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Erratum: When the Primers in Medicine article, “Current Guidelines on Syncope” was published in the November 2016 issue, the following sentence had parts inadvertently left out: “Fludrocortisone or beta-blockers have no role in the treatment of reflex syncope.”
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President’s Comments

Season of Giving

By Tom Hermann, MD

The holiday season is often a “time of giving” and a time for being mindful of the virtues of charity and caring for others. For the many blessings that we have as physicians, we can truly be grateful. Caring for others has led us down the path of compassion, while promoting the greater good and promoting the health of our patients and families.

With this honor comes a heightened level of responsibility as others look to us to practice and live a life of integrity and professionalism. Let us reflect on our mission as SDSMA members: to promote the art and science of medicine; to protect and improve the health of the public; and to advocate for the well-being of patients and the best environment for physicians to advance quality health care.

When used appropriately, opioids can be important tools for relieving moderate to severe pain arising from a wide range of conditions, disease states, and medical procedures. These drugs however, may also be misused and abused, and overprescribing of opioids can result in multiple adverse health outcomes to include accidental fatal overdoses.

Our white paper and participation by Chris Dietrich, MD, on the governor’s task force helps us identify problems and potential solutions to this issue. Participation on the governor’s task force also grants us an opportunity to dialogue with other stakeholders, and to work with them to address our growing drug addiction and diversion problem.

The high number of prescriptions and the perceived excessive quantities of pills prescribed in our state, combined with the low percentage of physicians registered and routinely accessing the South Dakota Prescription Drug Monitoring Program (SD PDMF), which potentially recognizes those diverting or doctor shopping, have been highlighted as areas of concern by the governor’s task force.

We as physicians recognize there are many factors that impact our prescribing patterns: medication preference, practice patterns, and time limitations. Additionally, our days are often filled with pre-authorizations, oversight and administrative regulations that steal time from our patient care activities.

Physicians must exercise their own best medical judgment when providing treatment, taking all relevant circumstances into account, including the potential for abuse, diversion and risk for addiction. Also we need to take into account that there are many pharmacologic and non-pharmacologic options available for the treatment of pain. Regardless of the course of action, options should be employed by using the following general principles:

- Identify and treat the source of chronic pain, if possible, although treatment can begin before the source of the chronic pain is determined;
- Select the most clinically appropriate approach to chronic pain management. This generally means using non-pharmacologic approaches as much as possible and/or trying medications with the least severe potential side effects first, and at the lowest effective doses; and
- Establish a function-based plan if treatment is expected to be long-term.

However, I believe it is important to note that simply taking away the pills in and of itself will not solve the problem. Did you know that 75 percent of physicians believe direct to consumer (DTC) ads cause patients to think that a particular drug works better that it actually does, and many physicians feel pressure to prescribe something when patients mention DTC ads. Of note, the U.S. and New Zealand are the only two countries that allow DTC advertising of prescriptions drugs, and in November 2015, the AMA called for a ban on DTC advertising.

And then there are the issues of poverty and the lack of access to mental health services. A recent report finds that 56 percent of US adults with mental illness do not receive treatment. Conjoined at the hip, both issues feed off each other and their effects strengthen their respective feedback loops. Poverty leads to mental states which can lead to drug abuse with leads to addiction, which begets crime, which leads to poor employment prospects and further poverty.

As we enter into our “season of giving” we must take a look at the factors that contribute to the opioid crisis that we are facing as a country. May we be willing address the issues that are contributing to this problem, and may we be willing to work with others to protect and improve the health of the public, and to advocate for the well-being of our patients. Together may we find the renewed strength of purpose and faith to do so. I would recall with you a well-known verse of a song: “there is a time for every season, turn, turn, turn,” and invite you to turn toward the challenges ahead for medicine, and embrace them and each other. Be part of our SDSMA. We are there with you and for you, and for our profession of medicine.
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Since 1950, several dangerous and deadly diseases have been brought under control or eliminated by vaccination: smallpox, diphtheria, tetanus, measles, haemophilus and polio. This cooperative effort by medical and public health, and a concerned, cooperative and supportive public has saved millions of lives and prevented innumerable people from suffering and disability. We now have the misguided luxury of short memories and forgetting these scourges of past generations.

Currently we confront the polio global end game. Polio, one of the most destructive and feared diseases, is on the threshold of total eradication. The only pockets of polio remaining are in areas of Pakistan, Afghanistan and Nigeria strangled by superstition, myth and fanatical religious terror. We are horrified when polio vaccination teams in these countries are ambushed and killed. As long as the polio virus exists anywhere on Earth, we are all at risk and must keep vaccinating for that disease. Here in South Dakota our last case of polio was in 1963, but we still vaccinate against it. We eliminated polio from our state and country thanks to informed supporting citizens, focused resources, good science and bold research. In recent years, however, the influences of social media and reckless opinion makers have pushed claims that resist the science of infection, immunity and immunization. Good science is meant to be questioned, challenged and improved, but when the hypothesis is proven or disproven multiple times by methodologically gathered evidence, the myths, superstitions and falsehoods must be put to rest.

For the vast majority of South Dakotans, preventive immunizations are personal and family actions of good health and civil responsibility to protect ourselves and others. Last year, once again, South Dakotan’s achieved the nation’s highest rate of influenza vaccination coverage at 56.6 percent. Five out of the past six years South Dakota has had the U.S.’ flu vaccination highest rate – and second-highest the other year. We have a solid tradition of common sense.

In South Dakota today we have adequate community (herd) immunity to protect the bulk of the population from most vaccine-preventable diseases, including those who cannot or refuse to be vaccinated. The 12,181 South Dakota kindergarteners entering school in fall 2015 were outstandingly vaccinated with overall rates of 96.5 percent for measles, mumps and rubella (MMR), diphtheria and tetanus toxoids and acellular pertussis (DTaP) 96.4 percent, varicella 95.2 percent, polio 95.2 percent, but riskily under-vaccinated for hepatitis A at 63.8 percent. That year there were 197 (1.6 percent) unvaccinated kindergarteners, 22 with medical exemptions and 175 who claimed religious exemptions. Herd immunity should protect these unvaccinated children.

With highly vaccinated school children large disease outbreak are very unlikely, but small clusters of illness are bound to occur. An example of an outbreak disease cluster was last year’s measles outbreak in Davison County. After a 17-year absence, measles reemerged in South Dakota in an unvaccinated extended family. This measles cluster did not spread to the wider community because the already very high vaccination coverage stopped the virus in its tracks.

Our high vaccination rates are our best defense against infectious diseases, but this status must be constantly maintained and renewed with every baby born, every child entering kindergarten and throughout our lives. New parents need to be educated, boosters need to be given to teenagers, and old myths need to be rectified. We are fortunate to live in an age when safe and effective vaccinations are readily available.

About the Author:
Lon Kightlinger, PhD, State Epidemiologist, South Dakota Department of Health.
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Strategies for Prevention of Methicillin Resistant
*Staphylococcus aureus* (MRSA) Infections
and Decolonization

By Ashlesha Kaushik, MD; Cassie Wagner, CNP; Hollie Consoer, RN;
and Archana Chatterjee, MD, PhD

Abstract

Methicillin resistant *Staphylococcus aureus* (MRSA) invasive infections can be severe in the pediatric population with high morbidity and mortality. MRSA colonization can predispose to recurrent skin and soft tissue infections and invasive MRSA disease and is a frequent challenge faced by clinicians. This article reviews the importance of MRSA as a pathogen, MRSA colonization and various MRSA decolonization strategies.

Introduction

*Staphylococcus aureus* is the most common etiology of surgical site infections and ventilator associated pneumonia and one of the most common pathogens associated with hospital associated bacteremia. Estimates suggest that 49 to 65 percent of health care-associated *S. aureus* infections reported to National Healthcare Safety Network (NHSN) are caused by methicillin-resistant strains. Treatment options for MRSA are limited and less effective than options available for methicillin susceptible *S. aureus* (MSSA) infections and result in higher morbidity and mortality.

The clinical spectrum of MRSA infections is broad and includes skin and soft tissue infections (SSTIs), bacteremia, endovascular infections, necrotizing pneumonia, empyema, osteomyelitis, septic arthritis, toxic shock syndrome, and disseminated infections with septic emboli. MRSA is an important cause of skin and soft tissue infections (SSTIs) including furuncles (abscessed hair follicles or “boils”), carbuncles (coalesced masses of furuncles), abscesses, pyomyositis and necrotizing fasciitis.

The attributable mortality for MRSA bloodstream infection (BSI) is estimated to be 33 percent compared to 19 percent with MSSA. MRSA infections not only contribute to high mortality but are responsible for increased morbidity, prolonged hospitalization and increased health care expenditure.

The National Nosocomial Infections Surveillance System showed that between 1995 and 2004 the incidence of MRSA infections increased by 308 percent. South Dakota Department of Health statistics show a total of 142 cases of invasive MRSA infections in 2015 with an incidence rate of 16.6 cases per 100,000 population, which represents a 69 percent increase over the five-year median of 69 cases between 2009 and 2014.

**MRSA Colonization**

MRSA colonization has been implicated as a major risk factor in MRSA infection. Colonization with MRSA refers to the presence of the bacteria on body surfaces such as the skin or nasal mucosa without showing signs or symptoms.

Persistent colonization has been defined as two nasal cultures positive for MRSA obtained at one-week interval, or (more rigorously defined) as positive cultures on 80 percent or greater of five or more nasal swab samples, with each nasal swab sample obtained at least one week apart, i.e., at weekly intervals.

MRSA colonization can predispose to recurrent SSTIs (defined as two or more discrete episodes of skin and soft tissue infections at different sites over six months) and invasive MRSA disease, and is a frequent challenge faced by primary care providers.

Given the potential role of colonization in the pathogenesis of recurrent SSTI, prevention strategies focusing on decolonization have been suggested.
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Rationale and Evidence for MRSA Decolonization

Decolonization entails the use of topical and/or systemic agents to suppress or eliminate colonization that may reduce risk of subsequent infections in MRSA carriers and help decrease MRSA spread by reducing the reservoir of transmission. Several studies have shown that decolonization reduces healthcare associated S. aureus infection. Decolonization strategies focusing on the use of antimicrobial or antiseptic agents to reduce or eliminate S. aureus carriage have been suggested as a means of prevention of re-infection and controlling MRSA transmission in accordance with Infectious Diseases Society of America (IDSA), and Centers for Disease Control and Prevention (CDC) recommendations.

The efficacy, optimal regimen, frequency and duration of decolonization are not entirely clear and this continues to be an active area of investigation with several ongoing clinical trials. While awaiting guidance from ongoing clinical trials, the IDSA guidelines suggest use of mupirocin alone or a combination of mupirocin for nasal application and topical antiseptics such as chlorhexidine or hexachlorophene or diluted bleach baths for MRSA decolonization. The guidelines note that mupirocin appears to be effective in reducing MRSA colonization and a Cochrane Review showed that mupirocin was associated with a reduction in nosocomial S. aureus infections, mainly among patients undergoing surgery or dialysis. The potential effectiveness of topical skin antiseptics, such as chlorhexidine and hexachlorophene, in preventing ongoing transmission and infection is seen together with other interventions, and chlorhexidine does not appear to be effective when used alone. Hexachlorophene should not be used in infants below 2 months of age, because of the potential for neurotoxicity. Bleach baths have previously been recommended for skin infections in eczema patients, and sodium hypochlorite at a concentration equal to one-half cup of bleach in one-fourth tub (13 gallons) of water has been shown to be bactericidal for community acquired MRSA (CA-MRSA) after five minutes. Experts suggest that bleach baths at a concentration of 1 teaspoon per gallon of bath water for 15 minutes given twice weekly for three months may be effective with few adverse reactions.

MRSA Prevention and Decolonization Strategies

According to the IDSA’s clinical practice guidelines for MRSA infections in children and adults, all patients with MRSA infections should receive personal hygiene instructions to include avoidance of sharing or re-using personal items such as towels, razors or linens; keeping draining lesions covered with bandages that are clean and dry, bathing regularly with soap and water; and maintaining good hand hygiene practices that include washing with soap and water or an alcohol-based hand rub, particularly after direct or indirect contact with infected skin or draining lesions (A-III). (Strength of recommendation and Quality of Evidence are shown in Table 1).

Table 1. Strength of Recommendation and Quality of Evidence for IDSA Guidelines

<table>
<thead>
<tr>
<th>Category/Grade</th>
<th>Definition</th>
<th>Strength of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Good evidence to support a recommendation for or against use.</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>Moderate evidence to support a recommendation for or against use.</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>Poor evidence to support a recommendation.</td>
<td>C</td>
</tr>
<tr>
<td>Quality of Evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Evidence from one or more properly randomized, controlled trial.</td>
<td>I</td>
</tr>
<tr>
<td>II</td>
<td>Evidence from one or more well-designed clinical trial, without randomization; from cohort or case-controlled analytic studies (preferably from 0.1 center); from multiple time-series; or from dramatic results from uncontrolled experiments.</td>
<td>II</td>
</tr>
<tr>
<td>III</td>
<td>Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.</td>
<td>III</td>
</tr>
</tbody>
</table>

Certain environmental hygiene efforts for the household or community setting should be considered for patients with recurrent MRSA infections. This includes focused cleaning of surfaces that frequently come into contact with the skin such as counters, door knobs, bath tubs and toilet seats, using the appropriate cleanser according to the specific surface being cleaned, while taking care to follow the label’s instructions for routine cleaning (C-III). According to the CDC, there is no evidence that spraying or fogging rooms or surfaces with disinfectants will prevent MRSA infections more effectively than the targeted approach of cleaning frequently touched surfaces. Large surfaces such as floors and walls have not been directly linked to MRSA transmission.
who develop recurrent MRSA infections despite the above efforts, or in cases where ongoing transmission between household members or other close contacts is occurring. This should be used in addition to the above personal and environmental hygiene measures (C-III).

Decolonization strategies include the use of nasal mupirocin (2 percent) twice daily for five to 10 days for nasal decolonization, or in addition to topical body decolonization, in which a daily skin antiseptic such as chlorhexidine is used for five to 10 days or dilute bleach baths using 1 teaspoon per gallon of water (one-fourth cup per one-fourth tub or 13 gallons of water) twice weekly for 15 minutes for approximately three months (C-III).

Oral antibiotics are not routinely recommended for decolonization (A-III). However, an oral agent in combination with rifampin (if the strain is susceptible) may be considered if infections recur despite diligent adherence to the above personal and environmental hygiene practices and decolonization strategies (C-III). If prescribed for decolonization, rifampin-based combination (e.g., with trimethoprim-sulfamethoxazole or doxycycline) may be considered in select cases for short courses (five to 10 days). Hygiene measures should be reinforced in all instances.

In cases where household or interpersonal transmission is suspected, the above personal and environmental hygiene measures are recommended for the patient and such contacts (A-III). These individuals should be evaluated for evidence of active infection (A-III) and the above nasal and body decolonization strategies may be considered following treatment of any active infection (C-III). In such instances where ongoing transmission is suspected and contacts are asymptomatic, nasal and body decolonization of household contacts may be considered (C-III). Screening cultures are not recommended prior to decolonization when at least one of the preceding infections is documented to be due to MRSA (B-III). In the absence of an active infection, surveillance cultures are also not routinely recommended following a decolonization regimen (B-III).

MRSA prevention and decolonization strategies according to the IDSA guidelines are summarized in Table 2.

Easy to follow MRSA decolonization instructions for use by patients and families have been compiled at Sanford Children’s Pediatric Infectious Diseases clinic (Appendix 1 located at sdsmc.org).

### MRSA and Daycare Facilities

According to the current CDC recommendations, a daycare facility does not need to close due to attendance of a child with MRSA skin infection. Appropriate cleaning and disinfection routines should be used on surfaces and toys within the establishment. Children with MRSA skin infection do not need to be exempt from daycare facilities. It is important that the area of skin infected is kept covered with a clean, dry bandage to prevent the infection from coming into contact with other children. Good hand hygiene techniques should be performed by everyone within the facility to provide a sanitary environment for all.

In summary, MRSA colonization has been implicated as a major risk factor in MRSA infection and decolonization strategies focusing on the use of antimicrobial or antiseptic agents to reduce or eliminate *S. aureus* carriage have been suggested as a means of prevention of re-infection and controlling MRSA transmission. CDC and IDSA guidelines recommend a multifaceted approach involving personal and environmental hygiene measures and suggest using a combination of mupirocin and topical antiseptics such as chlorhexidine or diluted bleach baths for MRSA decolonization. Oral antimicrobials are not routinely recommended for decolonization and should only be considered in select patients who continue to have recurrent infections despite following other measures.

### Table 2. Summary of Prevention and Decolonization Strategies for MRSA

<table>
<thead>
<tr>
<th>Personal Hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep draining wounds covered.</td>
</tr>
<tr>
<td>Good hygiene with regular bathing and cleaning of hands with soap and water or an alcohol-based hand gel.</td>
</tr>
<tr>
<td>Avoid reusing or sharing personal items (e.g., disposable razors, linens, and towels).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Hygiene</th>
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</thead>
<tbody>
<tr>
<td>Focus cleaning efforts on high-touch surfaces that may contact bare skin or uncovered infections.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decolonization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal decolonization with mupirocin twice daily for five to 10 days</td>
</tr>
<tr>
<td>Nasal decolonization with mupirocin twice daily for five to 10 days and topical body decolonization regimens with a skin antiseptic solution (e.g., chlorhexidine) for five to 14 days or dilute bleach baths. (For dilute bleach baths, 1 teaspoon per gallon of water [or one-fourth cup per one-fourth tub or 13 gallons of water] for 15 minutes twice weekly for three months)</td>
</tr>
</tbody>
</table>
REFERENCES


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Increased Activity in Unstructured Versus Structured Gym Time in an After-School Program

By Matthew A. McDougall, MD; Rachel Schaeffer, MS; Richard Holm, MD; Bonny Specker, PhD

Abstract

Background: More than 10 million American youth engage in after-school programs that provide an opportunity to increase physical activity. The purpose of this study was to test the hypothesis that children in unstructured gym time (free) would have greater activity than both structured gym time (structured) and when increased screen time was available.

Methods: Three interventions were compared in a nested design, with each two-week intervention preceded and followed by a two-week control period. Seventy-four children aged 6 to 12 years were enrolled and wore pedometers during the interventions.

Results: Mean pedometer counts were higher during free than structured gym time (p=0.01), which was more apparent in boys (p=0.02) than girls (p=0.24). Neither age nor habitual activity was associated with pedometer counts. Body mass index (BMI) was inversely correlated with counts during free gym time (r=-0.314, p<0.05) in boys and girls combined. Accident rates did not differ among interventions.

Conclusions: After-school programs may be appropriate environments to increase activity levels, but greatest increases were observed in children with the lowest BMIs and may not be as effective in girls as boys. Future research should focus on identifying where children at risk of overweight spend their time and how to implement a program designed at increasing activity levels within those spaces.

Introduction

Since the 1970s, childhood obesity has increased from approximately 5 percent to approximately 17 percent (12.5 million) in children between the ages of 2 and 19.1,2 This increase in obesity has been observed in every geographic, demographic and socioeconomic class in the U.S., and is disproportionately elevated in racial and ethnic minorities.1,3,6

Inactivity also has been on the rise. Current recommendations are that a child receives at least 60 minutes of moderate or vigorous physical activity per day;7,8 however, only 42 percent of children between the ages of 6 and 11 years, and 8 percent of adolescents aged 12 to 18 years, achieve this goal.5,10

Obesity and activity patterns share commonalities. Both persist from childhood into adulthood and both independently predict future morbidity and mortality.11-13 Obese children become obese adults, inactive children become inactive adults, and both result in higher morbidity and mortality. Additionally, studies have also shown that overweight children are routinely less active than ideal weight children and inactive children are more likely to be overweight.14-18

Obesity and inactivity predict future morbidity and mortality, but activity level is a predictor of health status, independent of weight.19 Children who are active are healthier: they have stronger bones, less long term cardiovascular morbidity and mortality, greater insulin sensitivity (or less type 2 diabetes), and less asthma.20-24 They also have healthier minds: children who are active show greater cognition and have fewer mental health issues such as depression and anxiety.25-27
Since activity patterns established in childhood persist into adulthood, and activity patterns are a predictor of health status, independent of weight, increasing activity levels in childhood may lead to long term health benefits. Of the locations available to increase activity, schools may be the most promising. Nearly every child attends school, school children are captive audiences, family cooperation is not needed, and nearly every ethnic and socioeconomic group can be reached.

Encouragingly, a recent systematic review, found that school-based interventions were effective in increasing the number of children and adolescents engaged in moderate to vigorous physical activity during school hours (five to 60 additional minutes). Interventions have also been shown to decrease screen time and to improve VO₂max. Unfortunately, public pressure to optimize academic achievement and limitations on school resources have led to decreased opportunities for school children to be active.

Since activity in school is limited, after-school programs may provide the second best setting to increase childhood physical activity behavior. According to a report published in 2014, nearly 10.2 million American youth (18 percent) engage in some sort of after-school program and an additional 19.4 million children (41 percent) would take advantage of this type of programming if it were available.

Although after-school programs are a viable location for activity interventions, a comprehensive review from 2012, of 25 after-school based obesity prevention interventions found that research in this area is lacking scientific rigor, with fewer randomized controlled trials than would be necessary to draw useful conclusions. This review also found that a majority of the interventions were of short duration (less than 12 weeks), which may have contributed to a lack of significant findings. It also found that the studies had several methodological problems including a limited distribution of subject ages and a multifaceted approach to interventions (i.e., physical activity and nutrition interventions), rather than a single-component approach which better allows for tests of efficacy. Still, although lacking in scientific rigor, evidence of positive outcomes in previously published studies do indicate that further research should be done.

Increasing activity levels in children requires more than the right venue, it requires the correct intervention. Unfortunately, although multiple approaches have been tested, the ideal intervention needed to increase physical activity in the childcare setting remains uncertain.

With these limitations in mind, we decided to implement an intervention in an after-school childcare center, because a successful intervention might be highly effective, easily replicated and complimentary to school-based interventions. A successful after-school intervention might provide a second opportunity for children to engage in the 60 minutes of recommended physical activity per day.

The purpose of our study was to test the hypothesis, in a nested design, that children given unstructured gym time would have greater activity levels in a childcare setting compared to structured gym time or when video games and television were available. The goal of this study was to identify a specific, effective, and generalizable intervention that would increase physical activity levels in the childcare setting.

**Methods**

**Participants**

Subjects included 74 boys and girls aged 6 to 12 years who attended the Boys and Girls Club of Brookings, South Dakota. The study was explained to all children in first through fifth grades during club assemblies and an information sheet, brief questionnaire and consent were sent home with the children who were interested. Participants included all children whose parents returned the consent and questionnaire. The South Dakota State University Institutional Review Board approved the protocol and parent(s) signed a written consent and the child gave assent.

**Instruments**

Three interventions each involved two weeks with a two-week control period before and after each intervention (see description below). Prior to starting the interventions, parental consent/child assent and demographic and anthropometric information were obtained. This information allowed us to determine whether specific interventions were more effective at increasing activity levels in certain populations (e.g., boys versus girls, high versus low BMI). Height and weight were measured at the beginning of the study and BMI was calculated as weight (kg)/height (m)². Height and weight were obtained at the Boys and Girls Club by individuals who have been trained in these measurements.

Each child was expected to participate in all phases of the 14-week study. Each child served as their own control and
participated in all three interventions and all control periods. Pedometer counts were obtained daily (Monday through Friday) when the child was at the club. Children were given a pedometer daily upon arriving at the Boys and Girls Club. Staff were trained on correct placement of pedometers and assisted the children in placing the pedometer in the correct location and ensuring that the pedometer was zeroed out at the beginning of the day. The children read their pedometer at the end of the day and with assistance of a staff member they recorded pedometer counts on a spreadsheet. The date and times the pedometer was placed on the child and removed were also recorded. Injury reports were summarized weekly.

Procedures/Intervention
The Boys and Girls Club of Brookings serves more than 300 youth daily in first through 12th grades year-round. As youth enter the club facility, they explore various program spaces that include an education center, cultural arts room, social recreation space, a games room, and a gymnasium (there is also a space set aside for teens only, commonly known as The Club). Within these program spaces, youth participate in both independent and teacher-led activities. These activities are set up to meet the needs of youth which have been identified by conducting community surveys, speaking with local school systems, feedback from parents, observations from staff, etc.

Club staff reach out to and serve young people by implementing the Five Key Elements for Positive Youth Development: 1) creating a safe, positive environment; 2) having fun; 3) developing supportive relationships with caring adults; 4) offering opportunities for and having high expectations of members; and 5) recognizing members for who they are and their achievements. Regular attendance is encouraged and targeted programs are offered. Combined, these efforts should result in positive youth outcomes in three key impact areas: academic success, good character and citizenship, and healthy lifestyles.

During the control weeks children followed the standard Boys and Girls Club curriculum. In the standard curriculum the wellness center has scheduled activities each hour that it is open, and activities begin after-school and start with super stations (a time allotted for youth to participate in various activities throughout the gym). After super stations, youth participate in structured activities led by the wellness staff. These activities are posted on a monthly calendar, as well as on a white board in the gym, so youth know when the activity will occur. Youth are able to come into the activity when they chose, as well as exit the activity at any point; in other words, youth are not required to be present during the entire activity. The three interventions are summarized in Table 1 and include the following:

1. Free gym time: This intervention included access to outdoor and large play space with minimal supervision except for monitoring safety. In this intervention, children had access to space (indoor and outdoor) and no structured activities occurred. This is most commonly known as “open gym.” Youth had access to various materials that are utilized in the wellness center. These items included, but were not limited to, basketballs, footballs, jump ropes, scooters, dodge balls, hula hoops, etc. To ensure safety, youth chose

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Gym/Wellness Center</th>
<th>Movies</th>
<th>Video Games</th>
<th>Access to Computers</th>
<th>Access to Other Club Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Activities on a schedule for each day and youth come &amp; go as they please.</td>
<td>Fridays</td>
<td>Thursdays &amp; Fridays</td>
<td>Homework only</td>
<td>Yes</td>
</tr>
<tr>
<td>Free Access Time</td>
<td>Supervision for safety only.</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Structured Gym Time</td>
<td>Structured activities where youth had to stay the entire time the activity was offered.</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Screen Time</td>
<td>Activities on a schedule for each day (the gym ran as it would during the control period).</td>
<td>Daily</td>
<td>Daily</td>
<td>Daily</td>
<td>Yes</td>
</tr>
</tbody>
</table>

74 children participated in the study. Mean weekly pedometer counts were available for 64 children during the control periods, 46 during intervention 1, 43 during intervention 2, and 28 during intervention 3.
which equipment they wanted to utilize by having free choice of the materials provided by the wellness coordinator. The role of the staff members and volunteers were to observe and walk around the wellness center and keep interaction between them and the child to a minimum by only intervening when safety became an issue; staff did not participate in any of the free play.

2. **Structured gym time**: During this intervention, structured activities were available to the children in the gym with maximum adult supervision and encouragement. Theoretically, this type of intervention may increase activity levels in children who need more encouragement, but it also may reduce activity levels in other children due to the need to wait for instruction (e.g., standing in lines, transitioning to other programs, etc.). Structured activities in the wellness center were planned by the wellness coordinator and often followed a specific plan. For example, each Monday youth participated in basketball-inspired activities, each Tuesday girl’s wellness occurs, etc. Youth are often asked to be a part of the planning process to ensure that their ideas are integrated into the programs. However, it is the coordinator’s responsibility to plan the activities in an organized manner to ensure both safety and enjoyment of the youth. Some of the activities that were implemented included kickball, flag football, dodgeball, and relays. The role of the staff members and volunteers were to not only lead the activity, but also to participate in the activity, as well as ensuring the safety of all members. During the structured gym time, youth had to come in at the beginning of activity (once it was announced) and stay until the activity was over (each activity lasted 45 minutes). If youth were not present at the beginning of the activity, they were not able to join.

3. **Screen time**: During this intervention children had access to the gym and other play space, but there also were activities available that included “screen time” (e.g., computer, videos, games, movies, etc.). Specifically, all children had full access to the 17 computers in the education center. Youth were able to have free choice on these computers, which are generally limited to what is planned by the technology youth development specialist (YDS). Youth also generally do not utilize computers during the first hour of the club as the computers are reserved for homework purposes. In addition to the computers, youth had the ability to view movies on a daily basis in the social recreation room. Movies are regularly played only on Fridays in the education center with an educational activity attached to the movie. Finally, youth also had full daily access to video games in the social recreation room. In general, youth are only allowed to play video games on Thursday and Fridays and only if they are participating in a tournament.

Compliance was estimated by determining the number of days that the pedometer counts were entered into the spreadsheet. Each child earned points when their pedometer readings were recorded and at the end of each two-week intervention they received small tokens of appreciation for their involvement in the study.

**Data Analysis**

Outcome measurements included mean pedometer counts per minute and accident rates. Data were entered into a database and counts per hour were calculated for each day and the mean counts for each child during each intervention were determined. Accident reports were tabulated for participating children at the end of each week and recorded in the database. This allowed us to compare accident rates among the three different interventions.

Potential confounders included sex, body mass index (BMI), and baseline activity levels as determined by the Netherlands activity scale (NAS), which has been shown to be associated with a child’s activity level.40,41

The NAS was completed by the parent at the beginning of the 14-week study and was used to determine whether specific interventions are more effective in increasing activity levels for certain types of children. For example, it is possible that the structured gym time intervention may be more effective in increasing activity levels among children who have lower baseline activity than children with higher activity levels, while the free gym time intervention may be more effective in increasing activity levels among children with high baseline activity, compared to children with low baseline activity.

Data were analyzed using JMP (SAS Institute) statistical software. The main dependent variable was average pedometer counts/minute and the main independent variable was intervention group. There was no difference in mean counts for the four control periods so the overall mean for the control periods was used. Counts per minute had a log normal distribution so all analyses were performed on the log value. Potential confounders and effect modifiers included sex, age, BMI, and NAS scores.
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Table 2. Baseline Characteristics of the Study Population and Pedometer Counts by Intervention Week

<table>
<thead>
<tr>
<th></th>
<th>Boys N=33</th>
<th>Girls N=41</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race (white/other/unknown)</td>
<td>29/3/1</td>
<td>37/4/0</td>
<td>NS</td>
</tr>
<tr>
<td>Age (y)</td>
<td>9.0 ± 0.3</td>
<td>8.9 ± 0.3</td>
<td>NS</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>30.3 ± 1.4</td>
<td>31.1 ± 1.2</td>
<td>NS</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>132.2 ± 1.9</td>
<td>131.9 ± 1.6</td>
<td>NS</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>17.1 ± 0.5</td>
<td>17.8 ± 0.4</td>
<td>NS</td>
</tr>
<tr>
<td>Participate in Organized Sports (yes/no/unk)</td>
<td>23/9/1</td>
<td>22/18/1</td>
<td>NS</td>
</tr>
<tr>
<td>Screen Time (hours/day)</td>
<td>1.6 ± 0.1</td>
<td>1.5 ± 0.1</td>
<td>NS</td>
</tr>
<tr>
<td>NAS</td>
<td>23.9 ± 0.6</td>
<td>25.1 ± 0.6</td>
<td>NS</td>
</tr>
</tbody>
</table>

Pedometer Counts/minute (range) (% of children with pedometer counts)

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th>Girls</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>At baseline</td>
<td>39 (15-146)</td>
<td>36 (14-115)</td>
<td>NS</td>
</tr>
<tr>
<td>Control period</td>
<td>29 (15-146)</td>
<td>36 (14-115)</td>
<td>85%  NS</td>
</tr>
<tr>
<td>Free Gym Time</td>
<td>48 (18-156)</td>
<td>37 (10-119)</td>
<td>61%  88%  NS</td>
</tr>
<tr>
<td>Structured Gym Time</td>
<td>31 (3-63)</td>
<td>29 (12-116)</td>
<td>55%  61%  NS</td>
</tr>
<tr>
<td>Screen Time</td>
<td>37 (14-82)</td>
<td>30 (7-74)</td>
<td>33%  41%  NS</td>
</tr>
</tbody>
</table>

Data are mean ± sem unless otherwise stated. Analyses of count data were performed on log values and geometric means are given.

Analysis of variance was used to test whether the mean pedometer counts differed by intervention group overall and within each sex. Correlation analysis was used to determine whether activity levels were associated with age, BMI or NAS both overall and within each intervention. The percent of children reporting an accident during the control weeks ranged from 0 to 12.5 percent per week. In order to compare the percent of children reporting an accident among the different interventions, one control week per child was randomly chosen and used in a chi-square analysis comparing the percent of children with accidents among the different weeks.

Results

Baseline characteristics of the 74 children who participated are given in Table 2. There were no differences in any of the potential covariates between boys and girls. The geometric mean for pedometer counts per minute during the control weeks was 33 (range: 14 to 146), while the mean counts/minute during the free gym time, structured gym time, and screen time were 35 (10 to 156), 25 (three to 116), and 27 (seven to 82). Overall, the mean pedometer counts were significantly higher during the free gym time compared to the structured gym time intervention (Figure 1, p=0.01); however, the difference among interventions...
was apparent in the boys (p=0.02), but not the girls (p=0.24). The correlations between average pedometer counts and age, NAS, and BMI are shown in Table 3. Neither age nor NAS, an indicator of a child’s habitual activity levels, were associated with pedometer counts during any of the intervention periods. When data from boys and girls were combined, pedometer counts were inversely correlated with BMI during the free gym time intervention. Among girls, overall pedometer counts were inversely correlated with BMI. Accident rates are shown in Figure 2 and were not significantly different among interventions.

**Discussion**

The purpose of this study was to test the hypothesis that children given unstructured gym time would have greater activity levels in a childcare setting compared to structured gym time or when video games and television were available. Of the three interventions tested, free gym time did indeed result in greater activity levels than structured gym time, with the benefit being more pronounced in children with lower BMIs and in boys. Unfortunately, the differences in activity level between the free gym time and the screen time intervention, as well as the control periods, were not statistically significant. Additionally, girls with higher BMIs were found to be less active overall than girls with lower BMIs. Analysis also failed to show a significant difference in the percentage of accident reports filed during the different interventions.

Although we met our goal and identified a specific, effective and generalizable intervention for increasing activity in the after-school setting, the increase in activity that we observed was limited to boys and was greater in lean children. Since overweight and obese children are known to have lower activity levels than normal weight children, and boys are generally more active than girls, future studies should use our findings, along with the findings of other research in the after-school setting, to identify activity interventions that are sex-specific and tailored children with higher BMIs.

Our study is significant for several reasons. First, it shows that children respond less favorably to structured gym time than free gym time. Therefore, after-school programs that are trying to increase physical activity levels may benefit by having more open gym time rather than having children spend their time in a structured gym environment. Second, it shows that the Boys and Girls Club curriculum is effective in promoting physical activity. Although there was no significant difference between the control environment and any of the other interventions, the Boys and Girls Club current curriculum could serve as a starting point for other after-school programs that are trying to increase children’s activity levels. Third, our study showed experimental rigor. Unlike most other stud-

### Table 3. Spearman Correlation Coefficients Between Pedometer Counts/Minute (log) and Age, NAS1, and BMI.

<table>
<thead>
<tr>
<th></th>
<th>Age (y)</th>
<th>NAS1</th>
<th>BMI (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Both Sexes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All interventions</td>
<td>-0.002</td>
<td>0.056</td>
<td>-0.178 *</td>
</tr>
<tr>
<td>Control</td>
<td>0.116</td>
<td>-0.009</td>
<td>-0.080</td>
</tr>
<tr>
<td>Free gym time</td>
<td>0.048</td>
<td>-0.053</td>
<td>-0.314 *</td>
</tr>
<tr>
<td>Structured gym time</td>
<td>-0.166</td>
<td>0.213</td>
<td>-0.117</td>
</tr>
<tr>
<td>Screen time</td>
<td>-0.047</td>
<td>0.032</td>
<td>0.010</td>
</tr>
<tr>
<td><strong>Boys</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All interventions</td>
<td>-0.151</td>
<td>0.184</td>
<td>-0.055</td>
</tr>
<tr>
<td>Control</td>
<td>0.105</td>
<td>0.030</td>
<td>0.060</td>
</tr>
<tr>
<td>Free gym time</td>
<td>-0.292</td>
<td>0.051</td>
<td>-0.184</td>
</tr>
<tr>
<td>Structured gym time</td>
<td>-0.381</td>
<td>0.392</td>
<td>-0.100</td>
</tr>
<tr>
<td>Screen time</td>
<td>-0.391</td>
<td>0.174</td>
<td>0.214</td>
</tr>
<tr>
<td><strong>Girls</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All interventions</td>
<td>0.065</td>
<td>-0.038</td>
<td>-0.252 *</td>
</tr>
<tr>
<td>Control</td>
<td>0.077</td>
<td>-0.740</td>
<td>-0.192</td>
</tr>
<tr>
<td>Free gym time</td>
<td>0.137</td>
<td>-0.137</td>
<td>-0.358</td>
</tr>
<tr>
<td>Structured gym time</td>
<td>-0.021</td>
<td>0.094</td>
<td>-0.165</td>
</tr>
<tr>
<td>Screen time</td>
<td>0.164</td>
<td>0.018</td>
<td>-0.036</td>
</tr>
</tbody>
</table>

* p < 0.05

1 Netherlands Activity Scale

**Figure 2.** Reported accident rates did not differ among the different intervention weeks.
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ies in this area our study was controlled, was longer in duration, had a broader distribution of ages and targeted only physical activity, and not physical activity and nutrition, thereby allowing for better assessment of efficacy. Unfortunately, our study was of insufficient duration to determine effects on obesity rates.

Our study has the following limitations: first, participation in the various interventions was subject to the child's interest. If a child did not want to participate in any of the interventions he or she could follow the usual Boys and Girls Club curriculum. For example, if a child did not want to attend the activity intervention they were able to participate in activities in the education center, cultural arts room, or social recreation room. This may explain why the counts per minute during the screen time intervention were similar to the counts per minute for the structured gym time; the children had access to additional screen time activities, but did not necessary participate in them. Second, participation or recording of pedometer counts by the children was found to decrease as children proceeded through the 14-week study. By the time screen time intervention was implemented, there were fewer children still recording their pedometer readings and the numbers were smaller than with the other interventions. Although the absolute mean pedometer counts were lower, we had little power to detect statistically significant differences between the screen time intervention and the other interventions. We could have overcome this problem by having more staff to ensure that pedometers were on the children and that the pedometer readings were consistently recorded. Third, accident reports may have failed to show a significant difference among interventions because the overall number of accidents was too low to provide the power needed to detect a statistically significant difference. Finally, because we used a relatively simple pedometer we were unable to determine how many minutes were spent in moderate to vigorous physical activity. We were only able to determine the total counts over a period of time, because the pedometer only provided the total number of counts and only the time it was placed on and removed from the child was recorded. In retrospect, the use of an accelerometer would have provided minute-by-minute counts that could have been translated into different levels of activity intensity, thus allowing us to establish how these activity levels would have translated into the current recommendations that a child get at least 60 minutes of moderate or vigorous physical activity per day. Since we do not have these data, we cannot make any inferences.

In conclusion, free gym time resulted in increased activity levels, but the greatest increases were observed in children with the lowest BMIs and were greater in boys than girls. Future studies should combine our findings, along with the findings of other studies, to develop and test alternative, and hopefully better, activity interventions. In developing these interventions, researchers should pay close attention to where children at increased risk of overweight and obesity spend their time, in an effort to develop interventions within these spaces. They should also focus on increasing activity in children with higher BMIs and girls.

Acknowledgements
Funding was provided by the Ethel Austin Martin Endowment at South Dakota State University and the Egger Foundation through the Sanford School of Medicine Scholarship Pathways Program. Authors would also like to acknowledge the staff of the Boys and Girls Club of Brookings for their willingness and assistance in executing this study and the children for their eager participation.

REFERENCES

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

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A Case of Silent Q Fever Endocarditis

By Kashif Shaikh, MD; Amornpol Anuwatworn, MD; Kalyan Potu, MD; Brandy Ponnell, MD; Maria Stys, MD; Anoop Kumar, MBBS; and Adam Stys, MD

Abstract
Q fever endocarditis is a rare, culture negative endocarditis caused by Coxiella burnetii, a spore-forming gram negative coccobacillus. Presenting symptoms can be very non-specific; thus, diagnosis may be delayed. We present a case of a 65-year-old male patient with history of aortic aneurysm who complained of chronic fatigue. He was found to have aortic valve vegetation on routine echocardiography. Q fever endocarditis was diagnosed based on elevated Q fever serology; there was absence of fever. This case illustrated a rare, under-recognized and atypical manifestation of Q fever endocarditis. We would like to encourage physicians of rural states like South Dakota to remain vigilant when it comes to screening for the suspected cases of Q fever, specifically in cases of unexplained fatigue and valvulopathy.

Introduction
Q fever is caused by Coxiella burnetii, a spore-forming, gram negative coccobacillus (historically grouped with Rickettsia). It is a worldwide zoonotic disease with acute and chronic stages. Its main route of transmission is inhalational, with the respiratory system being most often affected, but the gastrointestinal, hepatic, and cardiac systems may also be involved. The most common animal reservoirs are cattle, sheep, and goats. These animals shed the organisms in their urine, feces, milk, and especially in birth products. Following exposure, the incubation period is nine to 40 days. More than half of patients are asymptomatic, while most of the rest present with flu-like symptoms or pneumonia. Adults are more commonly symptomatic than children. Chronic cases are rare and most often manifest as culture-negative endocarditis.

Case Presentation
A 65-year-old male with history of aortic aneurysm presented with chronic fatigue. He had not experienced fevers, chills, sweats, or weight loss. He did report undergoing a dental cleaning six weeks prior to the admission. No rashes, sore throat, or visual changes were reported. The patient reported having horses at home and exposure to different animals a few years earlier. Past medical history was significant for carotid stenosis and coronary artery disease. The physical exam was unremarkable for rashes or cardiac murmurs.

The patient underwent routine transthoracic echocardiography (TTE) for the ascending aortic aneurysm follow-up. TTE revealed a large mobile echogenic density attached to the aortic valve, consistent with vegetation. The blood cultures were drawn and the patient was started on vancomycin and ceftriaxone for empiric treatment of infective endocarditis (IE). Given the history of exposure to different animals, Q fever and Bartonella serology were tested. Blood cultures were negative. Q fever serology came back with a phase I immunoglobulin G (IgG) of 1:4096. As per modified Duke Criteria, our patient met two major criteria for diagnosis of Q fever endocarditis including Q fever IgG Phase I >1:800 and presence of vegetation on echocardiogram. Treatment with doxycycline was started and hydroxychloroquine was added after testing for G6PD. Vancomycin and ceftriaxone were continued due to the possibility of co-infection with other bacteria. Due to generalized maculopapular rash two weeks after starting doxycycline and hydroxychloroquine, these were stopped. After a few days, hydroxychloroquine and minocycline were successfully introduced, replacing doxycycline, which the patient tolerated fairly well. The
patient has completed a four-week course of vancomycin, ceftriaxone and continued treatment with hydroxychloroquine and minocycline.

The patient underwent successful aortic valve replacement (AVR) and aortic aneurysm repair surgery after eight weeks of antibiotic treatment. Interestingly, there was no vegetation found intraoperatively on the aortic valve. The valve was confirmed to be bicuspid, with significant calcification. Aortic valve pathology revealed chronic inflammation and no evidence of organism growth. Minocycline and hydroxychloroquine were continued postoperatively. With the treatment there has been a decrease in antibody titers (Table 1). The typically recommended treatment timeline of 18 months for Q-fever endocarditis has been planned.

<table>
<thead>
<tr>
<th>Date</th>
<th>Q Fever Serology</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11-19-2014</td>
<td>1:4096 1:2048</td>
<td></td>
</tr>
<tr>
<td>1-08-2015</td>
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**Discussion**

Based on Modified Duke’s criteria, our patient falls under category of definite endocarditis as he met two major criteria including Q fever IgG Phase I >1:800 and presence of vegetation on echocardiogram. Q fever endocarditis is caused by zoonosis Coxiella burnetii. It is mainly carried by domestic cattle, goats, and sheep, but there have been reports of the organisms being found in domestic animals such as dogs and cats. Humans are usually infected by inhaling contaminated aerosols from domestic animals.

Acute Q fever can be asymptomatic, or patients can present with flu-like illnesses. Other major manifestations of acute Q fever could be atypical pneumonia and hepatitis. “One to 5 percent of patients with a prior history of acute Q fever can experience chronic Q fever.”

Manifestations of chronic Q fever can be endocarditis, infections of the aortic aneurysm, and vascular prosthesis, but endocarditis remains the most common.

Predominant risk factors for developing chronic Q fever are valvulopathy (including the bicuspid aortic valve), aortic aneurysms, vascular prosthesis, older age, and renal insufficiency. Our patient has had two major risk factors: the bicuspid aortic valve and aortic aneurysm. However, it is difficult to establish whether the chronic Q fever infection caused the aortic aneurysm in our patient or if the aortic aneurysm served as a potential risk factor for developing a chronic infection. The fact that potentially lethal cases of chronic Q fever can become apparent years after exposure should be kept in mind and such patients should undergo evaluation for chronic Q fever. As chronic Q fever can be potentially fatal, it is important to identify patients at risk of having the chronic Q fever infection and keep atypical manifestations in mind. The main approach to preventing chronic infection is to identify the acute one, treat it, and follow it serologically; however, many of the cases of acute Q fever go unnoticed due to the non-specificity of symptoms.

Echocardiography to detect valvulopathy and vascular aneurysms in high-risk patients has also been suggested.

In conclusion, in rural states like South Dakota, in a patient with a preexisting heart condition who presents with non-specific symptoms such as fatigue but without documented fever – and who has vegetation(s) found on ECHO and is suspected of having culture negative endocarditis, Q fever serology should be obtained.

**Table 1. Q Fever Serial Serology**

**REFERENCES**


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

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A Case of Acute Compartment Syndrome of the Thigh Associated with Repetitive Athletic Trauma

By Samuel Schimelpfenig, MD, FAAP, FAWM; Travis Liddell, MD; and Eric Page, MS, ATC

Abstract
We present a case of acute compartment syndrome (ACS) in an athlete who sustained minimal but repetitive trauma to the thigh during a sporting event. During his evaluation, concern was raised regarding the diagnosis of ACS as a cause of his symptoms. This was confirmed by measuring the intra-compartmental pressures and he subsequently underwent successful emergent fasciotomy, eventually making a complete recovery. ACS is a potential complication of muscular-skeletal injuries from various causes, and our case is unusual as the cause was mild but repetitive trauma in an otherwise healthy athlete. It is important to recognize the signs and symptoms of ACS to avoid the potentially significant complications should the diagnosis be missed.

Introduction
Sustaining mild trauma during sporting events is a common occurrence. Most of these injuries are relatively mild and resolve promptly with conservative care. However, rarely an injury that seems to be relatively uncomplicated initially may progress into something more significant. We present a case of an athlete who sustained relatively mild trauma to the thigh during a sporting event, but who later developed an acute compartment syndrome (ACS) from that injury.

Case Presentation
The patient is a 20-year-old male who is a member of a collegiate basketball program. Two weeks prior to his presentation, he sustained several minor blows to the anterior-lateral thigh during a game. These injuries produced only mild pain that he was able to play through, so he was managed conservatively by the athletic training staff.

On the day of his presentation he sustained two more similar injuries to that same region during a practice session. This time, the pain became both significant and progressive and caused him to stop practicing. He was evaluated in the training room where his symptoms continued despite various therapeutic modalities. On exam, the anterior/lateral thigh region was tense and significantly tender. Due to the increasing discomfort, he was taken to a local orthopedic clinic for further evaluation.

On exam at the orthopedic clinic (approximately one hour after the onset of symptoms), there was significant swelling and redness over the anterior-lateral aspect of the left thigh. Palpation of this area caused significant discomfort, as did passive stretching of the thigh. The posterior and medial compartments of the thigh were soft and supple, with no reported symptoms. Sensation to light touch was intact throughout the lower extremity. His left foot was warm and well-perfused with palpable distal pulses. Additional history obtained found him to be otherwise healthy with no significant past medical problems, and he was not taking any prescription or over-the-counter medications.

Due to concern for ACS, intra-compartmental pressure testing was performed and revealed an elevated pressure of 84 mm Hg (upper limit of normal 30 mm Hg) in the anterior compartment of the left thigh. Pressures in the other compartments of the thigh were normal.

The patient subsequently underwent emergent fasciotomy of the anterior compartment; in the operating room the muscle was found to be healthy and had no signs of necrosis. A large hematoma found deep to the vastus lateralis muscle was evacuated with irrigation. A wound vacuum was applied and the wound left open. He did well
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in the post-operative period and three days later, he returned to the operating room where he underwent successful delayed primary closure of the skin; however, the fascia and Ilio-Tibial band were not closed to avoid recurrence of the compartment syndrome.

Following surgery he completed a course of physical therapy, eventually returning to full athletic participation four months later. He did not have any residual loss of function.

**Discussion**

ACS is a condition where increased pressure within a defined space compromises the structure and function of the various tissues present within that space. ACS of the thigh resulting from sports-related trauma has been sporadically described in the medical literature. Common causes of ACS include acute fractures, crush injuries, vascular injuries, and surgical procedures.

The differential diagnosis in our case includes thigh contusion and hematoma. Unfortunately, there is a great degree of overlap between these two conditions and ACS in terms of the presenting history and physical exam findings, which can make definitive diagnosis difficult. Intra-compartmental pressures are needed to confirm the diagnosis of ACS once it is suspected. The classic symptoms and physical exam findings of ACS have historically included the six P’s: Pain out of proportion to the injury, Paraesthesia, Pressure, Pulselessness, Pallor, and Paralysis. However, it is important to note that not all may be present depending on timing and individual differences of the affected compartment; pain, a tense compartment, and pain with stretching are common early findings. Imaging (including X-ray or MRI) is generally not helpful in establishing the diagnosis of ACS but may assist the clinician if there is concern for an underlying fracture.

Complications of a missed diagnosis of ACS include continued compromise of neural and muscular tissue, which can lead to tissue necrosis and eventual muscle contractures. There are no firm guidelines regarding surgical treatment with fasciotomy for ACS; the decision to operate is variable to the surgeon and depends on the patient’s individual presentation and measurement of the intra-compartmental pressures. The upper limit of normal for a fixed intra-compartmental pressure is generally accepted to be 30 mm Hg, although there is not firm agreement in the literature. More recently a differential pressure of 30 mm Hg or less has been accepted as an indication for fasciotomy (the differential pressure is the difference between the mean arterial pressure and the compartmental pressure). Occasionally, the condition can be managed non-operatively. In our case, the patient’s blood pressure was not acutely measured so the differential pressure at the time of diagnosis is unknown; however, the significantly elevated fixed intra-compartmental pressure (84 mm Hg) noted on exam was felt to be sufficient regarding the need for emergent fasciotomy.

Contusion related ACS is often accompanied by formation of a muscle hemATOMA at the site of the initial trauma in as many as 76 percent of cases. Cases where delayed presentation is present may be secondary to a slowly developing hematoma, or potentially re-bleeding into a previous hematoma. This is a potential explanation in our case, where the patient had two separate episodes of thigh trauma at the same site, with development of ACS following the second episode. Physical activity and the associated increased muscle demand increases the amount of blood flow and compartmental volume, which also potentially increases the amount of bleeding into the injured muscle.

**Conclusion**

It is important that those involved in coverage of sporting events or the treatment of injured athletes be aware of this potential complication of a thigh injury and maintain a high index of suspicion as a delayed diagnosis is generally associated with increased complications and an overall poor outcome. In addition, there are potential medico-legal implications of delayed or missed diagnosis.

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**REFERENCES**


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Immunizations are an important advance in medicine to help prevent a variety of diseases. The only chance we have of making the vaccines effective is getting patients to get immunized. Adolescents are not as likely as young children to get to routine preventative health maintenance exams, but it is important to make sure that adolescents receive the vaccinations recommended to help protect them against these vaccine-preventable diseases.

Vaccines recommended routinely for adolescents are influenza, meningococcal, human papillomavirus (HPV), and tetanus-diptheria-pertussis (Tdap). The specific Centers for Disease Control and Prevention (CDC) vaccination recommendations for this age can be found in Table 1. The CDC also tracks rates of immunization. For the age 13 to 17-year-old group, the 2015 rates of immunization in South Dakota for the recommended adolescent vaccines are: Tdap at 72.4 percent, influenza at 64 percent, and meningococcal at 55.5 percent. The rates for HPV vaccination fall much farther behind with 32.4 percent of females and only 22 percent of males getting 3 or greater doses.

Health care providers need to work to help to make sure that their patients are protected against these diseases by getting immunized. Provider recommendation is known as one of the strongest predictors for immunization. Make sure your patients and patients’ parents know you strongly recommend vaccination. Make sure to ask about immunization status even when patients are coming in for visits outside of their routine preventative health care visits. Education is important so that parents understand the potential dangers of the vaccine-preventable diseases. Protocols or standing orders can also improve vaccination rates so that patients can get a vaccine without making an appointment for an exam to get a provider order.

Educating parents is especially important for the HPV vaccine as it has such low rates of immunization. Parents likely do not know much about HPV and the vaccine that protects against HPV. A recent news release about a change in recommendation for HPV vaccine schedule could also help to increase rates. The Advisory Committee on Immunization Practices (ACIP) reviewed data on the HPV vaccine and looked at the feasibility of a 2-dose series instead of the currently recommended 3-dose series. In October 2016, they voted to change the dosing schedule of HPV vaccination to a 2-dose series for children starting the vaccine between the ages of 9 and 14 years. In making their recommendation for this change, they looked at the immunogenicity, post hoc analysis of efficacy trials, post-licensure effectiveness, health economic models, and duration of protection. In the 2-dose versus 3-dose studies they reviewed, the studies showed that when compared with 3 doses in 16 to 26-year-old females, antibody titers after 2 doses (0, six months or 0, 12 months) in 9 to 14-year-old females and males were non-inferior and significantly higher one month after the last dose. Additionally, the studies showed that in comparing the same groups, antibody titers of the 2 dose, 9 to 14-year-old group remained non-inferior and higher 6 months after the last dose. Based on these trials, the Food and Drug Administration approved a human papillomavirus 9-valent vaccine (9vHPV) 2-dose series for 9 to 14-year-old persons. The ACIP recommendations can be found in Table 2.

Another change with the products available for HPV
vaccination is important to know. Currently, there are 3 vaccines licensed in the United States: bivalent (2vHPV, Cervarix), quadrivalent (4vHPV, Gardasil®), and 9-valent (9vHPV, Gardasil 9). By the end of 2016, the only vaccine for HPV that will be available is the 9-valent product. In those who have had prior vaccination with the 2vHPV, 4vHPV, or 9vHPV product, recommendations are as follows:

- Persons are considered adequately vaccinated if:
  - vaccination was initiated before the 15th birthday with 9vHPV, 4vHPV, or 2vHPV, and either 2 or 3 doses at the recommended dose schedule was received.
  - vaccination was initiated on or after the 15th birthday with 9vHPV, 4vHPV, or 2vHPV, and 3 doses at the recommended dose schedule was received.
- If the person started the series with the 2vHPV or 4vHPV, 9vHPV can be used to complete the series.
- For those who have completed the series with 2vHPV or 4vHPV, they are considered adequately vaccinated and ACIP does not recommend additional vaccination with 9vHPV.
- If the series gets interrupted, there is no need to restart the series.
- Number of recommended doses is based on the age when starting the series.7

Additional updated ACIP recommendations regarding HPV include immunocompromised persons:

- 3-doses of HPV vaccine for those with primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity.

Potential advantages of the 2-dose series include that it may be easier to implement and allows for more flexibility with the six to 12 month second dose. The second dose could fall in line with regular preventative health visits. It is important to note that the minimum interval between dose 1 and dose 2 in the 2-dose series is five months.7

Making sure that our patients receive the recommended vaccinations is a great way to improve public health and decrease the morbidity and mortality that can come from vaccine-preventable diseases. Adolescents and their parents should be educated on the importance of vaccinations, and one of the best sources of reliable information comes from you as one of their health care providers.

**REFERENCES**


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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.

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Shaping the Future of Medicine in South Dakota
The Big Dog was full of it, a forensic fortuity that provided a semblance of satisfaction to some historians when, in 2004, the body of Congrande I della Scala was exhumed. Dead after a four to five days’ illness, Congrande’s feces contained, even after 700 years, sufficient foxglove (digitalis) to kill him. It was probably administered at the direction of his nephew, Mastino II, by a physician who was, of course, subsequently hanged.

The mystery contained in this small historical anecdote was solved by examining a material typically referred to in its plural, feces, even though it is sometimes present both within the colon and in our toilets as a more singular element, a faex. The existence of a singular is somewhat of an enigma: the cow pie, for example, is clearly a singular term while the reality of the physical object itself is – at least in its freshest state – dichotomously pleural and circumscribed. A turd, however, is unmistakably singular.

Also known as dung, guano, meadow muffins, scat, manure, poop, crap, night soil, and, in French merde, the socially and medically acceptable term feces tends to be rendered in common speech more often in the vernacular: in English, shit. Other related medical terms derive from the Greek κόπρος or copros: coprophagia and the equivalent slang (i.e., eat shit) is a lesson in the specific utility of language forms for diverse purposes. One example may be found in the writings of one of medicine’s foremost pioneers, Abu ‘Ali al-Husain ibn Abdullah ibn Sina, better known as Avicenna. The author of the five volume Canon of Medicine, Avicenna was known as well for his arrogance. In the late 990s CE, Avicenna engaged in an exchange of letters with a fellow physician, Abu ‘l-Faraj ibn al-Tayyib. The letters were merciless, but not abusive, until Avicenna wrote On the Reprimands of a Feces-Eater. It is no wonder this icon of medicine was viewed as “poisonous, and foul of speech, with an evil tongue.”

Appropriate context may sometimes be conveyed without a specific term as one may see from this passage in Cervantes’ Don Quixote where Sancho is forced to relieve his bowels while riding on a horse: “Don Quixote, hearing it, said, “What noise is that, Sancho?” “I don’t know, senõr,” said he; “it must be something new, for adventures and misadventures never begin with a trifle.” – Part I, Chapter 20

While essentially a biological waste product, feces are far from worthless. In addition to their utility as fertilizer, they may be burned as fuel, serve as a source of nitrate for explosives, and – as we shall see later – provide a curative medicine. Historically, feces have been used both as a weapon (stench weapon) and to enhance the lethality of weapons. In one fascinating, but futile, episode in the

1. The name “Congrande” literally means “Great Dog,” a name attesting to the size and abilities of this 14th century ruler of Verona and Vicenza, Italy.
3. The word has Old English origins as scite, which became the Middle English schitte and variants (schyte, shiten) in which form it was taken up by Germanic tribes.
annals of malodorous warfare, the trebuchet was employed by the Hussites in 1422 CE to hurl 2,000 “loads” of feces into the besieged Karlštejn Castle located in the present-day Czech Republic. The Hussite leader, Prince Sigismund Korybut, didn’t stop there, but added in bodies of dead soldiers and even the occasional horse in what turned out to be an unsuccessful attempt to take the fortress.

Centuries earlier and about 1,200 miles southeast of Bohemia, the Scythians, Iranian nomads occupying the region to the north of the Black Sea from 900 BCE to 100 CE, were apparent masters of the poison arrow. They would mix “…the dung and serum with the venom and matter from the decomposed vipers” to tip their missiles. Similar to the injury suffered by Philoctates while sailing to Troy to participate in the reclamation of Helen from the Trojan prince Paris, festering and foul-smelling wounds inflicted by Scythian arrows would cause shock, gangrene and tetanus and lead to an agonizing death in hours to days.

One would think that the term “Scythian arrow” would have found its way into literature in a connection similar to the lesson in Longfellow’s poem The Arrow and the Song (“And the song, from beginning to end, I found again in the heart of a friend”). There are, however, only rare references, and these more specific to actual warfare: (e.g., Joseph Mead’s 1876 poem, Alexander the Great: “Are by Scythian arrows deadly vexed.”; or John Dryden’s 1808 translation of Virgil’s Georgics: “Thus formed for speed, he challenges the wind, And leaves the Scythian arrow far behind”). Just as surprising is the absence of the term from sports writing: a reference to then-Oakland pitcher James Augustus (Catfish) Hunter hurling “Scythian arrows” at the Minnesota Twins on his way to a perfect game in 1968 is not to be found.

In a more recent time and in an altogether different context, avian fecal material played a small role in an eventual (and some would say inappropriate) Nobel Prize for radio astronomers Arlo Penzias and Robert Wilson. Even though in 1965, among other false leads, they attributed the “static” corrupting their radio signals to “white dielectric material” – colloquially “bird shit” – its correct attribution to the cosmic background radiation left over from the birth of the universe occurred too late to save them from the chore of cleaning a large antenna of the stuff.

Exploring the choices of words in the context of feces as human medicine, while not requiring references to classic literature and history, nonetheless reaps a generous benefit from those sources. Properly called fecal microbiota transplant, the use of feces to treat the persistent and troublesome intestinal distress attributed to C. difficile has only recently gained scientific legitimacy as a more effective treatment than antibiotics for C. difficile colitis (New Eng J Med. 2013;368(5):407-15). In spite of our adoption of this procedure in recent practice, its therapeutic use is not new and its history illustrates how our natural aversion to its medicinal use can be overcome with creative terminology.

According to Vrieze8 “enterically derived material” was used to treat diarrhea and food poisoning in China during the Warring States Period (475 to 221 BCE). In the centuries that followed, Chinese materia medica became codified in multiple works, often illustrated, but little was made of this remedy. Nearly 2,000 years later, during the Ming dynasty (1368 to 1644 CE) Li Shi-Zhen9 (typically rendered today as Li Shizhen and known in his later years as a recluse on Ping Hu Lake), was born into a respected medical family. Li was studious and learned; he uncovered numerous “mistakes” in previous Chinese

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9. History and Development of Traditional Chinese Medicine, Chen Ping (Editor-in-Chief), Science Press, Beijing, 1999.
compendia of materia medica. Over a 30-year period he wrote the Compendium of Materia Medica or the Grand Materia Medica, a book of some 52 volumes in which he described the use of infant feces, either dried, fresh or fermented for the treatment of gastrointestinal illness. Delicately named “yellow soup” or “golden soup,” it was administered orally. While “golden soup” of human origin does not seem to have survived into modern Chinese pharmacology, a related substance, EXCREMEN TROGOPTERI SEU PTEROMI (flying squirrel feces) is used today for post-partum abdominal pain and pain associated with “blood stasis”.

The first report in the U.S. of the procedure was in 1958 when Denver Veterans Administration surgeon Ben Eismen published four cases of pseudomembranous enterocolitis treated by fecal transplant administered by enema. All four patients recovered rapidly. A colleague of Eismen’s enlisted future Institute of Medicine member, “father” of molecular microbial pathogenesis and chair of Stanford’s Medical Microbiology Department, Stanley Falkow, to prepare capsules of the preoperative feces of patients who would receive presurgical antibiotics. The capsules would be given after the patient’s discharge to forestall antibiotic-associated colitis. Accused by a hospital administrator of “feeding the patients shit,” Falkow was summarily fired (he was later reinstated).

Although 33 years have elapsed since the first successful use of fecal transplant in the specific treatment of C. difficile colitis, only recently have we seen an increase in utilization largely because of its documented effectiveness, simplicity, low cost and the perception of it as a “natural” remedy. Nonetheless, a recent review recommends the procedure only after a patient is not responsive to “standard” therapy. Caution is advised primarily because of the lack of information regarding long-term adverse events.

As with other medical procedures in our current era (and together with both new words and repurposed old ones) there are studies to be done, regulations to write, standards to be developed, data to analyze, and – not least – money to be made. One company, OpenBiome of Massachusetts, recruits donors and processes fecal material for shipment to practitioners performing fecal transplant.

Perhaps, though, the giants of medicine upon whose shoulders we have stood, as well as lesser lights both ancient and modern – Avicenna, Li Shi-Zhen, Eismen – would yet approve the related terms now generated by advertising firms rather than physicians (“RePOOPulate” comes immediately to mind) placing fecal microbiota transplant within the varied historical context of words for human waste.

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Board News

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

SDBMOE Announces New Administrative Rules Affecting the Practice of Medicine

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

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

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

The New Administrative Rules

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

General Authority: SDCL 36-4-35.
Law Implemented: SDCL 36-4-29, 36-4-30.

References: Federation of State Medical Boards Model Policy for the Use of Opioid Analgesics in the Treatment of Chronic Pain; Federation of State Medical Boards Model Policy on Data 2020 and Treatment of Opioid Addiction in the Medical Office.

20:47:07:02. Definition of chronic pain. For the purposes of section 20:47:07:01, the term, chronic pain, means ongoing, recurrent, or persistent pain lasting beyond the usual course of an acute illness or injury or that is three months or longer in duration.

General Authority: SDCL 36-4-35.
Law Implemented: SDCL 36-4-29, 36-4-30.
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~ E. Paul Amundson, MD, Chief Medical Officer for DAKOTACARE

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~ Michael W. Pekas, MD, Associate Medical Director for DAKOTACARE

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~ James A. Engelbrecht, MD, Associate Medical Director for DAKOTACARE

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First, Do No Harm: Adverse Drug Events

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

The prescribing, as well as the administration, of medications gives providers, nurses, and pharmacists the opportunity to assist with the maintenance of health, as well as promote healing and reduce the burdens of disease and injury. Adverse drug events (ADEs) are defined by most entities as the injury or harm caused in the use of a drug. It may result from a medication error or an adverse drug reaction. Harm is the impairment of the physical, emotional, or psychological function or structure of the body and the pain or injury resulting therefrom.

Great Plains Quality Innovation Network (QIN) works to assist communities in our states – Kansas, Nebraska, North Dakota, and South Dakota, to improve medication safety and help reduce or prevent ADEs. Three types of adverse events were considered and they include those that are: 1) preventable, 2) clinically significant, and 3) measurable. The high-risk categories of medications include: 1) anticoagulants, 2) diabetic agents, and 3) opioids.

The goal is to promote medication management as well as medication reconciliation. This effort will require interdisciplinary involvement and responsibility. Nurses, pharmacists, and patients or their caregivers will play a huge role in this effort. Patient compliance and health literacy will require ongoing monitoring by these above groups of caregivers. Other tools to improve outcomes include interoperable EHRs, evidence-based guidelines for the use of the medications, and screening for adverse events.

ADEs account for an estimated one-third of all types of adverse events in hospitals, and approximately one-third of hospital admissions have medication related issues. Risk factors include multiple chronic conditions and taking three or more medications, if they include one of the categories of medications listed above. The age, weight, and creatinine clearance of the person taking the medication can affect ADEs as well. The goal of CMS is to reduce 65,000 admissions and 14,000 readmissions in this high-risk population of Medicare beneficiaries. CMS hopes to demonstrate improvement in the quality and safety of care by reducing the potential harm associated with these medications.

An environmental scan done by Great Plains QIN revealed that larger hospitals and pharmacies were most likely to have a standard definition for adverse events as well as tracking their efforts at improvement. Critical access hospitals and skilled nursing facilities had less standardization in their ADE definition and measurement. The use of these agents in the outpatient and clinic setting is showing increasing reports of harm. With opioid use now in epidemic numbers, their overuse and misuse will contribute to harmful events and present an enormous future challenge. Standardized reporting requires overcoming the burden of common data extraction. Manpower and staffing issues, along with the voluntary nature of reporting, may also hinder ongoing efforts in this area.

In addition to their work in hospitals, pharmacists are helping to deliver comprehensive medication management services to ambulatory and community dwelling patients in primary care and multiple types of clinics. They can provide a valuable resource in coordinating care across multiple providers and settings. Patients depend on the efforts of their provider and pharmacist to ensure that the medications they receive are safe, timely, and effective. This represents an achievable goal of improving overall patient safety and quality of care. We must always be reminded that our first and foremost duty is avoiding harm.

For more information, please feel free to contact me at stephan.schroeder@area-a.hcqis.org.

REFERENCES
National Action Plan for Adverse Drug Event Prevention
U.S. Department of Health and Human Services
Office of Disease Prevention and Health Promotion

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Talk to a man about a complicated physics-type issue, and he will often have some working knowledge about it. Ask a guy about the Twins or Vikings, and usually he is following and knows some stats. Ask him to fix a mechanical whatsit and commonly he can figure it out. But ask a guy about how many calories are in the biscuits and gravy on his plate, and you’d think you were expecting him to know how to sew on a button or plan a shopping trip.

It is amusing to kid around about manly men stereotypes, but it’s no joking matter that eating too much food and too many calories can bring on heart attacks, strokes, cancer, and early death. And men are usually the big eaters.

We find rats live about 40 percent longer when they are fed about 40 percent less, and we think humans work the same way. It seems the rats who are on the “eat anything and everything you want diet,” die prematurely, just like humans. Researchers believe those vascular and malignant medical problems are due to premature oxidation, which is, in turn, due to excessive calorie intake. You reduce that oxidative load not by “antioxidants” but by eating less.

We’re not just talking about obesity; we’re talking about learning to eat right. Obese or not, we need to realize that having seconds and thirds, constant snacking, ordering high calorie foods, drinking non-satiating sugar or alcoholic drinks, all can be poisonous. Plain and simple, too many calories are dangerous to your health.

Dietary experts have defined a normal sized man’s total goal for a full day of eating should be about 2,000 calories, and to lose weight, about 1,500. Not surprisingly, a single fast food meal often approaches our entire daily caloric need. For example, a loaded big burger with bacon, large fries, and a 12-ounce soft drink adds up to 1,334 calories. Try this: ask your smart phone how many calories are in each portion of food you eat for three days, or write it down, keep track, and add up your daily count. Ask for help if needed. Knowing the total calories in food will help you eat less.

Indeed, men in general usually don’t eat enough fruits and vegetables, but the most important error in their modern diet comes from eating too many calories. And, by the way, there are about 400 calories in a single order of biscuits and gravy.
Welcome to the new SDSMA members who joined in 2016.

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Your SDMSA PAC membership is very important in order to elect political candidates who understand the practice of organized medicine in South Dakota. To donate to SDMSA PAC, please visit www.sdsma.org.
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Delivering Knowledge to You

The SDSMA is an authoritative source for health care news and information. We deliver it at your fingertips through our website, www.sdsm.org. We promote the art of medicine and the advancement of science.

- South Dakota Medicine – SDSMA’s monthly peer-reviewed journal;
- www.sdsm.org – a dynamic, up-to-the-minute website;
- Weekly legislative updates during session;
- Legislative and public health alerts;
- Seminars and educational programs for you and your staff on topics like risk management, physician employment, and leadership; and
- A knowledgeable, experienced staff on call for you.

Call us at 605.336.1965 or visit www.sdsm.org. And, as always, thank you for your membership in SDSMA.

Nominate a Physician or Supporter for SDSMA Awards

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

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

The SDSMA is seeking nominations for the following awards:

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

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

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

Source: SDSMA staff

SDSMA and SDAHO Meet with Governor

Gov. Dennis Daugaard met with representatives from SDSMA and SDAHO as part of the joint SDSMA-SDAHO meeting Nov. 3 in Pierre. Left to right: SDSMA President Tom Hermann, MD; SDSMA CEO Barb Smith; Gov. Dennis Daugaard; SDAHO Chairperson Curt Hohman; and SDAHO CEO Scott Duke.
Legal Brief Highlight: Patient Choice and Network Participation

No health insurer, including the South Dakota Medicaid program, may obstruct patient choice by excluding a health care provider who is willing and qualified to meet the terms and conditions established by the insurer.

For more information, download the SDSMA legal brief *Restrictive Covenants* at www.sdsma.org. Through the SDSMA Center for Physician Resources, the SDSMA has developed more than 50 legal briefs that are available to members. In addition, the Center develops and delivers and programs for members in the area of practice management, leadership and health and wellness.

Source: SDSMA staff
The state of South Dakota recently notified its employees of the discontinuation of its primary care clinic pilot program. In January 2014, the State Employee Health Plan partnered with Sanford Health for a pilot program to provide select services at a reduced cost at four primary care clinics in Sioux Falls. The program will end on Dec. 31, 2016 due to low utilization. In 2017, state employees may visit their providers of choice with normal plan benefits. The state says it is evaluating “new and innovative services.”

Source: State of South Dakota

Support Medical Student Scholarships

Since the establishment of the SDSMA Foundation in 1949, hundreds of medical students have received help through much needed scholarships and low-interest loans. With the rising cost of education, the need continues. There is still time to make a year-end tax deductible donation.

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

Visit www.sdsma.org to make a donation online, or send your contribution to SDSMA Foundation, PO Box 7406, Sioux Falls, SD 57117. Thank you for your generosity and support of the SDSMA Foundation.

Source: SDSMA staff

Council of Physicians Meets in Pierre

The SDSMA Council of Physicians met Nov. 4 in Pierre. A number of items were discussed, including planning and budgeting for 2017, marijuana use, and the sale of tobacco. The Council voted to follow the Committee on Medical Marijuana’s recommendation to oppose legalization for recreational use. The committee updated the SDSMA’s policy on medical marijuana that states legitimate medications should be able to: 1) have reproducible composition of matter; 2) come in pure and stable forms; 3) be delivered into the body in fixed doses with known pharmacokinetic properties; 4) have dose-response efficacy; and 5) have been safety tested with documented side effects. Additionally, the committee is working on a white paper which will be presented to the Council in June.

The Council approved the Committee on Tobacco’s recommendation to support policy increasing the minimum age for purchasing tobacco in South Dakota to 21. More details from the meeting can be found in Council Comments, at www.sdsma.org.

Source: SDSMA staff

Upcoming MACRA Presentations

The SDSMA Center for Physician Resources brings you a series on Medicare payment reform with the following webinars:

**MACRA: Quality Performance Scoring**
Dec. 22, 2016
*Key changes from PQRS, MIPS data submission options, and quality performance category scoring*

**MACRA: Performance Categories and Scoring**
Jan. 12, 2017
*MIPS payment adjustment, APM scoring standard, category scoring, CPS calculation, CPS comparison with CPS performance threshold, payment adjustment and scaling, and payment adjustment application*

Presentations are at 7 pm CT and are free for SDSMA and SDMGMA members.

Source: SDSMA staff

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

State Primary Care Clinic Program is Ending

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In January 2014, the State Employee Health Plan partnered with Sanford Health for a pilot program to provide select services at a reduced cost at four primary care clinics in Sioux Falls. The program will end on Dec. 31, 2016 due to low utilization.

In 2017, state employees may visit their providers of choice with normal plan benefits.

The state says it is evaluating “new and innovative services.”

Source: State of South Dakota

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