in Opinion 2.03, “Allocation of Limited Medical Resources.”

3. Working towards achieving access to adequate medical services. This entails encouraging employers to provide services that would be considered part of an adequate level of health care, as articulated in Opinion 2.095, “The Provision of Adequate Health Care.” (I, III, VII)

REFERENCES


3. Code of Medical Ethics of the American Medical Association 2012-2013 edition, annotations prepared by the southern Illinois University School of Medicine. Copies may be viewed at the Board’s office or obtained from the American Medical Association by calling 800.621.8335 or visiting www.amabookstore.org.

The Issue Is...

Majority of Hospitals Hit With Medicare Readmission Penalties

In the fourth year of the hospital Readmissions Reduction Program, the majority of U.S. hospitals are being penalized by Medicare for having patients frequently return within a month of discharge. Kaiser Health News reported that this resulted in the combined loss of $420 million, government records indicate. According to the article, 2,592 hospitals will receive lower payments for every Medicare patient that stays in the hospital — readmitted or not — starting in October. The fines are based on readmissions between July 2011 and June 2014 and include Medicare patients who were originally hospitalized for one of five conditions: heart attack, heart failure, pneumonia, chronic lung problems or elective hip or knee replacements.

Source: Kaiser Health News

Legal Brief Highlight: Standing Orders for Immunizations

The South Dakota Board of Medical and Osteopathic Examiners (SDBMOE) issued a declaratory ruling in September 2013 concerning the use of standing, non-patientspecific orders for vaccinations. It authorizes the issuance of standing orders for vaccinations under certain circumstances and may only be issued to licensed health care professionals who are authorized by their scope of practice to administer vaccinations.

The ruling includes a list of licensed or registered health care professionals who may administer vaccinations. The list includes physician assistants and nurses. Paramedics, pharmacists, and medical assistants are also authorized to administer vaccinations in certain limited circumstances.

With the exception of pharmacists (who may administer flu vaccinations), the list itself is not specific as to which licensed or registered health care professionals may administer which vaccinations. Given that the ruling places responsibility for protecting patient health with the physician issuing the standing order or protocol, the SDSMA strongly recommends that the physician be cautious to ensure that the order or protocol only authorize vaccinations in circumstances (including the setting and the person administering the vaccination) appropriate for the vaccinations being authorized.

The ruling places the burden on the issuing physician to ensure that there is not undue risk to patient health resulting from the vaccinations authorized.

For more information, download the SDSMA legal brief Standing Orders for Immunizations at www.sdsma.org. Through the SDSMA Center for Physician Resources, the SDSMA develops and delivers programs for members in the area of practice management, leadership and health and wellness.

Source: SDSMA staff

Support Medical Student Scholarships

Since the establishment of the SDSMA Foundation in 1949, hundreds of medical students have received help through much needed scholarships and low-interest loans. With the rising cost of education, the need continues.

Please support South Dakota medical student scholarships. Your donation to the SDSMA Foundation has a lasting impact and helps offset the more than $180,000 in debt incurred by medical students upon graduation.

Log in through your SDSMA user account at www.sdsma.org to make a donation to the SDSMA Foundation, or send your contribution to SDSMA Foundation, PO Box 7406, Sioux Falls, SD 57117. Thank you for your generosity and support of the SDSMA Foundation.

Source: SDSMA staff
**For Your Benefit: Shaping Your Profession**

The SDSMA has a member-driven focus on issues, programs and policies, professional involvement, personal development and representation in organized medicine.

- SDSMA policy is developed through your representatives on the Council of Physicians;
- Leadership opportunities on SDSMA committees, task forces and through sections;
- Representation for students, residents, young physicians and senior physicians;
- Low-interest educational loans and scholarships for students and residents;
- Collaborating with the University of South Dakota Sanford School of Medicine on physician workforce and medical education funding;
- Networking with colleagues during SDSMA meetings, conferences, seminars and social events; and

We want to help nurture your professional development and your personal development. If you have questions about these programs, give us a call at 605.336.1965, or visit www.sdsmo.org.

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

---

**SDSMA 2016 Dues Renewal**

In October, SDSMA members will begin the renewal process for annual membership dues. Payment of membership dues will take place on the SDSMA website.

SDSMA members will receive a notification by Oct. 1 to indicate the website is ready for 2016 dues renewal.

To renew your membership:

1. Log into your member profile online at www.sdsmo.org and verify your username and password is working. If assistance is needed with logging in, please contact the SDSMA office at 605.336.1965 or membership@sdsmo.org.
2. Contact your office administrator or clinic manager to determine if you or your organization will be paying the dues so it’s clear who will be completing this online process and to ensure your renewal is completed on time.
3. Watch your mail and email for announcements regarding renewals.

If you have any questions as you prepare for or complete the dues renewal process, please contact Laura Olson, Director of Administrative & Member Services, at 605.336.1965 or membership@sdsmo.org. Thank you for your membership in the SDSMA.

Source: SDSMA staff

---

**SDSMA Center for Physician Resources Webinar – Avoid a Malpractice Claim**

As part of the SDSMA Center for Physician Resources Practice Education Series, five webinars on risk mitigation will be offered free of charge to SDSMA members, with the first webinar at 7 p.m. CT Tuesday, Sept. 8 with “Tips, Tricks and Steps to Avoid a Malpractice Lawsuit.” To register for the webinar, visit www.sdsmo.org. A registration link can be found on the calendar on the homepage.

Studies show one in 14 doctors face a malpractice suit every year, resulting in almost every physician dealing with more than one lawsuit during their career. Other webinars on risk mitigation include the following:

- 7 p.m. CT Tuesday, Dec. 8, 2015 - Protecting Yourself as an Individual: Malpractice Coverage and Limits
- 7 p.m. CT Tuesday, March 8, 2016 - “I’m Sorry” - 2 Simple Words that can Save You from a Malpractice Claim
- 7 p.m. CT Tuesday, June 14, 2016 - The Litigation Process: What to Expect and How to Prepare
- 7 p.m. CT Tuesday, Sept. 13, 2016 - Surviving a Medical Malpractice Suit

The webinars will also provide key advice on the litigation process and how to get through a malpractice claim both personally and financially.

Source: SDSMA staff
South Dakota's commissioners to the Interstate Medical Licensure Compact Commission have been announced by the South Dakota Board of Medical and Osteopathic Examiners (SDBMOE).

During a special board meeting July 21, SDBMOE member Mary S. Carpenter, MD, and SDBMOE Executive Director Margaret Hansen were appointed as the commissioners.

The commission will be organized this year. The legislation to join the compact was signed by Gov. Dennis Daugaard on March 11. The compact will expedite the process for physicians who wish to be licensed in multiple states. South Dakota was the second state to sign the bill into law, and along with four other states, the law was enacted in South Dakota effective July 1.

Since Jan. 1, compact legislation has been approved in Alabama, Idaho, Iowa, Illinois, Minnesota, Montana, Nevada, South Dakota, Utah, West Virginia, and Wyoming. The law in Alabama will take effect on Aug. 12, and the laws in Montana and Nevada will take effect on Oct. 1.

Source: SDBMOE

The SDSMA Center for Physician Resources Health Leadership Institute Receives Grant

The SDSMA Center for Physician Resources has received a $150,000 grant from The Physicians Foundation to further develop its Health Leadership Institute (HLI).

The grant will be paid to the Center over two years. The HLI aims to prepare physicians to lead the transformation of health care delivery by improving their development of the knowledge, skills, insights, relationships and confidence to bring their clinical perspective to decisions essential to the delivery of quality, efficient, and cost-effective care to patients. Partnering with health care organizations to bring caliber training to small cohorts of physicians, the HLI will facilitate interactive sessions over a one-year period, engaging physicians from across the state in regional or community-based cohorts.

The Health Leadership Institute is scheduled to launch its first Foundational Leadership course in March.
# CME Events

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

<table>
<thead>
<tr>
<th>September 2015</th>
<th>September 2015</th>
<th>September 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>September 2</strong>&lt;br&gt;Internal Medicine Grand Rounds – New Technologies in Cardiology: 1) Robot Coronary Angioplasty and Stenting, 2) CardioMEMs – Implantable device&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 16</strong>&lt;br&gt;Surgery Grand Rounds: Optimizing Surgery Education: How to Build a Boat in a Bottle&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 24</strong>&lt;br&gt;Pediatric Grand Rounds&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td><strong>September 3</strong>&lt;br&gt;Pediatric Grand Rounds – Clinical Conundrums: A Day in the Life of a Pediatric Hospitalist&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 16</strong>&lt;br&gt;VA Tumor Conference&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 24</strong>&lt;br&gt;VA ACLS&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td><strong>September 9</strong>&lt;br&gt;Dermatopathology Conference&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 17</strong>&lt;br&gt;Paving the Road to Success&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 25</strong>&lt;br&gt;VA Medical CME Activity – Veterans Crisis Line, Press #1: The Power of 1&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td><strong>September 9</strong>&lt;br&gt;Internal Medicine Grand Rounds&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 17</strong>&lt;br&gt;Pediatric Grand Rounds – Making Use of Clinical Guidelines&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 30</strong>&lt;br&gt;Internal Medicine Grand Rounds&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td><strong>September 15</strong>&lt;br&gt;Humphrey’s Forum for Infectious Disease&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>September 23</strong>&lt;br&gt;Internal Medicine Grand Rounds&lt;br&gt;AMA PRA Category 1 Credit(s)™ available&lt;br&gt;Register online: usdssom.learningexpressce.com</td>
<td><strong>DO YOU HAVE A CME EVENT COMING UP? WOULD YOU LIKE TO HAVE IT LISTED HERE?</strong></td>
</tr>
</tbody>
</table>

Contact: Elizabeth Reiss,<br>South Dakota Medicine<br>2600 W. 49th Street<br>Suite 200<br>Sioux Falls, SD 57105<br>Phone: 605.336.1965<br>Fax: 605.274.3274<br>Email: ereiss@sdisma.org
Anatomic Pathology & Clinical Pathology

PHYSICIANS LAB SERVICES
- Cytopathology
- Surgical Pathology
- Hematopathology
- Clinical Pathology Consultation
- Fine Needle Aspiration Cytology

PHYSICIANS LABORATORY
focused on excellence
1301 S. Cliff Ave., Suite 700 • Sioux Falls, SD • (605) 322-7200 • 1-800-658-5474
www.plpath.com

SIOUX FALLS:
Steven P. Olson, MD
Karla K. Murphy, MD
Diane C. Sneed, MD
Raed A. Sulaiman, MD
Bruce R. Prouse, MD
Michelle J. Bleile, MD
Jacquelyn Choate, MD
Shannon Gabriel-Giggs, MD
Heather Peck, MD
Jenny Starks, PA
Kirsten Whalen, PA
Myranda Tischer, PA

MITCHELL
Kim M. Lorenzen, MD

YANKTON
Richard D. Strom, MD

SPENCER, IA
Stephanie Johnson, MD
Lori L. Sinclair, MD

Advanced technology powered by human touch

Sioux Falls Client Support & Laboratory
(605) 328-5464 • 1-800-502-2543

Rapid City Client Support & Laboratory
(605) 716-0381 • 1-800-307-4823
sanfordlaboratories.org

SANFORD Laboratories
Physicians needed for Saturday physicals in Sioux Falls, SD. Payment is $1,000 per day. All dates are scheduled a month in advance and can vary month to month depending on the physician's schedule. We provide an office, staff, forms, brief training, electronic medical record or transcription service and malpractice coverage. If interested or would like more information contact Dr. Fox at 443-838-1168 or CEFox@medplusdisability.com
Help Shape the Future of Medicine in South Dakota

The South Dakota State Medical Association Foundation, the philanthropic arm of the South Dakota State Medical Association, is a tax-exempt 501(c)(3) non-profit corporation, was established to assist and support medical research, medical teaching and medical education at the Sanford School of Medicine.

On average, medical students graduate with $130,000 in debt. Contributions to the South Dakota State Medical Association Foundation provide financial assistance to students at the Sanford School of Medicine and are all designated for scholarships, grants and low-interest loans for students.

Any amount can be donated at any time throughout the year. If you have questions or want more information, please call Laura Olson at 605.336.1965.

Send Your Contributions Today:
South Dakota State Medical Association Foundation
PO Box 7406, Sioux Falls, SD 57117-7406
www.sdsma.org
Looking for a better way to manage risk?
Get on board.

At MMIC, we believe patients get the best care when their doctors feel confident and supported. So we put our energy into creating risk solutions that everyone in your organization can get into. Solutions such as medical liability insurance, physician well-being, health IT support and patient safety consulting. It’s our own quiet way of revolutionizing health care.

To join the Peace of Mind Movement, give us a call at 1.800.328.5532 or visit MMICgroup.com.