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RESIDENCY PROGRAM

Scholarly and Community Health Projects

from the Class of 2013

STEVE ALMASI, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

A review article published in the February 2012 issue of the Wisconsin Medical Journal: “An Update on the Diagnosis and Management of Concussion.”

Community Health Project:

The Verona Community Garden was a vision shared by former residents Patrick McKenna and James Bigham. They created a community garden on the Verona Clinic property in an effort to raise awareness of healthy lifestyles and to provide healthy food to clinic patients. Current residents Andrew Schmitt and Steve Almasi share the original vision of Patrick and James. Their current community medicine project is to carry on the Verona garden by replanting the garden, sharing produce with patients, and raising awareness about the importance of healthy diet.



A Wisconsin native, Steve earned his bachelor’s degree in Biomedical Engineering from UW-Madison before heading west to complete a master’s degree in Integrative Physiology from the

University of Colorado at Boulder. The Badger State ultimately called him back, however, and he earned his medical degree at the University of Wisconsin School of Medicine and Public Health. During medical school, Steve was a regular volunteer at the local MEDiC clinics, and he held a leadership role with Doctors Ought to Care, an organization dedicated to the promotion of healthy lifestyles in young people. His interests include preventative and sports medicine, fueled in part by his own passion for exercise. A long time runner and cross-country skier, he has competed in numerous endurance events, including the Chicago Marathon, the American Birkebeiner, and the 2007 Wisconsin Ironman. He also enjoys traveling and has taken several extended backpacking trips in wilderness areas throughout North and South America.



Thank you to my partner Anne, my parents and my sister for their support and patience during my medical training. Thank you to John Wilson for the time and energy he shared as my sports medicine mentor. Thank you to Benji, Tony and Will; I can’t imagine better residency colleagues.

– Steve

An Update on the Diagnosis and Management of Concussion

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ABSTRACT

Concussion is a common medical problem with significant morbidity and sometimes devastating consequences. Awareness of this injury has increased dramatically in recent years, and our understanding of its pathophysiology and treatment is rapidly evolving. This article reviews the current concepts of concussion pathophysiology and epidemiology, and will provide an overview of proper diagnosis and management. Complications and risk reduction also will be reviewed. By understanding the essentials of concussion medicine, health care professionals will be equipped to manage this injury, including common complications.

INTRODUCTION

Concussion is a common medical problem with significant morbidity and, rarely, devastating complications. Awareness of this condition and the importance of proper management has increased significantly in recent years. High profile cases involving athletes, large numbers of American armed services personnel sustaining battlefield injuries, as well as new research revealing the long-term risks of this injury have brought concussion to the forefront of mainstream medicine and the mass media. The goal of this article is to provide physicians with a review of the current state of concussion medicine including recommendations for management and strategies to minimize risk of both short- and long-term complications.

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Definition

The currently accepted definition of concussion established in 2008 is as follows:

Concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:

1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an “impulsive” force transmitted to the head.
2. Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.
3. Concussion may result in neuropathological changes but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury.
4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in a small percentage of cases post-concussive symptoms may be prolonged.
5. No abnormality on standard structural neuroimaging studies is seen in concussion.¹

Notably absent from the current definition of concussion are the previously used grading systems that were abandoned in 2001.² In 2004, a classification system including simple and complex concussion was established.³ A simple concussion was defined as an injury that progressively resolves without complication over 7 to 10 days. In contrast, complex concussion was defined as an injury with persistent symptoms, specific sequelae such as concussive convulsion, loss of consciousness lasting more than

CME

CME available. See page 28 for more information.

Table 1. Signs and Symptoms of Concussion

Physical	Cognitive	Emotional	Sleep
Headache	Feeling mentally “foggy”	Irritability	Drowsiness
Nausea	Feeling slowed down	Sadness	Sleeping less than usual
Vomiting	Difficulty concentrating	More emotional	Trouble falling asleep
Balance problems	Difficulty remembering	Nervousness	
Dizziness	Forgetful of recent information		
Visual problems	or conversations		
Fatigue			
Sensitivity to light	Confused about recent events		
Sensitivity to noise	Answers questions slowly		
Numbness/Tingling	Repeats questions		
Dazed or stunned			

one minute or prolonged cognitive impairment. This classification system was discarded in 2008 amid concerns that it did not adequately describe concussions. It has been replaced by a group of modifying factors that help assess the severity of an injury (discussed further in the Management section).

Pathophysiology

The most common mechanism of head injury is dynamic loading caused by either direct impact to the head or by impulse, a sudden movement of the head produced by an impact elsewhere. Both impact and impulse injuries produce acceleration forces that can damage the brain.⁴ It appears that rotation of the head is necessary to produce diffuse lesions in the brain, causing concussion, while translation of the head in the horizontal plane tends to produce focal lesions such as cerebral contusions and intracranial hematomas.⁵

The neurometabolic response to concussion has been studied in animal models. Biomechanical injury to the animal brain triggers unchecked neurotransmitter release and ion flux through channels in the axonal membrane. An acute efflux of potassium depolarizes the neuronal cellular membrane. The sodium-potassium pump utilizes increasing amounts of adenosine triphosphate in an effort to restore the membrane potential. This hypermetabolic state in the presence of relatively decreased cerebral blood flow creates an energy deficit that may account for post-concussive symptoms, as well as injury vulnerability, leaving the brain less able to respond to a second injury or leading to more persistent deficits.⁶

Epidemiology

Traumatic brain injury (TBI) is a common medical problem in the United States with an estimated 1 million to 1.5 million injuries occurring each year.⁷ Of these injuries approximately 85% are considered mild traumatic brain injuries or concussions.⁸ Other estimates of the number of concussions occurring annually are as high as 3.8 million injuries per year.⁹ The

incidence is difficult to measure due to the difficulty in diagnosis, lack of public awareness, and athletes frequently under-reporting symptoms with the goal of returning to play.¹⁰ The leading causes of concussions treated in emergency departments are falls, motor vehicle collisions, unintentional head trauma, assaults, and sports. The frequency of these mechanisms varies with age. At the extremes of age, falls are the most common cause of concussion. Assaults and motor vehicle collisions are most common among middle-aged adults, while sports and bicycle

accidents are most common in children and teens.⁸

A subset of the American population with an unfortunately high incidence of TBI is military personnel deployed to Iraq and Afghanistan. Since 2001, over 1.5 million American military personnel have served and an alarming rate of 22% of all wounded soldiers have suffered a traumatic brain injury.¹¹ A recent study of 2500 US Army infantry soldiers returning from a 1-year tour of duty found an incidence of concussion of 15%.¹² This study defined concussion as an injury involving loss of consciousness or altered mental status. Compared to previous US military conflicts, the incidence of TBI has increased significantly, for several likely reasons. Advanced body armor allows soldiers to survive blasts that would have been deadly in previous wars. The frequency of blast attacks from improvised explosive devices predisposes current soldiers to concussive injuries. Finally, both soldiers' and the medical community's understanding of these injuries has increased significantly, likely resulting in increased diagnosis.¹³

The epidemiology of sports-related concussion has been well studied. It is estimated that 1.6 million to 3.8 million sports-related concussions occur annually. Of these, only 300,000 result in a loss of consciousness.⁹ Among 15 to 24 year olds, sports-related concussions are second only to motor vehicle crashes as the leading cause of TBI.¹⁴ Sports-related concussions are reported to be more common in females in sports with both male and female participants.¹⁵ It has been postulated that this is due to relatively decreased lower neck strength and girth, which results in greater head acceleration after impact.¹⁶ Among high school and collegiate athletes, concussion rates were highest in football and soccer.¹⁵ In all sports, collegiate athletes had a higher rate of concussion than high school athletes.¹⁵

DIAGNOSIS

Signs and Symptoms

The signs and symptoms of concussion fall into 4 categories: physical, cognitive, emotional, and sleep (Table 1).¹⁷ Headache

is the most common symptom with frequency between 40% and 86%.¹⁸ The constellation of signs and symptoms in a given patient traditionally has been thought to offer insight into the severity of injury and need for further diagnostic testing. However, the importance of various symptoms in terms of predicting injury severity and prognosis is unclear and remains an area of debate. One early review found that loss of consciousness (LOC) at the time of concussion signals a more serious injury and carries a greater risk of associated intracranial pathology.¹⁹ However, a subsequent study found no difference in post-concussion neuropsychiatric testing results between patients who had or had not suffered LOC with their injury.²⁰ Another review found that amnesia, not loss of consciousness, was the symptom most predictive of symptom and neurocognitive deficits.²¹

Initial Evaluation

The initial evaluation of a patient with a suspected concussion, conducted in an emergency department, office setting, or sporting event, should focus on several important areas. The history should cover common symptoms of concussion and review any past head injuries. The physical exam should include a neurologic exam (focused on mental status, balance, and gait) and examination of the cervical spine and head. A brief assessment of cognitive function also should be conducted. This may include 5-word recall, naming the months in reverse order, and reading random digits back in reverse order. Pocket-card concussion assessment tools, such as the Sport Concussion Assessment Tool (SCAT2) guide clinicians through a standardized evaluation. The SCAT2 is a collection of several previously validated assessment tools and symptom lists.¹ The final step in the initial assessment is determining the need for neuroimaging. While early studies suggested that all patients with loss of consciousness or amnesia after head injury should have a cranial computed tomography (CT) scan in the emergency department, subsequent findings refuted this approach.²² The majority of patients (65%-85%) presenting to emergency departments after minor to moderate head injury have a Glasgow Coma Scale (GCS) of 15. Often, these patients do not require neurologic imaging. One study examining 2143 patients presenting to a large, urban level 1 trauma center with head trauma and a GCS of 15 found that no patients with the absence of nausea, vomiting, severe headache, and skull depression required neurosurgical intervention. Only 3.7% of these patients had abnormalities on head CT, none of which were clinically significant.²³ The current International Conference on Concussion in Sport consensus recommends neurologic imaging only in situations of prolonged alteration of consciousness, focal neurologic deficit, or worsening symptoms.¹

When imaging is necessary, CT is the test of choice for the diagnosis of intracranial pathology in the first 24 to 48 hours

after injury due to its availability, relatively low cost, and capability to detect fracture and intracranial hemorrhage. Forty-eight to 72 hours after injury, magnetic resonance imaging (MRI) becomes the superior imaging modality due to its ability to detect hematoma, contusion, and axonal injury.²⁴ However, the majority of concussed patients have no structural pathology and will therefore not have any abnormality on CT or MRI. The abnormalities in these patients' brains are more likely to be metabolic, raising the potential application of functional MRI (fMRI).²⁵ This potential was demonstrated in a study of high school athletes when the degree of brain activation detected with fMRI was found to be associated with symptom duration and performance on neuropsychological testing.²⁶ For now, fMRI remains experimental and needs further research before being used for routine evaluation of concussion.

Neuropsychological Testing

Traditionally the diagnosis and management of concussion has relied heavily on the patient's self-reporting of symptoms. Because symptom resolution often precedes cognitive recovery and because patients may not report symptoms in an effort to return to activity, the addition of neuropsychological testing can be a useful adjunctive tool in monitoring recovery after concussion.²⁷ Currently, neuropsychological testing is conducted most commonly with computerized tests, although paper versions are also available. While several computerized neuropsychological tests are available (Axon Sports, Concussion Vital Signs, Headminder, Automated Neuropsychological Assessment Metrics), the ImPACT (Immediate Post-concussion Assessment and Cognitive Testing) battery has been validated extensively and is used commonly.²⁸ The National Football League, National Hockey League, Major League Baseball, and many collegiate and high school teams currently use ImPACT testing.²⁹ Neuropsychological tests commonly evaluate the athlete's decision-making ability, reaction time, attention, memory, and cognitive processing speed in an objective fashion. The value of neuropsychological testing lies in its ability to detect patients who are asymptomatic following a concussion but still are suffering from lingering neurocognitive effects of the injury. Neuropsychological testing is used commonly to assist clinicians in determining whether to return an athlete to competitive play following a concussion. However, neurocognitive testing can miss concussions and therefore must be used along with clinical judgment, never in isolation, when making return-to-play decisions. It has been shown that athletes who have suffered a concussion but are asymptomatic perform below controls on neuropsychological testing, and their symptoms resolve prior to return of baseline cognitive function.³⁰ One study found that 2 days after concussion 64% of athletes had significant symptoms while 83% demonstrated poorer

Table 2. Factors Influencing Concussion Management and Return to Play

Factors	Modifier
Symptoms	Number Duration (>10 days) Severity
Signs	Prolonged loss of consciousness (>1 minute)
Sequelae	Concussive convulsions
Temporal	Frequency—repeated concussions over time Timing—injuries close together in time “Recency”—recent concussion or traumatic brain injury
Threshold	Repeated concussions occurring with progressively less impact force or slower recovery after each successive concussion
Age	Pediatric (< 18 years old)
Co- and pre-morbidities	Migraine, depression or other mental health problems, attention deficit hyperactivity disorder, learning disabilities, sleep disorders
Medication	Psychoactive drugs, anticoagulants

performance on neurocognitive evaluation—a net increase of 19% in sensitivity.²⁷

MANAGEMENT

Cognitive and physical rest are the fundamental treatments of concussion. Considering the postulated energy crisis occurring in the brain after a concussion this treatment regimen is intuitively logical.⁶ Cognitive rest involves minimizing activities that require concentration and attention. Unnecessary reading, schoolwork, television watching, texting, and video games should be avoided. For acutely symptomatic patients, staying home from school or work is advisable in the initial days after concussion. Once symptoms have improved or resolved patients may begin shortened work days with decreased work loads.³¹ Students may benefit from short periods of reading and studying with frequent breaks, and may require extended time to complete examinations or assignments until they have fully recovered. Adequate physical rest involves avoiding any activity that could result in a second concussion and all strenuous activity including both aerobic and resistance training. Once a patient is able to return to a full work or school schedule without symptoms or medications for concussion symptoms, they may initiate a return to physical activity. Athletes are currently advised to follow a slow, stepwise return to play. This involves slowly progressing from no activity to light aerobic exercise, sport-specific exercise, noncontact training drills, full-contact practice and finally return to play. Each step in this plan may be completed in 24 hours if no symptoms occur or recur. A recent study demonstrated that strenuous physical activity in patients suffering from concussion resulted in poorer neurocognitive testing scores when compared with patients engaging

in intermediate levels of activity.³² This finding supports the use of the currently accepted graded return to activity protocol. If symptoms do occur, the athlete should return to the previous activity level before progressing.³³

Deciding when an athlete should return to play is rarely an easy decision. The fundamental rules are that an athlete should never return to play on the day of a concussion and must have full clinical and cognitive recovery before returning to play.³⁴ However, some experts agree that same-day return to play may be considered in adult athletes when adequate resources are present: a team physician experienced in concus-

sion management, access to neurocognitive testing, and neuroimaging.¹ Several modifying factors also influence concussion management and return to play (Table 2).¹ When these factors are present the patient should be cared for by a physician with experience in concussion management.¹

Most patients will recover from concussion spontaneously within 1 week. However, the length of time to recover depends on age. Athletes younger than 18 years old may take from 7 to 14 days to recover.^{35,36} The National Collegiate Athletic Association concussion study found that on average, concussed collegiate football players had resolution of symptoms within 7 days, regained baseline cognitive function within 5 to 7 days and had normal balance within 5 days. However, 10% of players required more than 7 days for symptoms to resolve.³⁷ If a patient's symptoms have exceeded the expected duration, or the symptoms are negatively affecting their ability to function, pharmacotherapy may be considered. Headache pain management during the acute symptomatic period can be treated with analgesics such as acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs). Aspirin should be avoided due to theoretical concerns of increased bleeding risk. If sleep hygiene is not adequate, diphenhydramine, melatonin, or other prescription sleep medications may be used for sleep disturbance. Finally, tricyclic antidepressants and selective serotonin reuptake inhibitor antidepressants may be used for persistent mood disturbances.³⁸

COMPLICATIONS

The complications of concussion, though rare, are potentially serious. Recently the potential for long-term complications of recurrent mild traumatic brain injury as commonly suffered in professional football players has gained widespread attention

in the mass media. However, the risk of recurrent mild head trauma has been appreciated in sport for many years. Originally studied in boxers, it was first known as the “punch drunk” or “slug nutty” state and eventually came to be called dementia pugilistica.³⁹ Currently, the clinical and neuropathologic consequences of repeated mild head injury are known as chronic traumatic encephalopathy (CTE). The disease manifests years or decades after the inciting head injury(ies) with effects on behavior, cognition, and movement. Behavioral changes are often the first sign and include increased irritability, anger, apathy, or suicidality. Cognitive changes may occur early in the disease course as well and may include loss of executive function and poor memory. Dementia, movement, and speech disorders can develop late in the course of the disease.⁴⁰ The characteristic neuropathology seen in CTE is the deposition of neurofibrillary tangles and neuropil threads throughout the neocortex. These neurofibrillary inclusions are made up of the tau protein.⁴¹ The prevalence of this disease in people who have suffered concussions and the factors that increase susceptibility have yet to be elucidated.

Postconcussion syndrome (PCS) is another potential complication of concussion. It is defined as the persistence of post-concussive symptoms beyond the expected time frame of 1 to 6 weeks.⁴² The incidence is estimated to be approximately 10%. Comorbid psychiatric illness, advanced age, heightened symptoms, and intense emotions at the time of injury are all apparent risk factors for developing PCS.⁴³

A widely feared complication of concussion is the second-impact syndrome. While very rare, it may have devastating consequences. It is proposed to occur when someone who is still recovering from a recent concussion suffers a second head trauma. Significant morbidity and even death can result from the proposed mechanism of diffuse cerebral edema caused by cerebral vascular congestion, which can progress to brainstem herniation.⁴⁴ Some doubt that the cause of diffuse cerebral edema is 2 closely spaced injuries, arguing instead that a rare physiologic vulnerability may predispose some patients to developing cerebral edema after a single minor head trauma.^{45,46} What appears to be more clear is that the risk of a second concussion is higher in the 7 to 10 days after an initial concussion.⁴⁶

RISK REDUCTION

Concussion risk reduction initiatives include education, use of protective equipment, rule changes, and legislation. While public awareness and professional understanding of the frequency and dangers of concussion are improving, there is still significant progress to be made. A recent survey of high school and collegiate certified athletic trainers revealed that while they

would not allow an athlete to return to play if still symptomatic (95%), they would allow an athlete still scoring below baseline on ImPACT testing to return to play (89%).⁴⁷ Another study found that 15% of concussed high school football players returned to play before the currently accepted guidelines would allow.⁴⁸ While athletic trainers are responsible for concussion management at many larger schools, this is often the responsibility of coaches and staff without any medical training at smaller schools. A survey of New England high school football coaches without access to athletic trainers found that the coaches had a much better understanding of concussion than the general public. However, 30% of coaches stated they would allow an athlete to return to play after a head injury that left them appearing to move clumsily, and 5% would allow an athlete back into the game after a loss of consciousness.⁴⁹ This study also offered an interesting insight into concussion education. It revealed that most coaches received concussion education from coaching associations and conferences. The CDC concussion kit, “Heads Up” was the most helpful source, but also the least used/received. The CDC has educational materials for coaches, clinicians, parents and athletes available for order at no charge from its website.¹⁷

The use of mouth guards, new football helmets, and proper heading technique for the prevention of concussion all have been studied. While mouth guard use significantly reduces the risk of orofacial injuries, there is no evidence of preventing concussion.⁵⁰ Recently, new football helmet designs have been introduced with the goal of reducing the risk of concussion. One study revealed decreased rates of concussion with the new helmets.⁵¹ However, additional large trials are needed to conclusively prove that new helmet technology can prevent concussions. While the majority of concussions sustained in soccer are the result of collision rather than heading the ball, prevention has focused on the latter. Proper heading technique, including tensing the neck muscles prior to impact and striking the ball at the hairline on the forehead are the most effective preventative strategies. There is currently insufficient evidence to support the use of protective headgear for preventing concussion in soccer.⁵²

Rule changes and their enforcement are an essential element of concussion prevention. In 2010 the National Football League expanded rules protecting defenseless players by banning direct blows to the head.⁵³ The Wisconsin Interscholastic Athletic Association (WIAA), the governing body for high school athletics in Wisconsin, recently adopted a new rule that directs game officials to remove any football player from competition if they show signs, symptoms, or behavior consistent with concussion. This supplements the WIAA protocol for concussion which specifies that: (1) no athlete should return to

play or practice on the day of a concussion; (2) any athlete suspected of having a concussion should be evaluated by a health professional that day and medically cleared prior to resuming practice or competition; and (3) after clearance, return to play should follow a stepwise protocol.⁵⁴

Legislation regulating concussion management aims to prevent the potentially catastrophic effects of the injury. A law regulating concussion management was passed initially in the state of Washington in 2009 and many states have since passed similar legislation. In May of 2011, a bill was introduced to the Wisconsin State Legislature that would require children and adolescents with symptoms consistent with concussion to receive written permission from a health professional before returning to organized athletic activities. The Wisconsin Medical Society, WIAA and Brain Injury Association of Wisconsin all support this legislation.⁵⁵

CONCLUSION

Concussion is a common medical problem with significant morbidity and potentially devastating complications. As active research advances our knowledge of concussion, health care professionals must continue to improve their understanding of this injury in order to provide excellent patient care and to lead public health initiatives aimed at risk reduction.

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JENSENA CARLSON, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

A “Topics in Maternity Care” article published in the June 2011 issue of *Evidence-Based Practice*: “Should we give anti-D immunoglobulin to Rh-negative women with first trimester bleeding?”

Community Health Project:

The UW Belleville Family Medicine Clinic’s Community Vegetable Garden -- Gardening can be a relaxing and renewing activity; it is also a wonderful opportunity for access to and investment in fresh foods. Dr. Sarah Galewyrick and I took advantage the outdoor space at our new clinic to start a community garden. We solicited community involvement and last spring installed two raised beds next to the clinic. The limited produce that grew in this past dry year was shared with the clinic staff and patients. This spring we hope to again plant these beds as well as increase the visibility of fresh food with information and recipes in our front lobby.



Jensi Carlson is a proud Wisconsin native and completed both her undergraduate and medical degrees at UW–Madison. Her interest in family medicine was affirmed as a third-year medical student, when she completed a five-month

longitudinal rural rotation in Black River Falls, WI (population 3,600). She worked with the 14 family physicians at the sole clinic in Jackson County. The breadth of experience that the rural clinic afforded, as well as the relationships she was able to build with patients, convinced her that she had found her calling. Throughout medical school, Jensi was active in the Family Medicine Interest Group, and she served as co-leader during her second year. She also volunteered at the student-run MEDiC clinics that serve homeless and uninsured populations in the Madison area. In addition, Jensi was the bassist for the Arrhythmias, a medical school cover band and tradition for over 20 years. During residency Jensi has had the opportunity to serve as the resident board member of the Wisconsin Academy of Family Physicians and enjoyed sharing her love of Wisconsin with applicants as a recruitment committee co-chair. Outside of medicine, some of Jensi’s hobbies include camping, gardening, and music. She also enjoys traveling with her family.



Thank you to all of my residency classmates who made this not only survivable, but even at times fun. Special thank you to my intern partner, Bryan Webster, who brings a level of enthusiasm to life that I can only hope to achieve. I also extend a well deserved thank you to my parents for their unending support and encouragement. Thank you to my brother for being an excellent sounding board and cat sitter. Thank you to my auxiliary support for their love and travel companionship - my Aunt Lois, Uncle Rolf, and Gma and Gpa Carlson in particular. Without all of you I would not be who I am or be constantly striving to “live up to my potential.” And finally, On Wisconsin!

– Jensi

Should we give anti-D immunoglobulin to Rh-negative women with first trimester bleeding?

Bottom line

Little solid evidence exists for or against the use of anti-D immunoglobulin (RhIG) in women with first trimester bleeding who have a viable intrauterine pregnancy. Both the benefits of administering RhIG (a theoretical reduction of alloimmunization) and potential harms (other than the known cost) are likely small. Guidelines conflict on their recommendations.

Evidence summary

Most alloimmunization events occur at delivery and in the 72 hours after birth. Only 10% occur antenatally, likely due to fetomaternal hemorrhage (FMH), which happens predominantly in the third trimester.¹ For this reason, RhIG is recommended at 28 weeks' gestation and after delivery of an Rh-positive infant, with a subsequent risk reduction of Rh D alloimmunization during a first pregnancy from 1% to 0.2%.²

No RCTs have explicitly evaluated the utility of using RhIG in Rh-negative women with first trimester bleeding who do not go on to miscarry.

A 1968 study demonstrated that as little as 0.1 mL of Rh-positive blood can produce anti-D antibodies in Rh-negative postpartum women.³ The mean volume of fetal blood that can enter maternal circulation at 8 weeks due to FMH has been calculated to be 0.33 mL.⁴

Studies have shown that up to 11% of women with first trimester bleeding have a positive Kleihauer-Betke test, demonstrating that some FMH has occurred. In addition, there is a documented 1.5% to 2% rate of alloimmunization in mothers after a spontaneous first trimester abortion.^{1,5} Experts have extrapolated these data into a recommendation to administer RhIG in first trimester bleeding.^{1,5}

Three lines of argument support limiting the use of first trimester RhIG. First, most first trimester bleeding (when the pregnancy remains viable) is likely maternal, coming from the decidua or cervix.⁶ Most RhIG therapy would therefore be inappropriately targeted.

Second, anti-D is a blood product and critical shortages have occurred in countries other than the United States, such as Australia. Any limitation in the supply of anti-D argues for optimally targeted administration.

Finally, the cost effectiveness of administration of anti-D in threatened abortion is unknown.¹ At the University of Wisconsin Family Medicine Clinics, an RhIG 300-mcg dose costs \$153. Some experts recommend that, from a cost-benefit standpoint, RhIG should only be given to primigravid women.¹

Because of the paucity of evidence on the risks and benefits, a candid discussion with the patient is warranted. Some physicians choose not to recommend anti-D for first trimester bleeding, while others recommend RhIG for recurrent or painful bleeding (interpreting the symptoms as indicating an increased risk of FMH).⁷ Use of RhIG may be considered if pregnancy dating is uncertain, as risk of alloimmunization increases further into pregnancy. The heterogeneity of the guidelines below is indicative of the limited evidence available.

Recommendations

The American College of Obstetricians and Gynecologists states RhIG prophylaxis should be considered if the patient has threatened abortion (based primarily on consensus and expert opinion).¹

The British Committee for Standards in Haematology notes that before 12 weeks, administering RhIG in threatened abortion is not necessary, as the risk of FMH is low.⁷

The Society of Obstetricians and Gynaecologists of Canada recommends that after threatened abortion during the first trimester, Rh-negative women should be given RhIG (based on a theoretic risk of FMH extrapolated from the 1.5%–2% risk of alloimmunization after spontaneous abortion).⁵ EBP

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DAVID DANIELSON, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

C-Section Curriculum for the Baraboo Rural Training Track

Quality Improvement Project:

Ultrasound Curriculum for the Baraboo Rural Training Track -- I collaborated with Dr. Munneke to develop curriculum to train residents in the utility, indications for, and procedure of doing an ALSO level OB ultrasound. This was done with formal training for complete 20-week ultrasound scans done by myself and Dr. Munneke. Subsequently adequate numbers of ALSO level scans were done and formal approval performed by Dr. Dresang. Then a document was generated to guide ultrasonographers through the entire process of performing ultrasound including functionality of the specific ultrasound machine and the technique used to perform the scan.



David Danielson grew up in a small farming community in southern Minnesota, where he saw firsthand the impact that good family physicians can have in rural areas. He earned a B.A. in Biology

from Hamline University in St. Paul and then went on to complete his medical degree at the University of Minnesota Medical School. He has a strong interest in rural medicine and joins the Madison Program as part of the Baraboo Rural Training Track. During medical school, as a Rural Physician's Associate Program scholar, David completed a nine-month clinical experience in Redwood Falls, MN. He also returned to Redwood Falls during his senior year to serve as Project Organizer for a community health project that assessed the health needs of the community and worked to create solutions. Throughout his education, David has served in several leadership positions, including Board Member for the Northeast Minnesota Area Health Education Center and Alternate Student Director for the Minnesota Academy of Family Physicians. In his free time, David enjoys pottery, biking, bicycle mechanics, camping, backpacking, hiking, fishing, and golf.



Special thanks to my wonderful wife Adrienne and two wonderful children Corinne and August. I would also like to thank my resident colleagues who inspired me on a daily basis to be the best physician I could be.

– Dave

C-section Curriculum

Baraboo Rural Training Track

By end of 1st year:

- learner will assist in c sections when available while on first year ob
- participate in post op care while on surgery rotation
- demonstrate adequate surgery skills (knot tying etc)
- perform academic study
 - this can be performed by video, written material, lecture or any combination of these
 - this will prepare learner to begin assisting c-sections
 - Please see resources section
 - this should be finished prior to starting second year
- learner will demonstrate knowledge of
 - Indications for primary and repeat c-section

To begin 2nd year learner should:

- obtain program directors permission
 - must be in good academic standing with program and meeting all other requirements
- obtain permission from cooperating faculty
 - cooperating faculty are not required to teach, this training is a privilege
 - any reservations by staff should be remedied if this is possible
- Begin assisting C-section deliveries

By January of second year learner should:

- Be competent assist c-sections deliveries
 - cooperating physician will sign off once adequate skill demonstrated
 - numbers ~ 5-20 depending on demonstrated skill
 - case logs should be kept
- learner will demonstrate
 - adequate knowledge of surgical procedure
 - knowledge of post op course normal and abnormal

By end of 2nd year learner should:

- Be competent closing
 - cooperating physician will sign off once adequate skill demonstrated
 - numbers ~ 5-20 depending on demonstrated skill
 - case logs should be kept
- Learner will demonstrate
 - adequate surgical acumen including approaches to close skin, peritoneum and uterus
 - knowledge of surgical complications including
 - bladder lacerations
 - hemorrhage
 - endometritis
 - etc
 - knowledge of surgical indications for
 - B-Lynch sutures
 - uterine artery ligation
 - Cesarean hysterectomy
 - adequate implementation of post operative care knowledge as judged by attending
 - articulate risks and complications of primary and repeat c-section
 - articulate contraindication to repeat c-section

By end of 3rd year learner should:

- Learner should demonstrate
 - ability to perform c-section with minimal assistance from attending
 - ability to manage immediate complications surgically where appropriate
 - Adequate experience by case logs
 - numbers will be dictated by skill, opportunity and credentialing requirements

General Goals and requirements:

- post op care
 - learner will participate in all post op rounding unless specifically discussed with cooperating physician
 - learner should participate in all post op clinic follow up whenever possible
 - learner will demonstrate adequate skill in managing postoperative complications and routine care
- continued academic learning
 - learner will meet quarterly with available cooperating physicians
 - formal feedback should be sought at this time
 - quarterly case logs should be reviewed and difficult cases discussed
 - learner will lead a journal club at this time
- special considerations
 - learners ability to continue training depends on learners ability to continue to show proficiency in regular duties
 - cooperating physicians may at any time modify requirements to prove proficiency
 - duty hours are learner's responsibility

Resources

General Cesarean Section technique

- Penninger and Fowler's Procedures for Primary care
 - chapter 162, page 1105
- William's Obstetrics
 - Chapter 25
 - available online at Ebling Library
- Lange Current Diagnosis and Treatment: Obstetrics and Gynecology
 - Chapter 30
 - available online at Ebling Library

Post C-Section Hysterectomy

- William's Obstetrics
 - Chapter 25
 - available online at Ebling Library

Cystotomy Repair

- William's Obstetrics
 - Chapter 25
 - available online at Ebling Library

B-Lynch Compression Sutures

- William's Obstetrics
 - Chapter 23
 - available online at Ebling Library (video also available)
- Lange Current Diagnosis and Treatment: Obstetrics and Gynecology
 - Chapter 31
 - available online at Ebling Library

Internal Iliac Artery ligation

- Lange Current Diagnosis and Treatment: Obstetrics and Gynecology
 - Chapter 31
 - available online at Ebling Library

Evidence Based Discussion on Cesarean Section Delivery

- ACOG Update: Evidence-Based Cesarean Delivery
 - available in resident resource bookshelf

Example Case log:

Patient ID: 12345678

Admit Date: 1/2/2012

Discharge date: 1/5/2012

Date of procedure: 1/2/2012

Attending physician: Dr. Meier

Location performed: St. Claire Hospital

Procedure: repeat c-section, Primary surgeon

Indication for procedure:

1. elective repeat c-section
2. desire for permanent sterilization

Admission diagnosis

1. term pregnancy
2. repeat c-section desired

Discharge diagnosis

same

Hospital Course:

Patient is a 33 year old G2P2002 who was admitted on 8/7/2012 for elective repeat c-section. She underwent a low transverse cesarean section with a two-layer closure of the uterine incision. She delivered a 8lb 4oz healthy baby girl with apgars of 9 and 9. There were no complications during the procedure and EBL was 400.

Her post op course was unremarkable. She is breast feeding. Her admission hemoglobin was 12 and post-op hemoglobin was 9.8. By the time of discharge she was ambulating independently, voiding, and tolerating PO intake without difficulty. Her pain was well controlled on oral narcotics and non-steroidal anti-inflammatories. She expressed readiness for discharge and reported that she does have good support at home.

LE ROSE DHANOA, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

A “Topics in Maternity Care” article submitted for publication in *Evidence-Based Practice*: “Should women be screened for post-partum hypothyroidism?”

Community Health Project:

Post-Partum Depression Screening in New Fathers -- My community health project was to screen for potential depression in new fathers within the Northeast Clinic population. I was able to obtain a list of 120 families that had a recent birth. Using the PHQ-2, I telephoned new fathers to answer to the best of their memory how they felt during the 2 weeks following the delivery of their child. Of the 120 families on my list, I was able to get a hold of 95 fathers. Of these, 10% of fathers screened positive (scored = or > 3 on the PHQ-2). If using a PHQ-2 score of 2 or higher (as some advocate), positive screening jumps to 20% of fathers. This of course does not make the diagnosis of depression, but this does necessitate our asking “...and how is Dad doing?”



LeRose Dhanoa hails from Alberta, Canada, and he completed his bachelor's degree in psychology from the University of Alberta in Edmonton. With his wife, Adrienne, he attended medical school at Jefferson Medical College of

Thomas Jefferson University, initially assuming he would pursue a career in psychiatry. Ultimately, however, family medicine emerged as a better fit, given his interest in treating the whole person. LeRose has a strong interest in working with people with disabilities, and he has worked and volunteered with children and adults with disabilities in many different contexts. During college, he worked at *Elves Special Need Society* and *I have a Chance Support Services*, both organizations that provide day programs for adults with a wide range of disabilities. He also mentored a young boy with autism as part of the Big Brothers and Big Sisters program of Edmonton. During medical school, he volunteered with several organizations that address the needs of the homeless, including Jeff HOPE, a student-run group that provides medical care for homeless shelters across the Philadelphia area. LeRose speaks fluent French, Punjabi, and Hindi, and his hobbies include waterpolo, muay thai training, swimming, snowboarding, football, and “Big-Rig” trucking.



To my parents, the hardest working “Mummy” and “Daddy” in the world; without you I would not be where I am today. To my wonderful mentors at the DFM, in particular Dr. Edgoose, for everything that I have learned from you not just about medicine but, more importantly, about life; you truly were my “family away from home.” To my brother, Jotee, who will always be the biggest inspiration in my life. To my precious daughter, Londy-Lou, for reminding me daily that “everything is okaaaaay, Daddy.” And of course, to my beautiful wife Adrienne; I would thank you from the bottom of my heart for your love and support for the past 12 years, but for you my darling, my heart has no bottom.

— LeRose

Title

Should women be screened for post-partum hypothyroidism?

Author

LeRose Dhanoa, MD

Lee T Dresang, MD, Professor

Affiliation

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Bottom Line

There are no randomized controlled trials or Cochrane Reviews to guide whether to screen for postpartum thyroiditis (PPT). Organizations including the US Preventive Service Task Force (USPSTF), the American College of Obstetricians and Gynecologists (ACOG), the Endocrine Society and the American Thyroid Association (ATA) conclude that there is insufficient evidence to screen all women for PPT. Yet, PPT is common and should be considered in women with symptoms including low energy, postpartum blues or depression, weight gain, cold intolerance, palpitations, abnormal bleeding and poor milk production.

Evidence summary

Postpartum thyroiditis (PPT) typically progresses from transient thyrotoxicosis to transient hypothyroidism and back to normal. Approximately 8 percent (range 1.1 to 16.7 percent) of pregnant women develop PPT and 10 to 20 percent of women with PPT have permanent hypothyroidism.¹

There are no RCTs for an evidence-based recommendation whether to screen for PPT. A cohort study of 605 asymptomatic women found 7.8% developed PPT.² Of these women, only 11 percent had permanent hypothyroidism; none with thyrotoxicosis and only 40% with hypothyroidism required treatment.² Based in part on these findings, ACOG recommended against universal screening for postpartum thyroiditis.³

Other organizations also recommend against screening all postpartum women for thyroid abnormalities including: the USPSTF⁴, the Endocrine Society⁵ and the ATA¹.

However, assessment for PPT with TSH +/- Free T4 should take place when indicated by history or physical. Signs and symptoms which may prompt screening include: low energy, postpartum

blues or depression, weight gain, cold intolerance, palpitations, abnormal bleeding and poor milk production. Most of these findings are common in postpartum women and providers in collaboration with their patients can decide whether PPT evaluation is warranted.³ A goiter on exam also warrants evaluation.

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KELITA FOX, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

A “Topics in Maternity Care” article published in the December 2012 issue of *Evidence-Based Practice*: “How effective is misoprostol for treatment of incomplete abortion?”

Community Health Project:

Health and Wellness Promotion in Women with a History of Substance Abuse -- I have been working with the ARC community services AODA counselors in establishing a series of presentations, handouts, and discussion topics that will be a core part of the health and wellness curriculum for the intensive outpatient program for women with a history of substance addiction. I have emphasized topics that disproportionately affect the health and lives of women such as mental health, reproductive health, sexually transmitted infections, domestic violence, and chronic disease prevention. The topics are to be cycled in such a way that as women complete the program they each have a similar experience and cover the same health and wellness topics. My hope is that through this program participants will feel empowered to improve their health, reintegrate into the medical system, and openly discuss high risk behaviors as they relate to current and future health issues.



Originally from Ontario, Canada, Kelita Fox completed both her undergraduate and medical degrees at Wayne State University in Detroit. Her interest in preventive medicine and counseling initially drew her to

family medicine, and she comes to the specialty with a long history of community service and outreach. As a medical student, she served as a team leader for the Back 2 School Rally, a health fair organized for Detroit youth to encourage healthy habits, and she taught science lessons to school children as part of the Reach Out To Youth campaign. Kelita also was a frequent volunteer at the Huda Clinic and the Joy-Southfield clinic, both free clinics for the uninsured in Detroit. Even before entering medical school, she frequently found herself in medical settings as an ER volunteer and a children’s hospital volunteer. In addition to her professional interests, Kelita is an avid volleyball player; she played for the Wayne State University team as an undergraduate, and she continues to play competitively on various community and intramural teams. She has also studied violin throughout her life, and she enjoys traveling, camping, and listening to music of all kinds.



How effective is misoprostol for incomplete abortion?

Bottom line

Expectant management, misoprostol, and vacuum aspiration are all reasonable options for women with incomplete miscarriage. Misoprostol increases complete miscarriage rates over expectant management and can often avoid the need for surgical intervention. Both oral and vaginal misoprostol have similar efficacy in treating incomplete abortion, but the oral regimen is associated with a significantly higher incidence of diarrhea. There is no good evidence to support one dose of misoprostol over another; 600 and 800 mcg are commonly used doses.

Evidence summary

Spontaneous miscarriage occurs in 10% to 15% of all clinically diagnosed pregnancies.¹ Incomplete abortions, when products of conception are only partially aborted, can be managed with expectant management, medicine, or surgery. Prolonged symptoms of incomplete abortion can be distressing to patients and often guide treatment choices. Surgical management remains a quick and effective mode of therapy; however, medical management is another reasonable alternative.

One RCT found that vaginal misoprostol leads to complete abortion faster than placebo or expectant management. In a study of 126 Swedish women who presented with incomplete miscarriage, 64 were randomized to vaginal misoprostol and 62 to placebo.² The primary outcome measured was complete miscarriage at 1 week, which occurred in 81% of the misoprostol group and 52% in the placebo group (risk ratio [RR] 1.8; 95% CI, 1.2–2.1).

In a 2010 Cochrane review in which data from the above study were combined with that of a similar RCT in which the primary outcome was assessed up to 2 weeks after the intervention, no difference was seen between expectant management and vaginal misoprostol in complete miscarriage (RR 1.2; 95% CI 0.72–2.1; 2 studies, 150 women) or need for surgical evacuation (RR 0.62; 95% CI 0.17–2.3; 2 studies, 308 women).¹

Surgical management (with vacuum) of incomplete abortion results in a higher rate of complete abortion than with misoprostol, but success is high with both methods. In a trial of 652 women with missed, incomplete, or inevitable abortions, patients were randomly assigned in a 3:1 ratio to vaginal misoprostol

or vacuum aspiration.³ The rate of complete abortion in the misoprostol group was 84% (95% CI, 81–87) up to 8 days after the intervention, compared with 97% (95% CI, 94–100) in the surgical group. The incidence of hemorrhage and infection were similar between the groups, as were the overall rates of patient satisfaction.

In a 2010 Cochrane review subanalysis, data and outcomes from the above study and 2 others were separated for those with incomplete abortion versus intrauterine fetal death. Of the 154 women with confirmed incomplete abortion, fewer had a complete miscarriage with vaginal misoprostol compared with vacuum (RR 0.90; 95% CI, 0.82–0.99), but complete miscarriage rates were high for both (80%–91% with vaginal misoprostol and 89%–100% with vacuum).¹ Patients who received vaginal misoprostol bled for more days, with a mean difference of 2.8 days (95% CI, 1.5–4.0), compared with vacuum aspiration, but there was no difference in rates of anemia or need for blood transfusions. There were otherwise no significant differences in secondary outcomes between the 2 groups.

For incomplete miscarriage, oral and vaginal misoprostol have similar rates of success but the oral formulation causes more gastrointestinal adverse effects. A study of 201 women with incomplete miscarriage were randomized to 800 mcg oral or 800 mcg vaginal misoprostol.⁴ Complete uterine evacuation was achieved in 61% of the vaginal group and 64% of the oral group (not statistically significant). The incidence of diarrhea was significantly higher in the oral group compared with the vaginal group (65% vs 17%; $P < .01$).

Recommendations

No consensus has been reached on first-line treatment of incomplete abortion from the Royal College of Obstetricians and Gynecologists (RCOG), the American College of Obstetricians and Gynecologists (ACOG), and the Society of Obstetricians and Gynecologists of Canada (SOGC).

EBP

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ADRIENNE HAMPTON, MD

PROJECTS COMPLETED DURING RESIDENCY:

Community Health Project:

Osteopathic Manipulative Treatment for the Treatment of Low Back Pain in Pregnancy -- A Guide for the Non-DO Provider

Scholarly Project:

Mediterranean Diet Patient Education Materials -- There is mounting evidence of the health benefits of a Mediterranean-style diet. In 2007, Mitrou et al demonstrated the Mediterranean diet to reduce all-cause mortality in a US population. Dr. Jon Meiman and I collaborated on a series of pamphlets to educate patients about the Mediterranean diet. These pamphlets were designed to provide simple, concrete information about which foods to consume, in what quantities, and how to personally assess adherence to the diet. They were crafted specifically for use by patients with low levels of literacy. We hope these informational materials will help bring the benefits of the Mediterranean diet to our medically vulnerable patient population.



Adrienne Hampton earned her B.A. in Biology from Longwood University in Virginia and completed her medical degree at Northwestern University's Feinberg School of Medicine.

She was initially

drawn to family medicine through her strong interest and investment in the community. Before beginning medical school, she completed an AmeriCorps year of service as an HIV counselor and tester in Washington, DC, where she witnessed firsthand how profoundly social forces shape health outcomes. She also worked as an intern with the Mautner Project in Washington, DC, where she designed and implemented a wellness intervention for African American women who partner with women. During medical school, as an Albert Schweitzer Fellow, she implemented prenatal yoga programs in two low-income Chicago communities to combat the stress experienced by so many of the expectant mothers in those areas. These experiences reaffirmed her calling to family medicine, as well as her ultimate goal of creating an inclusive, family-centered practice that will make a positive difference in the health-status of low-income communities. In her free time, Adrienne's hobbies include yoga, classical vocal music, and creative writing.



Thank you very much to Drs. Hollis King and Adam Rindfleisch, whose guidance helped make my academic project possible. Thank you also to Dr. Kenneth Kushner, whose instruction in the Zen arts has been invaluable.

— Adrienne

Osteopathic Manipulative Treatment for the
Treatment of Low Back Pain in Pregnancy-

A Guide for the Non-DO Provider

Adrienne Hampton, MD

UW Department of Family Medicine PGY-3

Academic Project

Back Pain in Pregnancy

Low back pain is a common complaint during pregnancy and the post-partum period. Most studies suggest that approximately 50% of pregnant women will experience low back pain, though some studies indicate as many as 90% of pregnant women will experience low back pain. In one study of pregnant women, 80% reported low back pain affected their daily routine, and 10% reported they were unable to work. Low back pain is the leading cause of missed work in the postpartum period.ⁱ

The etiology of low back pain in pregnancy is thought to be secondary to a variety of pregnancy-related changes. The growing uterus places strain on the back muscles. As the center of gravity changes, many pregnant women will lean backward placing additional strain on the back muscles. The abdominal muscles stretch and weaken, resulting in diminished spinal support. The pregnancy hormone relaxin leads to increased mobility of the pelvic joints, causing pain and instability.ⁱⁱ

The Role of Osteopathy in Low Back Pain Associated with Pregnancy

With osteopathic manipulative therapy (OMT), osteopathic physicians use hands-on techniques to diagnose illness and injury and to encourage the body's natural tendency toward good health.ⁱⁱⁱ For over one hundred years, osteopathic physicians have applied the principles and techniques of osteopathy to treat back pain in pregnancy.^{iv}

Two recent studies have looked at osteopathic manipulation for management of low back pain in pregnancy.

In 2010, Licciardone et al published “Osteopathic manipulative treatment of back pain and related symptoms during pregnancy: a randomized controlled trial.” This study examined outcomes related to osteopathic manipulative treatment rendered in the third trimester. The design was a randomized placebo controlled trial. Participants were randomized to either usual obstetrical care and osteopathic manipulative treatment, usual obstetrical care and sham ultrasound treatment, and usual obstetrical care only. Intention to treat analysis of data from 144 participants revealed statistically significant differences in the Roland-Morris Disability Questionnaire Scores between the three groups. The OMT intervention group reported the least amount of disability, followed by the sham ultrasound and finally the usual obstetrical care only group. The authors conclude that “osteopathic manipulative treatment slows or halts the deterioration of back-specific functioning during the third trimester of pregnancy.”

The “Pregnancy Research in Osteopathic Manipulation Optimizing Treatment Effects” (PROMOTE) study is a five-year randomized controlled trial lead by principal investigator Kendi Hensel, DO, PhD. Building on the work of Licciardone et al, 400 patients have been randomized to one of three groups: standard obstetrical care + OMT, standard obstetrical care + placebo ultrasound, or standard obstetrical care only. Main outcome measures include low back pain, functional status, and the presence of meconium-stained amniotic fluid. Results of the PROMOTE study are pending publication. The OMT protocol for this study is reportedly similar to that employed by Licciardone et al in their above-mentioned 2010 study, and is presented in this guide.

Target Patient Population

As pregnancy progresses, back pain and associated loss of function typically escalate. The treatment plan outlined below has been studied in women in the third trimester, but may be suitable at any stage of pregnancy, and in the postpartum period.

Contraindications to OMT During Pregnancy

Prenatal OMT is contraindicated in the setting of undiagnosed vaginal bleeding, ectopic pregnancy, placental abruption, untreated DVT, elevated maternal blood pressure, unstable maternal vital signs, preterm labor, and/or fetal distress.^v

Treatment Frequency

In the aforementioned studies, treatment was rendered at each third trimester prenatal visit. This schedule is ideal, but there may also be benefit from less rigorous schedules.

Setting the Stage

The physician should be calm and centered during treatment.^{vi} A pre-treatment centering practice may be considered.

Physician and patient should be dressed comfortably.

Planned treatment should be reviewed with the patient, and verbal or preferably written consent should be obtained.^{vi} Potential risks of prenatal osteopathy include increased pain, headache, and fatigue. These symptoms are usually mild and resolve within 4-24 hours. Serious complications are very rare and include stroke and spinal cord injury.^{vii} These are thought to be mostly associated with high velocity treatments of the spine, which are not covered in this guide.^{viii}

The patient should be comfortably positioned on the table. The table should be at a height that allows the physician to bend at the waist and apply acceptable force to the patient's tissues, but not so low as to strain the back. To compensate for a table that is too low, the physician may separate the legs to minimize leaning and back strain.^{vi}

The PROMOTE Study Protocol

What follows is a description of the maneuvers employed during the PROMOTE study. The CV4 technique has been omitted due to a possible risk of stimulation of uterine contractions.^{ix} The protocol and photographs presented here are the property of the PROMOTE study team, lead by principal investigator, Kendi Hensel, DO, PhD. This protocol was accessed from the American Academy of Osteopathic Obstetricians and Gynecologists website (<http://www.acoog.org/PDF/PROMOTE%20protocol%202011%20w%20video%20link.pdf>). I have adapted some of the original language and added additional illustrations to make these techniques more accessible to the non-DO provider. A instructional video of the PROMOTE study protocol is available on the University of North Texas Health Science Center Website (<http://www.hsc.unt.edu/sites/osteopathicmanipulativemedicine/index.cfm?pageName=Research>).

Seated Forward-leaning Thoracic Spine Articulator

-The patient is seated on the exam table, the physician stands facing her.



-The physician immobilizes the patient's upper extremities and thorax, choosing the best position based on patient's body habitus and pattern of movement restriction.



-The physician's knee apposes the patient's knee to stabilize the patient.

-The physician places her hands on the patient's transverse processes, or costo-transverse process junctions.

-The physician draws the patient forward until tissue resistance is met.

-At the point of resistance, gentle anterior/posterior undulation called “low velocity medium amplitude springing” is performed to facilitate increased motion of the ribs and/or vertebral bodies. At the anterior endpoint of the motion, apply a small amount of extra anterior and superior force to achieve the effect of “springing.”

*This undulation may be forward/backward, or may include elements of side-bending and rotation depending on the pattern of restriction.

-Treat the entire thoracic spine. Recheck motion of the treated area, repeat as indicated.

Cervical Soft Tissue Myofascial Release

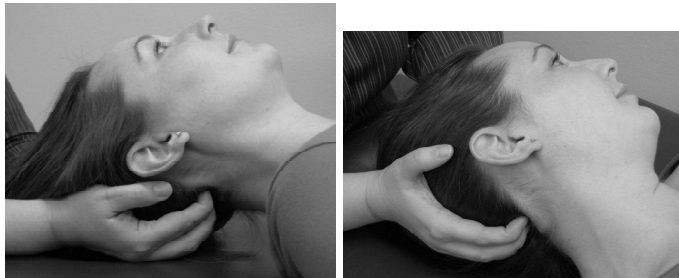
- The patient is supine on the exam table, the physician is positioned at the head of the table.
- The physician places her hands on the medial aspect of the cervical paraspinal muscles.



- Draw the tissue anteriorly in a kneading fashion.
- Continue until the tissue relaxes.
- Recheck motion of the treated area, repeat as indicated.

Occipito-Atlantal Decompression

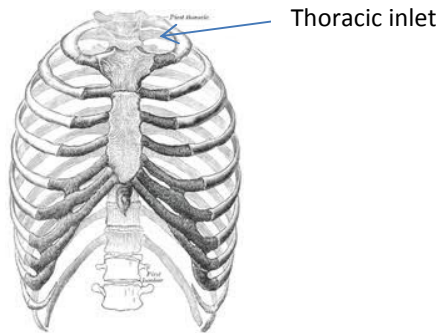
- The patient is supine on the exam table, the physician is positioned at the head of the table.
- The physician places his hands as close to the occipital condyles as possible.



- Force is applied toward the patient's orbits.
 - *Traction is achieved by drawing the elbows in medially.
- Ask the patient to inhale slowly and deeply, and increase the force applied to the occiput on the patient's exhalation.
- Hold this position until release of tension is felt, and motion is improved (at least 20-30 seconds).
- Recheck motion of the treated area, repeat as indicated.

Thoracic Inlet Myofascial Release

- The patient is supine on the exam table, the physician is positioned at the head of the table.
- The physician places his four fingers at the anterior aspect of the thoracic inlet, with the thumbs on the posterior aspect of the thoracic inlet.



- Mobilize the area of the thoracic inlet with rotation, side-bending, and flexion/extension.
- If a barrier is found, hold here. Otherwise, find the position of balance and hold here.
 - *Hold 20-60s until tissue slowly mobilizes under your hands which indicates a release of tissue tension.
- Recheck motion of the treated area, repeat as indicated.

Lateral Recumbent Scapulothoracic Myofascial Release

Part I

- The patient is in the lateral recumbent position, the physician stands facing the patient at the level of the patient's chest/shoulders.
- The physician places her hands on the superior and inferior medial aspects of the scapula, with the patient's arm draped over the physician's caudad arm.



-The physician's cephalad hand mobilizes the scapula laterally in a rhythmic, circular motion to release muscle attachments.

-The physician's caudad hand simultaneously palpates the rhomboids and paraspinous muscles along the medial border of the scapula.

-Scapular motion is then assessed for restriction in the superior/inferior, medial/lateral, and rotatory directions.

-If a barrier is found, hold here. Otherwise, find the position of balance and hold here.

*Hold 20-60s until release is palpated.

-Recheck motion of the treated area, repeat as indicated.

Part II

-The patient remains in the lateral recumbent position, the physician remains standing facing the patient at the level of the patient's chest/shoulders.

-The physician places her cephalad hand over the superior aspect of the patient's shoulder, while the thenar eminence of the caudad hand is engaged in the posterior axillary fold. The patient's arm is draped over the physician's cephalad arm.



-Tissue texture is assessed for rigidity, flaccidity, contracture, spasm, boggy, ropiness/stringiness.^x

-Compressive force is applied into the axillary and subscapular tissues in a rhythmical fashion until a change in tissue texture is felt.

-Recheck motion/texture of the treated area, repeat as indicated.

Lateral Recumbent Lumbosacral Soft Tissue Release

-The patient is in the lateral recumbent position, the physician stands facing the patient at the level of the patient's torso.

-The physician's forearms are braced against the patient's iliac crest and axilla.

-The physician grips the paraspinal muscles.



-Three motions are then applied rhythmically.

1. The physician applies a distracting force with his two arms to carry the patient's ilium and axilla in opposite directions. This creates an elongating effect through the lateral aspect of the patient's body.

2. The physician's arms twist, to move the patient's shoulder posteriorly, and her ilium anteriorly.

3. The physician's hands gently displace the paraspinal muscles laterally in a "bowstring" action. The physician treats the paraspinal muscles throughout the lumbar region.

-Repeat to muscle softening.

Supine Diaphragm Myofascial Release

-The patient is supine.

-The physician stands next to the exam table with either of two hand positions:

- 1.) The hands are placed broadly over the bottom ribs.



- 2.) One hand is placed just below the xiphoid process, while the other is placed at the thoracolumbar junction.



-Mobility is assessed with rotation, side-bending and flexion/extension.

-If a barrier is found, hold here. Ask the patient to inhale slowly and deeply, and increase force applied with the exhalation. Otherwise, find the position of balance and hold here.

-Hold 20-60s until release is palpated.

-Recheck motion of the treated area, repeat as indicated.

Anterior/Posterior Pelvic Diaphragm Myofascial Release

-The patient is supine, and the physician stands to the side of the examination table.

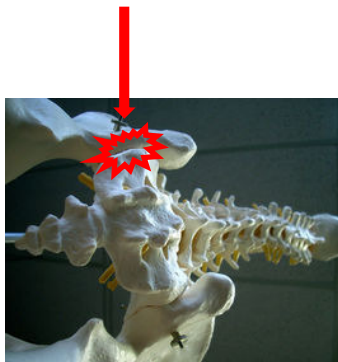
-The physician places one hand just superior to the pubic symphysis anteriorly, and the other hand on the sacrum/coccyx with fingers toward the contralateral ischial tuberosity.



- Assess rotation with side-bending and flexion/extension.
- If a barrier is found, hold here. Otherwise, find the position of balance and hold here.
- Hold until release is felt.
- Recheck motion of the treated area, repeat as indicated.

Sacroiliac Articulation

-The physician first performs a pelvic compression test. The patient lies in the lateral decubitus position. The physician applies a downward force to the iliac crest. Pain at the ipsilateral SI joint indicates a positive test.^{xi}



- Next, the patient assumes a supine position.
- The physician flexes the patient's hip and knee and applies a mild compressive force to engage the femur into the acetabulum.



-The physician then externally rotates the hip and simultaneously straightens the lower extremity by extending the knee. Compression is maintained with this motion.



-The physician then flexes the patient's knee again. The physician internally rotates the patient's hip and simultaneously straightens the lower extremity by extending the knee. Compression is maintained with this motion.



- Repeat technique 4-5 times until motion at the hip improves.
- Repeat on opposite side.
- Recheck pelvic compression test, and repeat treatment as indicated.

Frogleg Sacral Articulation

- The patient is supine.
- The physician places one hand on the patient's sacrum, with the palm at the apex of the sacrum, and the fingers at the base of the sacrum.



-The subject flexes her hips and knees, keeping her feet together.



-As the patient exhales, the physician mobilizes the sacrum to the point of ligamentous balance.

-On subsequent exhalations, the patient allows her knees to fall out to the sides and simultaneously straightens her legs to rotate the innominate bones.

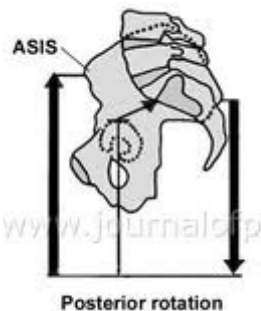
-As the patient straightens her legs, the physician applies inferior traction to the sacrum.

-Repeat maneuver 3-5 times, until sacral motion is significantly more symmetrical.

Muscle Energy Treatment for Posteriorly-Rotated Innominate Bone

-The patient is supine.

-To identify a posteriorly rotated innominate bone, evaluate the ASIS bilaterally. Posterior rotation yields an ASIS that is posterior and superior relative to the other ASIS.



Dontigny, RL (2011). Sacroiliac 201: Dysfunction and Management A Biomechanical Solution. *Journal of Prolotherapy*, 3(2), 644-652.

-The leg on side of posterior rotation is extended off of the side of the table until a restrictive barrier is reached.



-The physician places one hand on the extended thigh, and one hand on the contralateral ASIS to stabilize the pelvis.

-The patient attempts to lift the knee of the extended leg toward the ipsilateral shoulder. The physician resists this motion with isometric downward force.

-Hold 3-5 seconds.

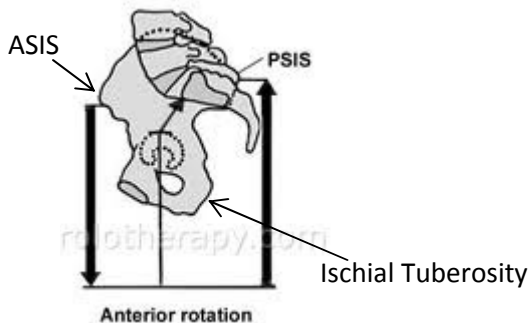
-After relaxation, the leg being treated is extended until the new barrier is reached, and the maneuver is repeated 3-5 times.

-Return both legs to neutral, and recheck ASIS positioning. Repeat maneuver as indicated.

Muscle Energy Treatment for Anteriorly-Rotated Innominate Bone

-The patient is supine.

-To identify an anteriorly rotated innominate bone, evaluate the ASIS bilaterally. Anterior rotation yields an ASIS that is anterior and inferior relative to the other ASIS.



Dontigny, RL (2011). Sacroiliac 201: Dysfunction and Management A Biomechanical Solution. *Journal of Prolotherapy*, 3(2), 644-652.

- The leg on the side of anterior rotation is flexed at the knee and hip
- The physician places her hand on the ipsilateral PSIS and ischial tuberosity with the patient's knee against the physician's chest.



- The leg is flexed until a restrictive barrier is reached.
- The patient pushes the flexed knee against the physician's chest for 3-5 seconds.
- After relaxation, the innominate is taken to a new barrier, and the maneuver is repeated 3-5 times.
- Return both legs to neutral, and recheck ASIS positioning. Repeat maneuver as indicated.

Pubic Decompression

- The patient is supine.
- The hips and knees are flexed with the feet together.
- The physician encircles the patient's knees with her arms.



- The patient attempts to separate the knees for 3-5 seconds, while the physician simultaneously provides isometric counterforce with her encircling arms.
- The patient relaxes, and the knees are rocked from side to side 3 times.
- These initial steps are repeated 2 additional times.

-The patient's knees are again flexed with her feet together. The knees are separated the width of a fist.



-The physician places her hands on the medial aspect of the patient's knees.

-The patient attempts to unite her knees, while the physician simultaneously provides isometric counterforce.

-The patient relaxes, and the knees are rocked from side to side 3 times.

-The maneuver is repeated first with knees separated the width of two fists, and subsequently with the knees separated the length of a forearm.



-Return legs to neutral, check patient's experience of pubic discomfort, and repeat maneuvers as indicated.

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ELIZABETH KVACH, MD

PROJECTS COMPLETED DURING RESIDENCY:

Community Health Project:

Filling the Gaps: Family Medicine Training in Ethiopia

Scholarly Project:

A “Topics in Maternity Care” article published in the April 2012 issue of *Evidence-Based Practice*: “Are there any risks to water birth?” -- Despite reports in the literature of anecdotal adverse outcomes, water birth has not been shown in RCTs or observational studies to increase maternal or neonatal morbidity or mortality. However, research looking specifically at the second stage of labor in water is limited and would need to be undertaken to more thoroughly evaluate the risks.



Elizabeth Kvach earned her bachelor's degree in Women's Studies from the University of Oklahoma and completed her medical degree at Yale University. Prior to medical school, she completed a graduate degree in Post-War

Recovery Studies to better understand the context of health development and reconstruction in countries recovering from armed conflict. She brings to family medicine a strong commitment to providing primary care to the underserved. During medical school, as a board member for the HAVEN Free Clinic, she helped establish and manage a student-run Saturday clinic that provides free care for the local uninsured, primarily Spanish-speaking immigrants. Elizabeth has a strong passion and commitment to global health. She has studied and worked in South Africa, Jordan, Ghana, Mexico, and Uganda to learn more firsthand about global health inequality and to prepare herself to practice internationally in the future. Most recently, as part of the Global Health Pathway during residency, she spent two months in Ethiopia assisting with a project to establish a family medicine residency at Addis Ababa University. After graduation, she will complete an Obstetrics Fellowship through the Exempla-St. Joseph Family Medicine Program in Denver, CO. In her spare time, she enjoys spending time with her fiancé and their dog, live music, hiking, camping, cooking and baking vegetarian food, and traveling.



Many thanks to: Nathan, for loving and supporting me through all of this; my parents, for putting up with my endless years of school and training and never once doubting I would finish; Cindy Haq, for being such an incredible role model, and mentoring me in my passion for global health; Ildi Martonffy, for collaborating to write such a fun article on water birth and Lee Dresang, for helping to edit it; Jenn Mastrocola, for being co-editor of the Intern Survival Guide (without whom the project never would have been finished); all my fellow Wingra residents and faculty who so very graciously covered by inbox for weeks and weeks while I was away; and all of my Ethiopian colleagues at AAU who warmly welcomed me into the gender equity and family medicine projects.

– Elizabeth

The Dawn of Family Medicine in Ethiopia

INTRODUCTION

Ethiopia's first training program in Family Medicine (FM) was launched on February 4, 2013 at the Addis Ababa University (AAU) School of Medicine (SoM). The FM program will prepare highly trained comprehensive-care doctors for all parts of the country who seek generalism as a lifelong career choice. This article describes the early development of the specialty of FM in Ethiopia with insights to guide development of similar training programs.

Background

The introduction of FM in Ethiopia is a strategy to improve health outcomes and manage healthcare costs. Ethiopia has a population of 91 million.¹ It ranks 174 out of 187 countries on the United Nation's Human Development Index.² Mortality from preventable illness is high, with most deaths caused by communicable infections, followed by malnutrition, maternal and neonatal conditions. Only 10% of births are attended by skilled birth attendants, reflected by a maternal mortality rate that remains starkly high at 590 per 100,000 live births.³⁻⁵ Though the under-five mortality rate has been reduced, it is still high at 106 per 1000 live births in 2010.⁶

There have been discussions and debates about the roles of generalist physicians to address the health needs of Ethiopia for many years. In 1995, AAU Professor Jemal Abdulkadir noted "the place of general practice in Ethiopia's health care system is still undefined. There are very few incentives to attract young doctors to it as a career. As a result, most see it as a temporary occupation."⁷ He also had the foresight to describe the potential role of generalist physicians in primary care teams, and suggested that "the nearest thing to personalized medical care in a country like Ethiopia for the foreseeable future is within a well-organized health team with the doctor as the leader and other members of the team sharing diagnostic and therapeutic decisions according to their level of competence."⁷

Despite awareness of the need to bolster the role of generalist physicians, the movement to developing specialty training for family physicians is relatively recent. This movement has been supported through strong advocacy from AAU senior faculty including Dr. Pawlos Quanaa who exhorted in 2011 "Is it not time to launch the forgotten Family Physician graduate program?"⁸

Rationale

The current supply of trained health workers available is insufficient to address the overwhelming health care needs of Ethiopia. In 2009 there were 2,152 physicians total in the country (working in the public sector?).⁹ Of these, 53% were specialists, who had completed post-graduate training, and 47% were general practitioners (GP), who had

completed medical school and a one-year internship. The national average physician-to-population ratio is 1:36,158, which is well below the WHO minimum target of 1:10,000 for developing countries. This number obscures regional variations, particularly as the majority of physicians are located in urban areas and 83.6% of the population lives in rural areas.⁴ In a 2006 survey of 76 public hospitals outside of Addis Ababa, nearly half had no specialists on staff and several had no physicians. Reasons for the low physician-to-population ratio include a high rate of physician emigration, rapid population growth, and low production rates of physicians. It is estimated that, from 1986 to 2006, over 70% of physicians left the public sector to work in another country or within the private sector or a non-governmental organization.¹⁰ Ethiopia has lost an investment equivalent to approximately \$260 million USD by training doctors who have since migrated out of the country.¹¹

The Ethiopian Federal Ministry of Health (FMOH) is addressing this critical shortage of human resources for health through its long-term Health Sector Development Program (HSDP), which began in 1993 and is now in its fourth phase. Strategies include increased annual enrollment of medical students; education and deployment of health extension workers (HEW), health officers and midwives; and training health officers for surgical and obstetric emergencies.¹² These efforts are primarily intended to bolster the capacity of low- and mid-level health workers in rural areas (see Fig 1), including primary hospitals, health centers and health posts.⁴ The innovative HEW program –which provides one year of training to local high-school graduates to provide public health outreach in their communities – has resulted in modest improvements in communicable disease prevention, immunization rates, contraception and prenatal care utilization, and environmental hygiene and sanitation.¹³ Though the HSDP has expanded access to health care through task shifting to facilities staffed with allied health workers at the community level, the stark reality is that the majority of facilities in the primary and many at the secondary level have no physicians – GPs or specialists.

The introduction of a new specialty of FM in Ethiopia is expected to improve health outcomes in at least four ways: developing a new cadre of highly-trained comprehensive care physicians; placing an emphasis on primary care physicians that should support better outcomes and lower costs; developing skilled leadership to work in primary care teams; and improving the recruitment, retention and distribution of physicians who are generalists.

DEVELOPMENT

The development of the FM began in earnest in 2008 when AAU hosted an International Workshop on Postgraduate Programs. Attendees included 120 international guests representing universities from 21 countries who had been invited to consider potential collaboration in the development of new postgraduate programs at AAU.

Eleven faculty members from the University of Toronto (UT) attended the meetings. Prior to this time there was a successful partnership between UT and AAU to support a

new residency in psychiatry that was launched in 2003. This was considered a model that could be used to introduce other new postgraduate clinical training programs. One of the potential areas for collaboration discussed was the introduction of a new training program in FM. At the meeting in 2008 the topic of FM was specifically discussed with the Dean of Medicine (Dr. Miliard Derbew), the President of the Ethiopian Medical Association (Dr. Yirgu Hiwot) and the co-lead of the Toronto Addis Ababa Psychiatry Project (Dr. Atalay Alem). They were enthusiastic about the potential for a program in FM and quickly advised that a FM residency should be 3 years in order to align with all other specialty training programs.

There is no single model for the development of FM in a country where it does not yet exist. Each country has a unique set of circumstance that will inform the most appropriate path for program development.¹⁵⁻¹⁷ Experience from Brazil suggests that government commitment, followed by needs assessments, continuing education for health workers and team training are important steps to be considered prior to launching a residency program.

In the case of Ethiopia, a series of strategies were used from 2008 to 2013 to take the FM program from a vision to a reality. These strategies included: Continuing Medical Education (CME) events; discussions with key stakeholders; international collaboration; needs assessment; curriculum design and faculty development.

Continuing Medical Education

CME was identified as an early and important step in the introduction of FM. The first CME workshop on FM was held in 2009 followed by a series of similar events. The Ethiopian Medical Association (EMA) hosted the first session with support from UT.¹⁸ This event was effective in raising awareness and preparing the way for the new program. A subsequent event inspired two GPs who attended to apply to be among the first FM residents in the country. Presentations about FM in Ethiopia were also made at the EMA Annual General Meeting, at second CME event in 2012, and at WONCA Africa regional conferences.

Stakeholder Discussions and Engagement

Some models that have been proposed for the introduction of FM in a new setting suggest that the first step should be a commitment from the government.¹⁴ In the case of Ethiopia, the FMOH has worked to build a strong system of primary care over the past two decades with a focus on training primary level health care workers.¹² Discussions about enhanced post-graduate training for physicians as part of the primary care team were coordinated in large part by senior faculty members at the AAU SoM. These academic leaders liaised closely with the FMOH throughout the process of the program development. International partners were involved in some discussions with policy makers. In April 2010, there was a formal meeting about FM that involved the FMOH Dr. Tedros Adhanom Ghebreyesus meeting with the Dean of the AAU SoM Dr. Miliard Derbew and UT faculty. In October 2011, the FMOH officially approved the concept and requested that AAU should proceed with plans to start a new residency training program in FM.

International Collaboration

One of the common ingredients for new programs in FM has been some measure of support from international colleagues to help in program development,¹⁵ and this was certainly the case in Ethiopia due to the absence of any pre-existing discipline of FM. Efforts began through long-standing collaboration with UT. A relationship between the AAU and UT has existed since 2002 for the purpose of building capacity in post-graduate clinical training at AAU, including development of a psychiatry residency program.¹⁹ The Toronto Addis Ababa Academic Collaboration has been a successful model that involves UT faculty from several clinical departments providing one-month blocks of teaching at AAU several times each year in order to strengthen new training programs.

University of Wisconsin (UW) faculty visited AAU in 2001 to explore the potential for academic collaborations and initiated discussions about the potential for FM training with academic leaders. Subsequently, a series of faculty exchanges between AAU and UW led to a partnership to support the development of an Emergency Medicine (EM) Training Center, EM residency and a master's in emergency nursing beginning in 2008. UW faculty continued to contribute to discussions about the development of FM at AAU and were able to secure additional funding to support these efforts through a US government-funded Medical Education Partnership Initiative (MEPI) beginning in 2010.

Needs Assessment

A needs assessment study was conducted in 2011 for the purpose of informing the curriculum about the competencies that would be required for generalist physicians practicing in Ethiopia. This was an observational study using a modified time-motion design and brief interviews to analyze the work of 46 GPs across ten sites in Ethiopia. The results of this study are beyond the scope of this article will be part of the ongoing effort to work toward a competency-based curriculum (to be reported in a separate article).

Curriculum Design and Faculty Development

The first draft of the curriculum was prepared in April 2010. This curriculum was developed using multiple resources including AAU specialty curricula, international literature pertaining to FM competencies²⁰, and examples from other countries. The AAU Graduate Medical Education Council approved a final version of the FM curriculum in January 2012.

A group of 8 AAU faculty members from the departments of Internal Medicine, Pediatrics, Surgery, Obstetrics/Gynecology, Psychiatry and Public Health participated in two-week faculty development fellowships in Toronto and Wisconsin in 2011 and 2012. The AAU faculty met with Canadian and US family physician educators, visited academic departments, clinics and hospital training centers to learn more about the scope of family physicians' practice.

Due to the absence of experienced FM faculty in Ethiopia, AAU and UT recruited three full-time Canadian family physicians as visiting faculty in 2012. These physicians worked with the Ethiopian residency program director and other Ethiopian faculty to prepare for launching the program. A Canadian FM training program director spent a month in Addis Ababa to help develop the program curriculum and academic teaching sessions. The group held a continuing medical education program for prospective trainees. Regular communication with the initial collaborators from UT and UW also helped to shape and consolidate the program.

Recruitment of prospective trainees was accomplished through the CME program, local advertisements and word of mouth. Ultimately seven residents were accepted into the program: four men and three women. The culmination of these years of planning and hard work was the official launch of the FM program at AAU on February 4, 2013. Dr. Dawit Wondimagegn was the inaugural program director for FM at AAU. In his remarks at the opening ceremony, Dr. Dawit stated, "I think family medicine is going to change the face of primary care in Ethiopia."

Immediately following the inauguration, the new residents participated in a two-week orientation to the principles and development of FM provided by local AAU faculty and visiting faculty from UT and UW. Faculty development was emphasized in orientation as an essential component of the residency. One of the main goals of the program was to train prospective teaching faculty for FM in Ethiopia, both at AAU and at other training sites in the country.

DISCUSSION

FM is a new specialty in Ethiopia. Its introduction brings tremendous potential to contribute to the country's health system. FM will face many challenges until the specialty is well established. These challenges include: the ambiguous roles of the family physician in the Ethiopian health care system; uncertainty about future career opportunities; adaptation of the curriculum to address local needs; expansion of the size and number training programs to produce larger numbers of family physicians; development of Ethiopian faculty who will be the future teachers of FM; and internal and external brain drain.

The roles of family physicians

The roles and responsibilities of family physicians in the health care system have not yet been clearly defined. Will family physicians function at the primary or secondary level or both? Will they serve primarily as clinicians, and/or as health managers, supervisors and team leaders? Roles will presumably be different for family physicians working in urban and rural areas. Family physicians working in health centres or district hospitals may act as consultants to other health care workers, they may have a greater community and public health roles, and they will be able to provide emergency surgical and obstetrical services. These roles are likely to evolve over time and will vary according to their locations of practice, other personnel and health resources available.

Career Opportunities

Attracting prospective residents into an unknown discipline may be a challenge. It is not clear to prospective residents what opportunities for advancement and professional development will be open to them once they are family physicians. The future career path and potential remuneration, including opportunities to work part-time in private practice, have not been delineated. The Ethiopian FMOH has confirmed that family physicians will be considered specialists on completion of their three-year residency program with commensurate salary.

Curriculum

A more immediate challenge will be revising and implementing the training curriculum for FM residents in the face of not being completely certain where they will be working and what skills they will require. The need for certain changes has become clear at the outset of the residency program, and the need for longer more advanced surgical and obstetrical training is quickly becoming evident. The program will need to stay flexible to prepare graduates with the skills necessary for clinical practice in a variety of locations.

Expansion of training opportunities

A much larger challenge will be training enough family physicians to begin to have a significant impact on the country's health and its health care services. The FMOH has already started a massive expansion of undergraduate medical education programs. A significant proportion of these graduates must be family physicians if they are to play a useful role in the country. In addition, expansion to other universities throughout the country will be essential, not simply to increase capacity, but also to ensure that family physicians are trained according to local needs and requirements.

In 2012 the FMOH opened thirteen new medical schools with innovative community-oriented curricula that may help to produce graduates oriented toward community-based FM. This new specialty will be introduced to undergraduate medical students at Addis Ababa University through a one-week block devoted to FM and participation by Canadian family physician faculty in courses such as Physical Diagnosis. At the UT family physicians are major contributors to undergraduate clinical teaching, and about 40% of its graduates choose a career in FM.

Faculty development and capacity building

Ethiopia does not have a body of family physicians from which to draw faculty, and will have to be creative if it is to dramatically expand its FM training program. Continued contributions from foreign academic family physicians both residing in and visiting Ethiopia will be necessary. Recruitment and development of specialists in other disciplines as 'champions' of FM will also be necessary. Finally, recruitment of FM residents who have the capacity and desire to become future faculty is critical to the future of FM in the country. Ongoing collaboration with UT and UW will provide continued input and assistance; at the same time, longer term plans for withdrawal of

intensive foreign involvement as Ethiopia develops its capacity to operate these programs as it does those in other discipline are necessary.

Retention

In the past Ethiopia has lost a large number of its trained health care professionals to other countries and internally to non-governmental organizations, and retention of physicians will be as important as training them. The Psychiatry residency program at AAU that started in 2003 with the support of UT has had notable success in retaining its graduates.¹⁹ FM should incorporate lessons-learned from programs such as this to retain its graduates in the public sector in Ethiopia.

CONCLUSION

After years of planning and hard work, the dawn of FM in Ethiopia is an exciting step forward in strengthening the primary health care system in the country. The development of the AAU FM residency is an example of a successful inter-institutional relationship between local and international partners to create a sustainable, Ethiopian-led training program for Ethiopian physicians. Though there are many future challenges to face, the program is off to a promising start. In the words of an Ethiopian proverb, ‘*Kes be kes inkulal be igru yehedal*’: ‘Slowly, slowly, the egg will grow to walk.’

FIGURES

Figure 1⁴

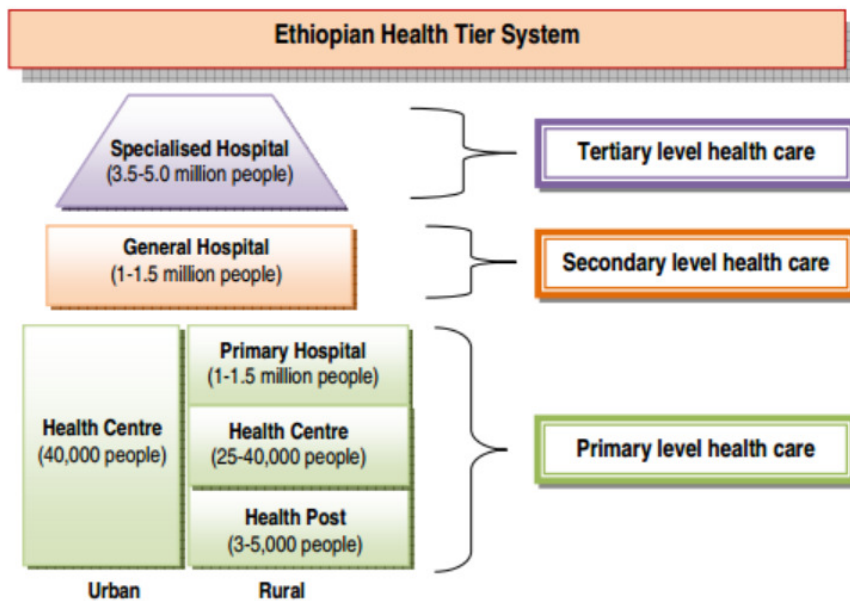
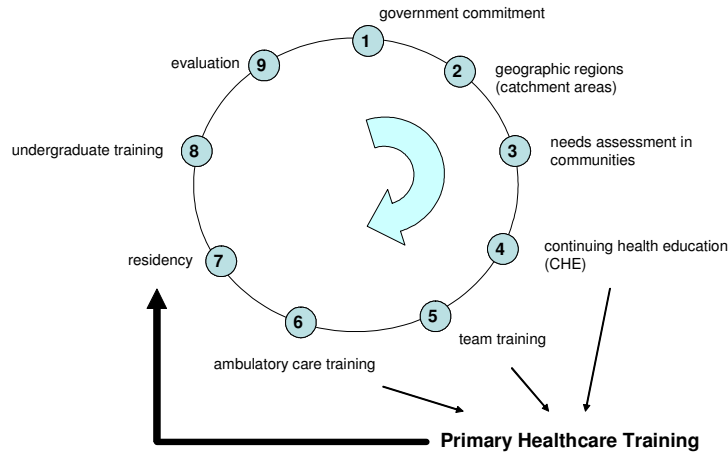


Figure 2¹⁴



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ERIC MARTY, MD

PROJECTS COMPLETED DURING RESIDENCY:

Community Health Project:

Increasing Utilization of Power of Attorney for Health Care Documents at Northeast Clinic

Scholarly Project:

Second Thoughts: A Reflection on Caring for My First Dying Patient -- I was privileged to care for one of my patients in multiple settings before, during, and after his diagnosis of lymphoma, including the last days of his life. I also saw his wife as a patient after his death. I found it both rewarding and challenging to help them navigate this part of their lives. In the end, I felt I could have done better, yet they thanked me profusely and praised my care for them. The essay is my attempt to reconcile these two emotions, and better make sense of what it means to be an imperfect healer. It has been accepted for publication in the June 2013 edition of *American Academy of Hospice and Palliative Medicine Quarterly*.



Thank you to my incredibly resilient and optimistic wife, without whom these last three years would not have been possible.

And thank you to the program directors, specifically Kathy Oriel, whose support and mentorship have meant all the world.

– Eric



Eric Marty grew up in central Missouri, and he completed both his undergraduate and medical degrees at Creighton University in Nebraska. He originally pursued interests in mathematics and the humanities, but

ultimately decided on medicine as the best field to express his commitment to social justice and meaningful action in the world. Throughout medical school, Eric was an active volunteer for several organizations that provide care to the underserved in Omaha. He has also volunteered internationally, with at-risk youth in Peru and at temporary medical clinics in remote villages of the Dominican Republic. In the spring of 2010, he was inducted into the Gold Humanism Society for his longstanding commitment to service. A strong advocate for primary care, Eric served as president of Creighton's Family Medicine Interest Group. He also continued to explore the humanities, and he established a Society for the Humanities in Medicine at Creighton. The group meets weekly to discuss literature, poetry, and art concerning doctoring, patients, and the human condition. Eric married his high school sweetheart, Megan, before moving to Madison to start residency. In his spare time, Eric enjoys reading, writing, watching movies, running, skiing, and most anything else that will keep him outside, especially walks with his dog Frank.

Eric Marty

I was struck during my hospital rotations by how little advanced care planning most patients had done. Patients who, when admitted, had on file a Power of Attorney for Health Care (POA-HC) document seemed to receive more timely and more appropriate care if and when they were unable to make their own decisions. But there was something more to it, as well.

It is not just that they had a health care agent; they were more likely to have had the difficult but thought-provoking conversations with loved ones about what the best care possible would mean for them. This discussion informs not only the decisions of the agent for the incapacitated, but often changes the perspective of the chronically ill or terminal patient with capacity, who obviously faces the same hard decisions concerning what interventions she would want under what circumstances.

I had a second realization I not while in the hospital, but while at Northeast, caring for my primary care panel. Discussion with a patient concerning advanced care planning is extraordinarily easier and more effective when facilitated by the primary care provider in the outpatient clinic rather than by a hospitalist during a hospital admission.

I discussed the idea for a project with Ann Braus, a resident colleague at Northeast, and together we developed a project to try to increase the number of adult patients at Northeast who have a completed POA-HC on file, and have therefore given at least some amount of thought to advanced care planning.

Review of baseline data by Wen-Jan Tuan at the Department of Family Medicine showed that only 1.2% of our active adult patients at Northeast, and just 6.4% of those aged 65 or older, had a POA-HC on file.

We knew there were multiple barriers to completion of a POA-HC, but we identified a few on which to focus. First, we had to make it easy for providers to provide both the document and brief education to the patient. So, we placed POA-HC forms in each exam room and created an informational page in a large font that provided just a few basic facts in lay terms about what the form and why it is important. Easy, right?

The more significant barrier, we predicted, would be completion of the form by the patient at home and return of a copy to the clinic. To address this barrier, we created a tracking system: providers place a patient identifying sticker on a tear-off cover page that was added to the packet, and then place that page in a box in a central location in the clinic. Once a month, Ann or I would call each patient who had received a form but did not yet have a POA-HC on file, and ask if they had any questions or concerns.

The results so far have been mixed. We underestimated how busy we as providers are; fewer than anticipated forms are getting into patients' hands. Additionally, of those who did receive the form, none completed it and sent a copy to place on file without at least one reminder telephone call. Overall, 5% of the forms provided to patients have been returned completed.

The vast majority of patients want to talk to their doctors about advanced care planning. The reaction to the project from colleagues and patients alike has been overwhelmingly positive. However, the two main barriers remain. Providers and patients both are very busy. Additionally, patients may appreciate that their doctors address advanced care planning with them, but it takes a great deal of initiative to do the difficult work of reflecting on and conversing with loved ones about a topic that not one of us enjoys considering. Additionally, the document the state of Wisconsin provides is written at a very advanced level and can be downright confusing, even to medical professionals.

I hope that Ann Braus and others can carry the project on. We will need to be more proactive in reminding our colleagues about the project, and we will need to train ancillary staff to do the telephone follow-ups. Perhaps, on a state or national level, this issue will come to the attention of the powers that be, as this is a public policy and public health issue as well.

JON MEIMAN, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

Presentation at the 2012 NAPCRG Annual Meeting: “School Attendance Is Linked to Seasonal Outbreaks of Respiratory Illness in School-Age Children”

Community Health Project:

The Mediterranean Diet: Patient Outreach and Dietary Adherence Guide -- The Mediterranean Diet (“Med Diet”) is an evidence-based diet that includes daily use of olive oil in cooking, frequent consumption of vegetables and whole grain foods, and modest consumption of dairy products, alcohol, and simple carbohydrates. The Med Diet has been shown to reduce the risk of many cardiovascular diseases. In conjunction with a fellow resident, a series of education tools were developed to guide patients towards healthier food choices. Gauging adherence to the Med Diet is key to insuring that patients reap the health benefits. A clinically validated dietary scoring tool was modified for lay readership and was provided to patients along with general information on the Med Diet. Patients were encouraged to log their “Med Diet Score” on a weekly basis to guide food choices and identify areas for improvement. By promoting healthier lifestyle choices, it is hoped that these education materials will help reduce the burden of chronic disease.



Thanks first and foremost to my parents, Greg and Anne Meiman, and my sisters, Julie and Meg. Thanks also to the residents, attendings, and staff who made residency a wonderful environment for learning and personal growth. A very special thanks to Jon Temte whose guidance and support helped launch me on an exciting career path.

— Jon



Jon Meiman took an indirect path to medicine. He graduated from Tulane University with double majors in accounting and finance before moving to Washington DC to pursue a career

in homeland security. While he enjoyed the scope and challenge of the work, his volunteer experiences at a local emergency room convinced him that a career in medicine would allow him to combine his interest in public policy with his desire to help people on a personal level. He returned to his home state of Alabama to work as a consultant while completing his pre-med coursework, and he earned his medical degree from the University of Alabama in Birmingham. As a medical student, he quickly began working to establish the school's first student-run free clinic. He took a leadership position in the clinic during his first and second years and helped build the groundwork for a lasting organization by creating a sound financial framework, developing an annual report, and helping draft the organization's first constitution. In recognition of this work, alongside a lifelong pattern of community service, Jon was inducted into the Gold Humanism Society in 2009. In his free time, Jon enjoys reading and international travel. He also has a pilot's license and takes to the skies whenever time allows.

TITLE: School attendance is correlated with seasonal outbreaks of medically-attended respiratory illnesses in school-age children

AUTHORS: Jon Temte, Jon Meiman, Ron Gangnon

INTRODUCTION

The prevalence of acute respiratory illnesses (ARIs) follows a seasonal pattern of activity that has been the subject of increased study over the last decade. This seasonality is generally believed to stem from three main factors: cyclical changes in host immunity, environmentally driven changes in pathogen survival, and changes in host behavior. (1,2) Close person-to-person contact, particularly among school-age children, is frequently cited as an important example of the latter. An association between school sessions and ARI prevalence has long been observed, and many researchers have proposed school attendance as an important driver of early autumn and winter spikes in ARI prevalence.

Despite the commonly held notion that school attendance may contribute to seasonality, research demonstrating this effect is relatively scarce. Measles was one of the first viruses to show a strong correlation with school sessions. (2-4) More recent research on influenza (5,6) has also suggested a link, and rhinovirus demonstrates autumnal peaks that correlate closely with the onset of school.(7) Any attempt to discern a correlation between school attendance and seasonality, however, is necessarily complicated by other potential drivers that these studies do not take into account.

Of all potential correlates of seasonality, temperature and relative humidity have been the most widely studied. Colder temperatures have been associated with increases in ARI prevalence, and studies have largely confirmed this inverse relationship in temperate regions. The most common viral pathogens, including influenza, respiratory syncytial virus, rhinovirus, adenovirus, coronavirus, and human metapneumovirus show an inverse relationship between viral prevalence and temperature. (8-12). Relative humidity has been studied extensively, albeit with less consistent findings. Several studies suggest that higher relative humidity correlates with increased prevalence of RSV, rhinovirus,

adenovirus, and coronavirus (8-10,13-15). Research on the role of temperature and relative humidity in bacterial causes of seasonal ARI is much more limited. This is likely because seasonal ARI outbreaks have been shown to be primarily viral in children (16,17) and viruses are a common cause of ARI in adults (18,19).

This study was designed to determine the level to which school attendance contributes to seasonal outbreaks of all-cause respiratory infections as assessed within a primary care electronic health record (EHR) database. To account for confounding meteorological factors, temperature and relative humidity were included in the model of seasonality.

DATA & METHODS

Respiratory illness prevalence

Weekly ARI prevalence was estimated using a composite of “all-cause” respiratory illness diagnoses based on ICD9 codings derived from the University of Wisconsin Department of Family Medicine’s Clinical Data Warehouse (CDW). The CDW aggregates EPIC EHR data (EPIC Systems, Verona, WI) from a network of 28 ambulatory practices, primarily in the south-central portion of the state. Data from each clinic’s EHR are extracted by the CDW on a daily basis. The records for approximately 350,000 ambulatory visits are available on an annual basis and represent approximately 2.5% of Wisconsin’s total population. Weekly ARI diagnoses from May 2004 to July 2011 were determined by ICD9 codes shown in Table 1. These diagnoses were stratified by patient age and trended over time. Five age categories were used: preschool children (0 through 4 years), school-aged children (5 through 17 years), young adults (18 through 24 years), adults (25 through 64 years) and older adults (65 years and older). Total ARI diagnoses and clinical encounters for each year under study are shown in Table 2. ARI counts from 2008 to 2011 are depicted graphically in Figure 1.

All-cause respiratory illness diagnoses were used as a surrogate measure for ARI prevalence in order to accurately capture respiratory pathogen activity. Because specific clinical and coded diagnoses in

primary care settings are imprecise, can be in error, or may be reflective of individual clinician prescribing behavior, the all-cause metric was felt to better reflect community trends in ARI activity.

[TABLE 1]

[TABLE 2]

[FIGURE 1]

School attendance

Public primary, middle, and high school calendars for all districts served by clinics included in the CDW were examined to determine start and end dates for both the fall and spring school semesters. Dates were relatively uniform across the state with variation of less than one week between districts. This is—in part—due to Wisconsin state mandates for the timing of the start of the public school year. School districts show substantial variation in timing of spring vacations, so schools were assumed to remain in session throughout the spring semester for purposes of analysis. School attendance for each week of every calendar year was coded with one of six values representing: one week out of session, two weeks out of session, more than two weeks out of a session, one week in session, two weeks in session, or more than two weeks in session.

Meteorological data

Weekly average temperature and relative humidity data were obtained from the National Climatic Data Center for the period under study. As most clinics are located in the south-central portion of the state, meteorological data was obtained from the Dane County Regional Airport weather (MSN) observation station (station ID 474961, latitude 43°08' N., longitude 89°20' W.).

Statistical analysis

Data analysis was performed using *R* version 2.15.1 (20). An overdispersed Poisson generalized additive log-linear regression model was fit to the weekly number of ARI diagnoses as a function of

school attendance as a categorical variable and temperature, relative humidity, year, and season (calendar week within year) as smooth functions (thin plate regression splines)(21). The number of ARI diagnoses in the prior week was also included as a covariate to account for possible autocorrelation. Analyses were conducted for all ages combined and for each age group individually. Risk ratios (RR) and associated 95% confidence intervals (CI) are presented for each attendance category relative to the baseline category of more than 2 weeks out of school (i.e. summer vacation). A nominal p-value of 0.05 was regarded as statistically significant.

RESULTS

During the 7-year study period, 492,037 all-cause respiratory infections encounters were recorded (8.3%) from a total of 5,922,770 clinical visits. Of note was an inverse relationship between age and the predominance of ARI diagnoses; with 27.2% of visits for young children including an ARI diagnosis as compared to 3.8% of visit for adults age 65 years and older (see Table 2).

School attendance

Risk ratios for ARI based upon school attendance are presented in Table 3. Controlling for temperature and humidity, increased risk ratios (RR) of ARI were statistically significant for children 0-4 years and 5-17 years during school sessions. For the second week of a school session, RR=1.12 for children 0-4 years and RR=1.39 for children 5-17 years. For more than two weeks into a session, risk ratios were 1.16 and 1.43 for children 0-4 years and 5-17 years, respectively. A similar finding was reflected in the pooled analysis of all ages, with statistically significant risk ratios of 1.15 for both two weeks and more than two weeks into sessions. A statistically significant risk ratio of 1.14 was also found for all ages the first week schools were in session. Risk ratios through a 12-month period for children ages 5-17 years are graphically depicted below in Figure 2.

Marginally statistically significant increased risk ratios were found in ages 18-24 years and 25-64 years. For patients 18-24 years, RRs were 1.18 and 1.13 for the first and second weeks of school sessions, respectively. For patients 25-64 years, the RR for the first week of a session was 1.16.

[TABLE 3]

[FIGURE 2]

There was no increase in risk ratio for out-of-school sessions for any age group with the exception of children 0-4 years, which showed a statistically significant RR of 1.14 during the second week following the conclusion of the school year. Adults older than 65 did not show increased relative rates at any point during the year when adjusting for school attendance.

Temperature and relative humidity

Once annual seasonality was modeled, neither temperature nor relative humidity (RH) were significantly associated with additional risk of infection ($p > 0.05$ in all age groups). These findings suggest that longer-term seasonal patterns are the predominant factor influencing disease activity and that these seasonal differences cannot be explained by temperature and/or relative humidity.

DISCUSSION

Key findings

This study shows that school attendance plays a significant role in seasonal outbreaks of all cause, medically attended ARI as extracted from a large primary care electronic health record. This effect is most pronounced in individuals under 17 years of age (see Figures XX and XX). The findings provide empiric support for the frequent observation that children experience a significant increase in illness both after the start of school in the autumn and after winter break. While there is evidence that a similar process is at play in adults between 18 and 64 years of age, the findings are less robust. Furthermore, there is no indication that school transmission leads to increased risk of illness in adults

older than 65 years. This last finding can probably be attributed to the fact older adults are less likely to be exposed to infected children compared to adults in their childbearing years.

Temperature and relative humidity were included as covariates in the analysis as current research indicates these meteorological parameters correlate with the most common ARI pathogens. When incorporated into the model, neither of these variables explained significant seasonal increases in ARI prevalence. Several factors may be at play. First, our primary care sample pools ARI etiologies into a single category. Enveloped viruses, for example, are known to be highly infectious at low RH, whereas studies of the non-enveloped rhinovirus indicate increased transmissibility at high RH(13). Because outbreaks of these viruses peak at different times and frequently overlap, underlying temperature and humidity effects may be obscured. Second, the relationship between these meteorological variables and virus infectivity may not be monotonic. Recent studies of influenza, for example, have demonstrated a complex relationship to RH, with increased risks of transmission at both higher and lower relative humidity (11,22). Future studies of other viruses may reveal complex weather relationships as well. Finally, although temperature and humidity have been widely studied, other meteorological variables may show better predictive value. Shaman et al have shown the absolute humidity alone can explain the seasonality of influenza in temperate climates(23).

Nevertheless, temperature and relative humidity are principal attributes of seasonality in temperate latitudes. Hence, the driving influences of these climatic factors were statistically accounted for by incorporating a seasonal term in the analysis. We were not able to isolate a significant role for short-term fluctuations in temperature and relative humidity.

Relationship to other studies

Studies linking seasonal outbreaks of respiratory illnesses in children to school attendance, while few, confirm the findings presented here. Fine and Clarkson published one of the first studies three decades ago and discovered a nadir in measles cases every year before the opening of primary schools and a decline during school holidays(4). A similar correlation was observed years later in a study of a measles epidemic in the Netherlands(3). Recent studies of influenza have demonstrated

similar results. Chao et al have shown that school opening dates can predict pandemic influenza outbreaks in the United States(5), a finding supported by another study showing a decline in influenza activity during school closure(6).

Implications for future study

An understanding of the mechanisms of seasonality is vital to designing public health interventions to intervene or halt outbreaks of significant respiratory illnesses. If school exposures can be shown to be an important cause of seasonal outbreaks, then school closure may be an effective way of preventing pandemic disease. School closure has been implemented to prevent the spread of both severe acute respiratory syndrome (SARS)(24) and H1N1 influenza(25), and this measure appeared to be effective. Future research on seasonality and the contribution from school attendance will both help to establish a causative link and may improve predictive models for specific pathogens.

Such methods may allow forecasting of the anticipated volume of medically attended ARI visits, thus allowing appropriate deployment of medical resources. Coupled with advanced community surveillance efforts(26) significant outbreaks of respiratory infection may be more predictable.

Limitations

This study uses all-cause respiratory illness diagnoses as a proxy measure for ARI activity within a region. We used this broad definition to allow for an “upper limit” of respiratory pathogen activity. For example, use of influenza vaccine has been shown to reduce episode of otitis media in children during the influenza season by 83%(27). Moreover, clinical diagnoses and coded diagnoses are often in error. Thus, “all cause” acute respiratory infection is an accurate measure of community trends in respiratory infections.

By utilizing a common measure, this research cannot assess the contribution from specific pathogens. Some pathogens may show a stronger correlation with school attendance, while other may be weaker. Furthermore, this study did not address spring school breaks, which may hamper transmission through school closure or conversely lead to high prevalence with increased travel(28). The use of a common

measure also likely obscures the contribution of some meteorological factors that are observed when studying specific pathogens.

CONCLUSION

This study is the first to show that school attendance an important driver of seasonal outbreaks of all cause medically-attended respiratory illness, particularly for children between the ages of 5 and 17 years. School sessions also appear to lead to outbreaks in younger children, young and older adults, but not elders.

CONFLICTS OF INTEREST

Jon Temte – none

Jon Meiman – none

Ronald Gangnon - none

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TABLES & FIGURES

Table 1: All cause acute respiratory infections – ICD9 Coding

- (460) Acute nasopharyngitis (common cold)
- (461) Acute sinusitis
 - (461.0) Sinusitis, acute, maxillary
 - (461.1) Sinusitis, acute, frontal
 - (461.9) Sinusitis, acute, NOS
- (462) Pharyngitis, acute
- (463) Tonsillitis, acute
- (464) Acute laryngitis and tracheitis
 - (464.0) Laryngitis, acute, no obstruction
 - (464.3) Epiglottitis, acute
 - (464.4) Croup
- (465) Acute upper respiratory infections of multiple or unspecified sites
 - (465.9) Upper respiratory infection, acute, NOS
- (466) Acute bronchitis and bronchiolitis
 - (466.0) Bronchitis, acute
 - (466.11) Bronchiolitis, acute, due to RSV

\

Table 2: ARI diagnoses as a percentage of all clinic visits, 2004-2011, by age group

Season	0 - 4 years			5 - 17 years			18 - 24 years			25 - 64 years			65+ years			Total		
	ARI	all visits	% ARI	ARI	all visits	% ARI	ARI	all visits	% ARI	ARI	all visits	% ARI	ARI	all visits	% ARI	ARI	all visits	% ARI
2004-05	15,2	48,78	31.1	17,51	81,02	21.4	6,598	63,26	10.4	37,00	32,06	7.7	6,180	129,911	4.8	82,53	807,419	10.2
2005-06	13,5	46,93	28.8	15,05	76,30	19.7	6,016	60,96	9.9	32,06	484,920	6.6	5,186	129,576	4.0	71,83	798,696	9.0
2006-07	13,6	47,65	28.8	15,56	78,56	19.9	5,878	61,39	9.6	34,65	509,013	6.8	5,222	137,139	3.8	74,92	833,764	9.0
2007-08	12,4	47,25	26.3	14,15	80,80	17.4	5,680	62,81	9.0	36,01	532,544	6.8	5,563	145,478	3.8	73,85	868,895	8.5
2008-09	11,1	44,09	25.3	12,85	81,80	15.7	4,635	57,51	8.1	30,36	531,460	5.7	5,244	148,184	3.5	64,24	863,048	7.4
2009-10	10,4	44,54	23.5	11,78	83,36	14.1	4,341	55,23	7.9	29,31	547,346	5.4	5,000	155,765	3.2	60,90	886,258	6.9
2010-11	9,58	37,20	25.3	12,51	79,37	15.8	4,317	51,43	8.4	31,74	539,787	5.9	5,574	156,902	3.6	63,73	864,690	7.4
total	86,0	316,4	27.2	99,44	561,2	17.3	37,46	412,6	9.1	231,1	3,629,5	6.4	37,96	1,002,9	3.8	492,0	5,922,7	8.3

Table 3: Relatives risks of infection during in-school and out-of-school sessions, by age group

School Session	Risk ratio (95% CI), by Age Category					
	0-4 years**	5-17 years**	18-24 years*	25-64 years*	>65 years*	All ages**
Out for >2 weeks	1	1	1	1	1	1
In for 1 week	1.07 (0.97,1.18)	1.12 (0.93,1.34)	1.18 (1.06,1.31)	1.16 (1.06,1.27)	1.11 (0.98,1.26)	1.14 (1.04,1.24)
In for 2 weeks	1.12 (1.02,1.24)	1.39 (1.15,1.68)	1.13 (1.02,1.26)	1.11 (1.00,1.22)	0.99 (0.86,1.13)	1.15 (1.05,1.26)
In for >2 weeks	1.16 (1.06,1.27)	1.43 (1.20,1.71)	1.07 (0.98,1.16)	1.09 (1.00,1.19)	0.98 (0.86,1.11)	1.15 (1.06,1.26)
Out for 1 week	1.07 (0.97,1.17)	1.03 (0.85,1.24)	1.05 (0.94,1.17)	1.02 (0.93,1.12)	0.92 (0.81,1.04)	1.03 (0.94,1.13)
Out for 2 weeks	1.14 (1.03,1.27)	1.06 (0.86,1.3)	1.03 (0.91,1.17)	1.05 (0.95,1.17)	0.98 (0.85,1.12)	1.07 (0.97,1.18)

Highly statistically significant (p<0.01) RRs above 1.00 shown in bold.

* p-value < 0.05

** p-value <0.01

Figure 1: ARI counts by age group (July 2008 through June 2011)

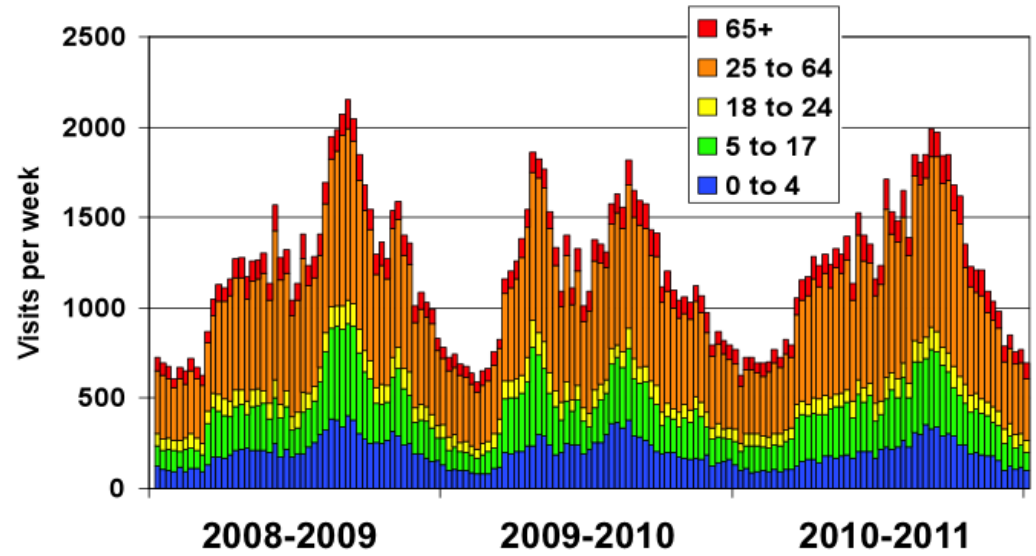


Figure 2: Relative risks of ARI (95% CI), children ages 5–17 years

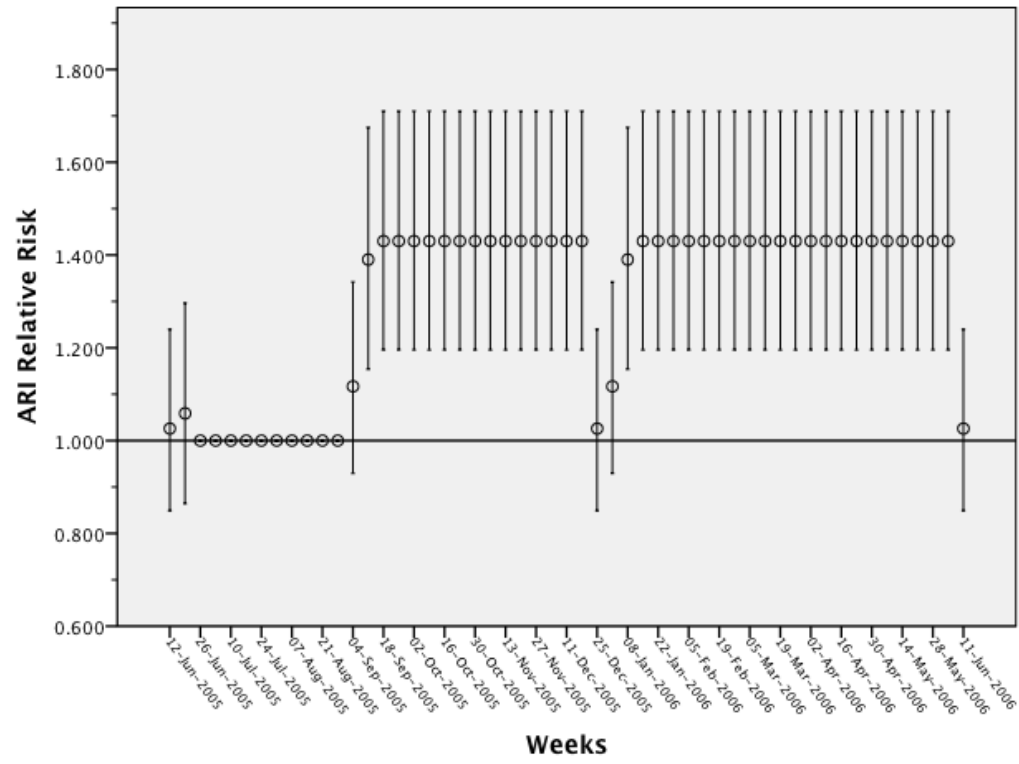


Figure XX. ARI Diagnoses, Children 5-17 Years by School Session

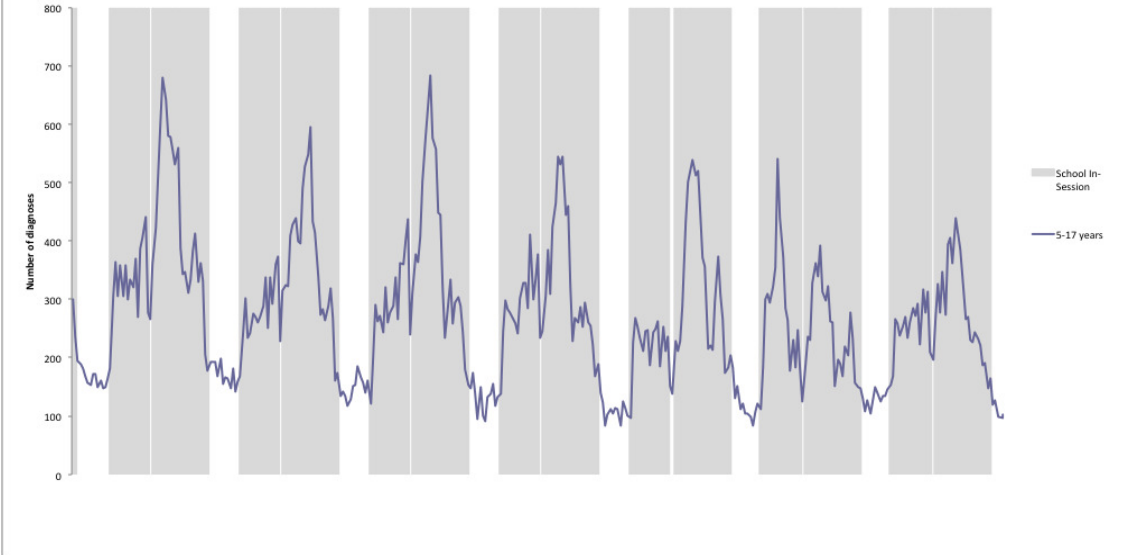
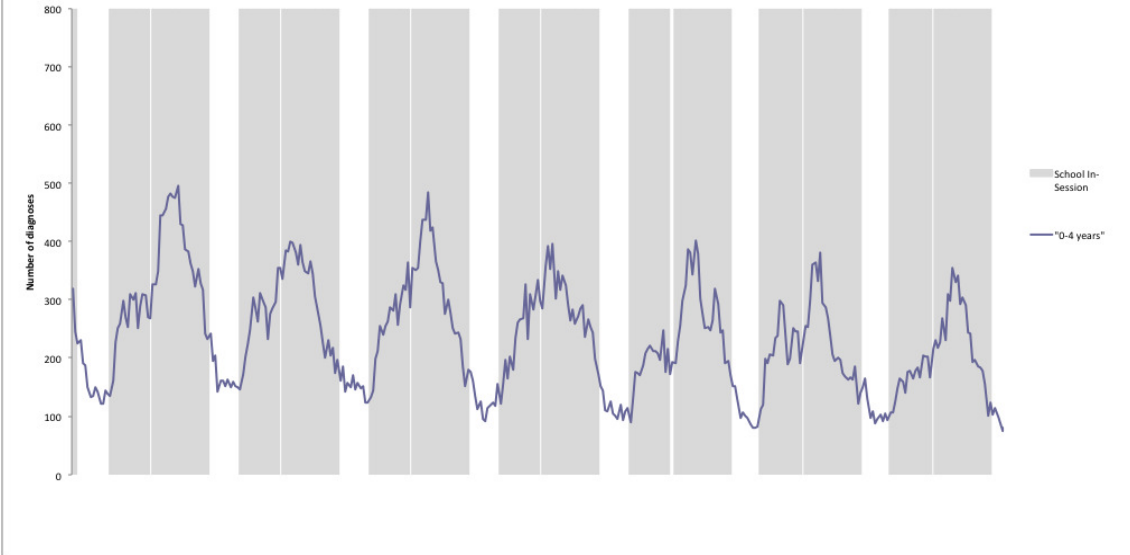


Figure XX. ARI Diagnoses, Children 0-4 Years by School Session

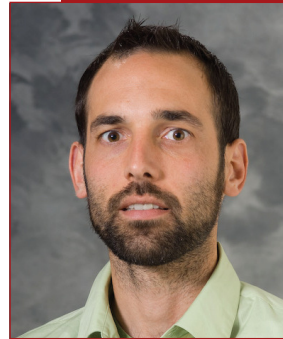


MICAH PUYEAR, DO

PROJECTS COMPLETED DURING RESIDENCY:

Quality Improvement Project:

Rapid Improvement Event Dean Clinic --
Baraboo Triage Event



Micah Puyear grew up in Pella, Iowa, a small town of 10,000 people. He completed bachelor's degrees in Exercise Science and Chemistry before attending medical school at Des Moines University Osteopathic

Medical Center. His small-town roots inspired a strong interest in rural/underserved medicine, and he joins the residency program as part of the Baraboo Rural Training Track. As a medical student, Micah completed rotations in two family medicine outreach clinics in Bussy, IA (population 500) and Sully, IA (population 1,000). These communities had significant numbers of low-income households, which allowed him to witness firsthand the need for good primary care physicians in rural, underserved areas. In addition to rural medicine, Micah also has a passion for teaching. During medical school, he served as a guest lecturer with the Central College Athletic Department, and he also worked as an Anatomy Teaching Assistant at Des Moines University. Micah enjoys staying physically active through cycling, running, lifting weights, and tennis, and he has completed several half-Ironman triathlons. He also enjoys trying new restaurants, going to concerts and plays, and learning new languages.



Thank you to my wife Kristen Prewitt, amazing intern partner David Danielson, twin brother Joshua, my parents Cristi and Charles Puyear, in-laws David and Donna Prewitt, and many friends for their love, support, and encouragement.

— Micah



Rapid Improvement Event
Dean Clinic - Baraboo Triage Event
Week of 12/03/2012



Our Team



Anita Dahlinger, Shelly Beschta, Brad Kunze, Kathy Thom, Sue Hasse, Micah Puyear, Tom Genovese, Kari Schaper, Valerie Jelle, Sandy Powell-Trollop

Reason For Action

Theme -
 Concerning number of lost calls and extended wait times for patients when calling the triage line. Slow response time on messages routed to Pods/Providers because of incomplete information and batching calls entered into Epic. Delayed turn around on medication refills due to volume of phone/fax and duplicate requests, and refills not being processed at appointments patients have had within the last 3 months.

Scope - Baraboo Triage/Refill

Initial State

- ❖ Triage and Refill Staff Hours Available 8-5 M-F, 8-12 Sat
- ❖ 2 Triage nurses M-F, 1 Triage nurse Sat, 1 Refill nurse M-F
- ❖ Phone stats for 2920 Triage Queue - average # of calls per day M-194 T-143 W-142 Th-153 F-161 S-32 - average % of lost calls per day M-15 T-9 W-15 Th-21 F-15 S-3
- ❖ TSF (Time Service Factor = % of calls answered within 20 sec) for 2920 Queue: M-51% T-63% W-58% TH-37% F-48% S-75%
- ❖ Average # of Refill requests- M-164 T-107 W-66 Th-119 F-143 Sat-2. Average # INR's M-24 T-23 W-10 Th-13 F-19 S-2

Initial State

- ❖ Refill nurse=average of 3.37 minutes per contact. Triage nurse= average of 3 minutes per contact. INR=5 minutes average per contact.
- ❖ Average # of Prior Auths per week is 25. 2/3 of these are "easy" and take an average of 12 minutes. 1/3 of these are "hard" and take an average of 30 minutes or more.
- ❖ Variation in duties based on staffing and lack of standard work flows which identify priorities.
- ❖ Refill requests currently processed in 48 to 72 hours.

Initial State



Target State

- ❖ Decrease average lost calls per day in triage queue M thru F from 15% to 7%
- ❖ All refill requests processed within 24 hours (based on refills sent to pharmacy or at front desk and patient notified). Narcotics to be refilled within 72 hours.
- ❖ Triage documentation complete and encounter routed or closed after every call.
- ❖ Increase TSF M thru F from 51% to 90%

Solution Approach

Solution Approach

If We ...	Then we should expect ...
Everyone trained and adequate staffing	Decreased lost calls, increase TSF, increased employee and staff satisfaction, reach all of the target states, increased revenue
Standard work and prioritizing work	Increased efficiency and satisfaction, decrease errors, decrease downtime
6s	Increase efficiency, decrease workload, decrease interruptions, decreased dropped calls
AVS at time of visit & documentation	Increased efficiency, decrease triage calls, increase patient and staff satisfaction, decrease refill calls, increase revenue
Document during call	Increased patient and staff satisfaction, increase efficiency, decrease adding addendums, information would be up to date, decrease errors
Triage In-Basket	All have access, decrease floor nurse satisfaction, increase errors, increase duplications, increase efficiency
In-Basket Message colored by time	Increase patient, staff satisfaction, decrease confusion, increase efficiency

Rapid Experiment

- 6S the stations for Triage
- Removed the phones from the lobby for Triage
- Correcting the voicemail options

Rapid Experiment

Training and Staffing

- Staffing to demand
- Training all Triage nurses to refill medications and process INR results

Rapid Experiment

- Standard Work and Prioritizing
- Dot phrases for triage
- Creating/Updating protocols

Completion Plan

What	Who	By When
Team meetings prior to 30.60.90	Anita	12/14
Kamishibai Cards	Anita/Shelly	1/31
Communicate Finger Tip.com	Sue	1/31
Auto Attendant	Kathy/Penny	12/31
Triage/Rx Reference Books	Sue/Anita	1/31
Train all triage RN's & LPNs to process Rx refills & INRs per protocol	Shelly/Super Users	1/31
ROI Potential Savings	Brad/Shelly	1/31

Completion Plan

What	Who	By When
Merge Triage and RX Roles	Shelly	1/31
Communicate DOT phrases	Sue	1/31
Staffing to Demand	Shelly/Tom	03/07
AVS at Time of Visit	Brad/Shelly	12/31
MyChart Auto Fill Subject	Valerie/Kari	12/31
Pharmacy Access to Epic	Brad/Kari	12/31
Set Up a Triage Pool	Shelly	01/31

Completion Plan

What	Who	By When
InBasket Message Change of Color Based on Duration	Kari	1/31
Home Health United Follow Up Fax/Phone	Shelly	1/31
Prior Auth Cheat Sheet by Company	Anita	1/31
Communicate Referral Advocate Runs	Tom	12/31
Floor Nurse Create Encounter for RX Refill	Shelly	12/14
Signature for Things Picked up From Desk	Tom/Kathy	12/31
Calculate RX being processed	Tom	On Going
6S Rest of Triage/Refill	Sue/Anita	12/31

Confirmed State

Measure	Baseline Pre-RIE	Target Pre-RIE	Expected 90 days
Average Calls Lost	15%	7%	10%
Time Service Factor	51%	90%	80%
Refills being processed	48/72 hours	24 hours 72 hours for Narcotics	85% of the time

- ### Insights
- “Sometimes EPIC is more Spaceballs than Star Wars”
 - Don't wear black on a 6S day
 - It all comes together in the end
 - Optimistic that we can reach the goals
 - TORA! TORA! TORA! “I am afraid we have awakened a sleeping giant and filled him with a great resolve” -Adm. Yamamoto

Standard Work

“Standard Work is only Standard until someone discovers a better way to do it!”

Wrap Up & Questions?

Are we done yet?

It's a Continuous Journey!



Rapid Improvement Event Dean Clinic - Baraboo

60 Day Report Out
Provider Event
Dr. Krszjaniek



Completion Plan

What	Who	By When	Completed
CPX Forms	Kellie	10/26/2012	10/19/2012
Medicare Questionnaire Workflow Communication	Kellie/Angie	10/29/2012	10/19/2012
MD Assist Paging & label phones in exam room	Penny	10/19/2012	10/19/2012
EPIC Optimization - Thursday AM's	Kari	10/26/2012	10/25/2012 & 11/8/2012
Provider Shadow	Kari	10/26/2012	Dr. K reviewing
Inbasket Workflow	Kari	10/22/2012	10/25/2012
Meetings with team	Penny	10/26/2012	10/26/2012

Completion Plan

What	Who	By When	Completed
AVS Workflow Communication	Angie	10/26/2012	10/29/2012
Black Microphone	Kari/Brad	11/30/2012	Not sure if it's needed
Referral Advocate Forms/Communication	Kellie	10/26/2012	On going
Move November 40min WCC to 20min	Kellie	10/31/2012	12/05/2012
Kamishibai Cards	Penny	11/30/2012	
ROI - Potential Savings	Penny/Brad	11/30/2012	
Protocol Changes	Kelli/Penny	12/01/2012	12/05/2012

Confirmed State

Measure	Baseline Pre-RIE	Target Pre-RIE	Expected Final	30 Day	60 Day
Close Encounters Same Day	57.9%	80%	75%	Pending Report	Pending Report
Increase Avg # of patients per day	15	18	17	17.4	16.16 ROI-\$500
Arrival to AVS	20min=57min 40min=66min	20=52 40=61	20=52 40=61	20= 40=	20= 66 40=69
Reduce Outside Hours	18 hrs	9 hrs	11.5 hrs	11 hrs	11 Evaluating practice profile.
3rd next available	Short=11 days Long=51 days			Short=11 Long=48	Short=16 Long=40
Other	5329 lines (2 mon average)				*0 lines ROI-\$800

Insights

- Dr. K has not dictated since the event!! Zero lines of dictation for the month of November!!
- Paging overhead is great
- Things are going forward it just takes time!!
- Bins on his desk are helpful!!



Dean

**Rapid Improvement Event
Dean Clinic – Baraboo
Business Office Project**

Reason For Action

Theme – Continuation of Business Office Rapid Improvement Event – potential for huge improvements required more investment of time to accomplish and need to team up with the WIITTS department and DHI Claim Processing.

Scope – Charge Review WQ, Claim Edit WQ, and Follow up DHI Denials

Initial State

- Charge Review WQ Errors – Top 6 Actionable Errors
 - DHP Charge Review WQ's – Average 671 charges added/day resulting in \$1,346,535/mo average
- Claim Edit WQ Errors – Top 10 Denials and Denial Definitions
 - DHI Claim Edit WQ's – Average 45 charges added/day, resulting in \$90,304/mo average
- Follow Up WQ (DHI Denials)
 - DHP WQ 6211 – Average 28 charges added/day, resulting in \$51,189/mo
 - DHI WQ 6214 – Average 111 charges added/day, resulting in \$222,747/mo
 - Missing DHI Edits to create rules to prevent charges from hitting the edits.
- Employee Productivity Report for Charge Review Only

Target State

- Decrease charges added daily to the Charge Review WQ by 50%
- Decrease charges added daily to the Claim Edit WQ by 50%
- Decrease charges added daily to the Follow up DHI Denial WQ's
 - WQ 6211(rejected) – Decrease by 50%
 - WQ 6214 (unpaid claims) – Decrease by 50%
- Claim Edit and Follow Up WQ – Reporting for productivity management
- Educate RBOS to Manage Daily Improvements via WQ Reports & Daily Trends

Completion Plan

What	Who	By When
Front End Training Guide	Valerie	12/14/12
Training for Site Coordinators	Valerie	12/20/12
Training for Super Users	Valerie	1/02/13
30,60,90 Day Pre Meetings	Debbie	12/15/12
Missing Admin w/ IMM injections-train nursing (change from coding WQ to Nursing)	Morgan/Kari	12/21/12
Reports for more specific production out of WQ's	Ryan and Katie	01/15/13
WIITTS Request CRWQ	Ryan	01/01/13

Completion Plan

What	Who	By When
WIITTS Request Claim Edit	Ryan	01/01/13
Schedule DHI Meetings on a monthly basis to review denials	Debbie	12/31/12
WQ summaries as a RBOS monthly meeting as a standing agenda item	Debbie/Patti	12/15/12
Coding to be a standing agenda attendee to review issues each month	Morgan	01/15/13
Invalid primary payor or subrogation Dean & Dean MA (same # invoice)	Ryan/Debbie WIITTS request	1/1/13
Dean EOP leaving balance at insurance level that should go to secondary or self pay	Ryan WIITTS request	12/14/12

Confirmed State

Measure	Baseline Pre-RIE	Target Pre-RIE	Expected Final
DHI Avg Days in A/R	39 days	35 days	35 days
DHP decrease charges added to charge review WQ	671/day	Decrease by 50% 336/day	Decrease by 25% 493/day
DHP decrease charges added to claim edit WQ	45/day	Decrease by 50% 23/day	Decrease by 25% 34/day
Decrease charges added to DHP WQ 6211	28/day	Decrease by 50% 14/day	Decrease by 50% 14/day
Decrease charges added to DHP WQ 6214	111/day	Decrease by 50% 56/day	Decrease by 50% 56/day

Confirmed State

Confirmed State

Report Out
Date: Week of 11/12/2012

RIE Name: Business Office Sponsor(s): Matt Bagley

Clinic: Platteville Senseel: Sandy Powell-Tropop

Process Owner: Debbie Weber Facilitator: Valerie Jelle/Karl Schaper

Measures	Baseline Pre-RIE	Target Pre-RIE	Final	30 Day	60 Day	90 Day	120 Day	Percent Change
DHI Avg Days in A/R	39 days	35 days	35 days					
DHP decrease charges added to charge review WQ	671/day	Decrease by 50% 336/day	Decrease by 25% 493/day					
DHP decrease charges added to claim edit WQ	45/day	Decrease by 50% 23/day	Decrease by 25% 34/day					
Decrease charges added to DHP WQ 6211	28/day	Decrease by 50% 14/day	Decrease by 50% 14/day					
Decrease charges added to DHP WQ 6214	111/day	Decrease by 50% 56/day	Decrease by 50% 56/day					

- ## Benefits of Experiments
- Having WIITTS representatives dedicated to the project enabled WQ Rule improvements – stopping errors from hitting WQ’s – correctly entered into EPIC initially.

- ## Project Overview
- Came up with Top 5 Edits in Charge Review WQ’s
 - Looked at the rules
 - Came with the Top 3 for Claim Edit
 - Looked at Top 10 Dean Denials
 - Received Security for Epic Reports
 - Defined some criteria that needs to be built
- Page 34

- ### Charge Review WQ - 264/1611 charges/day = 16%
- WQ 255 - (84/248 charges/day potential impact)
 - *Review G0008 & G0009 switch to 90471 & Std Work for Nursing
 - Std Work 90460 & 90461 - Imm's admin w/# of Componentes
 - * Add Admin Code to various Inj's & Std Work for Inj w/missing admins require specific nursing resource to fix - fix own errors
 - Pre-ops - Await Dean RIE Outcome
 - WQ 9920-9923 - (105/158 charges/day potential impact)
 - Missing Invalid Bill Provider (44/day)
 - Same Visit Carve Out (28/day)
 - Bill Provider Location Check (11/day)
 - Bill Provider Location Check/Charge Line (12/day)
 - Number of coverages in SA greater than P/F Acct (10/day)
 - WQ 5837 - (38/38 charges/day potential impact)
 - *New Patient - WIITTS to define New Pt w/in Epic and switch to Established
 - WQ 268 - (37/37 charges/day potential impact)
 - Modifier 25 - Compliance Project to expand current list
 - * equals WIITTS Request
- Page 35

- ### Claim Edit WQ - 48/133 charges/day potential impact 36%
- WQ 338 - (13 charges/day potential impact)
 - Missing subscriber ID (70136)
 - Ins ID not specified (70000)
 - Ins ID null/pending (700057)
 - WQ 355 - (5 charges/day potential impact)
 - Primary claim has secondary coverage Medicare (70471)
 - EOB info does not exist for DHP (71230)
 - Primary claim has secondary coverage DHI (70471)
 - WQ336
 - Not allowed to bill outside lab - Medicare (70259)
 - Provider first & last name not entered (70107)
 - Provider is missing (63271248)
 - WQ 339
 - Subscriber address incomplete (70252)
 - Missing subscriber ID (70176)
 - Ins ID not specified (70000)
 - WQ 340
 - Claim qualifies for component PQRI m124 numerator
 - Primary claim has 2nd coverage m124 denominator
 - Provider first & last name must be entered (70107)
- Page 36

DHI Denials - 95/139 Chg/Day Potential Impact = 68%

- WQ 6211 - (6/28 charges/day potential impact)
 - Podiatry - DHI Fix 1/1/13 if GZ present - DHI will denial to Pat Resp
 - Daily Max Units
 - 87186 Stop Bundling
 - Charge Handler - Qty 1 - 95115, 95117, 20552, 20553
 - Charge Handler - 94650 > 1 add modifier 76
 - *90471 Nurse Smartset
 - Duplicate Service
 - * Move to CRWQ coding 255 to prevent from erroring
 - DHI Fix - Denied in error
 - Duplicate report from DHI needs review
 - New Patient
 - WIITTS Project in progress
 - Face to face requirements will be followed for new pt
 - Global Service
 - *Add 24 modifier to different service performed during global period
- WQ 6214 - (89/111 charges/day potential impact)
 - Process check immediately vs hold 10 days
 - Modifier 51 - DHI corrects

*= WIITTS request

Page 37

Potential/Captured Savings

Measure	Service (Satisfaction)	Financial (Revenue/Expenses)	Quality	Growth (Volumes/Access)

Insights

- It was helpful having Ryan and Katie here from WIITTS!!!
- Members are willing to ask questions
- Great walk through with the teams
- Having WIITTS representatives dedicated to the project enabled WQ Rule improvements - stopping errors from hitting WQ's - correctly entered into EPIC initially.

KATIE RAY, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

Presentation at the 2012 meeting of the American Osler Society (with John Ray, MD):
“Physician Civil Disobedience: A Historical Perspective on Current Controversy”

Community Health Project:

Wingra Vegetable Recipe Board -- After many conversations about what types of foods my patients were eating, I decided to do a survey. For one week at clinic, a one page survey was distributed to every patient who checked in for an appointment. The surveys were completed in the waiting room and returned to a drop box. I got approximately 120 surveys back and it showed that the average Wingra patient has 0.9 servings of vegetables a day and the two most commonly cited reasons for not eating more were 1) They spoil quickly and 2) I don't know any good ways to cook them. When asked if they would eat more vegetables if they had tasty ways to prepare them, 85% said they would. The Wingra Vegetable Recipe Board was created as a forum for patients and staff to share their recipes for preparing vegetables. It hangs in the waiting room and looks like a Menu Board at a cafe. Every couple weeks, a new recipe is featured and half sheets with the recipe are available in a pocket on the board. So far, about 25 recipes are taken home each week.



Thanks to my husband, John, for all his support, wisdom and entertaining distractions. Also, thanks to my parents and brother, Nick.

– Katie



Katie Ray completed her bachelor's degree in Eastern European Studies from the University of Texas in Austin before attending medical school at the University of Texas Medical Branch in

Galveston. Her background in history and literature – a reflection of her interest in people, their stories, their joys and sorrows – makes family medicine a natural fit. A Gold Humanism Honor Society member, Katie has volunteered much of her free time throughout her life to serving others in need. During college, she volunteered with Casa Marianella, a temporary home for recent immigrants. As a medical student, she served as director of St. Vincent's House, a student-run free clinic that provides healthcare for a large portion of Galveston's working poor. Katie also held a leadership role in her medical school's global health group, and she has traveled to Kenya and Ecuador in recent years to provide clinical care and health education to remote populations in need. Outside of medicine, Katie deeply enjoys cooking for people, playing and listening to music, riding her bicycle and being outside.

Physician Civil Disobedience

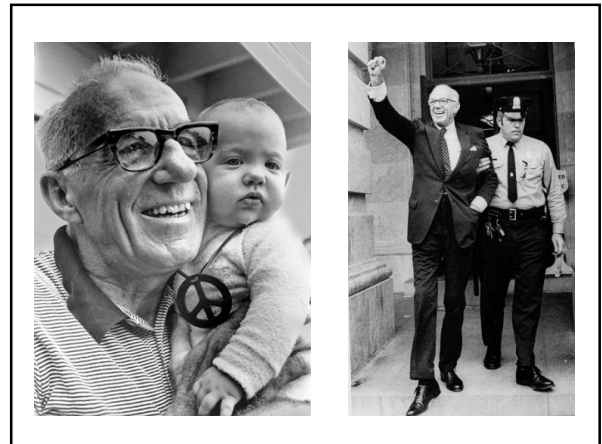
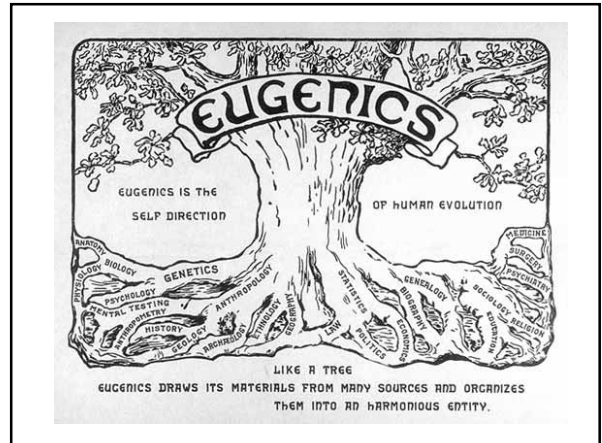
A historical perspective on current controversy

John and Katie Ray, MDs



AMA Code of Medical Ethics

- “Ethical values and legal principles are usually closely related, but ethical obligations typically exceed legal duties. In some cases, the law mandates unethical conduct. In general, when physicians believe a law is unjust, they should work to change the law. In exceptional circumstances of unjust laws, ethical responsibilities should supersede legal obligations.”



Free Dr. Howard Levy, Capt., U.S. Army. Demand His Immediate Release on Bail!

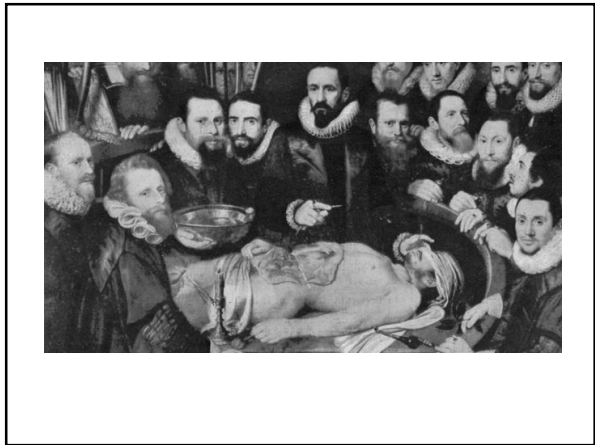
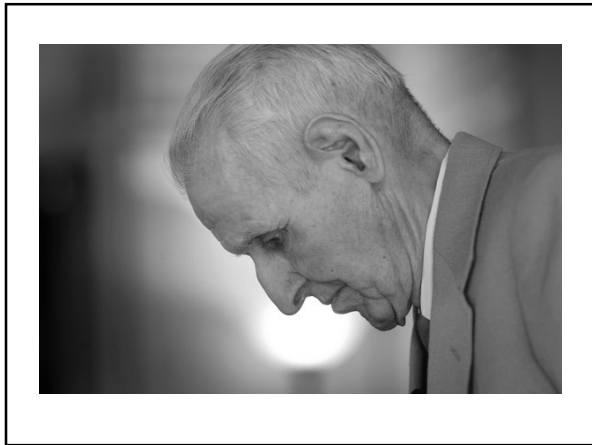
No More Hiroshimas! End the War in Vietnam Now! Bring Our Boys Home Alive!

Join With Thousands of New Yorkers to Commemorate HIROSHIMA DAY, and to Protest Dr. Levy's Confinement! Demand That Dr. Howard B. Levy Be Released on Bail Pending Appeal!

Saturday, Aug. 5th
ASSEMBLE 12 Noon, Columbus Circle
WALK Down Broadway
RALLY 2PM, Bryant Pl. (42nd St. & 6th Ave.)

Support by: 4th Avenue Veterans Peace Rally Committee, New York Medical Community to End the War in Vietnam, Veterans and Reservists to End the War in Vietnam, Veterans for Peace in America, Veterans for Human Rights, Student National Committee to End the War in Vietnam.

DR. HOWARD B. LEVY (1918-2008) was a brilliant and dedicated physician, a leader in the development of medical education, and a pioneer in the use of medical ethics. He was a member of the American Medical Association, the American Society of Internal Medicine, and the American Society of Clinical Pathology. He was also a member of the American Society of Human Rights and the American Society of Human Rights. He was a member of the American Society of Human Rights and the American Society of Human Rights. He was a member of the American Society of Human Rights and the American Society of Human Rights.



Baltimore City Hall, 1904

Special thanks to...

Micaela Sullivan-Fowler: History of the Health Sciences Librarian, UW-Madison

John P McGovern Academy of Oslerian Medicine

Physician Civil Disobedience: A historical perspective on current controversy.

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John Ray is the chief resident at UW Dept of Family Medicine in Madison, WI. Katie Kucera Ray is a 2nd year resident at UW Dept of Family Medicine in Madison, WI, and was recently published in *The Persisting Osler IV*. Both are graduates of the University of Texas Medical Branch and were student members of the Academy of Oslerian Medicine. The two got engaged while attending the 2009 AOS Annual Meeting in Cleveland.

Physicians are in a unique position not only to appreciate how social factors and injustice affect the health of our communities but also be in a position to effect change. As Virchow noted, “[P]hysicians are the natural attorneys of the poor, and social problems fall to a large extent within their jurisdictions.” [Segerist]

There are many types of political activism--Osler lobbied the political leaders of Baltimore with a provocative imploration to his “long-suffering, patient, inert fellow-citizens.” Other physicians have resorted to more extreme measures to voice their political opinions.

Our residency program was recently involved in a controversial situation when a small group of physicians attended a political protest and distributed “sick notes” to union protesters--making headlines on Madison’s Fox News. In response to this tumultuous event, we did what any good student of Osler would: we began asking what role physicians, as inherent community leaders, have historically played in political controversy and civil disobedience.

For example, in 1943, over six thousand Dutch physicians unanimously rejected Nazi orders and turned in their medical licenses, though it meant imprisonment. Numerous doctors during the Vietnam era helped soldiers evade the draft as a private way of expressing their disapproval of the war. Contemporary doctors are being arrested in Syria and Bahrain for treating wounded dissidents. Many doctors have participated in illegal acts (abortion, euthanasia, clean-needle exchanges, etc.) when they felt it was in the best interest of their patient. What happens when the legal system is in conflict with a physician’s commitment to their patients? What are the defining differences between these scenarios? How can a historical perspective improve our understanding of the events at the Wisconsin protests and help us find meaningful ways to balance our personal, professional, and political responsibilities.

Learning Objectives:

- Define civil disobedience
- Explore historic examples of physician involvement in civil disobedience
- Discuss instances of Osler’s involvement in acts of political controversy
- Apply our discussion to the recent UW Family practitioners’ involvement in writing “illegal sick notes”

Disclosure: no financial conflicts, currently residents at UW

Physician Civil Disobedience: A historical perspective on current controversy

In the spring of 2011, a dozen family medicine physicians from our residency program stood in the midst of a hundred thousand union protesters with a sign, "I'm a Doctor. Do you need a sick note?" Over the course of a day, they distributed hundreds of notes to excuse people from their jobs. This story was picked up by Madison's Fox News and broadcast as an outrage, a violation of professionalism and a misuse of authority. The headline read, "Fraudulent notes written by supposed physicians." As a consequence, the participating physicians were publicly chastised by the University of Wisconsin and the residency program director was suspended. Several faculty members are still dealing with the repercussions. In response to this tumultuous situation, we did what any good student of Osler would: we began asking what role physicians, as inherent community leaders, have historically played in political controversy and civil disobedience.

The AMA *Code of Medical Ethics* states "Ethical values and legal principles are usually closely related, but ethical obligations typically exceed legal duties. In some cases, the law mandates unethical conduct. In general, when physicians believe a law is unjust, they should work to change the law. In exceptional circumstances of unjust laws, ethical responsibilities should supersede legal obligations." [Wynia]

The practice of medicine is fraught with ethical, legal, and clinical dilemmas. There are competing interests between the needs of patients, third parties with financial concerns, the public, and the government, to name a few. It is conceivable the interests of an individual patient might be at odds with these other parties. Laws may prevent or mandate treatments contrary to what the physician and patient agree are just. The law may require the reporting of citizenship status, gunshot wounds, or certain diseases, any of which may put patients in a precarious position. Under these circumstances, physicians weigh potential risks and benefits and often act in the best interest of their patients. When the law is in stark contrast to their patient's best interests, physicians may opt to break it.

This brings us to subversive behavior, one example of which is civil disobedience. The ethicist, James Childress, defines civil disobedience as a public, nonviolent, submissive violation of law as a form of protest. The consequences of this disobedience must be acknowledged and accepted to bring about public awareness and incite change. It is the preliminary knowledge of the consequences that makes a public impression - a cause that is worth a personal cost. Such behavior is intended to fuel change while still paying respect to the system as a whole. For our purposes, there are other forms of subversive behavior which are useful to explore. Conscientious objection is a refusal to participate, on moral and religious grounds. If refusal is illegal and the act is public, this could also qualify as civil disobedience. Evasive noncompliance is a covert violation of the law to protect participant

confidentiality and to escape consequences. (Childress) A well-known historic example is the Underground Railroad, motivated by moral obligation, but more effective as a secretive undertaking. We can now apply this framework to the world of medicine.

Physicians are in a unique position not only to appreciate how social factors and injustice affect the health of our communities, but also be in a position to effect change. As Virchow noted, “[P]hysicians are the natural attorneys of the poor, and social problems fall to a large extent within their jurisdictions.” [Seegerist] There are countless examples of physicians using their clout to support one cause or another. As professionals, physicians balance two major priorities: the well-being of the patient sitting before them, and the overall well being of a community – i.e. public health. We want to focus on controversial behavior by physicians on behalf of their professional obligations.

Traditionally, medical ethics has dictated that it is morally questionable for doctors to strike, as it violates the patient-physician relationship and could very well cause harm to patients.

However, in 1943, 6,200 Dutch physicians unanimously rejected Nazi orders to join a seemingly benign Nazi-created Chamber of Physicians. They turned in their medical licenses, initiating a country-wide strike. In a letter to the Reich Commissioner, they declared that that they would have no part of a medical society that sponsored "deportation of the insane and sick persons and the sterilization of healthy people." Consequently, hundreds of doctors were sent to concentration camps [Himmelstein, Alexander]. After weeks without virtually any medical services in The Netherlands, the Nazis, fearful of epidemics, gave in. As a result, not a single Dutch doctor subsequently participated in euthanasia or sterilization. These physicians publicly broke the law and accepted severe consequences to protect their patients.

Numerous examples of civil disobedience, as well as evasive noncompliance, exist from the Vietnam War era. Physicians who objected to the war would certify young men as medically ineligible for the draft. This type of subversive objection to war is complicated; morally, ethically, and clinically. It not only involves dishonesty, but also possible personal gain, in the form of payment to the physician. Many physicians assisting draft evaders were doing it because they opposed the Vietnam War, not necessarily war in general. In this case, they were not primarily acting in order to protect patients. Instead, they were secretly breaking the law to enact a personal protest to a war they did not agree with. (Gross) This is hardly laudable, as the illegal action did nothing to further their cause. Though, few deny that for most people, going to Vietnam posed a significant health risk.

One doctor took it a step farther. Dr. Benjamin Spock, author of the famed book “Baby and Child Care”, was a pediatrician who fought the draft through acts of civil disobedience. He considered mandatory draft registration to be an unjust law that put his community in harm’s way, stating “what’s the use of physicians like myself trying to help parents to bring up children, healthy and happy, to have them killed in such numbers for a cause that is

ignoble?" (Maier). Believing this, he was compelled to change the law. In 1968, he was arrested for conspiring to instruct, aid and abet draft resisters. Specifically, he led public protests at army induction centers and collected draft cards from young men, returning them to the Justice Department. When charged with conspiring to disrupt the draft, he told the FBI interviewers "I'll give you enough evidence to hang myself." (Bigart) He wanted the trial to be as public as possible, so his arguments against the war would be better heard and incite change, stating, "If the Government were to prosecute me, I'd be delighted." (Maier) He was convicted and sentenced to 2 years in prison. However, his sentence was overturned on appeal. Dr. Spock was arrested for a dozen other acts of civil disobedience over the years, opposing nuclear weapons as the co-chair of the National Committee for a Sane Nuclear Policy, and speaking out to end homelessness and racial injustice. (Mitgang)

The highly-publicized case of Howard B Levy is another example of a physician committing a public act to draw attention to the unjust nature of the Vietnam war. Dr. Levy was a NYU-trained dermatologist, who was jailed for disloyalty and refusing to teach Green Berets how to identify and treat skin conditions. He argued the Green Berets would misrepresent their medical knowledge for political and strategic gain. Therefore, training the Green Berets was unethical and amounted to abetting war crimes. (Bigart 2, Bigart 3) Interestingly, Dr. Spock was one of the doctors called by the defense to testify on Levy's behalf. They testified that the art of healing should never be subverted to military ends (Wooten). For his refusal to train soldiers, Dr. Levy was jailed for 3 years.

More recently, physicians in Bahrain were subjected to imprisonment for acts of civil disobedience. In the spring of 2011, concurrent with the events in Madison, Bahrain had a political uprising to achieve political freedom for the Shia population and end the reign of King Hamad. In response to protests, the Bahraini government cracked down; forbidding doctors from providing medical treatment to anyone involved in the uprising, accounting for 25% of the adult population. Furthermore, strict mandatory reporting laws kept many injured from seeking care. Many doctors, declaring that it was their duty to treat anyone who came into the hospital, continued to treat patients despite the order. Consequently, some were jailed and tortured. At least 8 physicians received 15 year prison sentences. The court decision led to an international outcry, including several prominent human rights organizations. (Goodman) Almost identical events occurred in Syria just a month later following country-wide protests, with physicians persecuted for treating protesters.

The story of Dr. Kavorkian cannot be omitted when discussing physician civil disobedience. Dr. Kavorkian is one among many physicians who believe it is the right of terminally ill patients to take their lives. What separates Dr. Kavorkian is that he illegally assisted in over 100 patient suicides. As a euthanasia activist, he was public about his practice and, consequently, was convicted for second degree murder and served 8 years in prison. (Wikipedia)

An intentionally public act, civil disobedience is easy to identify. Far more common among physicians, however are acts of evasive noncompliance. While evasive noncompliance may be justifiable for an individual patient, for the most part, it is a resignation that the system is broken and cannot be changed (at least not in time for this patient). The result is frequently an additional burden on the system. In certain political reigns, cultures, or countries, the system may indeed be irreparably broken. Common examples include buffing diagnosis codes to get necessary medical care, draft evasion, providing illegal abortions or birth control, or providing clean needles to drug users with HIV. Physicians have a heritage of breaking laws when they thought it served a greater good. Many of the fathers of medicine participated in illegal acts from grave robbing to vivisection to unauthorized autopsies, arguing they were advancing medical knowledge.

Often, the authority of physicians alone has been used to effect political change. The opinions of popular physicians often carry influential weight in politics. One instance in particular (Cushing 569-71) seems bold yet also humorously critical. In 1902, tuberculosis was on the rise and public sanitation was lagging behind scientific developments and population growth. William Osler and his contemporaries realized, from working on the front lines, that TB was a growing public health issue. They further appreciated how public health policies could curb the spread of TB and decrease the suffering of those with the disease. Osler, William Welch (then president of State Dept of Public Health and one of the founding faculty at Johns Hopkins Medical School), and several others convened a special public meeting to discuss the state's plan to deal with tuberculosis.

After the mayor of Baltimore spoke, Osler was invited to say a few words. What followed was an impromptu, quite direct criticism of the city and its officials' apathetic response to this glaring public health issue, as well as the bureaucratic inertia that was actually slowing progress. Osler asks the mayor and his "inert, patient, and long-suffering fellow citizens" what they intended to do? Osler requests that, "if the citizens could wake up, and remain awake a few moments, he might tell them what to do", while he reduces the city's accomplishment to paving a few streets! Though the ends are not the only things that justify such means, it should be noted that this meeting did spur the city to action.

While invigorating, public, and somewhat unexpected, Osler's actions are not disobedient. He simply spoke frankly with the health of his patients in mind, and disdain for popularity and politics--what he felt were obstacles to health promotion in this situation. He was working within the frameworks of the law to bring about change. While there could have been consequences (we may never know if this damaged his relationship with Baltimore's mayor or Johns Hopkins' with the local government), it was clearly not illegal. Osler exhibited a wide range of opinions on the First World War even with his son's involvement--mostly by working himself to distraction with the wounded rather than pontificating or protesting. Though, after learning about the destruction of Louvain's library, he was certainly anti-German.

Civil disobedience comes in forms large and small. We came across an article in the New York Times about a passionate 85 year old great-grandmother. Kate Stahl started by organizing bus trips to Canada with a local seniors group to illegally smuggle cheap prescription medications across the border. She has since become a national advocate. She's hoping to get arrested, "can't you see the publicity...Frail old lady put in jail because she couldn't afford her drugs in America." She's hoping for her chance at civil disobedience. (Weil)

In Madison, a small group of University physicians, acting out of disapproval of the unilateral dissolution of all state employee bargaining rights, stood in solidarity with teachers, nurses, and other state employees. Their contribution was writing sick notes--emphasizing the effect this distressing legislation could have on one's mental health. They interviewed every person for whom they wrote notes. They also kept medical records including a list of names and contact information. In general, this would not be considered an act of civil disobedience because there are no laws prohibiting physicians from writing sick notes. It was certainly a public act meant to bring awareness to an unjust law. This story takes a novel turn when considering the unexpected degree of public and political backlash. The participants were unaware what the consequences would be going in. Interestingly, with over 100,000 protesters, this particular act is what made the headlines. The primary concern from critics was that the doctors misused their authority for personal political motives, undermining the sanctity of the patient-doctor relationship. Certainly, they were following in their predecessors' footsteps, protesting to bring attention to what they considered an unfair situation. Their act was controversial and, thus, successfully served the purpose of highlighting their cause. It is beyond our scope to judge whether these actions were justifiable. We simply aim to place it within the historical context of medical precedence.

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ELIZABETH SCHAEFER, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

A Family Practice Inquiry Network (FPIN) Help Desk Answer: "Is Misoprostol Effective for Pain Reduction Prior to IUD Insertion in Nullips?"

Community Health Project:

Lakeview Elementary Health Fair Day -- The Lakeview Elementary Health Fair Day is a fun, educational event resulting from community-wide collaboration designed to inform the Lakeview student body about essential health topics such as exercise, nutrition, literacy, simple physiology, public safety, dental health, hygiene, and more. We will offer age-appropriate, interactive sessions on a broad range of topics as well as physical activities such as yoga classes, calisthenics with UW athletes and Bucky Badger, and African dance set to the music of a local drumming troupe. Lastly, there will be drawings for prizes to reward children who have achieved goals for participation in a several months-long incentive to monitor distance walked via pedometers donated by the University of Wisconsin Medical Foundation.



A native of rural Wisconsin, Elizabeth Schaefer earned her B.S. in psychology from Carroll College before heading west to Portland, where she completed her medical degree at Oregon Health

Sciences University. Even before entering medical school, Elizabeth spent a good deal of time in medical facilities, working as a Tech Aide and CNA during high school and as a unit secretary in a busy cardiac unit during college. As an undergraduate, Elizabeth also volunteered weekly at the AIDS Resource Center of Wisconsin, where she got a true sense of what it feels like to benefit people at the community level. This interest in community health continued into medical school, where she served on the board of the Multicultural Integrated Kidney Education program and volunteered as part of the annual AMSA "Cover the Uninsured Week." While Elizabeth is drawn to family medicine for its breadth, she has a special passion for maternal and reproductive health, and she was a member of OSHU's Medical Students for Choice group. In her spare time, she enjoys hiking, cycling, discovering music, traveling, and exploring new restaurants with friends.



Is Misoprostol Effective for Pain Reduction Prior to IUD Insertion in Nullips?

The Bottom Line

The practice of using Misoprostol prophylactically to improve provider-perceived ease of insertion and reduce patient-perceived pain during IUD insertion is not evidence-based, and in fact evidence suggests that it might increase subjective pain experience. It has been shown to significantly increase adverse effects such as cramping and nausea.

Evidence Summary

Intrauterine devices are a highly successful contraceptive option for adolescent and young women in that they have comparable continuation rates to other hormonal contraceptives¹, do not increase rates of infection, PID, or infertility² and in fact may confer some protection against STI³, and are highly effective⁴. The American College of Obstetricians and Gynecologists (ACOG) has recommended consideration of long-acting reversible contraception (LARC), including both intrauterine devices and the contraceptive implant, in this population due to their effectiveness, satisfaction rates, and given the population's increased risk of unintended pregnancy⁵.

Though in all women intrauterine device insertions are overall highly successful procedures, the rate of failure and degree of difficulty are increased in nullips⁶. For this reason, many health care providers continue to limit access to intrauterine devices for nulliparous women⁷. Others, in an attempt to optimize success of IUD insertion, have adopted the practice of administering Misoprostol, a prostaglandin analog, to nulliparous women prior to their insertion procedures, though there is not currently evidence to support this. This practice arose from its successful "off-label" use in cervical ripening during induction of labor as well as in cervical preparation for other gynecologic procedures. Although a randomized Swedish study in 2007 did report a provider-perceived increase in ease of insertion in patients pre-treated with Misoprostol, there were no differences between groups in overall success of IUD insertion or subjective patient experience of pain⁸. Multiple other studies addressing the question of whether Misoprostol can be beneficial in IUD insertions have had study designs that could have affected the outcome, such as the use of Hegar dilators to assess dilation,^{8,9} studying women seeking IUD replacement as opposed to their first device,¹⁰ or the inclusion of women with a prior failed insertion attempt¹¹. A 2011 RCT from Oregon Health & Science University looked specifically at Misoprostol use in primary IUD insertions in nulliparous females and found neither improvement in ease of insertion from the provider perspective, nor improvement in patient-perceived pain, and in fact, there was a statistically non-significant trend toward increased pain in the Misoprostol group¹². Similar to several prior studies, in this work there was a significantly increased rate of adverse symptoms in the Misoprostol group, specifically cramping and nausea. Lastly, a literature review published in 2012 concluded, "research evidence clearly suggests that the routine use of misoprostol in this setting should be abandoned."¹³

Recommendations

Long-acting, reversible contraception should be offered to reproductive-aged women, regardless of their parity. No consensus has been reached on an appropriate prophylactic regimen to increase ease and success of IUD insertion or to decrease pain of the IUD insertion procedure in nulliparous women, and in particular, there is not currently evidence to support the use of Misoprostol for this indication. Fortunately, overall, the success rate is high and the procedure is tolerated well.

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CME Question:

Which of the following is associated with IUD insertions in nulliparous females?

- a) a benefit in subjective pain experience with prophylactic use of Misoprostol
- b) an increased rate of Pelvic Inflammatory Disease (PID)
- c) a continuation rate similar to other hormonal methods
- d) an increased risk of ectopic pregnancy compared to controls

BENJAMIN SCHERSCHLIGT, MD

PROJECTS COMPLETED DURING RESIDENCY:

Community Medicine Project:

Regular contributing author for the *Verona Press* newspaper

Scholarly Project:

A Family Practice Inquiry Network (FPIN) Help Desk Answer: “Does physical therapy after ankle sprain reduce the risk of re-injury?” -- I am authoring this Help Desk Answer with Dr. Ann Evensen. I researched the current evidence addressing this question, decided on the “answer” for the question, and summarized it in the publication’s standard format. Our conclusion at this point is that there is limited and inconsistent evidence that PT decreases re-injury at 12-36 months, and moderate evidence that PT does not decrease the risk of re-injury at 8-12 weeks. We have submitted one draft of the article, received feedback and request for edits, and are preparing to send the second draft.



Benji Scherschligt completed his undergraduate degree in Economics at Valparaiso University in Indiana, and he worked as an economist for five years at the U.S.

Department of Labor

in Chicago. In spite of this successful start to his career, however, he eventually harkened to the calling of medicine and returned to school in the evenings to finish his pre-med requirements. He returned to school full time in 2006 and earned his medical degree from Loyola University of Chicago Stritch School of Medicine. Benji enjoys teaching, and as a medical student he tutored anatomy students and served on the Physiology Course Review Committee. He also has a strong interest in sports medicine, inspired by his own love of athletics (he enjoys playing and watching all sports, especially golf, baseball, basketball, soccer, and football). Growing up in a family of seven, Benji learned early on the value of long-term relationships, and he was initially drawn to family medicine because of its focus on relationships with patients. He is also a generalist at heart, with interests in nearly every subspecialty of medicine. In his free time, Benji enjoys reading, cooking, spending time with his family, and playing the guitar.



Cholesterol: Just One Piece of the Puzzle

In the never-ending fight against heart disease, cholesterol, it seems, often gets portrayed as one of the main bad-guys. As a country, we spend almost \$20 billion per year on cholesterol medications, also collectively called “statins”, the most of any class of drugs. Physicians are often bombarded by advertising touting various meds directed at lowering cholesterol. With cholesterol such an oft-cited target, how concerned should you be about your levels?

As a family doctor, I see patients who are worried about their cholesterol on a daily basis. This concern spans all ages and ranges of health, from elderly folks with multiple medical problems, to healthy young athletes. We now know that taking into account these personal differences is essential in managing cholesterol, and that a “one size fits all” approach will not work.

Cholesterol is an important part of maintaining a healthy heart, and preventing future heart attack and stroke is really the main reason for trying to control cholesterol levels. When I review overall health with patients, I often discuss the future risk of having a heart attack. This risk can actually be determined by a number of different on-line calculators, and is useful when trying to give patients concrete reasons to improve their health.

When thinking about the chances of having a future heart attack, cholesterol is only one component in this overall calculation. Other factors such as age, smoking status, diabetes, a family history of heart disease, and blood pressure all play a role. Some of these may, in fact, be more important than cholesterol levels.

So what does this mean for someone who has abnormal cholesterol levels?

The first steps in improving cholesterol are the same that would be recommended to any person, no matter their health status: eat a healthy, balanced diet, and get plenty of regular exercise. Not only can this affect your cholesterol levels directly, but it will also combat the other risk factors. Aside from age and family history, all other factors are modifiable to some degree through a healthy lifestyle.

Despite our best efforts, however, much of our cholesterol profile is predetermined by our genetics. Those who have optimized their lifestyle yet still have elevated cholesterol are often left to wonder if they should take a cholesterol lowering medication. I point out to such patients that elevated cholesterol may be one of the only, if not THE only remaining risk factor they have for having a heart attack or stroke (although we can never *completely* eliminate our risk).

We must keep in mind that current cholesterol medications have potentially serious side effects, the most common and significant being liver and muscle damage. In many instances these side effects are mild and can be tolerated, and serious complications can be prevented by appropriate monitoring. However, the benefit of taking these medications must be balanced with this potential harm.

Another shortfall of statins is that they only target half of the cholesterol that is important. Two forms of cholesterol are commonly measured through blood tests: LDL, or “bad” cholesterol, and HDL, or “good” cholesterol. Statins target only the “bad” cholesterol, and do nothing to affect “good” cholesterol. Furthermore, “good” cholesterol may be equally or even more important than “bad” cholesterol.

Current guidelines for the treatment of high cholesterol classify various categories of people very differently. If you've had a heart attack or stroke, aggressively managing cholesterol, usually with medication, is probably appropriate. However, in young, healthy people it is acceptable to hold off on starting medication up to cholesterol levels almost twice as high as are acceptable in patients who have had a heart attack!

So next time you have your cholesterol screened, and are told it is "high", take a deep breath and realize that this number is only one component of your overall health. And if your physician recommends starting a statin to lower your cholesterol, discuss with him or her your current risk of having a heart attack or stroke, and ask how starting a statin medication will change that risk.

“The Flu” 101

Walk into almost any medical clinic’s waiting room these days, and you will see evidence that infections of varying shapes and sizes are running rampant. At the Verona clinic we are seeing patients of all ages affected by a wide range of infections. These illnesses also appear more severe, longer lasting, and more contagious than usual. While the common cold, gastrointestinal illnesses, and sinus infections seem to be ubiquitous, the influenza virus has received the most attention, and for good reason.

So far, this is the worst flu season in at least the past 10 years. Last week, 9.4% of all deaths in the United States were flu-related, which means that this flu season has become an “epidemic”. Here in Wisconsin, over 2,000 people have been hospitalized for the flu since October 1st, with scores more battling the illness at home. And although cases of the flu appear to have peaked and are declining, it will continue to be a significant problem for the next several weeks to months.

The flu is oftentimes difficult to diagnose because many symptoms overlap with other illnesses, and because of variation in symptoms from case to case. It usually starts, sometimes quite abruptly, with fever, headache, body aches, and extreme fatigue. This is usually then followed by respiratory symptoms, such as cough, sore throat, and runny nose. However, manifestations of the flu can vary widely, with a milder course resembling the common cold, or more severe course that includes severe systemic symptoms and possibly nausea and vomiting.

Many people label pure gastrointestinal illnesses that involve nausea, vomiting, and diarrhea as the “stomach flu”, but the influenza virus is not actually the culprit in these cases. This is especially pertinent this year, as the Norwalk virus, a cause of gastrointestinal illness, is also making the rounds. Not only are symptoms of this infection confined to the stomach and intestines, but it tends to last only 24-48 hours, much shorter than the flu.

If you are unlucky enough to catch the flu, there is usually not much that can be done besides taking care of yourself at home. Drinking plenty of fluids and getting plenty of rest are really the best ways to combat the flu. There are anti-viral medications on the market, Tamiflu being the most widely recognized, but these are only effective if taken within 48-72 hours of contracting the flu. Even then, they usually only shorten the duration of symptoms and don’t rid sufferers from the flu immediately.

As the flu rages on, the influenza vaccine has become a hot topic. Many myths abound about the vaccine, two of the most prominent being that it doesn’t work and that it causes the flu.

The vaccine is created every year based on what are anticipated to be the most common strains of flu for that year. This year’s vaccine is made up of 3 different strains, and is about 60% effective in preventing the flu, which is about average when compared to past years. Aside from preventing the flu, the vaccine can also shorten the duration of symptoms in some cases, and decrease the ability to transmit the illness.

The injectable flu vaccine is made from killed flu virus, making it virtually impossible to “catch” the flu from the vaccine. Mild flu-like symptoms may be experienced, but this is simply the body mounting an immune response to the vaccine rather than a true infection. Also, the vaccine takes about 2 weeks to take full effect, so if someone were to be infected prior to getting the vaccine, they could show symptoms soon after getting the injection.

While I recommend the flu vaccine to all my patients who are eligible, the best way of preventing the spread of the flu is through proper hygiene. Hand washing is of course the first step in stopping the spread of any communicable disease. The flu is spread primarily through respiratory droplets, so covering our mouths when coughing and sneezing is also essential. The virus can travel up to 6 feet with coughing, so make sure to keep your distance when around those who are infected.

While the flu is especially bad this winter, it is possible to avoid getting sick. Get vaccinated, practice proper hygiene at all times, and take care of yourself by drinking plenty of fluids, getting adequate rest, and exercising regularly.

Here Comes the Sun

After a long winter, the last few days have reminded us that yes, summer still exists. Residents of neighborhoods across the Midwest have emerged from their winter hibernation with hands shielding their eyes, awestruck and ready to worship the all-powerful sun. My own children, almost overnight, have shed layers of clothing and pale skin in exchange for layers of dirt on their feet, while they enjoy every last minute of sunlight. But while we rush to enjoy the much-deserved warmth, many of us tread cautiously because of the dangers of too much sun.

The main worry with sun over-exposure is, of course, skin cancer. There are three major types of skin cancer: basal cell, squamous cell, and melanoma (In order of increasing badness). A wide body of research shows that each of the three types is linked to sun exposure. While basal cell and squamous cell cancers appear to be related to total time spent in the sun, melanoma is linked more-so to sunburns and episodes of intense exposure. Other risk factors for melanoma include family history and fair complexion.

Avoiding skin cancer is not the only reason to seek protection from the sun. Other conditions can arise, such as premature aging and eye damage. Eye damage in particular comes in a variety of forms, from melanoma of the eye to increased risk of cataracts. Also, some research shows that UV sunlight can impair the body's immune system, thus making us more prone to illness.

While it might be difficult, staying out of the sun is our best defense. Ultraviolet sunlight is strongest in the middle of the day, and exposure from about 11am to 2pm should be avoided or minimized. Hats and protective clothing are important in combatting the sun. Nowadays, there are many light-weight, comfortable shirts and slacks on the market that provide adequate protection. Sunglasses should also be worn, and should specifically state that they block UV light.

For those of us who can't stand to forgo time in the sun, sunblock is essential. I recommend to all my patients to use a lotion with sun protection factor (SPF) of 15 or higher. This should be applied 30 minutes before sun exposure and reapplied after 2 hours or after any swimming or heavy sweating. Better yet, use it every day during the summer months, regardless of the amount of expected sun exposure. Make it part of your daily routine, like brushing your teeth!

Despite the dangers posed by sun exposure, there are benefits as well. It is true that the sun is a great source of vitamin D, which is an essential part of a properly functioning body. However, many foods are now fortified with vitamin D, and supplements are readily available. These forms are highly effective, very safe, and have the added benefit that the amount of vitamin D intake can be monitored. Also, the amount of time in the sun needed to get adequate amounts of vitamin D is far less than the average person gets during a typical summer day.

For many, including myself, being out in the sun is associated with a sense of general well-being and good health that cannot be overlooked. We tend to be more active and exercise more when the sun is shining, which is very important to living a healthy life. Also, time spent outdoors in the summer months is often spent with family and friends, which can lead to better mood and improved quality of life.

With the harmful effects of the sun, along with the benefits and unavoidable nature of being outside when the weather is nice, we are left to wonder how to approach sun exposure. To make the issue more unclear, no "safe" level of sun exposure exists currently, and nobody quite knows how much is too

much. Like most things that have both risks and benefits, we should partake, but in moderation. Be sensible, be safe, but don't let fear of the sun keep you from enjoying the beautiful days that surely lie ahead.

Osteoarthritis

It is no secret that the baby boomers and senior citizens of today are staying active longer than their parents, living life with passion and purpose well after retirement. My father-in-law is 72 years old and still plays basketball three times per week. My own father just turned 70 and plays golf and swims weekly. Any reasonable person would argue that, overall, this continued level of activity is a great thing. However, one problem is that nobody remembered to tell my father in-law or father's joints they'd be this active. Like many of their peers, they both battle knee problems that will likely cause them to cut their athletic careers short far sooner than they'd like.

While an elderly person can fall victim to any type of joint problem, the most commonly affected joint by far in people over the age of 50 is the knee, and the most common disorder is osteoarthritis. Osteoarthritis is a "wear and tear" problem where the knee joint degenerates after years of use. A healthy knee has plenty of space for movement, and has intact cartilage that cushions the joint. A knee with arthritis, however, has a narrowing of the space and usually breakdown of the cartilage. Pain usually develops gradually, and worsens over months to years, with occasional flares and good periods mixed in. Arthritis can range from being mildly annoying to completely debilitating.

Many different factors can play a role in developing arthritis. However, besides advancing age, body weight is the strongest risk factor. For every pound of extra body weight a person carries, the stress on the knee joint increases dramatically. This often results in a cycle where a person needs to lose weight to improve their pain, but can't because that very same pain hampers the ability to exercise and lose weight. In today's society, with life expectancy as well as average body weight both increasing rapidly, the perfect storm has been created for an arthritis epidemic.

Once a person has arthritis, many different treatment options are available, although none are perfect or easy remedies. For patients I see, the mainstay of treatment is moderate, low-impact exercise. Not only does this promote weight loss, but it can also strengthen the muscles around the knee, which takes some stress off the joint. If available, working in a warm water pool is a wonderful mode of exercise. This places little stress on the knee, and has the added benefit that the warm water itself is soothing to the painful joint. If needed, consulting with a physical therapist is often beneficial as the therapist is able to design personalized, targeted exercises.

To augment exercise, many people need some amount of medication, either daily or just occasionally, to relieve their pain. Tylenol and ibuprofen are the most common forms of pain medication used by arthritis sufferers. While these medications are very basic, they oftentimes work surprisingly well, and can make arthritis pain manageable for years. I usually tell patients to start with Tylenol, as this has fewer potential side effects than ibuprofen and is equally or more effective.

Many other medications exist as well, from the supplement glucosamine, to natural or alternative remedies, to topical creams and gels, to, finally, injections administered by a medical provider. While few, if any, of these have been proven to be effective in medical studies, some patients definitely get relief. I tell my arthritis patients, that if what they are doing is safe and is working, keep doing it!

Finally, if all else fails and pain progresses despite conservative treatment, surgical options are available. Procedures do exist to "clean out" the knee, but the definitive surgical treatment for osteoarthritis is joint replacement. While most patients have excellent results with joint replacement, this is a major procedure that should not be undertaken without careful consideration of the risks.

The best way to prevent arthritis has much in common with preventing many other common medical illnesses. Maintain a healthy weight, eat well, and get plenty of low-impact exercise. Despite our best attempts at prevention, many people are destined to be afflicted with arthritis in the future. For them, the treatment landscape of the future will likely look much different than it does now. Therapies are always being developed and tested, and new options will certainly be available in the next few decades. So, to my dad and countless other weekend warriors and backyard athletes, I say “play on”. Just give a little attention to those knees when they scream out in pain.

WILLIAM SCHUPP, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

A Family Practice Inquiry Network (FPIN) Help Desk Answer, to be completed and submitted for publication later this month: “Are there any proven methods to prevent recurrent infections in chronic indwelling urinary catheters?”

Community Health Project:

Verona Biomedical Sciences Forum/Curriculum: Project Lead the Way -- Project Lead The Way is an initiative to create a collaborative environment between the local high schools and the Wisconsin Technical College System curriculum. The ultimate goal is to facilitate a smooth transition from high school to a post-secondary experience that will position the students for successful entrance into the workforce with the 21st century skills needed in our global economy with emphasis on the biomedical sciences. This is accomplished through the Biomedical Sciences Curriculum, a new approach using case-based learning and hands-on experiences for students which has proven to result in better engagement and understanding of the core material. The Biomedical Sciences Forum is a group of local experts in the biomedical science professions. We meet on a monthly basis to discuss the curriculum and ways in which we can be helpful for the students in their curriculum and in mentoring them in their career opportunities.



Will Schupp’s journey to medicine was nontraditional. He started college in 2001, the year that Enron, Worldcom, and other multi-national corporations collapsed due to fraudulent business practices. He decided

to major in Accounting, given his interest in computers, business, and the larger goal of maintaining transparency in the financial markets. After graduation, he worked as a corporate tax auditor for the Minnesota Department of Revenue where he researched and audited corporations with a high likelihood for delinquency, ultimately bringing in over \$20 million dollars for the state. During these years, however, Will also began volunteering on a regular basis, and he ultimately decided that a career in medicine, grounded in direct interpersonal relationships with patients, would be a more fulfilling vocation. He attended medical school at the University of Iowa Carver College of Medicine and graduated as part of the Research Distinction Track. In addition to his research interests, Will enjoys teaching and has worked as a tutor and teaching assistant in many different contexts. In his free time, he enjoys reading and writing both fiction and nonfiction. He is also an avid cyclist and has completed two full RAGBRAIs (a ride across Iowa) and various other 100+ mile rides.



Big thanks to my wife and soul mate, for everything she does.

– Will

BRYAN WEBSTER, MD

PROJECTS COMPLETED DURING RESIDENCY:

Scholarly Project:

Pediatric Obesity Residency Curriculum:
A Brief Intervention around Well-Child
Checks

Community Health Project:

IMPACT Testing at Belleville High School -- Concussions are a common injury among high school athletes. Athletes can suffer significant morbidity if they return to play while still suffering symptoms of concussion. While clinical assessment of concussion symptoms is valuable, a systematic way of evaluating cognitive function is a necessary component of return-to-play evaluation. IMPACT testing accomplishes this cognitive evaluation. Working with the high school athletic director, athletic trainer, and coaches we instituted pre-participation IMPACT testing at Belleville High School. Over a two year period over 300 athletes were tested. The program is now self-sustaining without resident involvement.



Bryan Webster earned a B.S. in psychology and a certificate in business from the University of Wisconsin.

Originally committed to a career in law, he

changed his studies to medicine after taking a summer job as a therapist with the Wisconsin Early Autism project. He completed his medical degree at the University of Wisconsin School of Medicine and Public Health. He was drawn to family medicine due to his interest in pediatrics, obstetrics, and for the continuity of practice. During medical school, he was an active lobbyist at the capitol for public health initiatives. He is excited to start at Dean West next year and plans to continue his work in pediatric obesity. Bryan enjoys hiking, camping, sailing, Nordic and downhill skiing, golf, following Badger Athletics, Canadian walleye fishing, and playing fetch with his golden retriever.



Pediatric Obesity Residency Curriculum: A Brief Intervention During Well Child Checks.

Bryan Webster MD, Elizabeth Paddock MD, and Melissa Stiles MD.
University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin

Background

- Pediatric obesity is defined by age adjusted BMI greater than the 95 percentile.
- Pediatric obesity predicts a high level of adult morbidity and mortality.
- Residents and faculty at our rural family medicine clinic lack confidence in diagnosing and treating this condition (See Table 1).
- According to pre-intervention questioning all faculty and residents desired more systematic approach for diagnosing and treating this condition..
- The pre intervention prevalence of pediatric obesity at our clinic was 8%, which is well below the national prevalence of 16-33%.

Specific Aims

1. Increase resident/faculty skills in diagnosing and treating this common condition.
2. Integrate all levels of care team and utilize the EMR to full potential at clinic to minimize physician time burden.
3. When ever possible will use pre-existing materials.

Methods

Participants: 6 residents and 5 faculty at a rural family medicine residency clinic.

- Participants completed surveys pre and post intervention to assess comfort with various aspects of diagnosing and treating pediatric obesity.

Intervention:

1. Age adjust BMI was collected for all patients age 2-17 at Well Child Checks.
2. Patient roomers distributed *Pediatric Fitness Inventory* (modeled after AIM HI fitness inventory) to all parents/patients, which were completed prior to MD contact, to assess fitness/nutrition risks, family risk factors, and willingness to change (Handout 1).
3. EMR made available graphic representation of treatment algorithm during the visit (Figure 1).
4. Based on risk stratification, different *Fitness Prescriptions* were available in EMR *patient instructions* section (Handout 2).

Table 1

Well child visits in intervention period and same 6 month period in year prior.

	Pre-Intervention Period	Intervention Period
Number of Well Child Checks	166	176
Diagnoses of Pediatric Obesity	14	43

Figure 1

Graphic representation of treatment algorithm made available in well child visit EMR note.

Pediatric Obesity Prevention and Treatment Algorithm

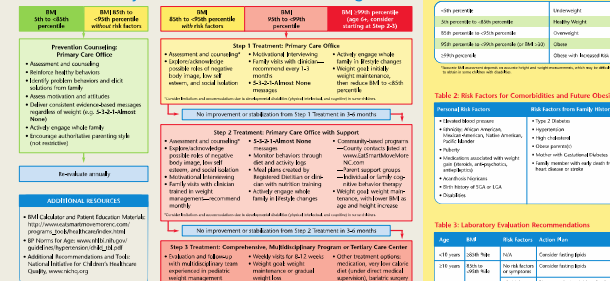


Table 1. Weight Category by BMI-for-Age Percentile

Weight Category	BMI-for-Age Percentile
Underweight	< 5th percentile
Healthy Weight	5th percentile - 84th percentile
Overweight	85th percentile - 94th percentile
Obese	≥ 95th percentile

Table 2. Risk Factors for Comorbidities and Future Obesity

Personal Risk Factors	Risk Factors from Family History
<ul style="list-style-type: none"> Black/African American Female Family history associated with weight gain Family history associated with type 2 diabetes Family history associated with hypertension Family history associated with cardiovascular disease 	<ul style="list-style-type: none"> Type 2 Diabetes Hypertension High cholesterol Obesity History with Coronary Artery Disease Family history with early onset heart disease or stroke

Table 3. Laboratory Evaluation Recommendations

Age	BMI	Risk Factor	Action Plan
10-19 years	≥ 95th %ile	None	Consider fasting lipids
10-19 years	85th-94th %ile	Family history of hypertension	Consider fasting lipids
10-19 years	≥ 95th %ile	2 risk factors	Family history of hypertension, history of stroke, or type 2 diabetes
10-19 years	≥ 95th %ile	3 risk factors	Family history of hypertension, history of stroke, or type 2 diabetes, or other risk factors

Results

- Improved resident/faculty comfort in several dimensions of diagnosing and treating pediatric obesity. (see Table 2).
- Using diagnosis codes in EMR, after 6 months of intervention diagnosis of pediatric obesity increased from 8% to 24%, much more in line with national prevalence.

Table 2:

Items scored on 7 point likert scale (1 = Totally Unconfident, 7 = Extremely Confident). Reported values are mean of resident and faculty responses.

	Pre-Intervention	Post-Intervention	Change
How comfortable are you diagnosing pediatric obesity?	4.67	5.40	↑ 0.73
What is your comfort with initial therapy?	4.42	5.98	↑ 1.56
What is your comfort in ordering labs for pediatric obesity?	3.17	4.38	↑ 1.21
What is your comfort in recommending initial follow up?	3.92	5.00	↑ 1.08
What is your comfort in treating refractory pediatric obesity?	2.92	4.0	↑ 1.08
What is your comfort managing weight goals in pediatric obesity?	3.15	4.5	↑ 1.35
How comfortable are you in assessing risk factors for adult obesity in the pediatric population?	3.92	5.38	↑ 1.46
Percent of well child checks with diagnosis of pediatric obesity.	8%	24%	↑ 16%

Conclusions/Limitations

1. Using all members of the health care team and maximizing the EMR are effective in increasing resident/faculty comfort with various aspects of diagnosis/management of pediatric obesity.
2. These methods increase diagnosis of this problem.
3. In the future, stricter follow up guidelines could be used to calculate post intervention BMI.

References

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TONY WESTON, MD

PROJECTS COMPLETED DURING RESIDENCY:

Community Health Project:

Diabetes Group Visits at Community
Connections Free Clinic

Scholarly Project:

A Family Practice Inquiry Network (FPIN) Help Desk Answer: “When should potentially allergenic foods be introduced to infants?” -- Tony highlighted food allergy during his January primary care conference. With Ildi Martonffy, MD, he has the opportunity to address the following question: Does dietary restriction of certain foods (egg, wheat, cow’s milk) prior to age one reduce the incidence of allergies? The review of current evidence will be published later this year in the Family Practice Inquiries Network *Evidence-Based Practice* journal.



Tony Weston grew up in a small community in northwestern Illinois. He completed his undergraduate degree in finance and pre-med studies at the

University of Iowa and earned his medical degree from Rush Medical College in Chicago. He was initially drawn to family medicine through his diverse medical interests, as well as his desire to provide direct patient care to people of all ages. As a committed volunteer, Tony also embraced family medicine as the best path to gaining the broad skills necessary to address the health needs of underserved communities. During residency, Tony has enjoyed volunteering at the Community Connections Free Clinic in Dodgeville. Outside of work, Tony enjoys spending time with his wife, son, and large immediate family.



Thanks to my wife, Stephanie, for patience during this long process that is medical school and residency. Looking forward to this next chapter with you and Max! Thanks also to Russ and Helen Weston for being amazing parents and friends. Thank you to Brian Arndt, Bill Scheibel, Ann Evensen, Jane Anderson, and all the faculty at the Verona Clinic for being the skilled and dedicated mentor (Brian) and teachers you all are!

– Tony

Community Health Project: Diabetes Group Visits

Anthony Weston, MD

I have worked with Elizabeth Fleming, MD, to initiate diabetes group visits at the Community Connections Free Clinic (CCFC). CCFC was started in 2006 by Dr. Aaron Dunn (a former graduate of our residency) along with other Dodgeville community physicians and citizens. Chronic disease management can be difficult in the free clinic setting with volunteer physicians and nurses providing intermittent rather than continuity care. In January we started our first cohort of 5-7 patients and having been following this group monthly. We have been able to provide comprehensive medical care. We also have fostered an environment in which our patients can learn from each other and from us on such topics as nutrition, personal goal setting, and foot care.