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Being a physician in 2016 is not for the faint of heart. The practice of medicine has become extraordinarily complicated. Health care reform, navigating the electronic medical record, dealing with increasing regulation, and complicated coding with ICD-10 are just a few of the challenges we have. These and other issues physicians face tend to take away from their personal fulfillment. How many of us entered medical school with the goal of practicing medicine in the present environment? Everywhere we turn, we are hearing about the increasing numbers of our profession suffering from burnout.

Richard Gunderman, in an excellent editorial, suggests the solution does not lie in incentivizing physicians with money or restructuring systems to minimize stress on physicians, but rather finding earnest professional fulfillment. He references the work of noted psychologist Frederick Herzberg, who argued there is little gain in trying to reduce our “dissatisfiers,” such as reducing all the regulations, increasing compensation, etc. In essence, reducing one’s dissatisfaction does little to improve one’s sense of fulfillment or quality of work. Gunderman goes on to say one needs to focus less on reducing stress and more on promoting what is best in us: compassion, courage, and wisdom.

The medical literature in recent years has placed increased attention to the basic skills of the physician. How many times have we all heard “Listen to your patients. They will tell you what is wrong?” In JAMA Internal Medicine, a recent series of monthly articles emphasizing the “teachable moment” can be found. One such submission described a middle-aged woman who presented to the emergency room with severe ankle pain, malaise, and a rash. Extensive lab tests, imaging, and whole-body scintigraphy were all normal. She was prescribed pain medications and antidepressants. After more than $40,000 was spent on the medical work-up, a further dietary history was obtained and a diagnosis was then made of scurvy—a diagnosis which could have been made with a good history, physical examination, and a serum vitamin C level. With increasing technological advancement, clinicians have become more and more reliant on laboratory tests, imaging, and other high-tech modalities. Yet, data suggests this increased reliance on imaging is not associated with better outcomes, but certainly increased costs. The value of the history and physical examination is gaining increasing attention in the present cost containment and outcomes based environment. The social history, something we many times overlook, also has been shown to be increasingly important (a discussion of the social determinants of health is beyond the scope of this editorial).

So what, you may ask, does this have to do with professional fulfillment? A few years ago, a middle aged woman was referred to me because of a concern she had a gastrointestinal cancer. She had been losing weight, had no appetite, and had abnormal abdominal imaging. The findings on imaging proved to be a normal variant, and she had an appropriate investigation prior to seeing me. I sat down and spoke with the patient and her daughter, and asked if there had been any substantial changes in her life, perhaps anything occurring socially which could be affecting her. There were no answers. Approximately two hours later, I received a call from the patient’s daughter, explaining that on the drive home her mother tearfully opened up about the years of abuse she had been suffering at the hands of her husband. The daughter profusely thanked me for being the vehicle to allow her mother to open up, and explained how she was going to work on getting appropriate help for her mother. That day was very fulfilling for me, and reminded me of why I enjoy the practice of medicine. I did not make any “unusual” diagnosis, and did not perform some state of the art, technically challenging procedure. I simply would like to think I made a positive difference in this person’s life. My point is this: We often can get caught up in the day to day grind—see patients, order tests, make referrals, make diagnoses, and move on. We can complain bitterly about all the regulations and impersonal nature of medicine. Some of this is beyond our control. But in the end, we still have the skill and acumen to make a difference in people’s lives. To me, that is fulfillment! Let’s all devote ourselves to a reemphasis on the importance of taking a good history, doing a focused but complete physical examination, and above all demonstrate kindness. “Let us not forget these fundamental resources of our profession—the power of our hands, our voices, and our rational thought—for these are free but priceless, so if value is the ratio of cost to worth, theirs is infinite.” Let us refocus our work with this principle in mind, and perhaps we can achieve more fulfillment is this wonderful profession in which we work.

REFERENCES

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In this month’s issue of *South Dakota Medicine*, we have a number of very interesting manuscripts. Dr. Freeman et al. discuss the utility of performing imaging in patients with a diagnosis of a chronic neurological disease – Parkinson’s. They found that the frequency of discovering clinically significant information with imaging in Parkinson’s disease was low and that it remains a clinical diagnosis. In their series, the authors did note a high incidence of vascular disease, in fact one patient had an acute stroke. It is important to remember that the history and physical examination remain the cornerstone of diagnosis, and that laboratory tests simply assist the physician and are not meant to stand on their own. In this manuscript these patients had CNS imaging after a thorough neurological evaluation by a trained neurologist who diagnosed them with Parkinson’s disease. This article elegantly raises the question of when to perform a diagnostic test in a patient with clinical evidence of a chronic, progressive disease. This article also highlights the importance of the clinician being familiar with and interpreting the literature about the validity of a new test.

Also in this issue, Huntington et al. discuss the importance of preconception counseling of the woman who is planning to become pregnant. This is a unique opportunity to evaluate the patient’s past medical and surgical history, substance use/abuse, medication use and family history. In this manuscript, the authors outline a thoughtful approach to these patients and the importance of a thorough medical evaluation to reduce the risk for the mother and infant. Preconception counseling also allows one the opportunity to review the family history for potential inherited illnesses as well as offer carrier screening for high risk genetic illnesses. The American College of Obstetricians and Gynecologists (ACOG) have noted that screening to determine carrier status for cystic fibrosis should be offered to all non-hispanic white individuals who are attempting pregnancy, since 2001. Recently this recommendation has been upgraded to include screening for all couples who are attempting pregnancy, but especially in those of non-hispanic ancestry. ACOG and the American College of Medical Genetics suggest screening for other diseases based on ancestry/ethnicity.

This issue also includes a manuscript on the management of skin abscesses by List et al. and two Primers in Medicine review articles on polymyalgia and *Clostridium difficile*. These are three interesting articles with up-to-date recommendations. We also have a wonderful Extenuating Circumstances piece on Fr. Ed Anderson and his journey from anesthesiology to the priesthood. I hope you enjoy this thought-provoking issue of *South Dakota Medicine*.

**REFERENCES**


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Preconception Counseling

By Kailey Witt, MD; and Mark K. Huntington, MD, PhD

Abstract
Preconception counseling is a way to discuss optimizing reproductive age women's health and chronic medical issues to facilitate the healthiest pregnancy possible. Preconception counseling is an important piece of care for reproductive aged women especially as nearly 50 percent of pregnancies in the U.S. are unplanned and important fetal development has already taken place prior to the initial obstetrics visit. Many opportunities are missed to provide this counseling; only approximately one-third of women receive it. Visits to primary care are the ideal time for this to occur. In this paper, topics to discuss will be presented along with some guides to optimizing chronic medical problems to improve pregnancy outcomes.

Introduction
Preconception counseling (PCC) is a time where providers identify and modify risk factors of reproductive age women to improve health and birth outcomes. The goal is to ensure that women are as healthy as possible prior to conception. During this time, providers should address social, behavioral, environmental, and medical risks to a woman's health and pregnancy outcome and make recommendations to reduce these risks. Preconception intervention is more important than prenatal intervention; important fetal development happens prior the woman's first prenatal visit. Maternal risk factors are associated with preterm birth, spontaneous abortion, stillbirth, fetal death, sudden infant death syndrome, low birthweight, fetal growth restriction, fetal alcohol disorders, and neural tube defects.

The American College of Obstetricians and Gynecologists, American Academy of Pediatrics, American College of Nurse Midwives, and March of Dimes all promote PCC as a way to enhance maternal and infant outcomes. In 2006, the Centers for Disease Control and Prevention (CDC) released 10 recommendations to improve preconception health and health care for women in the U.S. One of these recommendations was to provide risk assessment and educational and health promotion counseling during primary care visits for all women of reproductive age, regardless of desire to become pregnant. This is important as nearly 50 percent of pregnancies in the U.S. are unintended.

Studies have shown that only approximately one-third of women receive PCC. The lowest levels of receiving PCC were in women whose pregnancy was unintended, those who had no health insurance prior to pregnancy, were unmarried, ages less than 20 years, and those who had less than 12 years of education. PCC is particularly important in primary care as a study found that women with higher trust in their providers are more likely to discuss health concerns in relation to their reproductive health. Another study found that primary care physicians and obstetrician/gynecologists were preferred sources of PCC.

Preconception Care Promotion
During a visit for health maintenance exam is always a good time to discuss preconception health but other opportunities exist as well. Such visits might include a visit for premarital exam and testing, contraception counseling, after a negative pregnancy test, and evaluation for sexually transmitted diseases or vaginal infection. Other ways to aid in preconception care include preconception care checklists, patient brochures and handouts, and waiting room posters.
Components of Preconception Care

Reproductive Life Plan

The risk of infertility, fetal aneuploidy, miscarriage, gestational diabetes, preeclampsia, and still birth all increase as maternal age increases. These risks should be discussed with women as they contemplate having children or delaying childbirth until later for career purposes. If thinking about delaying childbirth the risk-benefits should be discussed including the increased risks associated with increased maternal age. Contraception should be discussed if they are not intending to have children immediately. Preconception health and women’s health can be improved by reducing unintended pregnancy and reducing risky behaviors.

Medical History

A thorough review of a woman’s medical history, family history and medications should be performed, along with review of chronic diseases to make sure they are optimally controlled with nonteratogenic medications prior to conception.

Pregestational diabetes increases risk of miscarriage, congenital fetal anomalies, and perinatal death (Table 1). Glucose is teratogenic at high levels. Glycemic control in the first trimester is essential as this is when organogenesis takes place. Ideally, hemoglobin A1c levels prior to conception should approach levels in patients without diabetes (less than 7). Hyperglycemia and hypoglycemia awareness are decreased in pregnancy. There are increased rates of diabetic ketoacidosis and progression of diabetic retinopathy and nephropathy.

Chronic hypertension in pregnancy is associated with higher rates of complications (Table 1). The risk of superimposed preeclampsia is 25 percent in all women with hypertension. It is important to have good control of blood pressure with nonteratogenic medications. Treating mild hypertension has not shown improvements in perinatal outcomes but treating severe hypertension (systolic greater than or equal to 180 mm Hg or diastolic greater than or equal to 110 mm Hg) improves pregnancy outcomes.

Thyroid disease also increases complications (Table 1). In the first trimester, hypothyroidism is associated with cognitive impairment in children. When treated adequately before pregnancy and those treated early in pregnancy have no increased risk of complications. Goal thyroid stimulating hormone levels vary with trimester: 0.1 to 2.5 mU/L in first trimester, 0.2 to 3.0 mU/L in second trimester, and 0.3 to 3.0 mU/L in the final trimester. Hypothyroidism affects 2.5 percent of women of reproductive age. Euthyroidism should be achieved prior to pregnancy. However, only women with risk factors and symptoms of thyroid disease should be screened.

Seizure disorders are the most common neurologic disease in pregnant women. During pregnancy, about one-third of women with a seizure disorder will experience more frequent seizures. Both the disease itself and the medications to treat them can affect the pregnancy

<table>
<thead>
<tr>
<th>Table 1. Chronic Medical Conditions, Risks, and Preconception Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical Problem</strong></td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Hypothyroidism</td>
</tr>
<tr>
<td>Hyperthyroidism</td>
</tr>
<tr>
<td>Seizure Disorder</td>
</tr>
<tr>
<td>Overweight</td>
</tr>
<tr>
<td>Underweight</td>
</tr>
<tr>
<td>Psychiatric Illness</td>
</tr>
</tbody>
</table>

Information from references 2, 8, and 10.
adversely. Seizure disorders are associated with a number of risks (Table 1). Congenital anomalies are more common with seizure disorders whether or not the mother is taking medications. With this being said it is very important to try and control the disorder with the least teratogenic medications possible.¹

Some authorities recommend screening for depression, anxiety, domestic violence, and major psychosocial stressors. The risks of anxiety and depression should be discussed as well as counseling on treatment options during pregnancy (Table 1).²,¹⁴

Family History

A woman’s family history should be reviewed to screen for history of congenital anomalies or genetic disorders in both the mother and the father’s families. Consider referral to genetic counseling when risk factors are present.² Some heritable conditions have strong association with the individual’s ethnic background, and carrier screening may be offered (Table 2).

Medications

Current medication use should be reviewed prior to pregnancy. This should include all medications including any over the counter medications, supplements, or vitamins the woman may be taking. Discontinuing unnecessary medications or finding safe alternatives is important to accomplish prior to conception.²,⁸

Nutrition and Weight

Women should be counseled on proper diet including foods to avoid while pregnant. Folic acid supplementation (400 to 800 mcg daily) and intake of folate fortified foods can reduce risk of neural tube defects. The neural tube closes between 18 and 26 days after conception so supplementation should be started prior to attempting conception.

A healthy prepregnancy weight (ideal BMI is 19.8 to 26.0) through exercise and nutrition should be encouraged. Overweight or obese women are at increased risk of diabetes, gestational diabetes, and hypertension. These can be associated with macrosomia, shoulder dystocia, operative delivery, congenital anomalies, intrauterine growth restriction, spontaneous abortion, stillbirth, preeclampsia, and eclampsia. Interventions should be taken to help women get to a normal weight prior to pregnancy. A review found that out of five commercial diets, Weight Watchers was least costly, and women maintained a 3.2 percent weight loss after two years.

On the other hand, low prepregnancy weight is associated with preterm birth, low birth weight, and a higher rate of gastrochisis. It is also associated with nutrient deficiencies, osteoporosis, amenorrhea, infertility, and maternal arrhythmias.⁸,¹⁰

Substance Abuse

Women should be screened for alcohol, tobacco, and drug use. Abstinence from alcohol and illicit drugs should be encouraged. A safe level of alcohol intake has not been established. In a national survey in the U.S., 87 percent of women who drank alcohol before pregnancy abstained during pregnancy, 6.6 percent reduced their alcohol intake, and about 6.4 percent reported no reduction. Preconception counseling has been shown to lead to an increased rate of cessation of drinking prior to pregnancy.¹ Fetal alcohol spectrum disorders can manifest with different severities. No exact dose-response relationship has been established between the amount of consumption and the severity of the complications to the infant.¹¹

Smoking cessation should be achieved prior to conception. Smoking and secondhand smoke exposure increases the risk of infertility, placental abruption, preterm premature rupture of membranes, and placenta previa.¹²

Infections and Immunization

Inclusion of screening for periodontal, urogenital, and sexually transmitted infections as indicated and updating immunizations is beneficial, as is counseling about prevention of TORCH [toxoplasmosis, other (syphilis, varicella-zoster, parvovirus B19), rubella, cytomegalovirus, herpes] infections.

Infectious diseases that should be screened for include...
chlamydia, gonorrhea, herpes simplex virus, syphilis, HIV, and tuberculosis according to standard guidelines. If chlamydia or gonorrhea is treated during pregnancy, follow-up testing for resolution needs to be performed. Immunizations that should be performed include hepatitis B, rubella, varicella, tetanus, diphtheria, pertussis, human papillomavirus, and influenza vaccines as needed. Some of these vaccines should be administered during pregnancy and others should be given at least three months prior to conception.8,13 A summary of immunization practices in pregnancy is shown in Table 3.

Environmental Exposures
Identification of potentially toxic exposures by discussing the woman’s work, hobbies, home environment, and pets can help identify potential toxic exposures including mercury, lead, pesticides, and endocrine disrupting chemicals. If the woman has cats in her life, she needs to be educated on avoiding cleaning up the kitty litter as this poses a risk of toxoplasmosis.2,15

Physical Exam
The physical examination should focus on assessment of periodontal, thyroid, heart, lungs, abdominal, and pelvic exams. The physical exam can help detect conditions that can affect maternal health and pregnancy outcomes, as noted in the sections above.2

Special Populations in South Dakota:
Refugees
Refugee women may experience barriers to accessing health care, including preconception care. Research has shown that foreign-born women have better birth outcomes than U.S.-born women. On the other hand, refugee women have worse birth outcomes than U.S.-born women. Refugee women have often experienced stressful conditions in their home country and spent time in refugee camps. They face many barriers including social, language, and cultural barriers that may affect their preconception health. They have lower overall health if they did not have access to health care in their home country. Immigrants from certain areas of the world are more at risk of tuberculosis (see Box) and hepatitis B infections.16,17

Preconception counseling can be integrated into refugee entrance examinations as this may be one of the only health care visits these women have before conception. Routine infectious disease screening and updating immunizations should be done at this time as well. Preconception counseling should then contain the same components as with non-refugee patients. In addition, preconception care messages can be provided at non-health care settings such as at English classes.

Conclusions
Preconception counseling can help ensure that women are as healthy as possible prior to conception. This can help reduce maternal and fetal complications. Providers should

Table 3. Vaccine use in pregnancy

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>BEFORE pregnancy</th>
<th>DURING pregnancy</th>
<th>AFTER pregnancy</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A</td>
<td>Yes, if indicated</td>
<td>Yes, if indicated</td>
<td>Yes, if indicated</td>
<td>Inactivated</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Yes, if indicated</td>
<td>Yes, if indicated</td>
<td>Yes, if indicated</td>
<td>Inactivated</td>
</tr>
<tr>
<td>Human Papillomavirus (HPV)</td>
<td>Yes, if indicated, through 26 years of age</td>
<td>No, under study</td>
<td>Yes, if indicated, through 26 years of age</td>
<td>Inactivated</td>
</tr>
<tr>
<td>Influenza IIIV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Inactivated</td>
</tr>
<tr>
<td>Influenza LAIV</td>
<td>Yes, if less than 50 years of age and healthy; avoid conception for 4 weeks</td>
<td>No</td>
<td>Yes, if less than 50 years of age and healthy; avoid conception for 4 weeks</td>
<td>Live</td>
</tr>
<tr>
<td>MMR</td>
<td>Yes, if indicated, avoid conception for 4 weeks</td>
<td>No</td>
<td>Yes, if indicated, give immediately postpartum if susceptible to rubella</td>
<td>Live</td>
</tr>
<tr>
<td>Meningococcal:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• polysaccharide</td>
<td>If indicated</td>
<td>If indicated</td>
<td>If indicated</td>
<td>Inactivated</td>
</tr>
<tr>
<td>• conjugate</td>
<td></td>
<td></td>
<td></td>
<td>Inactivated</td>
</tr>
<tr>
<td>Pneumococcal Polysaccharide</td>
<td>If indicated</td>
<td>If indicated</td>
<td>If indicated</td>
<td>Inactivated</td>
</tr>
<tr>
<td>Tdap</td>
<td>Yes, if indicated</td>
<td>Yes, vaccinate during each pregnancy ideally between 27 and 36 weeks of gestation</td>
<td>Yes, immediately postpartum, if not received previously</td>
<td>Toxoid/inactivated</td>
</tr>
<tr>
<td>Tetanus/Diphtheria Td</td>
<td>Yes, if indicated</td>
<td>Yes, if indicated, Tdap preferred</td>
<td>Yes, if indicated</td>
<td>Toxoid</td>
</tr>
<tr>
<td>Varicella</td>
<td>Yes, if indicated, avoid conception for 4 weeks</td>
<td>No</td>
<td>Yes, if indicated, give immediately postpartum if susceptible</td>
<td>Live</td>
</tr>
</tbody>
</table>


2. Sackey J. The preconception office visit. UpToDate. 2014.


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Jeffrey Olin, DO - Mt. Sinai School of Medicine
Suman Rathbun, MD - University of Oklahoma College of Medicine
David Slovut, MD, PhD - Montefiore Medical Center
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Diagnostic Yield of Brain Imaging in Persons with Parkinson’s

By Brian Westerhuis, MD; Bassel Salem, MD; Eugenio Matos, MD; Paul A. Thompson, PhD; Joanne Landis, RN; and Jerome W. Freeman, MD

Introduction

Brain imaging is frequently performed in patients with degenerative neurologic conditions. Scant data exists as to the yield of brain imaging in patients with features suggesting Parkinson’s disease. In 2013, several of the authors of this manuscript published a case report of a 48-year-old woman who presented with typical Parkinson’s symptoms and findings. She proved to have a large, left hemisphere meningioma and when this was surgically resected, her symptoms entirely abated. This dramatic case has prompted us to systematically look at the diagnostic value of brain imaging in persons with Parkinson’s features.

The diagnosis of Parkinson’s disease is a clinical one. There are no definitive, confirmatory tests. Often the diagnosis is only established, with certainty, based on a patient’s response to medication over time. In the initial stages, the clinician may not be certain whether a patient will prove to have drug-responsive Parkinson’s disease or a condition less responsive to therapy (so-called “Parkinsonism”). For instance, people with some features suggestive of Parkinson’s will ultimately be judged to have some variant of multiple system atrophy. Some patients with multiple system atrophy who have the so-called “striatonigral degeneration” may exhibit prominent Parkinson’s features. Patients with this latter condition generally do not respond dramatically to drug therapy.

Given the lack of diagnostic certainty with Parkinson’s and the fact that persons with Parkinson’s have a lifelong and progressive disease, many clinicians opt to do early brain imaging. Magnetic resonance imaging (MRI) or computerized axial tomography (CAT) can be used but MRI offers much more diagnostic information. When our literature review did not reveal definitive data on the yield of brain imaging in Parkinson’s, we decided to do a retrospective analysis looking at the results of brain imaging in persons who had Parkinson’s features (i.e., Parkinson’s disease or some form of Parkinsonism such as multiple system atrophy). We postulated that brain imaging would often be abnormal, and would have a reasonable yield in terms of demonstrating various findings that might require treatment.

Methods

For the purposes of this study, all patients seen by an eight-member neurology group within a two-year period (Jan. 12, 2012 through Feb. 12, 2014) were included. Each patient was identified by a neurologist as having Parkinson’s features such as tremor, rigidity or gait impairment. Some of these patients were seen as initial consults and others had been followed by a neurologist in the group over a number of years. A piloted data collection form was modified for this study. Each of the authors (excluding the biostatistician) participated in chart review and data collection. Care was taken to ensure the accuracy of data compilation. The chart review identified 179 patients who fit the inclusion criteria. Of this number, 135 had brain imaging and 44 did not. Of those who had brain imaging, 110 had an MRI and 25 had a CAT scan. Patients were excluded from this retrospective study if the records of an initial evaluation or brain imaging results at another facility were no longer available. Imaging performed within a year prior to the initial diagnosis of Parkinson’s features was included in the study. As this analysis focused on brain imaging around the time of diagnosis, long term follow-up was not undertaken. Appropriate institutional review board (IRB) approval for this chart review study was obtained (Sanford 03-13-026).

Results

The mean age of our patients at the time of brain imaging was 69 years. Notably, 99 (63.7 percent) patients had MRIs that suggested small vessel ischemic disease and 80 (47.4 percent) showed diffuse atrophy. While five (8.9 percent) showed evidence of a previous stroke, three patients demonstrated small areas of acute ischemia in the months leading up to their initial neurologic evaluation for Parkinson’s. Another patient, suspected of having
Parkinson’s, had a contemporaneous MRI that revealed a small acute ischemic focus in the left cerebellar hemisphere, in addition to diffuse small vessel ischemic changes and evidence of remote lacunar infarcts. No patient, other than our sentinel patient with meningioma, demonstrated a new tumor. The MRI of one patient with a known acoustic neuroma documented the lesion to be unchanged. Our finding of a single new brain tumor in the study group is comparable to a previously reported series that found an incidence of tumor in patients with Parkinson’s features of 0.3 percent.1

While many of our patients’ scans thus showed abnormalities, these findings rarely resulted in altered treatment. In three patients, antiplatelet therapy was started or adjusted based on imaging findings. The brain imaging in one patient led to subsequent magnetic resonance angiography (MRA) of the neck and brain vasculature and one patient received carotid stenting based on further investigation. Certainly, the majority of patients with abnormal imaging had evidence for small vessel ischemia or brain atrophy, both of which are fairly common, age-related changes.

Conclusion

The results of this study do not provide definitive evidence for the utility of brain imaging in persons presenting with Parkinson’s symptoms and features. Indeed, one could argue that based on the relatively benign findings of brain imaging in this series, a clinician could opt for empiric treatment or observation, rather than proceeding to brain imaging. However, we urge caution in foregoing routine brain imaging for persons presenting with Parkinson’s symptoms. In our series, there is a high incidence of vascular disease. The 8.9 percent incidence of prior stroke and 63.7 percent patients with small vessel ischemia are notable findings. As described, one patient who was imaged to evaluate his Parkinson’s symptoms also proved to have a small acute stroke. Certainly, the MRI is much more sensitive than the CAT scan at revealing both acute ischemia and the extent of small vessel ischemic change. Vigorous secondary prevention measures for stroke seem warranted in all patients whose brain imaging reveals ischemic changes. Limited literature exists supporting the benefit of treating asymptomatic MRI or CAT ischemic findings. The argument has been advanced that silent lacunar infarcts and chronic small vessel ischemic disease frequently coexist and have been associated with an increased risk of stroke and cognitive decline.4 In our cohort of patients, the degree to which follow-up of vascular risk factors was accomplished was not assessed. Also, a matched control group to compare MRI findings with our Parkinson patients was not incorporated into this study.

When considering the appropriateness of early brain imaging in Parkinson’s, the clinician must ponder the implications of a slowly progressive neurologic condition. If brain imaging is not performed initially, the clinical desire for such testing (not to mention patient and family pressures) may inevitably increase as a patient continues to demonstrate progression of symptoms. In a disease like Parkinson’s, in which there is no definitive way for diagnostic verification, due diligence may warrant early brain imaging to exclude significant structural and ischemic abnormalities. And arguably, the incidence of cerebral vascular disease in our series, coupled with the known utility of vigorous secondary stroke prevention measures, provides impetus for MRI imaging in persons with Parkinson’s symptoms.

REFERENCES


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Shaping the Future of Medicine in South Dakota
Treatment of Skin Abscesses: A Review of Wound Packing and Post-Procedural Antibiotics

By Mark List, MD; Donella Headlee, MD; and Katherine Kondratuk, MS I

Abstract

Objective: Skin abscesses can be a significant source of morbidity and are frequently encountered by physicians across the country. Incision and drainage (I&D) remains the standard of care; however, significant variability exists in the treatment of abscesses after I&D. Some recent evidence has suggested that routinely performed treatment modalities may not be beneficial. We examine the available evidence investigating if I&D alone is sufficient as the sole management for the treatment of uncomplicated abscesses, specifically focusing on wound packing and post-procedural antibiotics.

Methods: We reviewed available literature for any published observational or randomized control trials on the treatment of abscesses via packing and antibiotics. Only recent manuscripts published in the English language and in the past 10 years (2004 through 2014) were included due to the emergence of methicillin-resistant Staphylococcus aureus (MRSA) as one of the leading causative organism of soft tissue infections in the past decade.

Results: Three randomized control trials (RCT) and one observational study investigated wound packing versus no packing following I&D. None of the studies demonstrated a difference in treatment failure rates, recurrence rates, or need for secondary interventions in non-packed wounds; however, packing groups had more pain. Six studies investigated the post-procedural use of antibiotics. The RCTs failed to show decreases in treatment failure rates with antibiotics, but two studies demonstrated a short-term decrease in new lesion formation. The observational studies demonstrated mixed results regarding rates of treatment cure with appropriate antibiotic selection, specifically in patients with positive wound cultures for MRSA.

Discussion: Regardless of supplemental post-procedural treatment, all studies demonstrate high rates of clinical cure following I&D. While the number of studies is small, there is data to support the elimination of abscess packing and routine avoidance of antibiotics post-I&D in an immunocompetent patient; however, antibiotics should be considered in the presence of high risk features. Due to limited studies and conflicting data, we are unable to make a recommendation in support or opposition of adjunctive post-procedural packing and antibiotics in an immunocompromised patient.

Introduction

A skin abscess is a localized collection of pus that generally develops in response to infection or to the presence of other foreign materials under the skin. Abscesses are a common source of significant pain and morbidity for patients encountered by physicians and advance practice professionals (APPs) across the nation. The increase in incidence of skin and soft tissue infections, including abscesses, has been well-documented. In 1993, 1.2 million cases were diagnosed in the U.S., a number that increased to 3.4 million in 2005.1 This rise in cases of skin and soft tissue infections has also overlapped the emergence of community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA). Several studies over the past decade
have shown that the most common etiologic agent of these infections is now CA-MRSA.\textsuperscript{2-4}

While their incidence has increased in recent years, abscesses are not a new phenomenon, and the primary means to achieve clinical cure remains surgical incision and drainage (I\&D). For centuries, physicians have passed along the Latin phrase \textit{ubi pus, ibi evacua} translated as “where pus, there evacuate.”\textsuperscript{5} Even so, practice patterns for I\&D technique are not standardized, and significant variability exists in the type of incision, use of irrigation, decision to pack the wound, concomitant antibiotic use, anesthetic and pain control, and obtaining wound cultures.\textsuperscript{6-8} For decades, supplemental post-I\&D interventions were utilized and taught, often despite limited evidence supporting their use. In this review, we focus on the available medical literature regarding the use of wound packing following the procedure and evaluate the need for antibiotics following I\&D. The collection and assessment of pertinent, recent studies will allow physicians and APPs to choose post-procedural care wisely, not only providing the best possible rates of clinical cure, but also decreasing any unnecessary concomitant antibiotic exposure or unnecessary discomfort from packing. Additionally, we hope to assist medical educators in providing evidence-based medicine for clinical instruction on this topic. When applicable, we present the level of evidence using the Strength of Recommendation Taxonomy System (Figure 1).\textsuperscript{9}

**Methods**

**Literature Search**

Our search strategy, selection of publications, and the reporting of results for the review were conducted in accordance with the most recent Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. Randomized control trials and observational studies on the management of skin abscesses were acquired through PubMed, MEDLINE and CINAHL through EBSCOHost. We limited results to the English language. All articles were published in a 10-year time frame from Jan. 1, 2004 through Sept. 25, 2014, ensuring they were applicable for modern medical practice in the MRSA-era. All publications with medical subject headings (MeSH) and keywords in title, abstract, and full-body text containing “abscess AND packing” and “abscess AND antibiotics AND skin” were investigated. Results were then narrowed by author defined inclusion and exclusion guidelines designed for relevance for this systematic review.

**Selection and Quality Assessment of Articles**

All identified papers were critically appraised by the authors. The inclusion criteria were as follows: studies with full text available and having practical application to the management of skin abscesses regarding either packing and/or antibiotic use following I\&D. Exclusion

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**Figure 1. Strength of Recommendation Taxonomy (SORT)**

- **A**: Consistent, good-quality patient-oriented evidence
- **B**: Inconsistent or limited-quality patient-oriented evidence
- **C**: Consensus, disease-oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

**Figure 2. Flow Sheet Representing Database Literature Search and Selection for Articles Regarding Wound Packing Following Skin Abscess Incision and Drainage**

- 253 Database Search Results
- 128 Manuscripts searched
- 49 Abstracts reviewed
- 4 Relevant Full Text articles

**Figure 3. Flow Sheet Representing Database Literature Search and Selection for Articles Regarding Antibiotic Administration Following Skin Abscess Incision and Drainage.**

- 1310 Database Search Results
- 891 Manuscripts searched
- 420 Abstracts reviewed
- 6 Relevant Full Text articles
criteria were all studies prior to 2004 to eliminate any results not applicable to modern MRSA-era, studies comparing I&D techniques other than standard linear incisions, single case reports, and those specifically focused on abscess management in non-cutaneous abscesses or in perianal abscesses. Figures 2 and 3 illustrate the search process and selection of articles.

Results

Three randomized control trials (RCT) and one observational study were selected based on predetermined selection criteria regarding the use of wound packing following abscess incision and drainage. In 2009, O’Malley et al. produced an emergency department based RCT reporting results from 48 adults randomized to receive one-quarter inch non-iodophor-impregnated gauze packing. Follow ups were scheduled in the ED at 48 hours and a phone call between 11 and 14 days. Results showed no difference in treatment failure or need for secondary inventions, but the non-packed group had statistically significant reductions in pain scores and required less narcotic medications to control post-procedural pain. Another randomized control trial involved 57 pediatric patients and similarly showed no statistically significant differences in need for repeat interventions [5/22 non-packing group (NPG) vs. 3/27 packing group (PG)] and had similar low rates of treatment failure and satisfaction scores at one month (96 percent NPG vs. 93 percent PG). The most recent RCT was done on 85 pediatric patients, showing no differences in rates of abscess recurrence (1/42 NPG vs. 1/43 PG). The lone non-randomized trial investigated pediatric patients who had packing placed at the time of the I&D. Researchers then chose to post-operatively remove the packing from 16 pediatric patients and compared them to 19 historical matched controls who had packing left in place. The group who was packed were more likely to require post-operative IV pain control (6/19 PG vs. 0/16 NPG), hospitalization (11/19 PG vs. 0/16 NPG), follow up visits (7/19 PG vs. 0/16 NPG); however, there was no increase in treatment failure or abscess recurrence (0/19 PG vs. 1/43 PG, p= 0.15).

The results for antibiotic use following abscess drainage are less uniform in their outcomes. One RCT of 166 patients randomized to QID cephalexin vs. placebo found a 90.5 percent cure rate observed in the placebo arm and 84.1 percent cure rate in the antibiotic arm (p=0.25). In two RCT comparing two tablets of Bactrim BID to an identical regimen of placebo, Schmitz et al. found no statistically significant difference in failure rates between the groups (15/88 treatment vs. 27/102 placebo, absolute risk reduction (ARR) 9 percent, p= 0.12), as did Duong et al. (failure rate 3/73 treatment vs. 4/76 placebo, ARR 1.2 percent). Both of these studies, however, showed an increase in short-term recurrence or formation of new lesions (10 day: 26.4 percent placebo vs. 12.9 percent treatment; one month: 28 percent placebo vs. 9 percent treatment; p=0.02).

In observational trials, one small study of 68 pediatric patients with MRSA abscesses showed no difference in rates of treatment failure in patients who were appropriately treated vs. those given ineffective antibiotics (0/26 susceptible antibiotics vs. 4/37 resistant antibiotics; ARR 11 percent, p= 0.1). Again, a similar result was found in a larger (n=408) observational study in adults (failure rate 2/166 susceptible antibiotics vs. 1/242 resistant antibiotics; P=.74). However, one retrospective cohort study showed that treatment of abscess specifically from MRSA with appropriate antibiotics did lead to a statistically significant decrease in failure rates (16/312 susceptible antibiotics vs. 29/219 resistant antibiotics; ARR 8 percent, p= 0.001).

Discussion

Wound Packing

We summarize our clinical recommendations in Figure 4. The treatment of skin abscesses with incision and drainage alone has a high rate of clinical cure (SORT = A). The packing of wounds following incision and drainage of cutaneous abscesses has historically been a mainstay in medical treatment, with its origins dating back to ancient Mesopotamia when oil soaked linens were used to pack recently drained abscesses. More than 3,000

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<th>Figure 4. SORT Recommendations</th>
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<td><strong>SORT: KEY RECOMMENDATIONS FOR PRACTICE</strong></td>
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<td>• Incision and drainage alone is often sufficient for the treatment of uncomplicated skin abscesses in an immunocompetent patient.</td>
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<td>• Wound packing following incision and drainage is not necessary and is usually painful.</td>
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<tr>
<td>• Antibiotics following incision and drainage are often not necessary for clinical cure.</td>
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<tr>
<td>• Antibiotics following incision and drainage may decrease recurrence rates of abscesses.</td>
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<tr>
<td>• When antibiotics are prescribed following incision and drainage, medications with MRSA coverage should be selected.</td>
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years later, we describe several recent studies which consistently demonstrate that wound packing does not produce superior outcomes compared to wounds not packed after I&D. Wound packing following incision and drainage of abscesses is not necessary and is usually painful. (SORT = B). 1,3,10-11

Outcomes were not improved by packing, and patients experienced more pain than non-packing. However, the studies are quite small with the largest study containing only 85 patients. In addition, although the data, while limited, is supportive of avoiding packing following incision and drainage, it is difficult to make firm conclusions for standardized treatment of skin abscesses for all patients based on four studies, only one of which is in adults. Other studies have been done also showing no benefit to wound packing, but these were excluded due to their focus on perianal abscesses and their limited relevance to treatment of other generalized, uncomplicated skin abscesses. 19,20 The studies reviewed are by no means uniform in methodology. There was no standard of follow up, no uniform exclusion of patient populations, and antibiotics use was not standardized, as one study used antibiotics randomly based on physician decision at a rate of 43 percent. Additionally, O’Malley et al. limited their investigation to abscesses less than 5 cm in diameter, while the other two made no exclusions based on size: 18 percent of all cases in Kessler et al. had abscesses greater than 5 cm and Leinwald et al. had very large abscess, with the mean abscess diameters of 5.7 cm in the packing group and 4.6 cm in the non-packing group. The non-randomized trial is less comparable to the others as both control and treatment groups were packed after I&D, but investigators post-operatively removed the packing in the control group. This study resulted in much higher rates of hospitalization compared to the other studies (of which one study excluded hospitalized patients), but still showed low rates of recurrence and need for secondary interventions after initial I&D. Although there is great diversity in these four studies, the vast differences in the study populations and methods may make the case for non-packing even stronger, as they all showed a very high cure rate with low rates of recurrence and low numbers of secondary interventions needed on follow up. All studies reviewed list immunocompromised status as an exclusion criterion. To our knowledge, there has been no study investigating the use of packing in treatment of abscesses in an immunocompromised patient.

We feel that a recommendation of opposition to packing is appropriate due to the lack of benefits (no change in cure rates, no change in need for secondary interventions) and significant increase in pain caused by wound packing. Additionally, wound packing is still a frequent practice, highlighted in one 2013 study demonstrating a 75 percent packing rate among surveyed emergency department physicians, residents, and APPs. 21 Clearly, large scale studies are needed, but the uniformity of results despite the diversity of patient characteristics, size of abscess, and need for hospitalization due to severity supports that packing abscesses following incision and drainage is likely unnecessary in an immunocompetent patient. Unfortunately, given the dearth of information available on packing use in the immunocompromised patient, there is insufficient evidence to make a recommendation supporting or opposing the use of packing in the immunocompromised.

Antibiotic Treatment

Antibiotic use after incision and drainage is a controversial topic, with no clear consensus on whether or not their use improves outcomes. Yet, they are commonly and routinely prescribed in clinical practice. 6,21,22 We describe two RCTs in which antibiotic administration, specifically 320 mg to 1600 mg trimethoprim-sulfamethoxazole twice daily, following I&D demonstrated no statistically significant improvement over placebo, but may reduce abscess recurrence (SORT = B). 13,14 At the time of writing this review, a much larger clinical trial (n=1247) investigating the treatment of abscesses with placebo or high dose trimethoprim-sulfamethoxazole remains unpublished, but it has publically released its preliminary data, documenting treatment failure in 123/630 (19 percent) patients with antibiotics vs. 163/617 (26 percent) patients with placebo. 23 Another recent, large clinical trial regarding Clindamycin vs. trimethoprim-sulfamethoxazole did not address the issue of antibiotics versus placebo, but showed a high cure rate in both treatment groups and stated, “although incision and drainage alone may be sufficient for treatment in many cases, there are likely to be subgroups in which antibiotic therapy is needed. Outcomes in antibiotic-treated patients with abscesses in our relatively low risk population could reflect either similar true efficacies or the adequacy of incision and drainage alone.” 24

For immunocompetent patients with mild, uncomplicated infections; there is not enough evidence to support the routine use of antibiotics following I&D (SORT = B). 12,17,25 However, with the number of abscesses treated each year in the U.S., the absolute risk reductions shown in these
studies leads to a reduction of treatment failures leading to secondary interventions that number in the hundreds of thousands. This does not even include the statistically significant decrease in recurrence rates, which lead to additional interventions.

Recent guidelines recommend that purulent abscesses be empirically treated with antibiotics when infections are deemed moderate to severe, recommended strongly although based on “evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.” These guidelines define moderate infections as patients with systemic signs of infection and define severe infections as those who have failed incision and drainage plus oral antibiotics or those with systemic signs of infection or immunocompromised patients. In our review, several studies include immunocompromised patients (diabetics, HIV/AIDS, etc.); however, the results are mixed. Rajendran et al. and Paydar et al. both included immunocompromised patients and found no benefit to post-procedural antibiotics. Ruhe et al. did demonstrate an ineffective antibiotic regimen to be an independent risk factor for treatment failure in a population that included immunocompromised patients; but in sub-group analysis, immunocompromised status was not found to be statistically significant between clinical cure and failure groups. While these studies seem to suggest that immunocompromised status is not a risk factor in treatment failure, we find insufficient evidence to make a recommendation supporting or opposing the use of post-procedural antibiotics in immunocompromised patients.

Another possibility to guide treatment would be to only treat high risk cases that were likely to cause treatment failure and lead to complications like hospitalization or a secondary intervention. Lee et al. describe a study involving children, in which abscesses larger than 5 cm were associated with treatment failure; however, a separate study of adults found that size of abscess greater than 5 cm or area of cellulitis greater than 5 cm was not associated with treatment failure. The presence of MRSA, in that study, was associated with an increased risk for treatment failure. When antibiotics are chosen, due to the rise of CA-MRSA as the leading bacterial cause of abscesses, an antibiotic with MRSA coverage should be chosen as first line therapy (SORT=C). The decision when to obtain culture is also somewhat controversial, but newer guidelines suggest obtaining culture for susceptibilities only when choosing to initiate antibiotic therapy following I&D.


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.
Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2016.

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2]).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.

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<tr>
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</table>

This schedule includes recommendations in effect as of January 1, 2016. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (http://vaers.hhs.gov) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (http://www.cdc.gov/vaccines/recs/vac-admin/contraindication.htm) or by telephone (800-232-4636).

This schedule is approved by the Advisory Committee on Immunization Practices (http://www.cdc.gov/vaccines/acip), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

NOTE: The above recommendations must be read along with the footnotes of this schedule.
### Children age 4 months through 6 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for First Dose</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 1 to Dose 2</th>
<th>Dose 2 to Dose 3</th>
<th>Dose 3 to Dose 4</th>
<th>Dose 4 to Dose 5</th>
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</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>Birth</td>
<td>4 weeks</td>
<td>8 weeks and at least 16 weeks after first dose</td>
<td>Minimum age for the final dose is 24 weeks.</td>
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<td>Rotavirus</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
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<tr>
<td>Diphtheria, tetanus, and acellular pertussis</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
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<tr>
<td>Haemophilus influenzae type b</td>
<td>0 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
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<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
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<tr>
<td>Inactivated poliovirus</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
<td>6 months (minimum age 4 years for final dose)</td>
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</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>3 months</td>
<td>6 months</td>
<td></td>
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<tr>
<td>Hepatitis A</td>
<td>12 months</td>
<td>6 months</td>
<td>6 months</td>
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<tr>
<td>Meningococcal</td>
<td>Not Applicable (N/A)</td>
<td>8 weeks</td>
<td>See footnote 11</td>
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### Children and adolescents age 7 through 18 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for First Dose</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 1 to Dose 2</th>
<th>Dose 2 to Dose 3</th>
<th>Dose 3 to Dose 4</th>
<th>Dose 4 to Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningococcal</td>
<td>Not Applicable (N/A)</td>
<td>8 weeks</td>
<td>See footnote 11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, tetanus, diphtheria, and acellular pertussis</td>
<td>7 years</td>
<td>4 weeks</td>
<td>4 weeks</td>
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<tr>
<td>Human papillomavirus</td>
<td>9 years</td>
<td>Routine dosing intervals are recommended.</td>
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<tr>
<td>Hepatitis A</td>
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<td>6 months</td>
<td>6 months</td>
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</tr>
<tr>
<td>Hepatitis B</td>
<td>N/A</td>
<td>4 weeks</td>
<td>6 months</td>
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<td></td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>N/A</td>
<td>4 weeks</td>
<td>6 months</td>
<td></td>
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<tr>
<td>Meningococcal</td>
<td>N/A</td>
<td>6 months</td>
<td>6 months</td>
<td></td>
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<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>6 months</td>
<td>6 months</td>
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<tr>
<td>Varicella</td>
<td>N/A</td>
<td>6 months</td>
<td>6 months</td>
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</tr>
</tbody>
</table>

**NOTE:** The above recommendations must be read along with the footnotes of this schedule.
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Introduction

Polymyalgia rheumatic (PMR) is almost exclusively a disease of adults over the age of 50 with a peak incidence between the ages of 70 to 80. Geographically, it is most common in Scandinavian countries and in people of Northern European descent. In the U.S., it is most common in the upper Midwest where a significant portion of the population is of Scandinavian descent. It is more common in women than in men and is rare in black, Asian and Latino populations.

PMR is an inflammatory rheumatic condition characterized clinically by aching and morning stiffness in the shoulders, hip girdle and neck. Most commonly PMR occurs in isolation, but it may be seen in 40 to 50 percent of patients with giant cell arteritis (GCA). In addition, approximately 10 to 20 percent of patients who initially present with features of PMR later go on to develop GCA. The strong clinical association together with data from pathophysiologic studies suggest that GCA and PMR are closely related diseases; however, the exact mechanism of these two conditions remains unknown. Despite the similarities, PMR and GCA have distinct symptoms with significantly different corticosteroid requirements and prognosis.

GCA is also referred to as temporal arteritis or cranial arteritis and is an inflammation of medium and large arteries and can result in blindness if untreated. Clinically it may present either gradually or abruptly. The most common presentation is headache with an aching pain classically localizing to the temporal region of moderate intensity which responds poorly to analgesics. Patients may also experience jaw or tongue claudication with weakening or pain in the muscles of mastication that is relieved by rest. The temporal artery may exhibit palpable beading, diminished pulses, bruits and tenderness.

Polymyalgia Rheumatica and Giant Cell Arteritis: A Review Article

By Ukamaka Nwadibia, MD; Eric Larson, MD, FACP; and Joseph Fanciullo, MD, FACP

Abstract

Polymyalgia rheumatic (PMR) and giant cell arteritis (GCA) are two rheumatological conditions with significant overlap that typically affect the older white population. PMR is the most common inflammatory rheumatic disease of the elderly and shares many pathogenetic and epidemiological features with GCA. Diagnosis is made primarily on clinical grounds with supporting laboratory evidence. Typical symptoms of PMR are bilateral aching of the shoulders and pelvic girdle associated with stiffness. PMR is associated with GCA and is considered to be on a disease continuum. Approximately half of patients diagnosed with GCA have already been or will be diagnosed with PMR.

GCA is the most common vasculitis in adults and affects medium and large arteries and can result in blindness if untreated. Clinically it may present either gradually or abruptly. The most common presentation is headache with an aching pain classically localizing to the temporal region of moderate intensity which responds poorly to analgesics. Patients may also experience jaw or tongue claudication with weakening or pain in the muscles of mastication that is relieved by rest. The temporal artery may exhibit palpable beading, diminished pulses, bruits and tenderness.
Primers in Medicine

Pathogenesis
The etiology of PMR and GCA is not clearly defined. Both genetic and environmental factors appear to play a role. Both conditions are associated with specific alleles of HLA-DR4. There has been demonstration of sequence polymorphism inside the hyper variable region of the HLA DRB1 gene that maps to the antigen binding cleft of HLA DR molecules suggesting an important role for antigen selection and presentation. Patients with GCA and PMR share this sequence polymorphism which is not found in patients with rheumatoid arthritis.

Histopathologically, GCA is a pan arteritis with inflammatory mononuclear cell infiltrate in the vessel wall with frequent giant cell formation and proliferation of the intima and fragmentation of the internal elastic lamina. The pathogenesis of GCA is thought to start in the adventitia where CD 4+ T cells are triggered, setting off macrophage differentiation. The T cells that are enrolled to vasculitic lesions in patients with GCA produce predominantly IL-2 and IFN-gamma, and the latter has been suggested to be involved in the progression to overt arteritis. Seasonal variations suggest a role of infectious agents such as viruses and mycoplasma as possible triggers, although specific causative agents and pathological mechanisms have not been identified.

Signs and Symptoms
Polymyalgia Rheumatica
PMR primarily affects the muscles and joints of the neck and hip girdles with prominent bilateral pain and morning stiffness. The shoulders are affected in about 70 to 95 percent of cases. Proximal myalgia and arthralgia typically develop over weeks to months, worsening at night and with movement. Up to 50 percent of patients with PMR display distal, transient, asymmetrical or symmetrical arthritis primarily in the knee or wrist. Tenosynovitis such as carpal tunnel syndrome is common. Pitting edema can affect the wrists, hands, ankles and feet and occasionally is the presenting finding. Systemic symptoms such as low grade fever, fatigue, malaise and weight loss occur in 30 to 50 percent of patients.

GCA
Patients with GCA usually have constitutional features including fever and fatigue. Cranial vessel involvement may precipitate jaw claudication, scalp tenderness and temporal or occipital headache. Inflammation of the ophthalmic artery may cause ischemia of the optic nerve resulting in visual loss. Involvement of the subclavian vessels may result in upper extremity limb claudication or subclavian steal syndrome. Aortic involvement occurs in 15 percent of cases and presents with decreased or absent peripheral pulses, discrepancies of blood pressure between both arms and arterial bruit. Aortic valve regurgitation may occur with GCA involvement of the proximal ascending aorta.

Evaluation
Patient evaluation starts with a detailed history and physical examination with suggestive clinical history and findings. Also, laboratory testing includes C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) which are classically elevated in both conditions. Complete blood count to evaluate for anemia and thrombocytosis is seen in some cases, liver function tests and creatinine phosphokinase may also be abnormal.

Other laboratory studies to assist in differentiating PMR and GCA from other conditions include thyroid studies, complete metabolic panel, rheumatoid factor measurement, cyclic citrullinated peptide (CCP) antibody, urinalysis as well as protein electrophoresis. For suspected GCA, temporal artery biopsy is indicated, though not required prior to starting steroid therapy to avoid serious complications of untreated disease especially blindness. Biopsy could be done up to five days, maybe even later following commencement of therapy without a significant effect on the histopathology. Since involvement of the vessel may be segmental, accuracy is increased by obtaining a biopsy segment of 3 to 5 cm together with serial sectioning of biopsy specimens. If disease suspicion remains strong after a negative biopsy, a biopsy of the contralateral temporal artery could be considered, thereby increasing diagnostic sensitivity by 9 to 12 percent.

In the circumstance of a negative temporal artery biopsy and a high clinical suspicion for GCA involving the aorta, diagnosis may be aided by CT angiography. Other imaging modalities including MRI and ultrasound of the temporal artery may also show lesions of GCA but are not generally clinically useful. PET scans have also been suggested to have a role in the diagnosis of large vessel vasculitis but data is limited.

Differential Diagnosis
Due to the sometimes nonspecific features of both PMR and GCA, it is necessary for the clinician to consider alternative diagnosis. Various vasculitides and connective tissue diseases share common features with GCA and PMR. Paraneoplastic conditions, occult malignancy and...
hypothyroidism may present similarly as can drug induced myopathy.  

**Treatment**

Treatment of both GCA and PMR is with glucocorticoids but at significantly different doses. Most treatment recommendations and guidelines are based on clinical experience rather than results of randomized clinical trials. PMR is treated with lower doses of prednisone 10 to 20 mg daily and then gradually tapered over one to two years. GCA requires higher doses of prednisone, typically 40 to 60 mg daily for approximately one month, followed by a gradual taper to lower doses depending on patients' response for a total of about two years of therapy. It is recommended to start therapy immediately if GCA is suspected to avoid visual loss. ESR and CRP serve as useful indicators of inflammatory disease activity in monitoring and tapering steroid therapy. Aspirin, 325 mg daily, has been found to reduce the occurrence of cranial ischemic complications in GCA and should be given in addition to glucocorticoids in patients with no contraindications. The use of weekly methotrexate is controversial as a steroid sparing agent but is used occasionally in clinical practice. In such situations, patients should be advised of the limitations of available data regarding the efficacy of potentially glucocorticoid-sparing therapies. Bisphosphonates should be used to maintain bone mineral density and decrease vertebral fractures in patients on long-term glucocorticoid therapy. Duration of glucocorticoid treatment varies from one to two years but could be continued or restarted if the patient is still symptomatic or having flares. It is recommended to consider Pneumocystis jiroveci pneumonia prophylaxis in patients receiving up to 20 mg or more of prednisone daily.  

**Conclusion**

GCA and PMR are two rheumatologic conditions with significant overlapping findings and pathophysiology. Clear differentiation between them is required for appropriate management. PMR is characterized by bilateral shoulder and pelvic girdle pain and responds briskly to low dose steroid therapy. GCA is a vision threatening vasculitis that requires prompt initiation of high dose prednisone with early temporal artery biopsy to confirm diagnosis. Both disorders are characterized by high ESR and CRP, which however, may not be present early in the course of disease. Prognosis is good with prompt diagnosis and treatment.
Background

*Clostridium difficile* associated diarrhea (CDAD) is diarrhea secondary to *Clostridium difficile* infection, usually in the setting of disturbed gut microbiota. *Clostridium difficile* is a gram positive anaerobic bacillus which has the ability to form spores, and is spread via fecal-oral transmission. CDAD is becoming more prevalent, with a two- to four-fold increase in the past 20 years. *Clostridium difficile* infection is the most common cause of hospital acquired infection in parts of the U.S., exceeding hospital acquired MRSA, causing the Centers for Disease Control and Prevention (CDC) to deem this an immediate public health threat that requires urgent and aggressive action.

The reason for the increase in CDAD is multifactorial, with contributions from poor antibiotic stewardship, virulent strains (NAP1/B1/027), sub-optimal prevention strategies (i.e., isolation practices for patients with CDAD), and increasing long-term facility residence where residents are more frequently colonized with *Clostridium difficile*. It is important to note that while 5 to 15 percent of the general adult population are carriers, non-toxigenic strains typically do not cause diarrhea and carriers are often asymptomatic. Of hospitalized or nursing home residing adults, 10 to 43 percent are carriers of *C. difficile*. Treatment is usually not recommended for asymptomatic carriers. Nationwide, there are greater than 300,000 new cases yearly, and in South Dakota, 1,032 cases were reported to the South Dakota Department of Health in 2015 – 312 of which were in hospitalized patients. It is important to note that this disease is not mandatorily reported and thus the prevalence is underestimated. More than $1 billion is spent treating this disease annually in the U.S. This disease is most frequently associated with antibiotic use. Other predisposing factors include inflammatory bowel disease, use of proton pump inhibitors, cirrhosis, and the peripartum state. Forty percent of CDAD is acquired in a non-hospital setting, and in one study, 22 percent of community acquired CDAD occurred in patients without preceding exposure to antibiotics.

Pathogenesis

CDAD often occurs when healthy colonic flora is disrupted by antibiotics, most frequently clindamycin, fluoroquinolones, and cephalosporins. After these broad-spectrum antibiotics kill the normal gut flora, susceptible patients are then exposed to and colonized with *Clostridium difficile*. As *C. difficile* multiplies, toxin A and B act synergistically to glucosylate Rho GTPase, interfering with signal transduction which leads to cytoskeleton...
dysfunction, resulting in enterotoxicity and cytotoxicity. Evidence of dysfunction of cytoskeleton and cell-cell adhesion may be seen on microscopy of cultured fibroblasts, which upon exposure to toxin B, become rounded and undergo apoptosis. The hypervirulent Clostridium difficile strain NAP1/BI/027 produces higher quantities of toxins A and B. This strain likely has other mechanisms promoting virulence, including fluoroquinolone resistance, increased sporulation and adherence. Another potential contributing mechanism is an altered immune response to infection with inadequate production of IgG antibodies against toxin A. Whereas a healthy immune system may keep Clostridium difficile activity to a level where the carrier is asymptomatic, low levels of IgG antibody against toxin A are associated with development of diarrhea and recurrence of CDAD.

Clinical Presentation
Clostridium difficile infection exists with remarkable variability. Those infected may indeed be asymptomatic or persistent carriers, or CDAD may progress to painful fulminant colitis that mimics an acute abdomen. Clinical CDAD most frequently presents with watery diarrhea after antibiotic use. In this mild presentation, patients typically note frequent watery or bloody stools, abdominal pain and cramping, nausea, vomiting and fever. Markers of severe CDAD include leukocytosis (WBC greater than 15,000 cells/uL), acute kidney injury (50 percent rise of creatinine over baseline), lactic acidosis, or shock presentation. CDAD may be complicated by hypotension, ileus, toxic megacolon, or colectomy from lack of response to therapy or colonic perforation. An occasionally overlooked scenario is that of a post-operative patient who has ileus, and in whom a septic picture without diarrhea emerges. As the presenting picture varies widely, and as prevalence is increasing, a high index of suspicion is warranted.

Diagnosis
CDAD is best diagnosed with PCR testing for toxin B, performed on liquid feces. Sensitivity and specificity of PCR is greater than 90 percent, and results from PCR can be available in one hour. If the patient is unable to have a bowel movement but CDAD is suspected, rectal swabs may be used to obtain a test sample. Other methods of testing include enzyme immunoassay (EIA) for toxins A and B, EIA for C. difficile glutamate dehydrogenase, cytotoxicity assay and anaerobe culture, or an algorithm combining EIA with PCR. While a majority of CDAD is diagnosed with stool testing, lower endoscopy (colonoscopy or sigmoidoscopy) is occasionally performed in carefully selected patients with negative stool testing but high clinical suspicion. Findings are variable, and include non-specific colitis-type changes to classic pseudomembrane formation with yellow-white plaques (giving the name pseudomembranous colitis, pathognomonic for CDAD, which correlates with severity). However, lower endoscopy should be minimized given the potential risk of perforation.

Treatment
Treatment of mild CDAD on its first occurrence is with metronidazole 500 mg three times daily for 10 to 14 days. If possible, precipitating systemic antibiotics should be discontinued. Initial treatment of CDAD cures 80 to 90 percent of patients. While a majority of CDAD patients are cured, recurrence continues to be a significant clinical problem, and roughly 10 to 20 percent of patients will have a first recurrence. Per Infectious Disease Society of America guidelines, CDAD on its first recurrence should be treated with a repeat 14-day course of oral metronidazole versus oral vancomycin 125 mg orally four times per day. Severe CDAD is treated with vancomycin orally 125 mg QID for 10 to 14 days, and complicated CDAD is treated with vancomycin 500 mg QID PO and metronidazole 500 to 750 mg IV Q8h. Vancomycin enemas may be employed for patients with ileus. Early surgical consultation is recommended in complicated CDAD, particularly in the ICU. A study of ICU patients with fulminant CDAD revealed that colectomy in selected patients reduced mortality (34 percent of patients who received a colectomy died, versus 58 percent who did not). Recurrence, as mentioned previously, is a significant issue resulting in re-hospitalization and health care expenditure.

<table>
<thead>
<tr>
<th>Table 1.</th>
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<tr>
<td>Mild CDAD</td>
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<tr>
<td>Severe CDAD</td>
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<tr>
<td>Severe, complicated CDAD</td>
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<table>
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<th>Table 2.</th>
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<tr>
<td>First Recurrence</td>
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<tr>
<td>Second Recurrence</td>
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<tr>
<td>Third Recurrence</td>
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</table>
Fidaxomicin (Dificid), a macrolide antibiotic, is another option for patients with recurrent CDAD. When compared to vancomycin, fidaxomicin achieved similar cure rates, but with fewer recurrences. Dosing of fidaxomicin is 200 mg orally BID for 10 days.

Unfortunately standard antibiotic treatment of subsequent relapses is less efficacious, with cure rates of approximately 50 percent. A second relapse may be treated with vancomycin with prolonged tapering or pulse dose of vancomycin. Tapering involves gradually smaller doses of oral vancomycin, often over the course of 21 days. Pulsed doses (125 to 500 mg) of oral vancomycin are given once every three days for 27 days. Variations or combinations of these regimens are often utilized. The use of probiotics (Saccharomyces boulardii or Lactobacillus plantarum) is controversial, with insufficient evidence to recommend their use.

It is important to rehydrate patients who have a fluid deficit, ideally by oral rehydration. IV fluid repletion may be warranted if adequate rehydration is not achieved by simple oral rehydration. It is important that anti-motility agents such as loperamide not be used, as this class of drugs may worsen CDAD.

Treatmente for a third recurrence should include consideration of fecal microbiota transplant (FMT) with the aim of restoring balanced microbiota. FMT has been practiced in the veterinary world for over 300 years in the treatment of ruminant disease and equine digestive disease. In the early 17th century, Hieronymus Fabricius noted that transplanting cud from a healthy cow into particular ailing cows cured them of their digestive illnesses.

In subsequent veterinary literature, this is termed “transfaunation.” Human FMT was described in medical literature as early as 1958. Under 2013 American College of Gastroenterology CDAD guidelines, FMT should be considered after three recurrences. One study used rRNA sequencing to investigate fecal microbiota in patients with recurrent CDAD, and found a paucity of normal microbiota such as of Bacteroidetes and Firmicutes species, often replaced with atypical Streptococcal, Clostridum and Lactobacillus species. FMT was successful at restoring normal flora, more closely representing the healthy donor.

Multiple trials with FMT have proven highly successful in preventing further recurrence of CDAD, with an approximately 90 percent cure rate. FMT involves instilling fecal material from a healthy donor into a patient with recurrent CDAD. Meta-analysis of 27 studies with a total of 317 pooled participants showed a cure rate of 92 percent. van Nood et al. published a three-arm randomized trial studying FMT for recurrent CDAD. Arm one received vancomycin followed by bowel lavage and FMT via nasoduodenal tube, arm two received a standard oral vancomycin course, and arm three received an oral vancomycin course with bowel lavage. Of the 16 patients receiving FMT, 13 were cured with one infusion, and 15 after two (94 percent cure). Four of the 13 (31 percent cure) in the arm two vancomycin group had resolution of their recurrent CDAD, and three of 13 in arm three were cured.

During FMT, fecal material is delivered to the colon with colonoscopy or enema, or alternatively to the small bowel using naso-enteric tube. While the ideal route of FMT is currently not firmly established, trials are ongoing to answer this question. Fecal transplant material is typically (although not always) from related donors. Donor stool is homogenized in a blender with 350 mL of saline. It is then filtered twice using saline-moistened gauze in a funnel and collected in syringes for injection into endoscopes used during FMT. In trials, both methods of delivery have achieved cure rate of approximately 90 percent. The FDA considers FMT an experimental therapy, and administration is typically in the setting of a clinical trial, or with informed consent.

FMT is being performed locally in South Dakota. Patients are usually enrolled after three recurrences of CDAD, and donors are recruited from relatives or spouses. Potential donors are screened for potentially transmissible diseases (see table) and feces are emulsified prior to transplant. Donor feces is prepared and a liquid suspension is transplanted using colonoscopy. FMT performed at the authors’ facility, taking place over one year and involving 36 patients has achieved greater than 90 percent success, defined as resolution of diarrhea without recurrence.

<table>
<thead>
<tr>
<th>Donor Serology</th>
<th>Donor Stool Tests</th>
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<tbody>
<tr>
<td>HIV</td>
<td>Bacterial culture</td>
</tr>
<tr>
<td>HTLV I/II</td>
<td>Ova &amp; Parasite</td>
</tr>
<tr>
<td>RPR</td>
<td>Giardia Ag</td>
</tr>
<tr>
<td>HAV IgM</td>
<td>Cryptosporidium</td>
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<tr>
<td>HBeAg</td>
<td>Microsporidia</td>
</tr>
<tr>
<td>HBeAb, HCV Ab</td>
<td>AFS for Cyclospora</td>
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<tr>
<td></td>
<td>AFS for Isospora</td>
</tr>
<tr>
<td></td>
<td>C. diff toxin B (PCR)</td>
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</tbody>
</table>
Prevention
Prevention is mainly aimed at: 1) antibiotic stewardship; and 2) containing infectious spores in hospitals. The CDC recommended prevention strategies include contact precautions, isolation, and optimized testing (PCR as above). Patients who are diagnosed with CDAD should be isolated with their own bathroom or commode. Closing toilet seat lids prior to flushing is recommended. Staff should be instructed to wear gowns and gloves, and wash their hands with soap and water prior to leaving the room of a CDAD patient, as well as universal glove use on units with high CDI rates. Environmental cleaning of CDAD patient rooms needs to involve agents containing bleach.

Conclusion
CDAD is increasingly important in primary care as well as specialized medical care as a result of increasing prevalence and resulting health care expenditure, as well as significant morbidity and mortality. Steps in counteracting the current swell in cases include antibiotic stewardship, improved hygiene, prompt diagnosis, appropriate treatment, and infection precautions in hospitals and skilled nursing facilities. It is important to stratify patients into mild versus severe and uncomplicated versus complicated, as treatment for the different groups varies considerably. Despite improvement in early diagnosis and therapy, recurrence continues to be a significant problem. In appropriately selected patients, fecal bacteriotherapy has emerged as an effective alternative for patient with multiple recurrences.

REFERENCES

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Emerging Evidence of Corticosteroids in Community-Acquired Pneumonia

By Claire Larson; and Tadd Hellwig, PharmD, BCPS

Community-acquired pneumonia (CAP) along with other lower respiratory infections have a significant impact on morbidity and health-care costs. Hospitalizations secondary to CAP are common and may lead to acute respiratory distress syndrome (ARDS), sepsis, or death.

CAP results from an inability of the immune system to clear bacterial pathogens in the lower respiratory tract. Inflammatory cytokine responses help clear bacteria but they may also exacerbate pulmonary dysfunction by impairing alveolar gas exchange possibly leading to sepsis or end organ damage. Use of systemic corticosteroids in patients with CAP may help reduce inflammatory processes in the lungs.

The use of adjunctive corticosteroids in patients with CAP has been studied for decades with results demonstrating inconsistent decreases in ARDS, sepsis and mortality. Previous systematic reviews have been unable to demonstrate conclusive benefits of corticosteroids in CAP and current practice guidelines do not recommend corticosteroids for CAP. However, two recent trials and a meta-analysis have once again brought attention to the potential benefits of corticosteroids in patients with CAP.

A systematic review and meta-analysis, recently published in the *Annals of Internal Medicine* evaluated the use of corticosteroids in patients hospitalized with CAP. This meta-analysis included studies that randomly assigned CAP patients to receive either corticosteroids or placebo. Eligible studies also had to report at least one of the following outcomes: need for mechanical ventilation, development of ARDS, need for ICU admission, time to clinical stability, duration of hospitalization or all-cause mortality. This analysis evaluated potential adverse effects associated with corticosteroid use such as hyperglycemia requiring treatment, rehospitalization, gastrointestinal (GI) hemorrhage and severe neuropsychiatric symptoms.

A total of 13 randomized controlled trials, involving 2005 patients, were included in the analysis. The addition of two recently released trials in *Lancet* and *JAMA* were included in this analysis, therefore, making it different than previous meta-analysis on this topic. Studies that were limited to patients with chronic obstructive pulmonary disease, ventilator-associated pneumonia, aspiration pneumonia, or *Pneumocystis jirovecii* pneumonia were excluded from the analysis. Most of the studies were conducted in Europe and excluded patients at high risk for adverse effects from corticosteroids such as GI hemorrhage within three months, immunosuppression, and pregnant women. Most patients were male in their early 60s. The studies used a variety of corticosteroid agents with the duration of treatment ranging from 1 dose to 10 days.

The use of corticosteroids in CAP was found to decrease the need for mechanical ventilation and the rate of ARDS. The relative reduction in the need for mechanical ventilation was found to be larger in patients with less severe pneumonia than those with severe pneumonia. Corticosteroids were also found to significantly decrease time to clinical stability and duration of hospitalization. Time to clinical stability was defined as having all vital signs within normal range and not requiring supplemental oxygen. As far as duration of hospitalization, in all studies, patients were discharged at the discretion of the admitting physician. Detailed results are included in Table 1.

There were no differences noted between corticosteroid groups and control groups in the rate of ICU admission or all-cause mortality. However, a mortality benefit was demonstrated in patients that met the criteria for severe pneumonia (RR 0.39 [CI, 0.20 to 0.77]), but not in those with less severe pneumonia (RR 1.00 [CI, 0.79 to 1.26]). Definitions of severe pneumonia are provided in Table 2.

No effect was found on the risk of GI hemorrhage, neuropsychiatric complications, or rehospitalizations with corticosteroid therapy. However, most studies excluded
patients at high risk for these adverse effects. There was a significantly higher risk of hyperglycemia requiring treatment in those patients who were treated with corticosteroids compared to those who were not.

The use of corticosteroids was found to significantly decrease the need for mechanical ventilation, rate of ARDS, time to clinical stability, duration of hospitalization, and mortality in severe CAP compared to no corticosteroid therapy. There are still questions, however, about the optimal corticosteroid, dose of corticosteroid, and duration of therapy in CAP. These results cannot be applied to those patients excluded from the trials, including patients who are immunosuppressed, pregnant, at risk for neuropsychiatric events, or have had a recent GI hemorrhage.

An ongoing phase 3 randomized trial, with an estimated enrollment of 1,450 patients, will further clarify the role that corticosteroids may play in patients with severe CAP (ClinicalTrials.gov: NCT01283009). This trial will also help define which corticosteroid to use, what dose to use, and the optimal duration of treatment.

In conclusion, a recent meta-analysis that included two recently released trials has demonstrated beneficial effects of corticosteroids in patients with CAP highlighted by a significant decrease in mortality in patients with severe CAP.

### Table 1. Outcomes of corticosteroids in patients with CAP

<table>
<thead>
<tr>
<th>Outcome</th>
<th># of Studies (# of Patients)</th>
<th>Event Rates, n/N (%)</th>
<th>RR (CI)</th>
<th>Level of Certainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Ventilation (%)</td>
<td>5 (1060)</td>
<td>17/550 (3.1)</td>
<td>29/510 (5.7)</td>
<td>0.45 (0.26 to 0.79)</td>
</tr>
<tr>
<td>ICU Admission (%)</td>
<td>3 (950)</td>
<td>25/476 (5.3)</td>
<td>36/474 (7.6)</td>
<td>0.69 (0.46 to 1.03)</td>
</tr>
<tr>
<td>ARDS (%)</td>
<td>4 (845)</td>
<td>2/473 (0.4)</td>
<td>14/472 (3.0)</td>
<td>0.24 (0.10 to 0.50)</td>
</tr>
<tr>
<td>Time to Clinical Stability (days)</td>
<td>5 (1180)</td>
<td>3.5 d</td>
<td>4.7 d</td>
<td>-1.22 (-2.08 to -0.35)</td>
</tr>
<tr>
<td>Duration of Hospitalization (days)</td>
<td>3 (1288)</td>
<td>7.9 d</td>
<td>9.1 d</td>
<td>-1 (-1.79 to -0.21)</td>
</tr>
<tr>
<td>All-cause Mortality (%)</td>
<td>12 (1974)</td>
<td>52/977 (5.3)</td>
<td>79/997 (7.9)</td>
<td>0.67 (0.45 to 1.01)</td>
</tr>
<tr>
<td>Hyperglycemia Requiring Treatment (%)</td>
<td>6 (1534)</td>
<td>88/640 (13.8)</td>
<td>50/640 (7.7)</td>
<td>1.49 (1.01 to 2.19)</td>
</tr>
</tbody>
</table>

### Table 2. Definition of Severe Pneumonia

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Pneumonia Severity Index: score of IV or V</td>
<td></td>
</tr>
<tr>
<td>CURB-65 score: 2 or greater</td>
<td></td>
</tr>
<tr>
<td>2007 IDSA/ATS guidelines: 1 major or 3 minor criteria</td>
<td></td>
</tr>
<tr>
<td>British Thoracic Society: score of 3 or greater</td>
<td></td>
</tr>
<tr>
<td>ATS 2001 rule: 1 major or 2 minor criteria</td>
<td></td>
</tr>
<tr>
<td>ATS 1993: 1 criteria</td>
<td></td>
</tr>
<tr>
<td>IDSA: Infectious Diseases Society of America</td>
<td></td>
</tr>
<tr>
<td>ATS: American Thoracic Society</td>
<td></td>
</tr>
</tbody>
</table>

### REFERENCES

8. Torres A, Sibilia O, Ferrer M, et al. Effect of corticosteroids on treatment failure among hospitalized patients with severe community-acquired pneumonia and high inflammatory response: a randomized clinical trial. JAMA. 2015;313:677-86. Please note: Due to limited space, we are unable to list all references. You may contact South Dakota Medicine at 605.336.1965 for a complete listing.

**About the Authors:**
Claire Larson, PharmD Candidate, South Dakota State University.
Tadd Hellwig, PharmD, BCPS, Associate Professor, Department of Pharmacy Practice, College of Pharmacy, South Dakota State University; Clinical Pharmacist, Sanford Medical Center.
**Question:** Where was your home of origin and what was involved in your early years to prepare for your future career path?

**Answer:** I was born in Philadelphia in 1943, four months after my father, a Naval aviator and test pilot, was killed in a plane crash while on active duty. I had an older brother, and we were raised by a courageous and devout mother. I graduated from Notre Dame with a B.A. in liberal studies in 1965 and B.S. in mechanical engineering in 1966.

**Q:** You mentioned your “call” to medicine. When did that occur?

**A:** While still at Notre Dame, I felt I was being called to serve other people through the practice of medicine, so I entered Georgetown University School of Medicine in 1966 and received my MD from Georgetown in 1970.

**Q:** Did knowing of your father’s service in the Navy have any influence on your life?

**A:** While attending Georgetown, I joined a Navy program for medical students, and after graduating I did a rotating internship at Great Lakes Naval Regional Medical Center in Chicago. Then for three years I did an anesthesiology residency at the National Naval Medical Center, Bethesda, Maryland, completing that in 1974. For the next few years I returned to Great Lakes as the assistant chief of the anesthesiology department. I had 11 years in the Navy, including two years of inactive service while attending medical school.

**Q:** How did you end up in Sioux Falls?

**A:** In late 1977, I received a phone call from Dr. Bob Willix, who invited me to join Sioux Valley Hospital because they were getting ready to start an open heart surgery program. In February 1978, I joined with Dr. Ed Daw, an anesthesiologist at Sioux Valley.

**Q:** In what ways did your responsibilities as an anesthesiologist increase at Sioux Valley Hospital?

**A:** In March 1978, I administered anesthesia for the first open heart surgery in Sioux Falls. In February 1981, Dr. Richard Belatti and I formed Anesthesia Physicians Ltd., the anesthesiology group at what was then Sioux Valley Hospital. That group continues to this day. Although initially part of the surgery department, anesthesiology became a separate department in 1985. I served as medical director of anesthesiology at Sioux Valley from 1985 through 2000.

**Q:** Was there any event in your life which impacted you immensely?

**A:** In 2000, after 28 years of marriage, my wife and I were divorced. That impacted me immensely. After receiving my annulment and looking back at this experience, I believe that this event, in part, began to lead me to eventually consider my “call” to the priesthood and would allow this, and other experiences, to be used for the benefits of others. My former wife and I remain good friends to this day.

**Q:** Because of your willingness to be vulnerable in sharing that part of your life, how did your calling to the priesthood all come together?

That is a seminary for the formation of priests who had previous careers. After having surgery for cancer of the bladder and prostate in Boston on May 1, 2008, I was ordained as a priest on May 30, 2008, in Sioux Falls.

Q: In what areas have you served after becoming a priest?

A: I spent two years as an associate pastor at Saint Lambert Catholic Church in Sioux Falls. Since 2010, I have been the Catholic chaplain at Avera Prince Of Peace and the Dougherty Hospice House. In addition, since June 2014, I have been the Catholic chaplain at the Royal C. Johnson Veteran’s Hospital. Furthermore, for the past four years I have been president of the Sioux Falls Ministerial Association. I am also the Bishop’s representative for medical ethics.

Q: Having spent nearly four decades of service in South Dakota, how would you summarize the areas of your life in which you’ve been called?

A: Physicians have a calling of the heart and I’ve always thought there was a certain spirituality in practicing medicine because God is involved in the healing. My call to the priesthood was a continuation of spirituality in the profession of medicine. It was also one from the heart, almost a longing for God, who seemed to be telling me to serve others’ spiritual health, not just their emotional and physical health. I believe that my experiences both in the practice of medicine and in life have helped me become a better and more understanding priest to those I serve. Understanding where they are emotionally and physically also helps me to understand where those I serve are spiritually.

A final question is addressed for the reader to answer. Would you be willing to respond to a second “calling” when you retire from serving in your profession?

About the Author:
South Dakota Board of Medical and Osteopathic Examiners

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Quality Focus:

National Colorectal Cancer Initiative

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

“80% by 2018” is a National Colorectal Cancer Roundtable initiative in which organizations are committing to eliminating colorectal cancer as a major public health problem and are working toward the shared goal of reaching 80 percent of adults aged 50 and older screened for colorectal cancer by 2018. The National Colorectal Cancer Roundtable, an organization co-founded by the American Cancer Society and the Centers for Disease Control and Prevention, is using this March, National Colorectal Cancer Awareness Month, to rally organizations behind this shared goal.

Thanks in part to the work of many of these leaders, colorectal cancer mortality rates have dropped by over 30 percent in the U.S. and over 37 percent in South Dakota among adults 50 and older in the last 15 years, with a substantial fraction of these declines due to screening. This evolving public health success story is good news; however, colorectal cancer remains the second-leading cause of cancer death in the U.S. and in South Dakota when men and women are combined. To reach the 80 percent goal in South Dakota, we must reach the thousands of South Dakotans between the ages of 50 and 75 who are not being regularly screened.

The principal challenge to reaching the 80 percent goal is that those who are still unscreened will be the most difficult to reach. This calls for a robust, coordinated effort to extensively reduce colorectal cancer as a major public health problem, to make sure that all South Dakotans are benefitting equally from life-saving technology and to sustain the progress we make. The map on the following page illustrates where we have the most work to do.

Achieving the 80 percent by 2018 is an ambitious goal, but leaders have led us to this moment. Utilizing an ambitious strategic plan that focuses on moving consumers to action, promoting practice improvement and systems change, and bringing down policy barriers and defining accountability, we can assure our continued successes. Over 500 organizations – including medical professional societies, academic centers, survivor groups, government agencies, cancer coalitions, cancer centers, payers and many others – have signed a pledge to make this goal a priority.

As a primary care physician, here are five things that you can do to be a part of 80 percent by 2018:

1. Understand the power of the physician recommendation.
2. Measure the colorectal cancer screening rate in your practice; it may not be as high as you think.
3. Use evidence-based practice changes to systematize screening in your office. More screening doesn’t have to mean more work for you.
4. Understand the screening options for colorectal cancer. Educate your patients and staff on the various, often less expensive, testing options.
5. Make sure that patients and staff understand that most insurance companies are required to cover colorectal cancer screening.

For more information, please contact Great Plains QIN/South Dakota Foundation for Medical Care at 605.336.3505 or email me at stephan.schroeder@area-a.hcqis.org.

Adapted from NCCRT’s new 80% by 2018 blog at http://ncrtr.org/welcome-2016-nccrt-new-blog/.

REFERENCES

South Dakota Colorectal Cancer Screening Rates
Medicare Claims Data (Age 50-75): 3Q2014 through 2Q2015

This material was prepared by the Great Plains Quality Innovation Network, the Medicare Quality Improvement Organization for Kansas, Nebraska, North Dakota, and South Dakota, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. 11SO W-GPQIN-SD-SIP1-124/0216

*Screening tests included: Colonoscopy, Sigmoidoscopy, FOBT, Barium Enema

Lowest Group
Middle Group
State Rate – 46.2%
4th Group
Highest Group

This material was prepared by the Great Plains Quality Innovation Network, the Medicare Quality Improvement Organization for Kansas, Nebraska, North Dakota, and South Dakota, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. 11SO W-GPQIN-SD-SIP1-124/0216

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

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AMA

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Please activate your 2016 AMA membership through the South Dakota State Medical Association by calling (605) 336-1965.
There are some 200 different kinds of headaches, and about 90 percent are of the non-dangerous type. We're not talking about how miserably or painfully headaches can be, just that most are not dangerous. This is about how to recognize when a headache might be dangerous, and when to come in and see the doctor or care provider.

I was an intern working in a big city hospital emergency room one late afternoon autumn day in Georgia, when a tall 40-something-year-old guy lumbered into my tiny exam room with the worst headache he'd ever had. He was a hiker who spent a lot of time out in the woods with his dog, but who was so miserable he wanted nothing to do with hiking this day.

He was running a 102 degree fever and he hurt everywhere I touched, especially when I bent his head forward. He had a light pink rash especially on the palms and he reported plenty of exposure to ticks lately. To make a long story short, the tests take a week to come back, but we treated him for Rocky Mountain spotted fever and later proved that was the case.

What clues are there to know when to do more than just cover up a headache with pain medicines?

In general people are safe if the headache is associated with a viral syndrome; is something similar to headaches in the past and has been defined already as migraine, tension, or neck arthritis headache; is occurring in a person otherwise healthy; or is accompanied by no other significant new physical or neurological symptom.

On the other hand, people are not so safe if the headache is completely different than any previous headache; is the worst headache ever; strikes suddenly like a thunderclap; is associated with a significant fever, generalized illness, stiff neck, or weight loss; comes with new one-sided face, arm, leg weakness, or vision change; or is a new progressively worsening headache that is happening in someone over 40 years of age.

Of course, these are just guidelines. If you have any question, seek professional help.

My woods walker had an unusual and severe headache with a generalized illness, and if not treated early, might have resulted in his death. As an intern, I was glad I had been listening during the lecture on the causes of headaches.
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- Doctor of the Day – serve as the physician for the South Dakota State Legislature for one day during session;
- Physician lobbyist – serve as a volunteer lobbyist during the legislative session;
- SDSMA PAC – help friends of medicine become elected officials and lawmakers;
- SDSMA committees and task forces – serve the organization and yourself;
- SDSMA appointments to state boards, committees and commissions – the SDSMA is asked to nominate and recommend physicians to fill positions to numerous vacancies every year;
- Membership sections for medical students, residents, young physicians, and senior physicians – needs vary at different points throughout a physician’s career, and we need leaders at each stage; and
- Districts and specialty societies – for local involvement.

If you’d like to get involved, give us a call at 605.336.1965 or visit www.sdsma.org for more information.

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

Registration Now Open For the 2016 SDSMA Annual Leadership Conference

Save the Date! The 2016 SDSMA Annual Leadership Conference – with a new schedule and new events – heads back to the Hilton Garden Inn, Downtown Sioux Falls on Friday, June 3.

| WHAT: | 2016 SDSMA Annual Leadership Conference |
| WHEN: | Friday, June 3 |
| WHERE: | Hilton Garden Inn, Downtown Sioux Falls |

With presentations, discussions, networking opportunities and social events, the Annual Leadership Conference is a great time to share ideas and learn from fellow members.

Check out the new schedule and new events! Do you have an issue you’d like to bring to the SDSMA's attention? Schedule a time to address the Council by contacting the SDSMA office at 605.336.1965 or visit www.sdsma.org. Visit www.sdsma.org for more information and registration.

The Annual Leadership Conference is a benefit of your membership. For the latest details about exciting events taking place during the 2016 SDSMA Annual Leadership Conference, visit www.sdsma.org.

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8:30 a.m. | Membership Meeting with presentations from AMA President Dr. Steven Stack and SSOM Dean Dr. Mary Nettleman
9:30 a.m. | Medical Marijuana Panel Discussion
11 a.m. | Open Forum
12 p.m. | SDSMA PAC Lunch on Human Trafficking
1:30 p.m. | Council Meeting
6 p.m. | Membership Mixer
7 p.m. | Awards Banquet & Scholarship Recognition

Source: SDSMA staff
The Issue Is...

Bipartisan Bill Would Expand Telemedicine

The Creating Opportunities Now for Necessary and Effective Care Technologies (CONNECT) for Health Act recently introduced in Congress would expand the use of telemedicine to achieve quality care for patients.

The bill reflects that the appropriate use of telemedicine can greatly improve access to quality care while maintaining patient safety. According to an independent study by Avalere Health, the bill could save $1.8 billion over 10 years.

“This legislation has the potential to remove barriers to new health care delivery models that promote coordinated and patient-centered care. Importantly, the bill aims to maintain high standards whether a patient is seeing a physician in an office or via telemedicine,” said American Medical Association President Steven J. Stack, MD. “Telemedicine can strengthen the patient-physician relationship and improve access for patients with chronic conditions and limited access to quality care.”

Source: AMA staff

Legal Brief Highlight: Restrictive Covenants

South Dakota law generally restricts geographic and length of time provisions in employment agreements that prohibit former employees from competing with a former employer. Restrictive covenants are unethical if they are excessive in geographic scope or duration, or if they fail to make reasonable accommodation of patients’ choice of a physician.

The SDSMA has adopted the position of the AMA Council on Ethical and Judicial Affairs that restrictive covenants restrict competition, disrupt continuity of care, and potentially deprive the public of medical services, and because of those reasons, the SDSMA believes restrictive covenants should be discouraged in physician employment agreements.

For more information, download the SDSMA legal brief Restrictive Covenants at www.sdsmo.org. Through the SDSMA Center for Physician Resources, the SDSMA has developed more than 40 legal briefs that are available to members. In addition, the Center develops and delivers and programs for members in the area of practice management, leadership and health and wellness.

Source: SDSMA staff

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Avoid Meaningful Use Penalties

Physicians have until March 15 to apply for a hardship exemption from the electronic health record (EHR) meaningful use financial penalties for the 2015 program year. Those who don’t apply could face up to a 3 percent cut in their Medicare payments in 2017 since the meaningful use program operates on a two-year look-back period. The good news is that exemptions will be granted broadly this year.

The Centers for Medicare & Medicaid Services (CMS) has stated that it will broadly grant hardship exemptions as a result of the delayed publication of the Stage 2 meaningful use modifications rule, which left physicians with insufficient time to report under the modified program requirements issued in late 2015.

This inclusive approach to hardship exemptions is a result of the Patient Access and Medicare Protection Act, passed just before Congress adjourned for the holidays, which directed CMS to make AMA-supported changes to the previously limited exemption process.

All physicians are encouraged to apply for the exemption. Even physicians who believe they met the requirements of the meaningful use program in 2015 can apply. Submitting an application for a hardship exemption will not prevent those who qualify from receiving an incentive payment.

Applications must be submitted before 12 a.m. ET March 15. To get started, download an application from www.cms.gov. The American Medical Association website at www.ama-assn.org provides step-by-step instructions to help simplify the submission process. New this year, individuals can apply on behalf of a group of physicians.

While CMS has given a deadline for applications, it has not yet indicated when physicians will receive confirmation of their exemption status.

Source: AMA

2016 SDSMA Annual Conference Sponsorship and Advertising Opportunities

The SDSMA Annual Conference is a perfect opportunity for organizations of all sizes to advertise their products and services to current and potential customers. The 2016 Annual Conference will be held on Friday, June 3, 2016 at the Hilton Garden Inn in Downtown Sioux Falls. As a sponsor or advertiser, you will have the opportunity to market your technologies, services, pharmaceuticals and other products. This is a valuable opportunity to reach key health care leaders from across South Dakota.

Diamond sponsors have the opportunity to attend the Membership Mixer and Awards Banquet on Friday evening to visit with physician members. Sponsorship and advertising options are available in many varieties to meet the needs of all organizations.

Check out the all NEW sponsorship and advertising opportunities for 2016 at sdsm.org. The sponsor and advertiser registration form along with a description of each sponsorship category and advertising option is available there. Complete the registration form and reach South Dakota physicians. Those with questions may contact Laura Olson at 605.336.1965 or lolson@sdsm.org.

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