Surgery without the incision.
Cancer care done differently.

With six major locations and 40 outreach clinics, the physicians at Avera Cancer Institute work together to develop a treatment plan that is unique to each patient. Many cancer patients face surgery as part of their treatment plan. For patients for whom surgery is not the best option, Avera Cancer Institute offers new hope using radiosurgery, the Versa HD. This non-invasive tool delivers high-dose radiation with pinpoint accuracy from hundreds of different angles that converge on the tumor while minimizing the dose to surrounding normal tissue. For certain patients, Versa HD may be the best option for their cancer treatment.

Avera Cancer Institute - providing the latest technology for the best patient care. That’s cancer care done differently.
SANFORD FIRST TO OFFER NEWEST DA VINCI® XI ROBOT FOR SURGERY

Innovative technology in the skilled hands of our surgeons is changing how complex procedures are performed in the OR. This new robot will enhance our team’s long-standing experience with robotics through greater anatomical access during surgeries, greater flexibility and reach with the robotic “arms”, and enhanced visualization with the compact design.

This means less pain, fewer complications and a faster recovery for your patients, so they can get back to life as quickly as possible.

With over 25 experienced physicians, our team includes some of the most highly trained robotic surgeons in the country and has delivered unprecedented outcomes in a variety of specialties including:

- General surgery
- Gynecologic oncology
- Head and neck cancer
- Single-site hysterectomy
- Weight loss surgery
- Cardiothoracic surgery
- Prostate cancer
- Esophageal cancer
- Hepatobiliary surgery
- Urology

ROBOTIC SURGERY PHYSICIANS

Chad Spanos, MD
ENT/Head & Neck Cancer

David Maziarz, MD
Cardiothoracic Surgery

Maria Bell, MD
Gynecologic Oncology

Thav Thambi, MD
Hepatobiliary Surgery

Curtis Peery, MD
General Surgery/Weight Loss Surgery

Laurie Landeen, MD
Gynecology

SANFORDHEALTH.ORG
KEYWORDS: ROBOTIC SURGERY SIOUX FALLS

SANFORD HEALTH
Contents

President’s Comments
335  The Hidden Curriculum – Tim Ridgway, MD, FACP

Editorial
337  Fighting Addiction – Barb Smith

The Journal
339  Length of Stay on Costs Incurred During a Pediatric Critical Care Hospitalization – Benson S. Hsu, MD, MBA, FAAP; Saquib Lakhani, MD, FAAP; Thomas B. Brazelton, III, MD, MPH, FAAP
346  An Unusual Case of Licorice-Induced Hypertensive Crisis – Ronovan Ottenbacher, MD; Julie Blem, MD, FACP
351  Influence of Resident Physician “Moonlighting” Activities on Educational Experience and Practice Choice – H. Bruce Vogt, MD; Mark K. Huntington, MD, PhD

Primers in Medicine
357  Review of Acute Coronary Syndromes: Diagnosis and Management of ST-Elevation Myocardial Infarction – Jimmy Yee, MD; Naveen Raipurohit, MD; Muhammad A. Khan, MD; Adam Stys, MD

Pharmacology Focus
363  Methods for Benefit and Risk Assessment of Drugs – Surachat Ngorsuraches, PhD

Special Features
367  Extenuating Circumstances: Smoking – A Deadly Addiction – E. Paul Amundson, MD
369  Quality Focus: Improving Health with Immunizations – Stephan D. Schroeder, MD
370  DAKOTACARE Update: Healthcare Quality Part 3: Cancer Screenings – E. Paul Amundson, MD, FAAP
372  Patient Education: Blessing and Curse of Alcohol – Richard P. Holm, MD
373  SDMOE Board News: South Dakota Law Regarding Ethics for Physicians – Margaret B. Hansen, PA-C, MPAS
374  SDSMA PAC Membership 2015

Member News
375  The Issue Is…CMS Proposes 2016 Fee Schedule Preparing for ICD-10
376  SDSMA 2016 Directory – Please Submit Your Updates
376  SDSMA CEO Barb Smith Elected to AMA Litigation Center Executive Committee
For Your Benefit: Fighting for You and Your Patients
377  SDSMA Member Directory a Great Advertising Opportunity
378  Legal Brief Highlight: Female Genital Mutilation
South Dakota EMS Stakeholder Group Meetings

For the Record
379  CME Events

Advertisers In This Issue
380  Physician Directory
Recently, a lot of publicity surrounded a medical suite in Reston, Virginia, where a Vienna man, preparing to have a colonoscopy, pressed record on his phone to capture instructions his doctor would give him after the procedure. What he heard on the recording, however, was anything but instructions. The anesthesiologist and gastroenterologist were heard making incredibly disparaging remarks about the patient. In addition to making insulting comments, they also discussed avoiding the man after the colonoscopy, instructing an assistant to lie to him, and then placed a false diagnosis on the chart. Needless to say, a lawsuit ensued, and a Fairfax County jury ordered the anesthesiologist and her practice to pay him $500,000.

This story caught my attention for two reasons. First, I am a gastroenterologist and perform many procedures on sedated patients. I am well aware of the necessity to exhibit the utmost in professionalism, not only in face-to-face encounters with patients, but also when they are sedated and vulnerable. Second, in my role as dean of faculty affairs at the University of South Dakota Sanford School of Medicine (SSOM), it is vital I help ensure our learning environment promotes the development of explicit and appropriate professional attributes in its medical students and residents. One could argue that if the patient had not recorded the conversation, there would have been no harm, as he would not have been aware of the conversation. However, comments like these markedly affect the clinical environment around him. There are serious ramifications on the culture of medicine, on teamwork, on medical learners and perhaps even the safety of the patient. As practitioners, we need to consciously engage in and model professional behaviors in our interactions with patients, team members and the health care system. Medical students and residents are particularly vulnerable, as they tend to learn what they see and experience in the “hidden curriculum.” When those of us who should be positive role models demonstrate disruptive behaviors, and if we systematically tolerate these behaviors, we threaten our culture of professionalism and send a dangerous message to learners.

The hidden curriculum was first described by Hafferty in 1998. We are all familiar with the formal curriculum, which is the stated, intended, formally offered and endorsed curriculum. The hidden curriculum, on the other hand, is learning that occurs by means of informal interactions among students, residents, faculty and other health care team members. It is what is said in the hallways, the lounge, the operating room suites or over a cup of coffee. In essence, all the other health care team members in that medical suite in Virginia were experiencing the hidden curriculum.

In an effort to address professionalism and the hidden curriculum, the SSOM requires students to write a professionalism paper involving experiences in their clinical year of training, citing specific examples of professionalism they have witnessed. The examples can be positive or negative and must include a reflection on the incidents. The papers are read by the academic dean, the evaluation director and the campus dean. The campus dean also holds a session where the papers are openly discussed. As one who leads these sessions, I can tell you the experiences are rich and varied. Yes, there still are some negative examples which serve as teaching points; however, there are incredibly positive experiences which make me very proud of our faculty. Overwhelmingly, the negative comments involve the theme of speaking disrespectfully of patients, staff or colleagues. Two years ago, I spoke at various departmental grand rounds and at specialty society meetings on the hidden curriculum. I cited specific examples of what our students are learning from us in the hidden curriculum. The responses of my audience were eye-opening and consistent. Many physicians came up to me after the presentation and told me they, too, were guilty, at one time or another, of some of the behaviors I described, and that the awareness they gained would certainly help them avoid similar incidents in the future.

So what is the take home message here? We all need to be aware of what our health care team members, students, residents and colleagues are learning from this hidden curriculum. We need to hold each other accountable for our behavior. When professional lapses occur, they can negatively affect not only our patients, but also our colleagues, students and other members of the health care team. By offering opportunities to openly discuss lapses, we can make our future generation of health care providers well qualified to maintain worthiness of public trust and live up to our expectations of competency and ethics. To quote an unknown author, “Do what is right, not what is easy. Rarely are they the same thing.”

REFERENCES
SAVE THE DATE

October 1 & 2, 2015

Upper Midwest Regional Pediatric Conference

Stoney Creek Hotel & Conference Center
Sioux City, Iowa

For conference information & updates go to UMRPCConference.com
Fighting Addiction

By Barb Smith, SDSMA CEO

According to an article published in *U.S. News & World Report,* addiction has become America’s most neglected disease. In that article, the author referenced a study in which Columbia University indicates 40 million Americans age 12 and over meet the clinical criteria for addiction involving nicotine, alcohol or other drugs. That’s more Americans than those who suffer from heart disease, diabetes or cancer. An additional 80 million people in the U.S. are classified as “risky substance users,” meaning that while not addicted, they “use tobacco, alcohol and other drugs in ways that threaten public health and safety.” The cost to government alone – which does not include family, out of pocket or private insurance costs – exceeds $468 billion annually.

The nonmedical use and abuse of prescription drugs is a serious public health problem in this country. Although most people take prescription medications responsibly, an estimated 52 million people – 20 percent of those age 12 and older – have used prescription drugs for nonmedical reasons at least once in their lifetime. Young people are strongly represented in this group. In fact, a National Institute on Drug Abuse 2010 survey found that one in 12 high school seniors reported past-year nonmedical use of Vicodin, and one in 20 reported abusing OxyContin – making these medications the most commonly abused drugs by adolescents.

And unfortunately, prescription drug abuse is a problem in South Dakota as well. In 2012, 40.5 million controlled substances were prescribed in our state – which equates to approximately 55 prescriptions per man, woman and child. According to data recently published by IMS Health, South Dakota ranks 36th among the states in annual prescriptions per capita of opioid products. And South Dakota ranks number 1 in growth in opioid utilization, with a 2.5 percent increase in the number of opioid products prescribed from 2013 to 2014. Arkansas and Nevada tied for number 2 with a 1.3 percent increase. Of the 50 states, only four showed an actual decrease when comparing 2013 to 2014. Oklahoma was last with a 9.1 percent decrease. Overall, South Dakota ranked 46th for annual prescriptions of oxycodone; however, it ranked second with a 9.7 percent increase in the number of prescriptions for oxycodone products. South Dakota ranks 29th in annual prescriptions for hydrocodone products but once again ranks number 1 with a 0.9 percent increase. South Dakota was the only state with an increase in the prescribing of hydrocodone products and Texas was last with a 19.1 percent decrease.

While opioid medications such as oxycodone are important tools for providing pain relief to patients, this drug category is too often misused and abused, and overprescribing of opioid pain relievers can result in multiple adverse health outcomes, including fatal overdoses. Furthermore, wide variation exists from one state and prescriber to another, indicating a need for further evaluation, guidelines and education.

In an effort to develop guidelines for prescribing controlled substances for pain, the SDSMA formed an ad hoc committee to examine this issue. Specifically, this committee will:

- Review current statutes and rules related to pain management and opioid prescribing;
- Develop guidelines to assist prescribers in the utilization of opioids for the management and treatment of pain;
- Develop a proposal for an educational program or series on the effective management and treatment of pain to include opioid prescribing and the detection of drug abuse;
- Compile a list of information, tools and other resources for South Dakota prescribers; and
- Review current treatment options and resources, and develop recommendations regarding the identification, treatment, and ongoing support for patients with opioid addictions.

To date, the committee has developed a white paper on pain management and prescription drug abuse as well as an educational plan. The white paper has been forwarded to the South Dakota Board of Medical and Osteopathic Examiners (SDBMOE) for review and in early June, the SDBMOE voted to form a special committee to work with the South Dakota State Medical Association to develop guidelines for pain management and the utilization of opioids.

I encourage you to stay abreast of the activities of this committee as there will be more information to come. Only by working together will physicians be able to effectively manage and care for their patients while reducing the alarming rates at which prescriptions drugs are diverted and abused.

REFERENCES

Celebrating Excellence

Outstanding Teaching

Devin Bissoon, MD
Clinical Assistant Professor
USD Sanford School of Medicine
Pulmonary – Internal Medicine
Sanford Clinic
Clinical Faculty Teaching Award

Jitendra Thakkar, MD
Academic Associate Professor
USD Sanford School of Medicine
Hospitalist – Internal Medicine
Sanford Medical Center
Academic Faculty Teaching Award

Both Physicians were chosen by the Residents of the Internal Medicine Residency Program to receive faculty teaching awards from the Department of Internal Medicine “in recognition of excellence as a teacher and clinician.”

University of South Dakota
Sanford School of Medicine

Paid for by private donations to the Department of Internal Medicine
Relationship Between Severity of Illness and Length of Stay on Costs Incurred During a Pediatric Critical Care Hospitalization

By Benson S. Hsu, MD, MBA, FAAP; Saquib Lakhani, MD, FAAP; and Thomas B. Brazelton, III, MD, MPH, FAAP

Abstract

Objective: To estimate the impact of severity of illness and length of stay on costs incurred during a pediatric intensive care unit (PICU) hospitalization.

Study Design: This is a retrospective cohort study at an academic PICU located in the U.S. that examined 850 patients admitted to the PICU from Jan. 1 to Dec. 31, 2009. The study population was segmented into three severity levels based on pediatric risk of mortality (PRISM) III scores: low (PRISM score 0), medium (PRISM score 1-5), and high (PRISM score greater than 5). Outcome measures were total and daily PICU costs (2009 U.S. dollars).

Results: Eight hundred and fifty patients were admitted to the PICU during the study period. Forty-eight patients (5.6 percent) had incomplete financial data and were excluded from further analysis. Mean total PICU costs for low (n=429), medium (n=211), and high (n=162) severity populations were $21,043, $37,980, and $55,620 (p < 0.001). Mean daily PICU costs for the low, medium, and high severity groups were $5,138, $5,903, and $5,595 (p = 0.02).

Conclusions: Higher severity of illness resulted in higher total PICU costs. Interestingly, although daily PICU costs across severity of illness showed a statistically significant difference, the practical economic difference was minimal, emphasizing the importance of length of stay to total PICU costs. Thus, the study suggested that reducing length of stay independent of illness severity may be a practical cost control measure within the pediatric intensive care setting.
Take the next step to financial freedom.

Private Banking
Trust
Investment Management*
Insurance
Loft Experience

A Division of First Dakota National Bank
101 N. Main Avenue Suite 201 | Sioux Falls, SD 57104
loftadvisors.com | 605.333.8266

*Securities offered through Raymond James Financial Services, Inc., member FINRA/SIPC, and are not deposits, not guaranteed by First Dakota National Bank, subject to risk, and may lose value. Loft Advisors and First Dakota National Bank are independent of Raymond James.
hospitalized past Jan. 1, 2009 were excluded. Patients admitted prior to Dec. 31, 2009 but hospitalized past Dec. 31, 2009 were included. A critical care team consisting of a pediatric critical care attending, pediatric critical care fellows, and pediatric residents cared for patients. A subset of patients also received care from consultants across various pediatric medical and surgical specialties. Institutional Review Board approval was obtained prior to data collection.

Exclusions
The study panel, composed of patients who were admitted to the PICU between Jan. 1, 2009 and Dec. 31, 2009, was cross-referenced with the financial database. Patients with incomplete financial data were excluded. No other exclusion criteria were applied (Table 1). Patients with incomplete critical care financial data may represent patients who were physically in the intensive care unit but not cared for by the pediatric intensive care team.

Clinical and Demographic Data
A pediatric critical care division administrator collected patient data on a daily basis for all patients in the PICU. Data specific to our study included the age of the patient on admission to the PICU, gender, length of stay within the PICU (based on date of admission to the intensive care unit and date of transfer or discharge from the intensive care unit), discharge disposition (survival with discharge from hospital, transfer from the PICU, or death), primary admission service to the PICU (medical versus surgical based on primary attending of record), primary organ system failure requiring intensive care admission (such as pulmonary, cardiovascular, etc.), and Pediatric Risk of Mortality (PRISM) III score captured within the first 24 hours of admission to the PICU.

PRISM III scoring is a validated mortality risk score based on physiologic status.10,11 Specifically, the scoring system addresses five measures of cardiovascular and neurologic markers including systolic blood pressure, heart rate, temperature, mental status, and pupillary status. Additionally, the scoring involves acid-base status and chemistry assessment including pH, pCO2, bicarbonate, paO2, glucose, potassium, creatinine, and BUN. Finally, hematologic scoring involves white blood cell count, platelet count, and PT/PTT parameters. PRISM III scores were captured within the first 24 hours of admission and used physiologic and laboratory factors in predicting mortality. This scoring system has been utilized nationally and internationally for both quality and cost research.8,12,13

Financial Data
Patient level cost data were obtained from the hospital decision support system that identified costs during the pediatric intensive care unit hospitalization. The hospital decision support system encompasses the information technology and accounting structures for reporting of specific metrics. We utilized this system to obtain accounting data regarding hospital costs. Costs incurred during the hospitalization not specific to the pediatric intensive care unit were excluded. For instance, supplies used during the intensive care stay were included whereas similar supplies used during the hospitalization on the pediatric ward were excluded.

Costs were compiled at the patient encounter level as a combination of direct and indirect costs. Direct costs were those related to direct patient care such as medications and central line kits. Indirect costs were those used to support patient care not specific to direct patient care such as building maintenance and administrative costs.

Statistical Analysis
Patients were segmented into three severity groups for

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Included Population (n = 802)</th>
<th>Excluded Population (n = 48)</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISM</td>
<td>Mean 3.2</td>
<td>Mean 0.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Median 0.0</td>
<td>Median 0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 5.2</td>
<td>SD 1.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25% 0.0</td>
<td>25% 0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75% 5.0</td>
<td>75% 2.0</td>
<td></td>
</tr>
<tr>
<td>LOS</td>
<td>Mean 6.1</td>
<td>Mean 1.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Median 3.0</td>
<td>Median 1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 10.8</td>
<td>SD 1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25% 2.0</td>
<td>25% 1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75% 5.0</td>
<td>75% 2.0</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>Mean 1.9%</td>
<td>Mean 0.0%</td>
<td>0.34</td>
</tr>
<tr>
<td></td>
<td>Median -</td>
<td>Median 0.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 0.5%</td>
<td>SD 0.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25% -</td>
<td>25% -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75% 13.9</td>
<td>75% 14.0</td>
<td></td>
</tr>
<tr>
<td>Age, Years</td>
<td>Mean 8.0</td>
<td>Mean 8.2</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>Median 7.5</td>
<td>Median 7.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 6.3</td>
<td>SD 6.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25% 1.6</td>
<td>25% 2.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75% 13.9</td>
<td>75% 14.0</td>
<td></td>
</tr>
<tr>
<td>Gender: % Female</td>
<td>Mean 47.4%</td>
<td>Mean 47.9%</td>
<td>0.94</td>
</tr>
<tr>
<td></td>
<td>Median -</td>
<td>Median -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 50.0%</td>
<td>SD 50.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25% -</td>
<td>25% -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75% -</td>
<td>75% -</td>
<td></td>
</tr>
<tr>
<td>Service: % Medical</td>
<td>Mean 45.0%</td>
<td>Mean 60.4%</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>Median -</td>
<td>Median -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 49.8%</td>
<td>SD 49.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25% -</td>
<td>25% -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75% -</td>
<td>75% -</td>
<td></td>
</tr>
</tbody>
</table>

* Comparison of means.
analysis. The low severity group represented patients with a PRISM score of 0. The medium severity group represented patients with PRISM scores of 1 to 5. The high severity group represented patients with PRISM scores greater than 5. These divisions demonstrated increasing mortality and have been utilized to segment populations similarly in prior studies.\textsuperscript{14}

Population segmentation for analysis was based on PRISM severity groups. Descriptive statistics of mean, standard deviation, median, 95 percent confidence intervals, and 25\textsuperscript{th} to 75\textsuperscript{th} percentile range (for non-parametric data) were determined for age, gender, mortality, length of stay, PRISM III scores, and costs as appropriate (Tables 1 and 2). Mean values were used for statistical analysis. All costs were in 2009 U.S. dollars. Comparisons of populations used the Kruskal-Wallis one-way analysis of variance and Wilcoxon-Mann-Whitney tests for non-parametric data to identify \( p \) values.

### Results

Eight hundred and fifty patients were admitted to the PICU during the study period. Forty-eight (5.6 percent) had incomplete financial data and were excluded from further analysis. Excluded populations were similar in age, gender, and mortality (Table 1). Overall length of stay (LOS) was less for the excluded group versus those within the included group (1.5 days versus 6.1 days, \( p < 0.001 \)) and overall PRISM scores were lower (0.9 versus 3.2, \( p = 0.003 \)).

When comparing the low, medium, and high severity populations, we found statistically similar ages (7.5, 8.6, 8.6 years, \( p = 0.13 \)) and gender (47.1 percent, 45 percent, and 51.2 percent female, \( p = 0.48 \)) (Table 2). With increasing severity, patients had longer lengths of stays (4.3, 7.3, 9 days, \( p < 0.001 \)) and higher rates of mortality (zero, 1 percent, 8 percent, \( p < 0.001 \)). Mean pediatric intensive care costs increased with increasing severity ($21,043, $37,980, $55,620, \( p < 0.001 \)) (Figure 1). With increasing severity, the daily pediatric intensive care costs had a statistically significant difference although economically the difference was minimal ($5,138, $5,903, $5,595, \( p = 0.02 \)) (Figure 2). When comparing only the medium to high severity groups, the difference in daily pediatric

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Low Severity: PRISM 0 (n = 429)</th>
<th>Medium Severity: PRISM 1-5 (n = 211)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISM</td>
<td>Mean 0.0 0.0 0.0 0.0 0.0</td>
<td>Mean 3.3 3.0 1.2 2.0 5.0</td>
</tr>
<tr>
<td>LOS</td>
<td>4.3 3.0 4.8 2.0 4.0</td>
<td>7.3 3.0 15.6 2.0 6.0</td>
</tr>
<tr>
<td>Death</td>
<td>0.0% - 0.0%</td>
<td>1.0% - 9.7% -</td>
</tr>
<tr>
<td>Age, Years</td>
<td>7.5 6.4 6.1 1.5 13.3</td>
<td>8.6 8.3 6.6 1.7 14.7</td>
</tr>
<tr>
<td>Gender: % Female</td>
<td>47.1% - 50.0%</td>
<td>45.0% - 49.9% -</td>
</tr>
<tr>
<td>Service: % Medical</td>
<td>33.1% - 47.1%</td>
<td>52.6% - 50.1% -</td>
</tr>
<tr>
<td>Hospital Costs (2009 $)</td>
<td>$21,043 $12,087 $25,428 $6,913 $25,945</td>
<td>$37,980 $17,625 $72,184 $7,658 $38,525</td>
</tr>
</tbody>
</table>

### Table 2 (Part 2). Characteristics Across Three Severity Groups

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>High Severity: PRISM &gt; 5 (n = 162)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRISM</td>
<td>Mean 11.5 9.0 6.1 7.0 14.0</td>
</tr>
<tr>
<td>LOS</td>
<td>9.0 5.0 13.6 2.0 10.0</td>
</tr>
<tr>
<td>Death</td>
<td>8.0% - 27.3% -</td>
</tr>
<tr>
<td>Age, Years</td>
<td>8.6 8.7 6.5 2.0 14.6</td>
</tr>
<tr>
<td>Gender: % Female</td>
<td>51.2% - 50.1% -</td>
</tr>
<tr>
<td>Service: % Medical</td>
<td>66.7% - 47.3% -</td>
</tr>
<tr>
<td>Hospital Costs (2009 $)</td>
<td>$55,620 $26,823 $106,388 $9,165 $56,922</td>
</tr>
<tr>
<td>Daily Hosp Costs (2009 $)</td>
<td>$5,595 $4,460 $4,147 $3,388 $6,001</td>
</tr>
</tbody>
</table>

* Comparison of means across all three severity groups.
** Comparison of means between medium versus high severity groups.
intensive care costs became statistically insignificant ($5,903, $5,595, p = 0.70).

Discussion
Our study demonstrated that the PRISM III raw score, as an indicator of severity within the pediatric intensive care setting, can be useful to determine total costs associated with the pediatric intensive care portion of hospitalization. We found that pediatric intensive care costs were congruent to higher PRISM scores. Total pediatric intensive care costs ranged from $21,043 in the low severity group to $37,980 in the median severity and $55,620 in the high severity group.

In contrast, daily pediatric intensive care costs were closely grouped ranging from $5,138 in the low severity group to $5,903 in the median severity and $5,595 in the high severity group. Although statistically significant, the differences in the daily costs across severity levels on a practical level are minimal, especially when compared to the wide variation seen with total pediatric intensive care costs across severity levels. We considered these differences statistically significant but economically similar. Furthermore, when comparing the medium and high severity groups, the daily pediatric intensive care costs were statistically similar (p = 0.70). Overall, these results highlighted the importance of length of stay on hospital costs for patients admitted to the pediatric intensive care unit.

In reviewing the literature, international studies based within both pediatric and adult studies were conflicted with several noting the relationship between severity scoring and cost while others finding no relationship between the two.\textsuperscript{18-21} However, with significant structural differences in health care finance across nations, these studies were unable to offer any consistent insights for the U.S. health care system.

In examining U.S. based studies, we found that severity scoring was useful in predicting health care costs within the adult population. In 2012, Dahl et al. identified the use of Acute Physiology and Chronic Health Evaluation (APACHE) scores as good predictors of costs within the adult intensive care unit (ICU) setting.\textsuperscript{4} However, U.S. based adult studies were inconsistent in determining length of stay as a predictor of costs. Rapoport et al. reported in 2003 that length of stay explained 85-90 percent of the interpatient variation in adult intensive care costs whereas Taheri et al. in 2000 reported that length of stay had minimal impact on costs for adult ICU hospitalizations.\textsuperscript{7,8} However, there are limitations in comparing adult literature to our pediatric study.

Our extensive review of the literature revealed only two dated U.S. pediatric studies relevant to this topic. In 1990, Klem et al. determined that severity of illness as defined by Physiologic Stability Index (PSI) and Dynamic Risk Index (DRI) influenced resource use and costs within the PICU. The study found that severity of illness drove both overall and daily resource utilization.
and costs, discounting the impact of length of stay. In 1999, Chalam et al. identified that severity of illness by Pediatric Risk of Mortality scores predicted health care costs at an academic PICU. This study found that the strongest correlation with cost was length of stay. However, if length of stay was normalized across patients, the study found that severity of illness best explained the differences in costs. In summary, both studies supported the use of severity scoring for predicting health care costs in the PICU. However, only one study found that length of stay had a strong correlation to health care costs.

Our study contributes to the limited and dated pediatric literature by supporting the importance of length of stay on health care costs within the existing U.S. health care finance system. Previous U.S. based adult and pediatric studies demonstrated the importance of severity of illness on costs but were inconsistent with regard to the impact of length of stay on costs. In comparison, our study suggested that severity of illness may not be the primary driver of costs. Instead, length of stay seemed to influence the overall costs for a pediatric intensive care hospitalization with similar daily costs independent of severity. We hypothesize that the majority of the hospital costs results from the aspects of care not related to severity such as room, nursing, and physician costs. These costs will be incurred regardless of severity and may comprise the majority of calculated costs. Costs related to severity of illness such as more intensive use of laboratory services and medications likely contribute a comparably lower portion of costs. This finding has an important implication for health care cost containment within the United States as practices that emphasize fee for service or payment per day have been identified to be a significant driver for escalating health care spending in the U.S.

If length of stay is a driver for costs within the pediatric intensive care setting controlling the length of hospitalization can effectively control costs. Although there is a positive relationship between severity and length of stay with higher severities resulting in longer hospitalizations, we suggest that, within similar severities of illness, interventions affecting length of stay may have cost control consequences. For example, interventions targeting quality indicators such as central line associated bloodstream infections and ventilator associated pneumonias, both consistently proven to increase the length of stay, may have a dramatic impact on overall costs when matching patients with similar severities of illness. Furthermore, providers can be more cognizant of a patient’s length of stay within the intensive care setting and consider earlier transition to lower levels of care, whether within the hospital or at home, to decrease health care costs borne by the patient. Ultimately, specific interventions such as stringent discharge criteria from the PICU or early discharge planning may help decrease length of stay. Comparatively, interventions targeted to decrease resource utilization such as imaging and laboratory studies without affecting length of stay may have lesser impact on hospital cost reduction.

Future steps include determining costs across the continuum of care, as a majority of care exists outside of the pediatric intensive care setting. Additionally, a multi-institutional approach may better characterize institutional and geographic variations on health care costs. Examining continuation of care while accounting for the geographic variation of spending may paint a more comprehensive financial picture.

Our study has several limitations. Our characterization of intensive care costs disregarded the financial impact of severity on the rest of the hospitalization and post-hospital care. Specifically, we did not categorize the financial impact once the patient left the intensive care setting by not accounting for costs of the whole hospitalization, long-term care, inpatient rehabilitation, or outpatient recovery. Our study also only examined one medium-sized children’s hospital in the Midwest. We acknowledge that there may be significant cost variability across institutions and across age groups. By examining only one specific facility based on pediatric care, our study could not account for this variability.

It is important to understand the drivers for costs within the U.S. health care finance system given the ever-increasing financial constraint. By understanding the existing cost structure, policy-makers can better identify levers with current processes to decrease the financial burden on the health care system.

### 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:
- Benson S. Hsu, MD, MBA, FAAP, Assistant Professor, Department of Pediatrics, University of South Dakota Sanford School of Medicine.
- Saquib Lakhani, MD, FAAP, Associate Professor, Department of Pediatrics, University of South Dakota Sanford School of Medicine.
- Benoît B. Brazelton, III, MD, MPH, FAAP, Associate Professor, Department of Pediatrics, University of Wisconsin School of Medicine and Public Health.
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 1.3% 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!
An Unusual Case of Licorice-Induced Hypertensive Crisis

By Ronovan Ottenbacher, MD; and Julie Blehm, MD, FACP

Abstract

Background: Black licorice induced hypertension is an uncommon cause of hypertension in modern times because newer types of licorice rarely use the active ingredients in licorice root in large quantities. However, certain licorices and candies still contain glycyrrhizic acid (GZA) in sufficient quantities to affect blood pressure and cause other health issues.

Case: A 65-year-old woman with previously well controlled hypertension on a single medication presented to the emergency room with acute, symptomatic hypertension with blood pressures running 200s/140s. Despite IV medications, her hypertension remained refractory to treatment. This prompted a hospital admission with treatment using nicardipine in the ICU. Her blood pressure was difficult to control without a short acting antihypertensive medication infusion. She required a seven-day hospitalization (five of which were in the ICU) until her symptoms and hypertension were controlled with a three-drug regimen. Labs were notable for potassium's running on the low side of normal and low levels of both renin (less than 0.6 with normal less than or equal to 0.6-3.0) and aldosterone (1.0 with normal 3-16 ng/dL). Ten days after discharge, she was having symptomatic hypotension and was seen in the clinic. She in fact was eating large amounts of Snaps licorice which uses its original 1930s recipe including licorice granules. Her licorice habit abruptly started six months prior and included a minimum of two to four boxes per day every day.

Conclusion/Discussion: The patient currently is doing well and is down to only two antihypertensive medications at lower doses. She has given up her licorice habit. Natural licorice is extracted from Glycyrrhiza glabra root containing glycyrrhizin or glycyrrhizic acid (GZA). GZA inhibits the type 2 isoenzyme of 11 beta-hydroxysteroid dehydrogenase (11 ß -HSD), which prevents local inactivation of cortisol, specifically in the renal collecting tubules. There is increased availability of cortisol to bind to renal mineralocorticoid receptors resulting in excess mineralocorticoid activity or pseudohyperaldosteronism. The patient may present with findings similar to primary aldosteronism: hypertension with sodium retention, edema, hypokalemia, metabolic alkalosis and low plasma renin activity. Plasma aldosterone levels would be low (in primary aldosteronism it is elevated). Specific testing can be performed, but resolution of symptoms after the patient stops eating licorice strongly suggests the diagnosis.

Introduction

Black licorice has been known for many years to have effects on blood pressure. However, in modern times medical cases resulting in significant blood pressure complications are becoming rare. This is due to newer types of licorice generally not using large quantities of the active ingredient in licorice root. There are still some licorices and candies that contain enough glycyrrhizic acid (GZA) to raise blood pressure and cause other health effects. In order to determine which patients may be having these complications, we as physicians need to be astute and also take the time to sit down with our patients and obtain a thorough history.
Case Report

A 65-year-old woman presented to the emergency room (ER) with acute complaints of headaches, chest pain and nausea/vomiting. She related that the chest pain had been going on for the last 12 hours, but her blood pressure had been running high for the last couple days. With her home machine, she was getting readings of 200s/140s. She had not had significant blood pressures issues like this in the past. Her only current pertinent medication included metoprolol succinate 25 mg daily, which had been at a stable dose for several years. Her blood pressures had been well controlled running typically 120-130s/80s at prior clinic visits.

In the ER she had routine labs, CT of the head, chest X-ray and EKG, all of which were unremarkable. She was given IV labetalol with good results and was determined safe to discharge home without any medication changes.

Two days later, she returned to the ER with the same complaints and with persistently elevated blood pressures. During her second ER stay, she was given a total of 50 mg of IV hydralazine, 30 mg of IV labetalol and 2.5 mg of IV metoprolol. The medications had transient effects with pressures spiking back up after IV doses. Due to the refractory nature of her hypertension, she was admitted to the ICU with a diagnosis of hypertensive crisis (symptomatic hypertensive urgency with no evidence of end organ damage indicating hypertensive emergency) and started on a nicardipine infusion.1

The patient had a difficult and labile seven-day hospital stay. It included five days going in and out of the ICU. Her pressures were difficult to control and quickly rebounded after the nicardipine infusion was weaned off. IV antihypertensives were used as necessary in addition to oral meds including: metoprolol succinate 100 mg daily, hydralazine 75 mg three times per day, hydrochlorothiazide 25 mg daily, and amlodipine 5 mg daily. Her symptoms were also quite refractory with her headaches even requiring a neurology consultation and MRI with large amounts of narcotics for symptom control. By discharge, she was stable on a regimen of metoprolol succinate 100 mg daily, hydralazine 75 mg three times per day, and hydrochlorothiazide 25 mg daily with good blood pressure control and corresponding symptom relief.

Laboratory workup for pheochromocytoma and hyperaldosteronism were initiated during the hospitalization after life threatening etiologies were excluded early on. Labs were otherwise unremarkable. Her potassium was consistently in the upper 3’s to low 4’s (3.5 lower limit of normal); TSH was normal. After she was discharged, the pheochromocytoma labs returned as normal. Although strict endocrinology testing was not done (in regards to timing, position, etc.) aldosterone came back as low at 1.0 (normal 3-16 ng/dL), renin activity was less than 0.6 (normal less than

---

Figure 1. A flowchart showing the inhibitory effect of licorice on 11 ß-HSD2 and the downstream mineralocorticoid receptor effects8

![Figure 1. A flowchart showing the inhibitory effect of licorice on 11 ß-HSD2 and the downstream mineralocorticoid receptor effects8](Image)

Figure 1. Mechanism of action for licorice-induced swelling or edema. ©2009 Pharmacology Weekly, Inc.
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/maf or call 800-235-8159.
or equal to 0.6-3.0) and cortisol was not tested.

Ten days after discharge she called into the clinic. She was feeling dizzy after taking her meds, and her blood pressures were as low as 65/48. She confirmed these issues the next day in clinic where her blood pressure was 110/70. After a discussion on transient causes of significant blood pressure disturbances was had with the author’s attending physician, both concurred that licorice-induced hypertension would be in the differential diagnosis. Therefore, the patient was asked more focused questions to ascertain her history of licorice ingestion. The patient said that in fact she was eating Snaps. These are an old style of black licorice bites made using its original 1930s formula which includes licorice granules. She confirmed that not only did she eat this licorice but that she had been eating very large amounts of it abruptly starting six months ago. She never came up with a reason for why she decided to do this, but just felt like eating a lot of Snaps. For the last six months, she was consuming a minimum of two boxes per day (up to four 8-ounce boxes daily) every day up until the day she was admitted to the hospital and had not eaten any since. The new low blood pressures (now secondary to over medication) corresponded with the typical timeframe of the licorice effect wearing off.2

Discussion

Relatively small amounts of licorice, as little as 50 g daily for two weeks, can produce a rise in blood pressure. This patient was eating Snaps at 128 g per box, two to four boxes daily, for a total of 256-512 g daily for six months. Natural licorice uses an extract of the root of Glycyrrhiza glabra, a 4- to 5-foot woody shrub that contains glycyrrhizin or glycyrrhizic acid (GZA). Note that most newer, licorice-flavored foods available in the U.S. do not contain significant amounts of GZA; rather, they are flavored or reinforced with anise seed oil to augment the raw root of the licorice plant, but the only biologically active glycyrrhizin is in the true licorice root.1

The Food and Drug Administration issued a warning in October 2011, Black Licorice: Trick or Treat? stating that those over the age of 40 should not consume more than 2 ounces of black licorice a day for more than two weeks as they would be at risk for cardiac arrhythmias secondary to hypokalemia.4 In the U.S., licorice root is used for licorice flavoring, but other cultures also use it for tea or as a herbal remedy. Note that in the U.S., it is also used in some chewing tobacco which may cause an additional hypertensive risk with these types of tobacco.3,16

Medically, GZA inhibits 11 beta-hydroxysteroid dehydrogenase (11 ß-HSD), specifically the type 2 isoenzyme, preventing local inactivation of cortisol. This form of the enzyme (11 ß-HSD2) is mainly found in aldosterone-sensitive sites in the renal collecting tubules. The effect is an increased availability of cortisol to bind to renal mineralocorticoid receptors.2,5 The patient develops an excess of mineralocorticoid activity or pseudohyperaldosteronism.

Chronic ingestion of licorice can therefore result in findings similar to those in primary aldosteronism: hypertension with sodium retention, edema, hypokalemia, metabolic alkalosis, and low plasma renin activity.3,5 However, plasma aldosterone levels are low following licorice ingestion rather than elevated, as in primary aldosteronism. Testing for licorice-induced hypertension shows an increased urinary cortisol-to-cortisone ratio which can potentially be confirmed with measurement of plasma glycyrrhizin concentrations.1 More practically, clinical resolution of symptoms after removal of licorice from the diet is highly suggestive of the diagnosis (in conjunction with more routine testing such as a metabolic panel plus renin and aldosterone).

Conclusion

In retrospect, this case is another poignant reminder of how in our hectic and overworked medical lives, taking time to sit down with the patient and getting a thorough history can make all the difference in the patient’s diagnosis and care. The patient currently is doing well and only requires two antihypertensive medications at lower doses. After our discussion, she was willing to give up her licorice habit.

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:
Ronovan Ottenbacher, MD, Sanford Broadway Medical Clinic, Fargo; University of North Dakota Internal Medicine Residency; 2012 Graduate, University of South Dakota Sanford School of Medicine.

Julie Blehm, MD, FACP, Sanford Broadway Medical Clinic. Internal Medicine Residency Clinic Director, Associate Professor of Medicine, University of North Dakota School of Medicine & Health Sciences.
the one to trust
to keep your
body in Motion

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 | 605.331.5899

I know you’re busy, but we were just served suit papers on a patient.

Send me the number of my malpractice insurance carrier.

A reputation is like trust.

It takes years to grow, but can be ruined in seconds. Make sure your reputation is protected with malpractice insurance coverage from PSIC.

Scan or visit psicinsurance.com
Call 1-800-786-8540

Malpractice insurance is underwritten by Professional Solutions Insurance Company
14001 University Avenue | Clive, Iowa 50321-8298 ©2014 PSIC. NHL 9549

PSIC Professional Solutions Insurance Company
Protecting Reputations ... One Doctor at a Time
Influence of Resident Physician “Moonlighting” Activities on Educational Experience and Practice Choice

By H. Bruce Vogt, MD; and Mark K. Huntington, MD, PhD

Abstract

Objectives: Moonlighting by resident physicians, though a long-standing practice in the U.S., is a controversial topic. Conflicting claims of both detriment and benefit to resident education have been made. In this study, we sought to evaluate practicing family physicians’ perceptions of the influence of moonlighting during their residency on their educational experience and selection of future practice site.

Methods: Graduates of two Midwestern family medicine residency programs in the U.S., one located in a metropolitan area of a populous state, one from a small city in a rural state, were surveyed via an internet survey tool as to their motivation for moonlighting, perceived educational effects – positive or negative – and its role in practice selection.

Results: Seventy-eight percent of respondents reported that they participated in moonlighting. Supplementation of income was the most commonly reported motivation (identified by 95.4 percent of respondents), followed closely by acquisition of additional clinical experience (87 percent). The majority perceived moonlighting as overall beneficial to residency program education (91.1 percent), beneficial in preparation for clinical practice (98.5 percent), and having a role in selection of future practice (89 percent).

Conclusions: Practicing Midwestern family physicians perceive an important role for moonlighting in residents’ clinical educational experiences and practice selection.

Introduction

“Moonlighting” by resident physicians, regardless of their specialty training program, is a long-standing practice in the U.S.13 In its glossary of terms, the Accreditation Council for Graduate Medical Education defines moonlighting as “voluntary, compensated, medically-related work” unrelated to training requirements.6 The subject has always been controversial but renewed debate has emerged given the Accreditation Committee for Graduate Medical Education’s (ACGME) duty hour regulations.7 Concerns are voiced by many academicians that the duty requirements have a negative effect on resident experience and, therefore, the adequacy of resident training and ultimately the preparation for practice.6-11 Some argue that moonlighting helps fill this gap and that the learning opportunities it provides, including independent decision making and autonomy, are valuable to resident education.12

Providing service to underserved communities is also suggested as a positive aspect of moonlighting.11 Others argue that moonlighting is not educational and can be detrimental to resident education.14 Larkin opines that patient safety, which has appropriately become the focus of medical care, trumps other arguments and, therefore, moonlighting should not be allowed.15 The recently updated ACGME rules require resident-initiated moonlighting outside of their formal educational program to be included in calculation of duty hours.7

Despite its controversy, the medical literature reveals limited information on the subject of moonlighting. Little is known regarding the frequency of this practice and reasons why residents choose to moonlight. This is particularly true of the recent literature. Debt load, supplemental income, the ability for autonomous decision-making,1 and...
practice assessment\textsuperscript{12,16} have been identified as motivators in previous studies. Emergency medicine residents participating in a large study identify enhanced residency performance and improved educational experiences as among the benefits of moonlighting.\textsuperscript{17} There is no peer-reviewed literature on a commonly accepted concept that providing moonlighting opportunities for residents is a successful strategy for physician recruitment by communities.\textsuperscript{18,19}

Our purpose in this study was to investigate the effects of moonlighting activities on resident education, preparation for practice, and selection of practice site. This inquiry into the purported benefits and liabilities of moonlighting, for which there is currently little data in the literature, is particularly relevant in light of the new ACGME regulations, the critical issues of quality medical care and patient safety, and the challenges of physician recruitment.

**Materials and Methods**

The study population consisted of graduates of two Midwestern family medicine residencies. The Sioux Falls

<table>
<thead>
<tr>
<th>Table 1. Moonlighting Experiences by Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Total respondents, n:</strong></td>
</tr>
<tr>
<td>Sioux Falls n (%)</td>
</tr>
<tr>
<td>120</td>
</tr>
<tr>
<td><strong>Participated in moonlighting, n (%):</strong></td>
</tr>
<tr>
<td>Sioux Falls n (%)</td>
</tr>
<tr>
<td>105 (87.5)</td>
</tr>
<tr>
<td><strong>Total activity throughout residency, n (%):</strong></td>
</tr>
<tr>
<td>Less than 168 hours</td>
</tr>
<tr>
<td>169-336 hours</td>
</tr>
<tr>
<td>337-720 hours</td>
</tr>
<tr>
<td>More than 720 hours</td>
</tr>
<tr>
<td><strong>Motivation (may be more than one), n (%):</strong></td>
</tr>
<tr>
<td>Income supplementation</td>
</tr>
<tr>
<td>Gain experience</td>
</tr>
<tr>
<td>Potential practice evaluation</td>
</tr>
<tr>
<td>Altruism</td>
</tr>
<tr>
<td><strong>Positive effect on educational performance (may be more than one), n (%):</strong></td>
</tr>
<tr>
<td>Confidence</td>
</tr>
<tr>
<td>Competence</td>
</tr>
<tr>
<td>Procedural skills</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>Negative effect on educational performance, (may be more than one), n (%):</strong></td>
</tr>
<tr>
<td>Fatigue</td>
</tr>
<tr>
<td>Stress</td>
</tr>
<tr>
<td>Decreased focus or attention on learning</td>
</tr>
<tr>
<td><strong>Affected practice choice, n (%):</strong></td>
</tr>
<tr>
<td>Type of practice setting chosen</td>
</tr>
<tr>
<td>Chose this specific site</td>
</tr>
<tr>
<td>Seriously considered this specific site</td>
</tr>
<tr>
<td>Ruled out this specific site</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>2 (3.6)</td>
</tr>
</tbody>
</table>
(South Dakota) Family Medicine Residency Program is located in a small city in a predominantly rural part of the upper Midwest; the University of Cincinnati (Ohio) Family Medicine Residency Program is located in a larger metropolitan area of the southeastern Midwest. All Sioux Falls graduates (1975-2012) for whom an active email address was available (n = 220), and Cincinnati graduates from 2006-2012 (n = 40), were invited by email to participate in an online survey of their moonlighting experiences. Several weeks after the initial invitation, a reminder was sent. No incentives or remuneration was offered for participation in the study.

The survey consisted of a total of 16 items, including one consenting to participate and two demographic questions (year of graduation and whether or not the respondent did any moonlighting during residency). Those who participated in moonlighting as a resident were offered an item quantifying the amount of moonlighting they did, followed by eight categorical items assessing their motivation and experiences. All respondents, whether they had personally participated in moonlighting or not, were presented with three 5-point Likert-scale items assessing their impression of the value or detriment of moonlighting in residency, and an open-ended comment item. Although the survey was completed anonymously, a separate URL was used for access by graduates of each program.

Statistical analyses were performed for non-parametric data using Mann-Whitney U test for multiple comparisons. All analyses were two-tailed.

The study was reviewed by the University of South Dakota Institutional Review Board and granted a Category 2 exemption.

**Results**

Responses were received from 120 (55 percent) Sioux Falls residency graduates, and from 18 (45 percent) Cincinnati residency graduates, yielding an overall response rate of 53 percent. A cumulative total of 78.2 percent of respondents participated in moonlighting. Among Sioux Falls graduates responding, 105 (87.5 percent) participated in moonlighting during their residency; only 3 (17.6 percent) Cincinnati respondents engaged in the activity. Three-fourths of Sioux Falls program graduates did so for greater than 336 hours. Of the three Cincinnati graduates who moonlighted, two reported doing so for greater than 336 hours.

A majority of the total population of residency graduate respondents perceived an overall beneficial effect of moonlighting to their residency program education (greater than 91 percent) and preparation for clinical practice (98.5 percent). All respondents identified positive effects on their performance in residency with less than 6 percent indicating any negative effects. (Table 1). The primary motivation for moonlighting was to supplement income (greater than 95 percent) followed by experience (87 percent).

<table>
<thead>
<tr>
<th>Effect on residency program education:*</th>
<th>Sioux Falls n (%)</th>
<th>Cincinnati n (%)</th>
<th>Cumulative n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly beneficial</td>
<td>68 (57.1)</td>
<td>4 (23.5)</td>
<td>72 (52.9)</td>
</tr>
<tr>
<td>Somewhat beneficial</td>
<td>47 (39.5)</td>
<td>5 (29.4)</td>
<td>52 (38.2)</td>
</tr>
<tr>
<td>No significant effect</td>
<td>4 (3.4)</td>
<td>3 (17.6)</td>
<td>7 (5.1)</td>
</tr>
<tr>
<td>Somewhat detrimental</td>
<td>0 (0.0)</td>
<td>5 (29.4)</td>
<td>5 (3.7)</td>
</tr>
<tr>
<td>Strongly detrimental</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

| Preparation for clinical practice:*              |                  |                 |                 |
| Strongly beneficial                              | 76 (63.9)        | 6 (35.3)        | 82 (60.3)       |
| Somewhat beneficial                              | 42 (35.3)        | 10 (58.8)       | 52 (38.3)       |
| No significant effect                            | 1 (0.8)          | 1 (5.9)         | 2 (1.5)         |
| Somewhat detrimental                             | 0 (0.0)          | 0 (0.0)         | 0 (0.0)         |
| Strongly detrimental                             | 0 (0.0)          | 0 (0.0)         | 0 (0.0)         |

| Moonlighting has a role in the residents’ selection of their future practice.* | 112 (94.1) | 9 (52.9) | 121 (89.0) |

*p < 0.05 between Sioux Falls and Cincinnati.
Comparison of the pre-2006 subset of Sioux Falls responses to total Sioux Falls responses was undertaken, because the Cincinnati population surveyed did not include graduates prior to 2006. The pre-2006 Sioux Falls subpopulation was not different than the overall Sioux Falls population (p = 0.970).

The experiences of these moonlighting residents are summarized in Table 1. A majority of the total population of respondents surveyed indicated a perception of overall benefit of moonlighting (Table 2). Between the two programs, however, there were significant differences, with Cincinnati graduates having a less positive perception of moonlighting’s value than Sioux Falls graduates with regard to any benefit to their residency program education (p < 0.001), preparation for practice (p = 0.034), and role in practice selection (p < 0.001).

Discussion
The percent of family medicine residency graduates responding to our survey and who participated in moonlighting (78.2 percent) compares to 40.6 percent of respondents to a national randomized survey of residents from all specialties at all levels reporting their moonlighting (78.2 percent) compared to 40.6 percent of medicine residents, who moonlighted, surveyed in an earlier study, averaged 28 hours per month.1 In the 1998-99 study by Baldwin and Daugherty, the hours of moonlighting per resident varied widely. We identified nothing in the literature or in our own data that explained the reasons for this. The Baldwin and Daugherty study did indicate, however, that there was no correlation between average hours worked and the percent of residents who chose to moonlight.4

The primary motivators of resident moonlighting in our study were to supplement income followed by experience. Practice evaluation and altruism were only selected as reasons by 9 percent and 8 percent, respectively. As in our study, financial reasons were primary in one study of emergency medicine residents,1 while in another the educational experience afforded was the number one reason cited.17 Finances was the number one reason given for moonlighting in a survey of fourth-year radiology residents and practicing radiologists who had graduated in the previous 10 years, but educational benefit was also cited.21 In a study of psychiatric residents, the major reasons given for moonlighting were again financial (82 percent).22 Respondents in our study cited improved confidence, competence, and efficiency in their performance during residency training as positive effects of moonlighting. In Li’s study, emergency medicine residents indicated that moonlighting actually enhanced their academic performance.12 Only a very small percentage of our sample (less than 6 percent) felt that moonlighting negatively affected or interfered with their performance in their residency program, citing “fatigue.” Other surveys of residents in various specialty programs reported positive educational benefits2 and no significant negative effects.16, 21 In a study of internal medicine residents, respondents also indicated that moonlighting did not interfere with job or educational responsibilities.16 Moonlighting had no demonstrable adverse effect on exam scores.21

Meterissian, in an opinion paper, argues that moonlighting is not educational and that lack of supervision precludes the valuable feedback it affords,14 and a survey found 90 percent of emergency medicine program directors believe moonlighting interferes with residency duties to a degree.24 Not surprisingly, organizations that represent residency programs and those that represent residents tend to respectively oppose and support moonlighting.13 Evaluating overall balance of the positive and negative effects of moonlighting on their residency education, respondents in our study overwhelmingly indicated that moonlighting had a strongly beneficial or beneficial effect.
Although, a small minority of residents felt there was some negative effect on their personal performance, none felt that the overall net effect of moonlighting was detrimental to their residency educational program.

The residency graduates in our study also believed that moonlighting helped in their preparation for practice. Less than 1 percent indicated it had no significant effect and none felt it was detrimental.

Residency graduates indicated their moonlighting experiences influenced their practice choice, specifically, that it affected the type of practice setting chosen. They either chose a site in which they moonlighted, considered such a site, or ruled the site out as a future practice location. Helping residents decide on type of practice setting and career path is reported as a benefit in other studies.\(^1\)\(^2\)\(^16\) Moonlighting also helps improve access in otherwise underserved areas,\(^13\)\(^25\) and may be an important tool in the recruiting armamentarium of such communities.

General applicability of this study is limited by the relatively low response rate, its geographic homogeneity, and potential recall bias of motivation for, and results of, activities that occurred decades previously in some cases. However, we believe the retrospective perceptions of practicing physicians of the benefit of moonlighting may be more salient than resident physicians’ anticipatory perspective or faculty whose experience in academia may be of a different nature than community medical practice.

Resident moonlighting remains a subject of controversy. There is a desperate need for evidence, especially related to both clinical and educational outcomes, to assist in the development of policies that regulate resident activity in both the formal educational process and during their “off” time. It may be that limiting self-initiated clinical activities outside of the formal educational programs is as rational as restricting residents’ reading of the medical literature to that which can be accomplished within the mandated duty hour limitations. In the absence of data, the benefit or harm of moonlighting – and its restriction – remain matters of speculation.

**Conclusions**

This pilot study found that practicing Midwestern family physicians perceive an important role, in terms of clinical educational experiences and practice selection insights, gained through their moonlighting experiences as residents. The recent expansion of resident duty hour limitations to now include independent moonlighting activities has the potential to inhibit self-initiated professional development by physicians-in-training. This unanticipated consequence could lead to physicians who are less prepared for practice to the detriment of their patients. A proper balance to allow for self-initiated learning opportunities while ensuring patient safety should guide educators and policymakers as they craft duty hour regulations.

**Acknowledgement**

The authors wish to thank Christopher Bernheisel, MD, University of Cincinnati – Christ Hospital Family Medicine Residency Program, who graciously contacted his program’s graduates to participate in this study.

**REFERENCES**


**About the Authors:**

H. Bruce Vogt, MD, Former Chair and Professor Emeritus, Department of Family Medicine, University of South Dakota Sanford School of Medicine.

Mark K. Huntington, MD, PhD, Director, Sioux Falls Family Medicine Residency Program; Professor, Department of Family Medicine, University of South Dakota Sanford School of Medicine.

**August 2015**
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

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.

South Dakota Perinatal Association

40th Annual Conference
September 10-11, 2015
Mitchell Highland Conference Center
Mitchell, SD
Info @ www.sdperinatal.org
Introduction

Coronary artery disease (CAD) is the leading cause of death in the U.S., with roughly one in every four deaths.1 Around 700,000-plus Americans present to hospitals every year with acute coronary syndrome (ACS) which contributes to roughly $100 billion annually in health care expenditure. With the rising age of the average American, the number of Americans presenting with ACS is expected to increase. Prompt clinical diagnosis and subsequent management strategies have been clearly shown to improve mortality and morbidity in patients presenting with ACS. It is critical for all physicians to be aware of the presentations of ACS. Appropriate management of ACS involves the coordination of many people, including but not limited to first responders, emergency medical services (EMS), emergency room (ER) staff, cardiologists and internal medicine physicians. This article aims to summarize the diagnosis and management of ACS, with a focus on ST-elevation myocardial infarction (STEMI). We have tried to answer some of the very basic questions about ACS and STEMI in a question-answer format.

What is Acute Coronary Syndrome?

Acute coronary syndrome is a chest pain syndrome that is a life threatening event if not recognized and treated promptly. It is defined as STEMI, non ST-elevation myocardial infarct (NSTEMI) or unstable angina (UA).2 All three are clinically distinct, but all have in common an acute ischemic event occurring in the myocardium. The severity and acuity of the ischemia is what determines how ACS is classified.

The presence of ST segment elevations on an electrocardiogram (EKG) is diagnostic of STEMI. It is indicative of transmural ischemia of the myocardium and is a clinical emergency. UA and NSTEMI are both clinically very similar, and are differentiated by the presence of biomarkers. Although not as urgent clinically as STEMI, NSTEMI/UA signifies that there is myocardial ischemia, and prompt diagnosis and intervention is required.

What is the Difference Between NSTEMI and UA?

NSTEMI and UA are closely related in that ischemia is occurring in both clinical entities, but the presence of elevated cardiac enzymes (i.e., troponin I or troponin T, creatinine kinase [CK], lactate dehydrogenase [LDH])
signifies that the degree of myocardial injury is sufficient to release cardiac biomarkers, which is what differentiates NSTEMI from UA (Figure 1). UA is defined as angina that is new-onset or abruptly increased in intensity, duration, or frequency within the last 60 days. Since it may take up to four to six hours for cardiac enzyme to become detectable in blood, NSTEMI and UA are often not distinguishable in the initial evaluation of a patient presenting to the emergency room with chest pain.

How does ACS Present Clinically?

Patients with ACS typically present with chest discomfort that can range in severity and variable presentation. Classically, it presents as sudden onset of retrosternal chest pain, with radiation to the arms, jaw or the neck. The patients may have associated nausea, vomiting and a feeling of impending doom. However, not all patients present with classical symptoms. A common presenting symptom is worsening dyspnea on exertion or signs of congestive heart failure (CHF). Syncope is a rare presentation of ACS. Silent presentations of ACS should also be in the differential in patients with a history of uncontrolled diabetes mellitus (DM) presenting with non-specific symptoms of malaise and fatigue. There is usually a history of cardiac disease in the past (known CAD, positive family history) or presence of other risk factors (DM, hypertension, hyperlipidemia), but ACS could present abruptly in an unsuspecting patient with no significant medical history.

The differential diagnoses of chest pain are many, which include (but not limited to) stable angina, gastroesophageal reflux disease, esophageal spasm, pulmonary embolism, peptic ulcer disease, anxiety and panic attacks. Thus a good history is one of the most important steps in the diagnosis of patients with ACS.

What is the Pathophysiology of ACS?

Plaque rupture is the pathogenesis of ACS. Atherosclerosis leads to plaque formation in coronary blood vessels. Most plaques remain stable or progress only gradually, and this may result in chronic stable angina, when myocardial oxygen demand may be greater (exercise, eating, cold weather, emotional stress) than supplied by the limited flow past stenotic coronary artery segments. It should be noted that severe stenosis (greater than 90 percent) is required to reduce myocardial oxygen supply at rest. Other plaques may rupture, often related to an inflammatory process and increased metalloproteinase activity. The rupture (often at the shoulder of the plaque) causes turbulent flow, extrusion of lipids and fatty gruel, and exposure of tissue factor that result in a cascade of events culminating in intravascular thrombosis. This may be accompanied by coronary vasospasm. The outcome of these events is determined in large part by whether the vessel becomes occluded, which depends on the lesion anatomy as well as the balance of pro- and anti-thrombotic and pro- and anti-fibrinolytic forces. The result may be partial (UA/NSTEMI) or complete vessel occlusion (STEMI), or the plaque may become re-stabilized, often with more severe stenosis.

How is STEMI Diagnosed?

A prompt 12 lead EKG should be done in any patient presenting with chest pain concerning for ACS. Initial presentation of patients with chest pain concerning for ACS should be risk stratified immediately after a careful, focused history, physical examination and an EKG. The EKG criterion for acute myocardial injury is defined as: new ST elevation at the J point in two contiguous leads with the cut-points: greater than or equal to 0.1 mV in all leads other than V2-V3 where the following cut-points apply: greater than or equal to 0.2 mV in men 40 years; greater than or equal to 0.25 mV in men less than 40 years, or greater than or equal to 0.15 mV in women. The evolution of a STEMI on EKG is from peaked T waves, to ST elevations, to Q wave development to T wave inversions. This may take several hours to several days. A pre-existing left bundle branch block (LBBB) makes STEMI difficult to interpret. A LBBB that is new in onset in a patient presenting with chest pain is considered a STEMI equivalent.
When the suspicion of STEMI is high, there is no role in waiting for cardiac enzymes to determine treatment, but they should still be drawn nonetheless. Roughly 20 percent of patients experiencing myocardial infarction are either asymptomatic or presenting with atypical symptoms, which are more common in patients who have DM and the elderly.

What is the Immediate Management of ST Elevation Myocardial Infarction?
The standard and ideal goals of care in patients presenting with STEMI is percutaneous coronary intervention (PCI) within 120 minutes after chest pain, with 60 minutes being the “golden” time correlated with the best clinical outcome. As total ischemic time progresses, the irreversible myocardial damage increases.

The first point of medical contact (hospital or EMS) to device (PCI) should be within 90 minutes. Patients presenting to a hospital without PCI capabilities present a more complicated scenario. The decision to administer thrombolytic agent is determined by three factors: 1) Onset of chest pain; 2) transport time to PCI capable facilities; and 3) eligibility for thrombolytic. Patients who meet the timing criteria for thrombolysis should be assessed for contraindications for thrombolytic therapy. According to the current guidelines, if a delay of greater than 120 minutes is expected from first medical contact to deployment of device/balloon (in the catheterization laboratory at a PCI capable hospital) thrombolytic agents should be administered. Ideally, a thrombolytic agent should be administered within three hours of onset of chest pain, with first point of medical contact to needle time (thrombolysis) within 30 minutes. Patients who are administered thrombolytic therapy should be transferred to a PCI capable center as soon as possible for coronary angiogram (incase of failure of thrombolytic therapy or a routine angiography three to 24 hours after thrombolytic administration) to assess degree of stenosis and possible PCI (Figure 2).

What is the In-Hospital Medical Management of a STEMI Patient?

Oxygen
Oxygen should be administered via nasal cannula even in the presence of good oxygen saturation, though good evidence is lacking, it is generally the standard of care.

Antiplatelets
Dual antiplatelet therapy (DAPT) should be given at time...
of medical contact in patients with high clinical suspicion for ACS. Aspirin should be administered orally 160-325 mg at presentation, and subsequently 75-325 mg daily thereafter. The second antiplatelet agent should either be clopidogrel (300 mg), prasugrel (60 mg) or ticagrelor (180 mg). The choice of which to use is at the discretion of the physician, but it should be noted that prasugrel and ticagrelor are more potent platelet inhibitors than clopidogrel. In clinical trials, prasugrel and ticagrelor have demonstrated better ischemic outcomes, but prasugrel (and not ticagrelor) had increased risk of major bleeding when compared to clopidogrel.6,7

Pain Relief
Adequate pain relief should be addressed as pain itself can cause increased anxiety, increased sympathetic tone which could worsen outcome of patients who have active chest pain. Morphine is often used (1 to 2 mg intravenous bolus, up to maximum of 10 to 15 mg for a normal adult). Caution should be used regarding respiratory suppression and in patients with hemodynamic instability.

Nitrates
Nitroglycerin causes coronary vasodilation, and can be useful in determining if the patient has cardiac cause of chest pain. IV nitroglycerin should be administered at 5 to 10 µg/min and should be titrated up with a goal of reduction of 10 to 30 percent systolic blood pressure as well as improvement of chest pain. It should not be administered to a patient with recent use of a phosphodiesterase inhibitor (i.e., sildenafil) as it may cause an unsafe decrease in blood pressure. It should not be used in suspected right ventricular infarct as pronounced drop in blood pressure can occur.

Beta Blockers
Beta blockers have been shown in many clinical trials to decrease early and late mortality, as well as decrease in re-infarction and cardiac arrest. Caution should be used in patients who have hemodynamic instability as beta blockers can increase risk of cardiogenic shock in the acute setting. It is recommended that beta blockers be used once the patient's vital signs are stable. Metoprolol 5mg IV boluses are typically used for a total of three doses five minutes apart, with switch to oral medication as tolerated.

Anticoagulants
Heparin should be administered intravenously as soon as possible in patients presenting with STEMI. There are two types of heparin products available, unfractionated heparin and low molecular weight heparin (LMWH). A 60U/kg IV bolus (4000 U max) followed by 12 U/kg/hr drip (max 100 U/hr) should be the starting rate. Unfractionated heparin should be used in patients with renal dysfunction (as it is not dependent on urinary excretion) and in patients whose PCI is likely to occur emergently as it has a much shorter half-life and sooner onset of action than LMWH. LMWH (enoxaparin), when compared to unfractionated heparin has a much more predictable bioavailability and anticoagulation effect, but is dependent on renal clearance. Due to the delay in clinical onset of subcutaneous injection of LMWH, it is recommended to give a loading dose (30 mg IV), followed by 1mg/kg LMWH subcutaneously every 12 hours.

Intravenous glycoprotein IIIa inhibitors should not be used routinely but are reasonable in the catheterization laboratory if there is a high thrombus burden during PCI and if a second antiplatelet agent has not been given prior to PCI. In the catheterization lab, bivalirudin can be used in lieu of heparin during PCI.8

Angiotensin Converting Enzyme Inhibitors
Angiotensin converting enzyme inhibitors (ACE-I) have been shown to improve survival in patients who presents with AMI and should be administered within 24 hours of presentation without contraindications (hypotension, hyperkalemia, angioedema). No specific ACE-I or dosing is recommended, ramipril 5 mg or lisinopril 10 mg is a reasonable choice. Angiotensin receptor blockers (ARB) should be considered if patient is intolerant to ACE-I.2

Statins
High-dose statin therapy should be considered as it has been shown to decrease short term mortality in patients presenting with STEMI due to plaque stabilization.

What are the Complications of STEMI?
Major complications of STEMI include cardiogenic shock, heart failure, atrial and/or ventricular arrhythmias, mechanical complications some of which include valvular abnormalities (i.e., severe mitral regurgitation due to papillary muscle rupture), right ventricular failure, left ventricular free wall rupture and ventricular septal defect. Most of these complications occur within 24 hours to seven days after STEMI. Prompt revascularization decreases the mortality and complications patients presenting with STEMI.1

What are the Issues Prior to Discharging the Patient?
Noninvasive testing for ischemia should be performed before discharge to assess the presence and extent of inducible ischemia in patients with STEMI who have not
had coronary angiography and do not have high-risk clinical features for which coronary angiography would be warranted. An echocardiogram should be performed in all patients with STEMI to stratify for risk of sudden cardiac death; and if the left ventricular ejection fraction (EF) is less than 35 percent, the patient should be considered for a temporary wearable defibrillator. A repeat echocardiogram should be done at 90 days (in those who underwent revascularization) to assess for improvement of cardiac function, and those with EF still less than or equal to 35 percent should be referred for an internal defibrillator implantation. Patients receiving stents should be on dual antiplatelet agents, with aspirin (81 mg) being the first agent, and a P2Y12 inhibitor (clopidogrel, ticagrelor or prasugrel) as a second antiplatelet agent. Duration of dual antiplatelet therapy is at least 12 months in patients receiving bare metal stents (BMS), all patients should be on a high dose statin. Post-hospital systems of care designed to prevent hospital readmissions should be used to facilitate the transition to effective, coordinated outpatient care for all patients with STEMI. A clear, detailed, and evidence-based plan of care that promotes medication adherence, timely follow-up with the health care team, appropriate dietary and physical activities, and compliance with interventions for secondary prevention should be provided to patients with STEMI. Encouragement and advice to stop smoking and to avoid secondhand smoke should be provided to patients with STEMI. All STEMI patients should be referred to a cardiac rehabilitation program.

References


About the Authors:
Jimmy Yee, MD, Resident Physician, Department of Medicine, Queens Hospital Center, Icahn School of Medicine at Mount Sinai, Jamaica, New York.
Naveen Rajpurohit, MD, Cardiology Fellow, Department of Cardiovascular Disease, University of South Dakota Sanford School of Medicine.
Muhammad A. Khan, MD, Cardiology Fellow, Department of Cardiovascular Disease, University of South Dakota Sanford School of Medicine.
Adam Styx, MD, Program Director, Department of Cardiovascular Disease, University of South Dakota Sanford School of Medicine.
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:
The 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 Prescription Drug User Fee Act (PDUFA) was enacted by Congress in 1992, which allows Food and Drug Administration (FDA) to collect fees from companies that produce certain human drug and biological products. These fees primarily help expedite the drug approval process. PDUFA needs to be reauthorized every five years and the most recent, PDUFA V, has been authorized through September 2017. As a result of PDUFA V, FDA has various new features, including enhancing benefit and risk assessment in regulatory decision-making and a new initiative called patient-focused drug development. The goal of these enhancements is to ensure the safety, effectiveness, and quality of drugs.

FDA then developed the benefit and risk assessment framework from regulatory decisions to guide the new drug approval process.

Previously, FDA stakeholders criticized the clarity and transparency of the benefit and risk assessment of drugs, although the FDA clearly provided relevant documents to the public. There has been a debate whether the benefit and risk assessment should be more formalized and quantitative since both could add less clarity to decision-making. FDA has developed a structured benefit and risk assessment to address the concerns since 2009 and made continued commitment with PDUFA V. Finally, FDA concluded that the best presentation of benefit and risk assessment is to include the individual benefits and risks, their frequencies, and their weights. Although FDA chose a structured qualitative approach to support the identification and communication of the key components in the benefit and risk assessment and how they led to the regulatory decision, the agency accepted that the quantitative assessment of certain components is essential for decision-making since it empirically places weights on each component.

For the patient-focused drug development in PDUFA V, FDA recognizes that patient perspectives on disease severity and currently available drugs are unique and valuable when the regulatory decision is made. The agency chose a set of disease areas, conducted a public meeting, and published a series of The Voice of the Patient Reports. They also anticipated a similar process for more disease areas. However, all information from the patient perspective is qualitative in nature and is not clearly incorporated into the benefit and risk assessment of drugs.

In the last decade, decision science and health economics have offered several rigorous methods for benefit and risk assessment based on patient perspective. These methods usually quantify and assign numerical weights to benefit and risk components of drugs by examining patient’s utility or preference. The objective of this article was to describe two emerging preference elicitation methods, discrete choice experiment (DCE) and multi-criteria decision analysis (MCDA), that have been increasingly used in the quantitative benefit and risk assessment of drugs. Not only are they rigorous methods but they also allow the inclusion of the patient perspective.

Both DCE and MCDA start with defining the study question, scope, and perspective. Usually mixed methods between literature review and qualitative interview of patients and/or clinicians are then used to identify a set of mutually exclusive benefit and risk criteria. Since these criteria need to be important to patients for the purpose of patient-centeredness, information that FDA obtained from the patient-focused drug development in PDUFA V could be used or nicely incorporated. It would be a method to engage patients in the patient-centered assessment of drug benefits and risks.

Next, DCE and MCDA use different methods to determine the weights of all criteria. For DCE, choice sets are then generated and each choice set contains a certain number of alternatives, which are hypothetical drugs described by the identified criteria and their levels. Ideally, one of these alternatives is an opt-out or reference alternative, which is used to imitate real-world choices.
Summary: 9vHPV Vaccine Characteristics and ACIP Recommendations

During its February 2015 meeting, the Advisory Committee on Immunization Practices (ACIP) recommended 9vHPV vaccine as one of three HPV vaccines that can be used for HPV vaccination of females, and one of two vaccines that can be used for HPV vaccination of males.

Key characteristics of 9vHPV vaccine

- Clinical trial data show that 9vHPV vaccine is effective and safe.
- 9vHPV vaccine protects against 9 HPV types. Similar to 4vHPV vaccine, 9vHPV vaccine protects against types 6, 11, 16, and 18, and 9vHPV vaccine also protects against types 31, 33, 45, 52, and 58. This additional protection means that 9vHPV vaccine can increase the percentage of cervical cancers prevented from 66% to 81%, and will also help prevent other HPV-attributable cancers and diseases.

February 2015 ACIP recommendations for use of HPV vaccines

- ACIP recommends HPV vaccination for all boys and girls at age 11 or 12 years.
- Girls and boys can start the series at age 9 years. ACIP recommends vaccination through age 26 for females and through age 21 for males, if they were not previously vaccinated. Vaccination is also recommended through age 26 years for men who have sex with men and for immunocompromised persons (including those with HIV infection), if they were not previously vaccinated. Other males aged 22-26 years may be vaccinated.
- HPV vaccination for females is recommended with either 2vHPV, 4vHPV, or 9vHPV, and vaccination for males is recommended with either 4vHPV or 9vHPV. 2vHPV, 4vHPV, and 9vHPV all protect against HPV 16 and 18, the types that cause about 66% of cervical cancers and the majority of other HPV-attributable cancers in the United States.
- If clinicians do not know or do not have available the previously administered HPV vaccine product, any available HPV vaccine product may be used to continue or complete the series for females, and 9vHPV or 4vHPV may be used to continue or complete the series for males. CDC recommends that health care professionals continue to use HPV vaccine(s) they have in stock to vaccinate their 11- and 12-year-old patients, as well as those adolescents and young adults who have not started or finished the HPV vaccination series.
- HPV vaccination should not be delayed pending availability of 9vHPV vaccine or future clinical trial data.

Additional 9vHPV vaccine information and resources

To learn more about 9vHPV vaccine and implications for practice, follow these links:
- CDC’s MMWR policy note contains more information about 9vHPV vaccine data and ACIP recommendations, and health care providers can receive CME for reviewing it: http://1.usa.gov/1NvFjH
- Presentations from ACIP meetings are publicly available at: http://www.cdc.gov/vaccines/acip/meetings/meetings-info.html
- The Vaccine Information Statement (VIS) for 9vHPV vaccine is now available at: http://www.cdc.gov/vaccines/hcp/vis/vis-statements/hpv-gardasil-9.html

South Dakota HPV coverage rate

- The 2013 National Immunization Survey found that 42.3% females and 8.4% males between the ages of 13-17 are fully vaccinated with three or more HPV vaccine. The Healthy People 2020 goal is for 80% of adolescents to be fully vaccinated with HPV vaccine.

Please remember to recommend the HPV vaccine for your adolescent patients.
Based on their preferences, participants are asked to choose an alternative in each choice set. Their choices are then converted into the relative importance or weight of each benefit or risk criterion in the assessment. An example of a DCE study is illustrated by a study that evaluated the benefits and risks of Crohn's disease treatment.\(^4\) Benefit and risk criteria were obtained from a literature review, health experts', and patients' interviews. The benefit criteria included severity of daily symptoms, frequency of flare-ups, prevention of serious disease complications, and the need for oral steroids while the risk criteria included death or severe disability from progressive multifocal leukoencephalopathy (PML), death from serious infections, and death from lymphoma. Five different questionnaires were developed and each contained nine choice sets. Patients randomly received one of five questionnaires and chose one out of two hypothetical drugs from each choice set. All responses were analyzed by random-parameter logit model to estimate the relative weights of all benefit and risk criteria. The study results showed that, among all criteria, the daily symptom severity had the highest weight. These weights were also used to calculate maximum acceptable risk (MAR), which is the maximum risk level that the participants accept to trade with higher efficacy level or to gain one more unit of the benefit criterion of drugs. For example, the same study showed that the acceptable mortality rate should not be more than 8 percent for trading with the reduction of disease severity from severe level to medium level.\(^4\)

MCDA separates benefit and risk criteria into pieces, evaluates them, and combines them into an overall picture for decision makers. After identifying the benefit and risk criteria, MCDA scores these criteria based on their clinical parameters and weighs them based on how a patient values them.\(^4\) Generally, there are direct and indirect rating methods for weighing or valuing the criteria. An example of the direct method is the point allocation method that assigns 100 points to each criterion, based on the importance of criterion, while the relative importance or weight of each criterion from DCE is an example of the indirect method. Overall benefit score and overall risk score are calculated and compared for the benefit-risk assessment purpose. Total weighted scores of all drugs can also be calculated from the assigned scores and weights of all criteria and used to rank them. A study used MCDA to assess the risk-benefit of three oral phosphodiesterase type 5 inhibitors (PDE5Is) including sildenafil, tadalafil, and vardenafil.\(^5\) The benefit criteria included erectile function, ability for sexual intercourse, and duration of erection, while the risk criteria included serious adverse events, headache, flushing and dyspepsia. Data from meta-analyses were used for scoring and an analytic hierarchy process was used as a weighting method. From the results of overall risk-benefit assessment, presented as utility, vardenafil had the highest benefit and lowest risk among those three drugs.

In conclusion, although several methods are available for the quantification of benefits and risks, there is no widely accepted method since each has their strengths and weaknesses. Primarily, they depend on resources, assumptions, and complexity of the methods. DCE and MCDA are relatively new methods in the healthcare field, but available literature has rapidly grown. They provide structured benefit-risk assessments not only at the drug approval point but also at any decision level. Using them in decision-making process inevitably requires the decision makers’ knowledge and time; otherwise, the complexity of the methods can be obscure and lead to transparency concerns.

### REFERENCES


About the Author:
Surachat Ngorsuraches, PhD, Associate Professor, Department of Pharmacy Practice, College of Pharmacy, South Dakota State University.
PHYSICIANS BOOST THE ECONOMY.

See the effect in South Dakota.

The American Medical Association 2014 Economic Impact Study, completed in conjunction with the South Dakota State Medical Association, shows how much physicians add to the economic health of South Dakota.

Check the effect physicians have on the U.S. economy by viewing the national report from the AMA, as well as highlights from the South Dakota study, at ama-assn.org/go/eis.

Please activate your 2015 AMA membership through the South Dakota State Medical Association by calling (605) 336-1965.
Extenuating Circumstances:
Smoking – A Deadly Addiction

By E. Paul Amundson, MD

Nicotine addiction is the largest preventable cause of morbidity and mortality in the Western World. Smoking is not just a bad habit, it is a substance addiction problem and should be treated by physicians accordingly.

According to Nora D. Volkow, MD, Director of the National Institute on Drug Abuse, “drug addiction is a mental illness. It is a complex brain disease characterized by compulsive, at times uncontrollable drug craving, seeking, and use despite devastating consequences – behaviors that stem from drug-induced changes in brain structure and function.”

According to the World Health Organization, more than 5 million smokers annually smoke themselves to death. Smoking claims half of its adult users, and is projected to kill more than one billion people before the end of the century. Recent research published in JAMA Internal Medicine indicates that “smoking causes more than 48 percent of deaths from the 12 types of cancer sometimes caused by smoking.”

Smoking tobacco and nicotine utilization is extremely addictive. An alarming 26 percent of our youth report signs of loss of control over continued smoking after just three to four cigarettes. That percent rises to 44 percent after five to nine cigarettes. There is a growing consensus among addiction experts that nicotine dependency is as permanent as alcoholism – nicotine takes over the same brain dopamine pathways as illegal drugs, and that successfully arresting nicotine dependency is as hard as or harder than quitting heroin.

A 1999 brain imaging study by Dr. Volkow showed nicotine’s amazingly quick arrival time, its stimulation of dopamine pathways, and how cigarette smoke diminishes monoamine oxidase (MAO), making inhaled nicotine possibly the most perfectly designed drug of addiction. Not only does nicotine stimulate dopamine release within 10 seconds of a puff, suppression of MAO and normal dopamine clean-up allows it to linger far longer than a natural release, such as that which occurs when eating food or quenching thirst.

More recently, scientists have discovered how nicotine physically alters the brain. Nicotine activates, saturates, and desensitizes dopamine pathway receptors, which is followed by growth or activation of millions of extra neuronal receptors. As a result, one cigarette per day then becomes two, three, etc.

The good news is that most everything which is done while under nicotine’s influence can be undone, and while there is no cure for the disease, smokers can take back their lives. In fact, today there are more ex-smokers in the U.S. than smokers. So firstly, as providers, we must do a better job of identifying and offering our patients options to quit smoking. Second, we must do a better job of assessing our patients and identifying the underlying cause or reason for their tobacco utilization. And third, we must remember that it is extremely difficult for our patients to quit smoking and it is likely that multiple attempts will be required to conquer this addiction.

And so I (again) ask you to Ask, Advise and Refer. Acquaint yourself with the South Dakota QuitLine, which is a South Dakota Department of Health (SDDOH) tobacco cessation project that is available to support patients’ efforts to quit their addiction to cigarettes and other tobacco products. Key components of our state’s QuitLine services are derived from national guidelines for tobacco cessation and include a combination of supportive coaching, self-help materials and quit assistance through nicotine replacement or cessation medications, all available at no cost to the participant. The QuitLine offers a toll free service for tobacco users (1.866.SDQUITS; SD Relay/TTY: 800.877.1113) and a fax referral service for health care providers (605.322.3858). For those who utilize an EMR, a referral may be accomplished within the medical record, thus eliminating the need for a fax. If you are unsure regarding your ability to make a referral within your EMR, contact the QuitLine at 866.737.8487.

I would like to remind my fellow physicians that treatment for tobacco dependence requires ongoing rather than acute care, and relapse should be considered an expected component of the chronic nature of nicotine dependence – not an indication of failure. As a physician, you are pivotal in winning the war against tobacco and helping those who wish to quit. Thank you for your efforts!
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

ACCREDITED
HEALTH PLAN WITH HEALTH INSURANCE MARKETPLACE

urac
The scheduled administration of immunizations allows providers an opportunity to offer a service that is, with little doubt, an effective means of preventive medicine along with a quality of health improvement. Our Great Plains Quality Innovation Network (QIN), serves as the Quality Innovation Network-Quality Improvement Organization for the states of Kansas, Nebraska, North Dakota and South Dakota. It has recently been awarded the task to increase immunization rates and reduce disparities among Medicare beneficiaries in our four states. Great Plains QIN will work directly with healthcare practitioners, providers and consumers to foster improvement in this area.

While immunization rates have made fairly steady progress, influenza and pneumonia are still the eighth leading causes of death in the U.S. Great Plains QIN will collaborate with physician offices and home health agencies to adopt and promote proven best practice approaches. We will focus on strengthening information exchange among state immunization registries and Immunization Information Systems (IIS) to enhance vaccine relate data.

Over the next four years our goal will be for immunization rates of 70 percent for influenza, 90 percent for cumulative pneumococcus and 30 percent for herpes zoster among Medicare patients. It is also desired that there will be a reduction in disparities among racial and ethnic minorities as well as those who reside in rural areas. CMS aims to have one million previously unimmunized beneficiaries given pneumonia immunizations.

Depending on your practice setting and environment, giving direct immunization or else referral for the vaccine will help promote this initiative. We as providers can become so focused on acute presentation signs and symptoms or other issues of health care maintenance that we forget or neglect to inquire about or undertake strategies to improve immunization rates. It is in this area that the Great Plains Learning and Action Network (LAN) will offer an opportunity for those providers to share, learn and help each other make a measurable difference in these rates. Incorporating this into clinic work flow will allow tracking and might help assist in areas of quality reporting. Meaningful Use and the Physician Quality Reporting System (PQRS) will have measures related to immunization, and those eventually may affect reimbursement. The IIS will help meet these requirements and update the patient’s immunization status.

Other areas which can offer assistance and resources include pharmacies, community health nurses, long term care facilities, Departments of Health and a host of other stakeholders who can help our Great Plains QIN achieve its goal. Patients with many of the chronic diseases like COPD and diabetes are at higher risk for pneumonia. FLU-FIT is an innovative process that combines an influenza vaccine with screening for colorectal cancer. Patient reminders and recall notices, as well as standard orders for the vaccine administration, may help improve rates.

August is Immunization Awareness Month and should remind us to not take the process for granted and to become involved in improving numbers. To join the Great Plains LAN, visit: http://greatplainsqin.org/improving-immunization-rates/. We look forward to helping prevent illness and avoiding unnecessary hospitalizations by partnering with patients, providers and stakeholders in our region in addressing this important issue.

For more information, contact Holly Arends, CSHP, program manager, Great Plains QIN/South Dakota, at 605.660.5436 or holly.arends@area-a.hcqis.org.
Summer has flown by, as time so often does. Hopefully you’re deep in the “dog days of summer” and those with school-age children are pondering back-to-school plans. With only one left in college, I can see the light at the end of the (tuition) tunnel. I appreciate the feedback I’ve had from readers regarding the healthcare quality articles these past few months. I’ll conclude this three-part series on specific conditions by looking at cancer screening rates this month. This topic was chosen for several reasons, not the least of which is the increasing debate over who should be screened, how often and with what technology. We have made progress in this area though: a CDC report in the journal Preventing Chronic Disease revealed a decrease in the overall cancer mortality risk for adults in the U.S. (despite an increase in the actual number of cancer deaths due to an aging population). Experts attribute the decrease in cancer mortality rates to improvements in early detection and treatment.

There is no doubt that screening methods have helped to identify various types of cancers in an earlier, thus oftentimes easier to treat, stage…but at what cost? Research published in the July 6 issue of JAMA Internal Medicine suggests that “the increased use of mammograms to screen for breast cancer has subjected more women to invasive medical treatments but has not saved lives.” Investigators found that the number of breast cancer diagnoses rose with more aggressive screenings, but the number of deaths remained the same. This certainly begs the question of what is the true value of breast imaging. Is it for the benefit overall improved public health or more to feed the “health care machine” that accounts for almost 20 percent of our country’s GDP?

The table provides data from our South Dakota DAKOTACARE fully-insured population (the National Standard(s) benchmarks used for comparison are derived from an aggregate of ~16 million commercial lives).

I’ve been impressed with the work of our colleagues at the American College of Physicians (ACP) who have released their own Advice for High-Value Cancer Screening, which contains high-value care screening advice for five types of cancer: breast, cervical, colorectal, ovarian and prostate. Please note this advice applies only to asymptomatic adults with average risk for these cancers.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Rule</th>
<th>Count</th>
<th>Observed</th>
<th>Benchmark</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast CA Screen</td>
<td>Patient(s) 42 - 69 years of age that had a screening mammogram in last 24 reported months.</td>
<td>4,067</td>
<td>66.0%</td>
<td>70.6%</td>
<td>-4.6%</td>
</tr>
<tr>
<td>Colorectal CA Screen</td>
<td>Patient(s) 50-75 years of age that had appropriate screening for colorectal cancer.</td>
<td>5,983</td>
<td>28.0%</td>
<td>37.5%</td>
<td>-9.5%</td>
</tr>
<tr>
<td>Cervical CA Screen</td>
<td>Patient(s) 21-64 that had a cervical cancer screening test in last 36 reported months.</td>
<td>5,049</td>
<td>63.7%</td>
<td>67.8%</td>
<td>-4.1%</td>
</tr>
</tbody>
</table>

You may not agree with the specifics of the HEDIS rules here, but they are the nationally recognized standards currently utilized. As a health plan required to comply with conditions of the ACA, we are mandated to offer “first dollar” coverage for those preventive services which are A or B rated by the USPSTF. Review this list at www.uspreventiveservicestaskforce.org.

### Breast Cancer Screening

Discuss the benefits and harms of screening mammography with average-risk women aged 40-49 years and order biennial mammography screening if an informed woman requests it; Encourage biennial mammography screening in average-risk women aged 50-74 years; Do not screen average-risk women < 40 years of age or ≥ 75 years of age for breast cancer or screen women of any age with a life expectancy < 10 years; Do not screen average-risk women of any age for breast cancer with magnetic resonance imaging or tomosynthesis.
Cervical Cancer Screening
Start screening for cervical cancer at age 21 years once using Pap tests without human papillomavirus (HPV) tests every three years but not more frequently; Stop screening women > 65 years of age who have had three consecutive negative cytology results or two consecutive negative cytology plus HPV test results within 10 years, with the most recent test done within five years; Use a combination of Pap and HPV testing once every five years in women ≥ 30 years of age who prefer screening less often than every three years; Do not screen women < 21 years of age for cervical cancer; Do not perform HPV testing in women < 30 years of age; Do not screen women of any age who have had a hysterectomy with removal of the cervix for cervical cancer; Do not perform cervical cancer screening with a bimanual pelvic examination.

Colorectal Cancer Screening
Encourage patients aged 50-75 years to undergo colorectal cancer screening by one of the following methods: 1) High-sensitivity fecal occult blood test (FOBT) or fecal immunochemical test (FIT) every year; 2) Sigmoidoscopy every five years; 3) High-sensitivity FOBT or FIT every three years plus sigmoidoscopy every five years; 4) Optical colonoscopy every 10 years in average-risk adults aged 50 to 75 years.

Do not screen for colorectal cancer more frequently than recommended in the 4 strategies above; Do not conduct interval screening with fecal testing or flexible sigmoidoscopy in adults having 10-year screening colonoscopy; Do not screen for colorectal cancer in average-risk adults < 50 years of age or > 75 years of age or those with an estimated life expectancy < 10 years.

Prostate Cancer Screening
Discuss at least once with men aged 50-69 years the limited potential benefits and substantial harms of screening for prostate cancer using prostate-specific antigen; Do not test for prostate cancer using the PSA test in men aged 50-69 years who have not had an informed discussion and who do not express a clear preference for screening; Do not screen for prostate cancer using the PSA test in men < 50 years of age or > 69 years of age or those with a life expectancy < 10 years.

Ovarian Cancer Screening
Note that the ACP advises not to screen average-risk women for ovarian cancer.

“DAKOTACARE Update” is a monthly feature sponsored by DAKOTACARE, the health care plan of the South Dakota State Medical Association.
For more information about DAKOTACARE, visit www.dakotacare.com

Is South Dakota medicine In Your Advertising Budget?

If not, contact us to reach over 2,000 physicians!

CONTACT:
Elizabeth Reiss,
South Dakota Medicine
PO Box 7406,
2600 W. 49th Street, Suite 200
Sioux Falls, SD 57117-7406
605.336.1965
E-mail: ereiss@sdsma.org
We need to be aware that alcohol can be a blessing and a curse.

Scientific studies have repeatedly shown that mild to moderate alcohol consumption (one to three drinks a day accounting for person size) brings a significant health benefit for most individuals, with reduced death rates from strokes and heart attacks, Alzheimer's disease, osteoporosis, diabetes, and even some cancers. Say it again: benefits.

Go to www.alcoholproblemsandsolutions.org/AlcoholAndHealth.html for references.

Death rates graphed with alcohol consumption becomes like a J-shaped curve: somewhat higher death rate for abstainers, dropping 25 percent lower for moderate consumers. Here’s the problem: then the death rate shoots up much higher for heavy drinkers because when drinking becomes heavy, it becomes very destructive.

The problem is also that the line between moderate and heavy drinking is a slippery slope. For some unknown reason, if there is any drinking for certain people, it turns into a binge.

A young woman was admitted with aspiration pneumonia resulting from inhaling her mouth contents during seizures, and then an alcoholic coma while lying in a pool of vomit. I came into her room on the second hospital day of recovery and found her crying while she was brushing her long ignored teeth. I can’t forget the malodorous brown scum as she brushed and wept.

A gentleman came into the hospital emergency room vomiting blood from bleeding esophageal varicose veins because he had alcohol induced liver cirrhosis, which dilated his upper venous system. We placed a special tube down his throat and expanded a balloon to put pressure on the veins, which stopped the bleeding. Drinking and then bleeding recurred again a month later, and that time he died.

The sad consequences of alcoholism affect almost everyone. About 17 million U.S. adults have alcoholic use disorder, costing our country about $250 billion per year, causing close to 90,000 deaths a year, and accounting for the third leading preventable cause of death. It affects rich and poor alike, and when it catches hold, alcohol can devastate and destroy good people and, what’s worse, all those nearby.

Alcohol can be a blessing when in moderation, way more protective than cholesterol-lowering drugs, for example. But it can also be a curse when in excess, more destructive than an unsuspected and ruthless poison.

Be aware.
SDBMOE Board News

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

South Dakota Law Regarding Ethics for Physicians

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 American Medical Association’s (AMA) 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 medical standards.

Adherence to professional medical standards includes the following:

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).

South Dakota Administrative Rules

Chapter 20:47:08

20:47:08:01 Professional ethical standards and conduct. A licensee under SDCL chapter 36-4 shall comply with the following professional ethical standards and conduct:

(1) A physician shall be dedicated to providing competent medical care, with compassion and respect for human dignity and rights;

(2) A physician shall uphold the standards of professionalism, be honest in all professional interactions, and strive to report physicians deficient in character or competence, or engaging in fraud or deception, to appropriate entities;

(3) A physician shall respect the law and also recognize a responsibility to seek changes in those requirements which are contrary to the best interests of the patient;

(4) A physician shall respect the rights of patients, colleagues, and other health professionals, and shall safeguard patient confidences and privacy within the constraints of the law.

(5) A physician shall continue to study, apply, and advance scientific knowledge, maintain a commitment to medical education, make relevant information available to patients, colleagues, and the public, obtain consultation, and use the talents of other health professionals when indicated;

(6) A physician shall, in the provision of appropriate patient care, except in emergencies, be free to choose whom to serve, with whom to associate, and the environment in which to provide medical care;

(7) A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health;

(8) A physician shall, while caring for a patient, regard responsibility to the patient as paramount;

(9) A physician shall support access to medical care for all people.

Source: 41 SDR 180, effective May 21, 2015.

20:47:08:02. Violations. A violation of any of the ethical standards and conduct are considered unprofessional conduct as defined by SDCL 36-4-30(22).

Source: 41 SDR 180, effective May 21, 2015.

20:47:08:03. Ethical considerations. The Board may utilize the annotations and opinions included in Code of Medical Ethics of the American Medical Association 2012-2013 edition as guidance in determining whether a licensee has violated professional ethical standards and conduct.

Source: 41 SDR 180, effective May 21, 2015.

REFERENCES


Additional reference: 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 South Dakota Board of Medical and Osteopathic Examiners office or obtained from the AMA by calling 800.621.8335 or online at www.amabooksstore.org.
### SDSMA PAC Membership 2015

#### Chairman’s Club $1,000+ (Physician and Spouse)
- Daniel C. Johnson MD
- Mary J. Milroy, MD
- Karla K. Murphy, MD
- Thomas Murphy

#### Senate Club $500+ (Physician and Spouse)
- E. Paul Amundson, MD
- Anne Barlow
- John F. Barlow, MD
- Jean Bubak
- Mark E. Bubak, MD
- Mary S. Carpenter, MD
- Mark East
- Janice Knutsen
- Roger S. Knutsen, MD
- Jennifer K. May, MD
- Jean McHale
- Michael S. McHale, MD
- Karen McPherson
- Scott A. McPherson, MD
- Stephan J. Miller, MD
- Connie Schroeder
- Stephan D. Schroeder, MD
- Barbara A. Smith
- Alison R. Tendler, MD

#### House Club $300+ (Physician and Spouse)
- Mike Alley
- Marty L. Allison, MD
- Robert L. Allison, MD
- David W. Bean, Sr., MD
- June Bean
- Kay Berg
- Tony L. Berg, MD
- Kevin L. Bjordahl, MD
- Mary Bjordahl
- Jeffrey S. Brindle, MD
- Sherri Brindle
- Jens Christensen
- Rochelle Christensen, MD
- Joanie Holm

#### Member $175+
- Richard P. Holm, MD
- Kathy Jacobs
- Tad B. Jacobs, DO
- James Keil, MD
- Deborah Ann Kuller, MD
- James B. MacDougall, MD
- Claudette Margallo
- Lucio N. Margallo, II, MD
- Scott Maxwell
- Janice Minder
- Jim L. Minder, MD
- Mary D. Nettleman, MD
- Rodney R. Parry, MD
- Ruth Parry
- Maryls Porter
- Richard I. Porter, MD
- Ihlene Rossing
- William O. Rossing, MD
- Herbert A. Saloum, MD
- Linda Saloum
- J. Geoffrey Slingsby, MD
- Jacalyn Slingsby
- Emily Thomas
- Eric R. Thomas, MD
- Marilyn Van Demark
- Robert E. Van Demark, Jr., MD
- David B. Whitney, MD
- Sheila Whitney

#### Resident Member
- Frank H. Shin, MD

#### Student Member
- Broderick T. Allen
- George A. Ceremuga
- Anthony L. Loewen
- Benjamin D. Meyer

#### Other
- David L. Elson, MD
- Karl L. Heilman, III, MD
- Paul J. Olson, MD
- Matthew E. Simmons, MD
- Gary L. Timmerman, MD
- Virginia Tracy

---

Your SDSMA PAC membership is very important in order to elect political candidates who share our vision. To donate to SDSMA PAC, visit [www.sdsmaw.org](http://www.sdsmaw.org).
CMS Proposes 2016 Fee Schedule

Physicians will see a 0.5 percent overall increase in Medicare reimbursement in 2016 under the proposed physician fee schedule announced by the Centers for Medicare and Medicaid Services (CMS).

The proposal also includes cutting gastroenterologists by 5 percent and radiation oncologists by 3 percent. Pathologists will see an 8 percent increase.

The proposed fee schedule, which will be finalized this fall, is the first to be issued since Congress repealed the sustainable growth rate (SGR) payment formula in April.

The proposed rule also calls for reimbursement for physician discussion of patients' wishes regarding end-of-life care, proposing to establish separate payment and payment rate for two advance care planning services.

Some modifications to the Physician Quality Reporting System (PQRS) have been proposed, adding measures where gaps exist and eliminating duplicative measures. If all proposals are finalized, there will be 300 measures in the PQRS measure set for 2016.

Source: MedPage Today

Preparing for ICD-10

With about two months remaining until the nation switches from ICD-9 to ICD-10 coding for medical diagnoses and inpatient hospital procedures, the American Medical Association (AMA) and the Centers for Medicare and Medicaid Services (CMS) have announced efforts to continue to help physicians get ready ahead of the Oct. 1 deadline. In response to requests from the AMA and state medical societies, CMS is releasing additional guidance that will allow for flexibility in the claims auditing and quality reporting process as the medical community gains experience using the new ICD-10 code set.

CMS and AMA will provide webinars, on-site training, educational articles and national provider calls to help physicians and other health care providers learn about the updated codes and prepare for the transition. The free help includes the Road to 10 program, aimed specifically at smaller physician practices with primers for clinical documentation, clinical scenarios and other specialty-specific resources. CMS has also released provider training videos. Learn more at www.roadto10.org and www.ama-assn.org/ama/ama-wire/blog/ICD-10/1.

Additional resources through CMS include the following:
- Setting up an ICD-10 communications and coordination center;
- Offering ongoing Medicare acknowledgement testing for providers through Sept. 30;
- Providing additional in-person training through the “Road to 10” for small physician practices; and
- Hosting a national provider call on Aug. 27.

Due to the coming transition, Medicare claims processing systems will not have the capability to accept ICD-9 codes for dates of services after Sept. 30, and they won’t be able to accept claims for both ICD-9 and ICD-10 codes.

Source: SDSMA staff and AMA staff

SDSMA 2016 Directory – Please Submit Your Updates

The SDSMA staff are working to produce the 2016 Member Directory. This important directory is widely referenced by health care facilities and personnel throughout the year. Nearly 3,000 directories are printed and distributed across the region annually. As a valuable member of the SDSMA, we want your information to be listed accurately.

To include your information in the 2016 directory, please visit www.sdsma.org and click “Update Your Record” to verify your information is correct. To update your information, enter your information into the fields provided and click “save.”

Please email a professional photo to membership@sdsma.org. To be included in the directory, all updates are due by Aug. 15 — log on and update your information today!
For Your Benefit:

Fighting for You and Your Patients

The SDSMA serves as your vehicle for advocacy for your patients and the art and science of medicine through lobbying at the state and federal levels, grassroots campaigning, and legal initiatives.

The South Dakota State Medical Association Political Action Committee (SDSMA PAC) is your grassroots avenue that was created to impact public policy decisions through bipartisan political participation in all aspects of the political process. SDSMA PAC supports and elects pro-medicine candidates on the state level. Members of the SDSMA and their spouses can join SDSMA PAC.

The Association’s motto is “Values. Ethics. Advocacy.” We take our advocacy role to heart. With your help, the SDSMA and SDSMA PAC have the opportunity to dramatically impact the political and legislative process to create meaningful changes in South Dakota's current health care system:

- Improving health and access to care in rural areas;
- Increasing Medicaid reimbursement;
- Promoting Medicare physician payment reform and stopping reimbursement cuts;
- Working to improve clinical quality and patient safety;
- Partnering with state agencies to tackle regulatory, socioeconomic, public health and scientific policy issues;
- Advocating for public health immunizations;
- Promoting adequate funding for medical education;
- Stopping inappropriate expansion of non-physician scope of practice;
- Defending the patient-physician relationship; and
- Reforming medical liability.

If you would like to become involved in any of our advocacy programs, call 605-336-1965, visit our website at www.sdsmag.org, or email Mark East at meast@sdsmag.org.

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

SDSMA Member Directory a Great Advertising Opportunity

The 2016 SDSMA Member Directory is a great opportunity for organizations of all sizes to reach physicians and health care facilities through nearly 3,000 directories printed and distributed across the region. The Member Directory is widely used and often-referenced throughout the entire year, giving your organization continuous exposure.

Advertisers receive a copy of the directory which includes photographs of the SDSMA’s more than 2,000 members as well as office addresses, telephone and fax numbers, and specialties. Directories are distributed in early January.

To maximize your advertising dollars for 2016, contact Laura Olson at lolson@sdsmag.org or 605.336.1965 today to secure a place for your organization’s advertisement. Ad copy is due Sept. 4. Call or email today for advertising rates, deadlines and to obtain a contract form.

Source: SDSMA staff
AMA Delegate Report: Annual Meeting 2015

Members of the South Dakota State Medical Association (SDSMA) and the SDSMA Medical Student Section attended the American Medical Association (AMA) Annual Meeting in Chicago June 8-11 with hundreds of others from across the country. The gathering was filled with activities and policy debate that will help shape the future of health care.

Some highlights include the following:

**Calling for Two-Year Grace Period for ICD-10 Implementation**
With months to go before the deadline for implementing the ICD-10 code set, delegates passed policy seeking a two-year grace period to avoid financial disruptions, facilitating a smoother transition that would allow continuing to provide quality care to patients. The policy calls for the Centers for Medicare and Medicaid Services not to withhold claim payments based on coding errors, mistakes or malfunctions in the system for the two years directly following implementation.

**Solutions to Overdose Epidemic**
As the nation continues to grapple with the issue of opioid misuse, overdose and death, physicians supported additional steps to address this pressing public health issue. Policies adopted on this subject call for increased reliance on prescribing data, more robust education, adequate coverage for addiction treatment, and encouraging physicians to use state-based prescription drug monitoring programs.

**New Public Health Policies**
Physicians approved a variety of public health policies that could influence how patients stay healthy in the years to come. Public health issues that the AMA will tackle next range from barring people younger than 21 from buying e-cigarettes to protecting youths with concussions.

**GME Funding and Physician Shortage**
Physicians passed policy to address insufficient funding for graduate medical education (GME) ahead of a predicted shortage of 46,000 to 90,000 physicians over the next decade. The policy calls for the AMA to advocate for continued and expanded GME funding from federal, state, local and private sources.

**Medical Reasons Should be the Only Exemptions from Vaccines**
Outbreaks of dangerous preventable diseases have continued to increase. Policies adopted at the meeting call for immunization of the population – absent a medical reason for not being vaccinated – because disease exposure, importation, infections and outbreaks can occur without warning in communities, particularly those that do not have high rates of immunization. Policies call for eliminating philosophical/religious exemptions from immunization requirements and disseminating materials to states about the effectiveness of vaccines, aiming to minimize the risk of outbreaks and protect vulnerable individuals from acquiring preventable but serious diseases.

**Researching Violence Against Physicians**
Policy adopted supports a new study on methods that will prevent violence against health care professionals while in the workplace. Attacks at hospital and social service settings account for almost 70 percent of nonfatal workplace assaults. There also have been more than 150 shootings in health care facilities in the past decade.

**“Innovation Ecosystem” Shaping Medicine’s Future**
The AMA is improving the health of the nation by crafting an “innovation ecosystem,” AMA Executive Vice President and CEO James L. Madara, MD, said in his address. This includes the launch of the AMA’s STEPS Forward website, www.stepsforward.org, which offers a free series of physician-developed, proven solutions to help practices thrive.

**Liability Related to Referrals from Free Clinics**
Delegates approved policy directing the AMA to work with state societies to enact state legislation that provides medical liability immunity, similar to the protections granted under the Federal Tort Claims Act, to physicians who provide charity care at their offices or clinics to patients referred from free clinics.

Respectfully submitted by SDSMA delegates to the AMA Mary S. Carpenter, MD, and Herbert A. Saloum, MD
Legal Brief Highlight: Female Genital Mutilation

Female genital mutilation (to knowingly do so, give consent or take a female overseas) of girls under age 18 is a Class 4 felony, effective July 1 under South Dakota Codified Law.

A surgical procedure is not in violation of law if it is conducted by a licensed medical practitioner in a licensed medical facility for purposes that are necessary to the health of an individual or for purposes related to labor or birth.

Female genital mutilation is also a crime under federal law and has been since 1996, punishable by up to five years in prison. The law states that it is not a defense to claim that it is a matter of religion, custom or ritual.

For more information, download the SDSMA legal brief Female Genital Mutilation at www.sdsm.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

South Dakota EMS Stakeholder Group Meetings

Emergency Medical Services (EMS) stakeholders from across South Dakota again met July 23 in Pierre to continue a discussion of challenges facing EMS in South Dakota. This was the third of four meetings hosted by the South Dakota Department of Health (SDDOH). SDSMA Vice President Mark East is a member of the task force.

The group has identified the following seven areas to explore and make recommendations:

- Rural EMS sustainability;
- Standards for EMS services;
- Funding;
- Medical direction;
- Advocacy;
- Data; and
- Miscellaneous – factors that impact and/or impede care.

The two areas garnering the most interest to date are rural EMS sustainability and standards for EMS services.

Sustainability can be measured by evaluating workforce, community support of the EMS, funding – both current budget and reserves, and structure. Currently, the minimum staffing requirements on all ambulances is two EMTs; however, a hardship exemption may be granted upon application. A hardship exemption allows the service to operate with one EMT and one driver on calls. The hardship exemption is for one year and must be renewed. South Dakota currently has 32 ambulance services on hardship.

The stakeholders will meet for a final time in Aug. 24 at which time the group will propose recommendations to the SDDOH. Results from a national EMS listserv indicate a minimum of 23 states, including those surrounding South Dakota, have minimum staffing requirements to include one EMT and another individual – the individual may be a driver, an emergency medical responder or something else. The group will call for an elimination of the exemption program.

Source: SDSMA staff

CONTACT:
Elizabeth Reiss, South Dakota Medicine
PO Box 7406, 2600 W. 49th Street, Suite 200
Sioux Falls, SD 57117-7406
605.336.1965
E-mail: ereiss@sdsm.org
# 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>August 2015</th>
<th>August 2015</th>
<th>August 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 5</td>
<td>August 18</td>
<td>August 20</td>
</tr>
<tr>
<td>Internal Medicine Grand Rounds — Melanoma</td>
<td>Humphreys' Forum for Infectious Disease</td>
<td>Pediatric Grand Rounds – Adolescent Drug &amp; Alcohol Issues</td>
</tr>
<tr>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
</tr>
<tr>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td>August 5</td>
<td>August 19</td>
<td>August 26</td>
</tr>
<tr>
<td>VA Tumor Conference</td>
<td>Internal Medicine Grand Rounds</td>
<td>Internal Medicine Grand Rounds</td>
</tr>
<tr>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
</tr>
<tr>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td>August 6</td>
<td>August 19</td>
<td>August 27</td>
</tr>
<tr>
<td>Pediatric Grand Rounds – American Indian Adolescent Health: Exploring the Role of Social Determinants of Health</td>
<td>Surgery Grand Rounds</td>
<td>Pediatric Grand Rounds – South Dakota Kids Count</td>
</tr>
<tr>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
</tr>
<tr>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
</tr>
<tr>
<td>August 12</td>
<td>August 19</td>
<td>August 28</td>
</tr>
<tr>
<td>Internal Medicine Grand Rounds</td>
<td>VA Tumor Conference</td>
<td>VA Medical Center CME Activity – Veterans &amp; Blast Injuries</td>
</tr>
<tr>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
<td>AMA PRA Category 1 Credit(s)” available</td>
</tr>
<tr>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
<td>Register online: usdssom.learningexpressce.com</td>
</tr>
</tbody>
</table>

**DO YOU HAVE A CME EVENT COMING UP? WOULD YOU LIKE TO HAVE IT LISTED HERE?**

**Contact:** Elizabeth Reiss, South Dakota Medicine, 2600 W. 49th Street, Suite 200, Sioux Falls, SD 57105

Phone: 605.336.1965 • Fax: 605.274.3274

Email: ereiss@sdsma.org

---

**Don’t forget to send in your favorite scenic photo for South Dakota Medicine front cover consideration.**

Send photos to ereiss@sdsma.org.
Physician Directory

PATHOLOGY

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-Greggs, 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) 322-5444 • 1-800-522-5241
Rapid City Client Support & Laboratory
(605) 716-0041 • 1-800-507-4813
sanfordlaboratories.org

SANFORD Laboratories
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.
WHY CHOOSE US?

5 Great Reasons to Choose Physicians Vein Clinics!

1. **99.9% Success Rate.**
   Physicians Vein Clinics has performed thousands of outpatient vein procedures with a nearly 100% success rate. As a private clinic specializing only in veins, you will receive the most advanced levels of care using minimally invasive technology and no general anesthesia.

2. **FREE Ultrasound Screening.**
   Many vein complications go beyond varicose veins to deeper problems below the surface. Physicians Vein Clinics offers a FREE ultrasound screening for anyone with the following ongoing symptoms:
   - Leg aching
   - Heaviness
   - Muscle cramping
   - Leg fatigue
   - Restless Legs Syndrome
   - Ankle or leg swelling
   - Itching and burning
   - Skin discoloration
   - Ulcers of the skin
   - Eczema to the lower legs
   - Phlebitis (blood clots)

3. **Comprehensive Vein Treatments.**
   Physicians Vein Clinics will customize the right treatment plans for you. The specialized clinic provides all levels of care — from complicated varicose issues to surface spider veins.

4. **Medical Expertise.**
   Owner and Medical Director Lornell E. Hansen II, MD, is one of the area’s leading experts in laser technology and is continually performing research in the area of venous medicine, with over 2,500 vein procedures. Jeffrey Heier, MD, brings 15 years of acute care expertise to the Physicians Vein Clinics team.

5. **Insurance Coverage.**
   Most procedures performed at Physicians Vein Clinics are covered by insurance. We will determine if you qualify for coverage through our free screening.

If you need help with your varicose veins, call us at today at 800-VEIN-DOC

800-VEIN-DOC » www.physiciansveinclinics.com