## Original Research Articles

### Liver Biopsy is Indicated During Laparoscopic Cholecystectomy for Patients with Preoperative Imaging Evidence of Fatty Liver
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### Heart Rate and Core Temperature Responses During Basic Yoga Compared with Those During Hot Yoga
Ashley N. Yereng, MS; John P. Porcari, PhD, RCEP, FAACVPR, FACSM; Clayton Camic, PhD; Cordial Gillette, PhD; Carl Foster, PhD, FACSM, FAACVPR

## Case Reports

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### Chronic Eosinophilic Pneumonia
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### Denial of Pregnancy
Charles W. Schaubberger, MD, MS, FACOG

### Dehiscence of Larynx in a Patient Treated with Bevacizumab for Colon Carcinoma
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## Tutorial

### Is There a Problem with Stimulants? The Abuse of Prescription Stimulants Used as a Study Drug by College Students
Steven J. Johnson, DO, FAAP

## Ethical Considerations

### The Baby Who Was Condemned to Live
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## Gundersen History

### La Crosse Encephalitis
Cathy Mikkelson Fischer, MA, ELS

## Supplement

Abstracts of presentations made by Gundersen staff in 2013.
EDITOR’S MESSAGE

“Science, like life, feeds on its own decay. New facts burst old rules; then newly divined conceptions bind old and new together into reconciling law.”

--William James

The Will to Believe and Other Essays in Popular Philosophy, 1910

In other words, “what goes around comes around,” an adage that we senior clinicians know only too well, and have learned to both anticipate and respect.

Welcome to the Fall issue of the Gundersen Medical Journal. I thank the Editorial Board and Cathy Mikkelson Fischer, Managing Editor, for their guidance and insights regarding the content and design of this publication. I would also like to remind readers that this publication is an interdisciplinary and archival journal. To this end, manuscripts are sought from any medical or surgical specialty or subspecialty, or health-related field. Manuscripts can be (1) original, data-driven, high quality randomized or nonrandomized controlled studies, (2) systematic reviews or meta-analyses, (3) clinical outcome studies, (4) tutorials, (5) case reports, or (6) letters to the editor. “Vignettes” and “how I do it” submissions that can potentially enhance patient care or stimulate research are encouraged, as well. I hope that you find this issue of the Journal both stimulating and rewarding!

Original Research

Based upon a 2-year study, Leroy J. Trombetta, MD, and colleagues from Winona Health, Winona, Minnesota, looked for and examined preoperative factors that could predict severity of steatohepatitis for 252 patients with preoperative evidence for fatty liver disease undergoing cholecystectomy. Sixty-eight of 94 patients with evidence for fatty liver disease from imaging studies underwent liver biopsy at time of cholecystectomy. A single factor that predicted overall severity of fatty liver was not identified.

Ashley N. Yereng, MS, and staff from University of Wisconsin-La Crosse looked for difference in heart rate and core temperature for healthy subjects participating in basic and hot yoga classes. Although a significant difference was not found, subjects perceived hot yoga to be more difficult. From a cardiac and core temperature standpoint, hot yoga was judged to be as safe as regular yoga.

Case Reports

There has been an upsurge in interest and legalization of marijuana for recreational and medical use. Marcus A. Crosby, MD, reports 3 cases of cannabis toxicity characteristics and a literature review.

Jonathan R. Eklof, MD, presents an interesting case of what initially was thought to be bacterial pneumonia but was recurrent and recalcitrant to standard therapies. Additional evaluation yielded a diagnosis of eosinophilic pneumonia and a change in the treatment regimen.

Amy N. Evjen, MD, and Steven B. Pearson, MD, discuss a case of weakness and confusion related to bacillus Calmette-Guérin instillation for bladder cancer in a patient with a complex history and multiple medical problems. A mechanism for the sepsis is posited.
Charles W. Schauberger, MD, discusses an unusual condition manifested by denied pregnancy for 2 pregnant patients. A review of the literature provides additional insights into this uncommon disorder.

Rajasree Nambron, MBBS, and Alcee J. Jumonville IV, MD, describe an unusual case of laryngeal dehiscence manifested by dysphonia, pain, epistaxis, and airway compromise in a patient who had been previously treated for laryngeal cancer, and was now undergoing chemotherapy for adenocarcinoma of the colon.

**Tutorial**

It is recognized that college students use stimulants—from caffeinated beverages to medication—to facilitate attention and studying. Steven J. Johnson, DO, describes the scope of the problem and health risks associated with misuse and abuse of stimulant agents.

**Ethical Considerations**

Decision making and ethics are integral to the practice of medicine. In this piece, Thomas D. Harter, PhD, presents a most challenging situation for family and staff involving life-death decision making for an at-risk newborn.

**Gundersen History**

Our Managing Editor, Cathy Mikkelson Fischer, MA, takes us on a historical journey through the research concerning La Crosse encephalitis that has been conducted over nearly 40 years at Gundersen Health System.

**Supplement**

A compilation of oral presentations and abstracts of poster presentations made by Gundersen staff and residents in 2013.

“They say that all good things must end someday, autumn leaves must fall . . . ”

--Chad and Jeremy

“A Summer Song,” 1964

As I will be retiring in December after almost 35 years with Gundersen Health System, this issue of the *Gundersen Medical Journal* brings an end to my role as Editor. In this position, I have learned and grown outside of my specialty and interests. Thank you to everyone who has contributed to this. Thank you Cathy Fischer for your truly outstanding skills as Managing Editor, it has been both an honor and professional treat working with you these past several years. Thank you Editorial Board and reviewers for your insights and support. Thank you Cindy Steinhoff for your organizational and stenographic skills. Thank you Gundersen Medical Foundation for your ongoing financial support. Finally, and most importantly, thank you contributors, for your efforts in making the *Gundersen Medical Journal* an interesting and viable tool for learning and sharing knowledge. Keep the submissions coming!!

Shalom, my colleagues and friends,

David
October 15, 2014

Sadly, this issue will be our current editor’s last. Dr Hartman, after 35 years at Gundersen, will be retiring in December of 2014 from his Speech Pathology practice. With his retirement, Dave has tendered his resignation this Fall not only from his position on the Gundersen Research Committee and the Wisconsin Network for Health Research Executive Committee, but also as the Editor in Chief of the Gundersen Medical Journal.

In these important positions, Dr Hartman has been a leader during major changes in Gundersen human health research. While on the Research Committee for 7 years, he has done many excellent reviews of proposed studies to be sure that they are scientifically correct, economically achievable, and ethically acceptable.

In October 2007, using his personal research background, his interest in improving human health care, especially the care of those who have had problems with swallowing or speech after strokes, and his careful personal striving to “get it right,” he was a natural fit for the Editor role for this Journal. For the last 7 years, working with his teammate, Cathy Fischer, who is Managing Editor, indeed they “got it right.” They have matured the Gundersen Medical Journal from a purely intramural educational publication towards a transition to a local upper Midwest publication. This maturation has created a solid record of sophisticated medical literature that will allow it to grow further into the future.

Therefore, it is with sorrow, sadness, reluctance, and regret that I must accept his resignation. I wish Dr Hartman well in his future endeavors, added time with his family, and concentrating on his avocation – playing a beautiful guitar.

William A. Agger, MD, FACP, FIDSA
Director of Research
Gundersen Medical Foundation
Liver Biopsy is Indicated During Laparoscopic Cholecystectomy for Patients with Preoperative Imaging Evidence of Fatty Liver

ABSTRACT

Background: Steatohepatitis can progress to cirrhosis and liver failure. Sonogram and computed tomography (CT) scan can suggest the presence of fatty liver (FL) disease. Patients with gallbladder disease frequently have evidence of FL on preoperative imaging. The purpose of this study was to determine whether any preoperative factors can predict the severity of steatohepatitis in patients with preoperative imaging evidence of fatty liver undergoing cholecystectomy.

Methods: A laparoscopic liver biopsy was performed on patients undergoing laparoscopic cholecystectomy who had preoperative imaging evidence of FL. Pathologic severity of steatohepatitis was quantified histologically using the Brunt scoring system based on degree of macrovesicular steatosis, necroinflammatory activity, and periportal fibrosis. Patients’ preoperative demographic and laboratory variables were compared by Brunt score.

Results: In the 2-year study period, 252 patients underwent laparoscopic cholecystectomy. Ninety-four patients (37.3%) had evidence of FL on preoperative sonogram or CT scan. Sixty-eight of 94 patients (72.3%) underwent liver biopsy concomitantly with cholecystectomy. Body mass index (BMI), calculated as weight in kilograms divided by height in meters squared, sex, age, and preoperative hepatic function serology values were recorded (aspartate transaminase, alanine transaminase, bilirubin, albumin, and alkaline phosphatase). Higher BMI (P = .03) and alanine transaminase (P < .001) correlated with the presence of FL on imaging.

Conclusion: Patients with preoperative imaging evidence of FL have varying histologic severity of steatohepatitis. Patients with low preoperative albumin and elevated alkaline phosphatase concentrations had a higher incidence of periportal fibrosis, and an albumin level <3.5 g/dL was 100% predictive for the presence of fibrosis. No other preoperative variable, including BMI, predicted the presence of fibrosis. No single preoperative factor predicted the overall severity of steatohepatitis in patients undergoing cholecystectomy who had FL seen on preoperative imaging studies. We recommend performing a liver biopsy for all patients undergoing laparoscopic cholecystectomy who demonstrate FL on preoperative imaging.

Nonalcoholic steatohepatitis (NASH), also commonly referred to as nonalcoholic fatty liver disease or hepatic steatosis, is the most common liver disease worldwide. Although the progression from steatohepatitis to cirrhosis is well documented, it is not completely understood. Terminology in recent literature is often used interchangeably, but it is safe to consider the term fatty liver (FL) as a clinical diagnosis based on imaging studies, while NASH is a pathologic diagnosis. The histologic diagnosis of steatohepatitis is established when varying degrees of hepatocellular steatosis, lobular inflammation, and periportal fibrosis are present.

Several risk factors for NASH have been identified, including obesity, diabetes, metabolic syndrome, hyperlipidemia, age, and even cholelithiasis. Several attempts to predict the histologic severity of NASH and its propensity to advance to cirrhosis based on noninvasive measurements, such as laboratory values, demographic variables, and imaging characteristics, have been proposed.

We noted that evidence of FL was frequently seen on the preoperative imaging studies of patients referred to the surgical service for management of gallbladder disease. We began offering a liver biopsy to all patients undergoing a cholecystectomy, who have preoperative imaging evidence of FL. Our goal for the study was to correlate preoperative clinical data with postbiopsy histologic...
METHODS

The creation and maintenance of a prospective database was approved by the Institutional Review Board of Winona Health, Winona, Minnesota. Winona Health is a 42-bed community-level hospital that serves southeastern Minnesota and western Wisconsin. It is the standard practice of the general surgery group to offer liver biopsy during cholecystectomy to patients who have preoperative imaging evidence of FL. Informed consent for the liver biopsy was obtained by the attending surgeon during the preoperative consultation.

All patients undergoing laparoscopic cholecystectomy between May 1, 2011, and May 1, 2013, were entered into a prospective database. Preoperative imaging studies were reviewed by the attending surgeon. If preoperative evidence of FL was present on either sonogram or computed tomography (CT) scan, at the discretion of the attending surgeon, the patient could be offered liver biopsy concomitant with the laparoscopic cholecystectomy.

Data recorded included age, sex, and body mass index (BMI, calculated as weight in kilograms divided by height in meters squared). Preoperative laboratory values recorded were aspartate aminotransferase (AST), alanine aminotransferase (ALT), total bilirubin (TBILI), albumin, and alkaline phosphatase (ALK). Système International (SI) conversion factors for all relevant analytes to which this article refers are provided after the conclusion. Preoperative imaging results were recorded when present, whether on sonogram, hepatobiliary iminodiacetic acid (HIDA) scan, or CT scan. Intraoperative cholangiogram results were also recorded.

Biopsy specimens were examined by a single pathologist (RE). Severity of histologic change was quantified using the system previously described by Brunt et al. Briefly, a score of 0 to 3 is given for each of 3 variables: (1) macrovesicular steatosis, (2) necroinflammatory activity, and (3) periportal fibrosis. It is our opinion that each of these categories is a separate entity. Therefore, the 3 variables were not combined for a total score of 0 to 9; rather, they were individually evaluated. Fibrosis is considered irreversible, so patients with any degree of fibrosis were considered to have a more severe form of NASH than those without fibrosis, regardless of the other variables.

The technique of performing the liver biopsy varied among the 3 operating surgeons. An automated 18-gauge disposable core biopsy needle (Bard Peripheral Vascular Inc., Tempe, AZ) was used by 2 of the surgeons (LT, MB). The biopsy was performed on the right side of the falciform ligament in all cases, well away from the gallbladder fossa, and at least 2 core specimens were obtained. The third surgeon (HZ) used bronchoscopy forceps to obtain a specimen from the inferior edge of the right lobe of the liver, well lateral to the gallbladder fossa.

RESULTS

During the 2-year study period, 255 laparoscopic cholecystectomies were performed at Winona Health. Data were incomplete for 3 patients, and they were excluded from the analysis. Of the 252 remaining patients, 94 (37.3%) had preoperative imaging studies, sonogram and/or CT scan, that displayed evidence of FL disease. Of these 94 patients, 68 (72.3%) underwent liver biopsy concomitantly with the cholecystectomy. None of the study patients experienced complications related to liver biopsy.

First, patients with normal liver imaging characteristics were compared with those with preoperative imaging evidence of FL. A binary logistic regression model was constructed with the presence/absence of FL as the response variable and age, BMI, and preoperative serology (ALT, albumin, ALK, and TBILI all transformed for normality) as the predictor variables. Because of high correlation between ALT and AST, AST was not included as a predictor variable in the model. Backward selection was used to simplify the original logistic regression model and determine what subset of the initial predictor variables is most relevant. Univariable tests between the response and each of the candidate predictor variables confirmed the results of backward selection. Body mass index ($P = .03$) and ALT ($P < .001$) are both significant predictors of having preoperative imaging characteristics of FL. None of the other predictor variables were statistically significant.

Next, we sought to determine whether there was a correlation between the presence of gallstones and the presence of imaging characteristics of FL. We pursued this comparison in order to explore a possible clinical correlation between NASH and biliary dyskinesia. A $\chi^2$ test of homogeneity was used to compare the likelihood of gallstones between patients with and without imaging evidence of FL. The likelihood of gallstones was not significantly different between patients with and without imaging evidence of FL ($X^2 \_W = 3.641, P = .55$).

Twenty-six (27.7%) of the 94 patients with preoperative imaging evidence of FL were not offered biopsy. In an attempt to identify possible bias in surgeon decision to offer biopsy, we compared selected variables of the patients who were offered biopsy with those who were not. Wilcoxon rank sum tests were used to determine whether these groups differed in median age, BMI, or laboratory results. In addition, Fisher exact tests were used to determine whether the rate of patients with stones differed between groups. Patients who were offered biopsy were significantly younger than those who were not (a median of 47.5 years vs 64 years, respectively; $W = 481, P = .003$). The groups did not differ significantly in BMI, in any laboratory test results, or in the incidence of gallstones. Therefore, for undetermined reasons, younger patients with preoperative imaging evidence of FL were more likely to be offered liver biopsy than older patients were.

The main focus of this study was to analyze the characteristics of the 68 patients who underwent liver biopsy. As discussed previously, we considered the 3 components of the Brunt score

| Table 1. Distribution of the 3 Components of the Brunt Score in 68 Patients Undergoing Liver Biopsy |
|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Histologic Feature                        | Brunt Score     |                 |                 |                 |
| Macrovesicular steatosis                   | 0 (7)           | 38 (56)         | 17 (25)         | 8 (12)          |
| Necroinflammatory activity                | 2 (3)           | 37 (54)         | 27 (40)         | 2 (3)           |
| Periportal fibrosis                       | 24 (35)         | 40 (59)         | 1 (1.5)         | 3 (4)           |

Data are presented as number of patients (%).
as separate, not cumulative, clinical entities. The distribution of Brunt score for each of the 3 components is shown in Table 1. Spearman rank correlation tests were used to assess the correlation between macrovesicular steatosis score and each of the predictor variables, between necroinflammatory activity score and each of the predictor variables, and between periportal fibrosis score and each of the predictor variables. Because of the large number of ties in the ranked data, \( P \) values were found using simulated permutation distributions based on 100,000 random permutations. Table 2 shows each measured variable categorized by histologic subset.

### Table 2. Demographic and Laboratory Result Data for 68 Patients Who Underwent Liver Biopsy Categorized by Brunt Score

<table>
<thead>
<tr>
<th>Histologic Component</th>
<th>Age, y</th>
<th>Sex women/men</th>
<th>BMI kg/m²</th>
<th>Gallstones Y/N</th>
<th>AST U/L*</th>
<th>ALT U/L*</th>
<th>Albumin g/dL†</th>
<th>ALK U/L*</th>
<th>TBILI mg/dL‡</th>
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</thead>
<tbody>
<tr>
<td>Macrovesicular steatosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (n=5)</td>
<td>34</td>
<td>4/1</td>
<td>25.2</td>
<td>4/1</td>
<td>56.8</td>
<td>100.6</td>
<td>3.22</td>
<td>99.2</td>
<td>0.86</td>
</tr>
<tr>
<td>1 (n=38)</td>
<td>50</td>
<td>26/12</td>
<td>33.1</td>
<td>26/12</td>
<td>67.0</td>
<td>88.9</td>
<td>3.93</td>
<td>86.8</td>
<td>0.74</td>
</tr>
<tr>
<td>2 (n=17)</td>
<td>47</td>
<td>9/8</td>
<td>34.6</td>
<td>12/5</td>
<td>33.9</td>
<td>45.0</td>
<td>3.99</td>
<td>82.5</td>
<td>0.58</td>
</tr>
<tr>
<td>3 (n=8)</td>
<td>44</td>
<td>8/0</td>
<td>50.0</td>
<td>2/6</td>
<td>179.3</td>
<td>118.4</td>
<td>3.88</td>
<td>92.4</td>
<td>0.83</td>
</tr>
<tr>
<td>Necroinflammatory activity</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0 (n=2)</td>
<td>47</td>
<td>2/0</td>
<td>26.9</td>
<td>2/0</td>
<td>35.5</td>
<td>41.5</td>
<td>3.65</td>
<td>45.5</td>
<td>0.75</td>
</tr>
<tr>
<td>1 (n=37)</td>
<td>46</td>
<td>27/10</td>
<td>33.5</td>
<td>28/9</td>
<td>52.7</td>
<td>82.8</td>
<td>4.01</td>
<td>85.4</td>
<td>0.69</td>
</tr>
<tr>
<td>2 (n=27)</td>
<td>49</td>
<td>17/10</td>
<td>36.0</td>
<td>14/13</td>
<td>102.9</td>
<td>89.3</td>
<td>3.75</td>
<td>83.9</td>
<td>0.75</td>
</tr>
<tr>
<td>3 (n=2)</td>
<td>49</td>
<td>1/1</td>
<td>45.9</td>
<td>0/2</td>
<td>20.0</td>
<td>17.0</td>
<td>3.85</td>
<td>75.5</td>
<td>0.95</td>
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<tr>
<td>Periportal fibrosis</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (n=24)</td>
<td>48</td>
<td>18/6</td>
<td>33.0</td>
<td>18/6</td>
<td>25.8</td>
<td>27.7</td>
<td>4.05</td>
<td>65.9</td>
<td>0.61</td>
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<td>26/14</td>
<td>34.9</td>
<td>25/15</td>
<td>101.3</td>
<td>117.3</td>
<td>3.84</td>
<td>102.8</td>
<td>0.79</td>
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<td>2 (n=1)</td>
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<td>1/0</td>
<td>25.7</td>
<td>1/0</td>
<td>99.0</td>
<td>183.0</td>
<td>3.2</td>
<td>69.0</td>
<td>0.80</td>
</tr>
<tr>
<td>3 (n=3)</td>
<td>48</td>
<td>2/1</td>
<td>37.0</td>
<td>0/3</td>
<td>24.0</td>
<td>15.0</td>
<td>3.5</td>
<td>57.0</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Abbreviations: BMI, body mass index; AST, aspartate aminotransferase; ALT, alanine transaminase; ALK, alkaline phosphatase; TBILI, total bilirubin. Data are expressed as mean or as a ratio, as applicable.

*To convert to μkat/L, multiply value by 0.0167.
†To convert to g/L, multiply value by 10.
‡To convert to μmol/L, multiply value by 17.104.

Macrophage Steatosis

Sixty-three of 68 patients showed some degree of macrovesicular steatosis on biopsy (92.6%). There is a statistically significant association between BMI and macrovesicular steatosis score (Spearman correlation coefficient, 0.38 \([P = .001]\)). No other predictor variables (age, laboratory test results, or presence of stones) have a significant association with macrovesicular steatosis score. The positive correlation between BMI and macrovesicular steatosis suggests that scores tend to increase as BMI increases.

Necroinflammatory Activity

Sixty-six of 68 patients showed some degree of necroinflammatory activity on biopsy (97%). There was a statistically significant association between the presence of gallstones and necroinflammatory activity (Spearman correlation coefficient, -0.33 \([P = .006]\)). Patients with stones tended to have lower necroinflammatory activity scores than those without stones. No other predictor variables (age, BMI, or laboratory results) had a significant association with necroinflammatory activity.

Periportal Fibrosis

Forty-four of 68 patients showed some degree of periportal fibrosis on biopsy (64.7%). Spearman rank correlation test indicated a statistically significant association between ALK and periportal fibrosis score (Spearman correlation coefficient, 0.32 \([P = .007]\)) and between albumin and periportal fibrosis score (Spearman correlation coefficient, 0.26 \([P = .03]\)). Age, BMI,
the other laboratory results, and the presence of stones were not significantly associated with periportal fibrosis score. Thirteen of the 44 patients with fibrosis (29.5%) had a BMI < 30.

Very few subjects in the study had a periportal fibrosis score above 1 (n = 4 [5.9%]). Therefore, in subsequent analysis of periportal fibrosis, we considered only the presence (score greater than 0) and absence (score equal to 0) of fibrosis.

A logistic regression model with the indicator of whether patients had a positive fibrosis score of 1 or more (not 0) as the response suggests that both ALK and albumin are significant predictors of the probability of having a periportal fibrosis score of 1 or greater. This logistic model can be used to better understand the relationship that ALK and albumin have with the likelihood of fibrosis. In particular, we can use this logistic model to quantify how well fibrosis can be predicted from ALK and albumin.

All patients in our sample with albumin concentrations below 3.5 g/dL had a positive fibrosis score. Low albumin and/or high ALK corresponded with an increased probability of having a positive periportal fibrosis score.

**DISCUSSION**

This study shows that patients with imaging evidence of FL tend to have a higher BMI and higher transaminase concentrations. However, when looking specifically at the patient who had imaging evidence of FL and underwent biopsy, our results are interesting. Elevated BMI correlated only with the severity of macrovesicular steatosis, not with necroinflammatory activity or fibrosis.

The presence of gallstones was included as a variable in our analysis because early in our data collection period it was noted that a high proportion of our patients suffered from biliary dyskinesia rather than gallstones. Hence, we sought to determine whether patients with steatohepatitis were at risk for biliary dyskinesia. This, in fact, was not the case. Patients with FL were not more or less likely to have gallstones than patients without FL. For unclear reasons, patients with gallstones tended to have less severe necroinflammatory activity. No other variables correlated with necroinflammatory activity.

We consider periportal fibrosis the most significant component of the Brunt score. Fibrosis signifies the early stages of cirrhosis and is also irreversible. We have shown that ALK concentrations are elevated and that albumin concentrations are decreased in patients with fibrosis. In fact, 9 of the 68 patients who underwent biopsy had a preoperative albumin < 3.5 g/dL, and all 9 of these patients had periportal fibrosis. It is striking that 29.5% of the patients with fibrosis actually had a BMI < 30, not actually qualifying as obese by Centers for Disease Control and Prevention criteria.

What is important to note is that age, ALT, AST, and TBILI had no correlation with the severity of NASH in any component of the Brunt score. Also striking is our finding that no single factor independently predicted the overall severity of NASH.

Ramos-De la Medina et al performed biopsies in 95 consecutive patients undergoing laparoscopic cholecystectomy, regardless of preoperative imaging. As in our study, they used the Brunt scoring system to quantify the severity of disease. They reported a 55% incidence of biopsy proven nonalcoholic FL disease in their patient population and found that obesity was the only preoperative factor that proved statistically significant as a predictor of disease severity. Only 13% of their patients had preoperative imaging characteristics of FL, and those patients were not analyzed independently. What is interesting about this study is that a large portion of the patients had NASH without evidence of FL on imaging. In contrast, we did not perform a biopsy for any patients who did not have FL on imaging. While their results are intriguing, we chose to focus on what we considered to be a higher risk group.

Angulo et al found that 5 clinical factors could be used to predict the presence of advanced fibrosis with a positive predictive value of 90%. They used this scoring system to reduce the number of biopsies performed. However, with the ease and low morbidity of liver biopsy during cholecystectomy, our data suggest that biopsy should be considered in these patients.

Our study has several limitations. First, all patients were included, regardless of the indication for the cholecystectomy. Therefore, in cases of acute cholecystitis or choledocolithiasis, elevated liver function test results could have been due to the pericholecystic inflammation of biliary obstruction itself, and not to the NASH. Due to the nature of the protocol, we could not quantify the degree of pericholecystic inflammation. Although the cholangiogram results could suggest the presence of choledocolithiasis, we could not determine which patients had transient preoperative choledocolithiasis that had resolved by the time of cholecystectomy. That said, a surgeon would never be certain regarding the variable contribution of inherent gallbladder disease or NASH to liver function values. Because the presence of NASH is independent of gallbladder disease and represents a chronic condition, we believe that the indication for the biopsy remains based solely on preoperative imaging results. Hence, imaging evidence of FL should prompt the surgeon to consider liver biopsy, regardless of the results of liver function tests. Interestingly, the study pathologist reported an abnormal histologic appearance for all 252 gallbladders in this study. The myriad of findings from microscopic examination included chronic cholecystitis, acute cholecystitis, and necrotizing cholecystitis, as well as several other descriptions.

The subset of patients in this study is interesting because they came to a surgeon for their gallbladder disease. To our knowledge, none of the patients in this study carried a diagnosis of steatohepatitis prior to the imaging work-up obtained for their biliary symptoms. This is in contrast to patients who may present to the gastroenterologist or the hepatologist with a primary diagnosis of NASH (without gallbladder disease), whereby liver function test results may play a more dominant role in the decision-making process. Hence, for the population that presents to a surgeon for gallbladder disease and has incidental FL found on preoperative imaging, liver function test results, whether normal or elevated, should not affect the decision to offer the patient a liver biopsy.

Another limitation was the biopsy technique and biopsy site on the liver. It is believed that different areas of the liver may manifest steatohepatitis to different degrees. While 2 of the surgeons performed an 18-gauge core biopsy toward the dome of the liver to the right of the falciform, the third surgeon collected the specimen from the inferior edge of the right lobe. This could have affected the outcomes. Standardization of the biopsy technique will be sought as our database proceeds.

Another limitation was that 27% of patients clearly had FL by imaging but were not offered biopsy. The reasons for this are unknown but could include oversight on the part of the surgeon or delayed final reports of imaging studies performed on the
weekends or off-hours. Regardless, this illustrates the complexities of performing this study at a community hospital with minimal resources currently devoted to research. We are developing a preoperative review process to attempt to screen the imaging studies with the intent of identifying all potential NASH patients prior to surgery.

We also did not control for, nor did we consider, a patient’s alcohol history. Certainly, alcoholism can cause chronic changes in the liver that could potentially result in histologic changes similar to those seen in NASH. Patients with a history of alcoholism were not excluded.

Theoretically, the imaging characteristics of FL can predict severity. For example, if imaging evidence of FL is present, should a liver biopsy be performed during a ventral hernia repair, fundoplication, or bariatric procedure? We are also in the process of designing studies to help answer these questions.

The clinical implications of this study are, at this time, limited to assessing the current status of the patient’s steatohepatitis. Our current practice is to refer all patients who undergo biopsy and have pathologic evidence of NASH to a hepatologist for further counseling. Currently, there is no defined treatment for NASH. Most clinicians recommend weight loss, although our study shows no correlation between BMI and periportal fibrosis or necroinflammatory activity. Some patients with advanced fibrosis may be considered for repeat interval percutaneous liver biopsy if clinically indicated. We plan to continue to offer liver biopsy to patients with FL and to collect data in our database. Long-term follow-up may shed further light on the natural history of this condition. Certainly, better defining the true epidemiology of NASH is the first step in defining future treatment.

CONCLUSION

In conclusion, we have shown that patients with preoperative imaging evidence of FL had varying histologic severity of steatohepatitis when liver biopsy was performed. Body mass index correlated with the degree of macrovesicular steatosis found at biopsy. Patients with gallstones were less likely to have necroinflammatory activity. The preoperative albumin level and ALK predicted the presence of periportal fibrosis. However, no single preoperative factor predicted the overall severity of NASH in patients undergoing cholecystectomy who had FL seen on imaging studies. Because the histologic severity of steatosis cannot be reliably predicted by preoperative laboratory or demographic data, we believe that it is reasonable and indicated to perform a liver biopsy on all patients undergoing laparoscopic cholecystectomy who demonstrate fatty liver on preoperative sonogram or CT scan.

Based on the results of this study and the complexities described above, we plan further investigations. Cholelithiasis, choledocholithiasis, and choledocolithiasis may all be inherently associated with abnormal liver function tests, so patients with FL on imaging who are undergoing surgical procedures other than cholecystectomy will be offered a liver biopsy. These include colon surgery, antireflux surgery, and laparoscopic gynecologic surgery—essentially any operation that provides access to the liver without modifying surgical exposure or adding significant operative time. Comparison of the Brunt score with liver function tests in these patients may potentially be more applicable, since no underlying biliary pathology will be apparent at the time of biopsy. In addition, we will continue to offer liver biopsy to all of our cholecystectomy patients who have fatty liver on imaging and continue to grow our prospective database. However, we intend to quantify the degree of alcohol consumption for each patient, both prospectively and retrospectively, and to include this variable for comparison in future data analysis. It is important to use these data and that of future studies to consider treatment options for these patients. Options for supervised weight loss, dietary modification, and referral for bariatric surgery are areas of future study.

Systeme International Conversion Factors

Alanine aminotransferase: to convert to μkat/L, multiply value by 0.0167.

Albumin: to convert to g/L, multiply value by 10.

Alkaline phosphatase: to convert to μkat/L, multiply value by 0.0167.

Aspartate aminotransferase: to convert to μkat/L, multiply value by 0.0167.

Total bilirubin: to convert to μmol/L, multiply value by 17.104.

REFERENCES


Yoga has been shown to improve strength, flexibility, maximal oxygen uptake ($\text{VO}_{2\text{max}}$), and body composition.1,2 Yoga has also been shown to be a therapeutic alternative for treating chronic illness and life cycle changes for women.3,4

The most common of the many yoga styles is hatha yoga. It is slow-paced and focuses on proper stance, body alignment, posture, and breathing. Another popular style of yoga is vinyasa yoga, which focuses on breath-synchronized movements. This yoga style is integrated with a series of poses known as sun salutations.

One of the newest concepts in yoga training is called hot yoga. Hot yoga involves practicing yoga in a room with temperatures ranging from 90°F to 105°F (32.22°C to 40.55°C).6 Hot yoga is sometimes confused with Bikram yoga. Whereas a hot yoga class can vary depending upon the instructor, all Bikram yoga classes run for 90 minutes and consist of the same series of 26 postures repeated twice. Additionally, Bikram yoga is practiced in a room heated to 105°F with a humidity of 40%, which tends to be hotter than most hot yoga classes.

Hot yoga purportedly offers many physical and mental benefits compared with regular yoga. The most commonly highlighted benefit of hot yoga is the ability to stretch through a greater range of motion, since the muscles are more “warmed-up” and elastic due to the higher room temperature. Another reported benefit of hot yoga is the mental gains resulting from participating in a class (eg, being able to push oneself outside the comfort zone).7

Although hot yoga has many proponents, it has its critics, as well. One potential problem of practicing hot yoga is dehydration.6 Because of the hot exercise environment, beginners may experience spells of dizziness, nausea, and syncope during class.7 Additionally, the ability to go through a greater range of motion may put too much stress on a participant’s joints. This increases the risk of overstretching, resulting in possible joint and muscle damage if participants push themselves too far.7

The biggest potential problem with hot yoga could be a dangerous increase in core temperature. Resting core temperature is normally regulated around 98.6°F (37°C). When exercising, the body is able to maintain a safe core temperature by dissipating heat through sweating and evaporation.8 However, thermoregulation becomes challenging when the air temperature is higher than body temperature, as it may be in a hot yoga studio.9 This could lead to heat exhaustion or heat stroke, which are dangerous and life-threatening conditions.7,10

The body’s responses to hot yoga are currently unknown. To our knowledge, the effects of hot yoga on heart rate and core temperature have not been studied. Therefore, the purpose of this study was to compare participant heart rate and core temperature responses to regular yoga with those during hot yoga.

**METHODS**

**Subjects**

Twenty apparently healthy volunteers between 19 to 44 years of age were recruited. Volunteers completed the Physical Activity Readiness Questionnaire (PARQ) prior to being enrolled in the
study. The PARQ is designed to screen for medical conditions which may preclude subjects from safely exercising. All participants provided written informed consent before undergoing any testing procedures. The study protocol was approved by the University of Wisconsin-La Crosse Institutional Review Board for the Protection of Human Subjects.

**Procedures**

Initially, all participants completed a treadmill $V_o_{2max}$ test in order to determine maximal heart rate and aerobic capacity. The test was conducted using the Bruce protocol, and participants exercised to volitional exhaustion. During the test, heart rate was recorded each minute using a Polar heart rate monitor (Polar-electro Inc., Woodbury, NY). Oxygen consumption was measured continuously with a Moxus Metabolic System (AEI Technology, Naperville, IL). Ratings of perceived exertion were assessed at the end of each stage and at maximal exertion using the 6-20 Borg scale.

The second part of the study took place at The Body and Sol Yoga Studio in Onalaska, Wisconsin. Volunteers participated in both a basic yoga class and a hot yoga class. Approximately half of the subjects completed the basic class first, and half participated in the hot yoga class first. Approximately 3 hours prior to their first exercise session, subjects swallowed a CorTemp Ingestible Core Body Temperature Sensor (HQInc, Palmetto, FL) in order to monitor core temperature. During the exercise class, each participant also wore a Polar heart rate monitor. Core temperature was recorded 5 minutes prior to exercise, every 5 minutes during the yoga class, and 5 minutes after the session. Heart rate was recorded each minute during the class. Session rate of perceived exertion (RPE) was recorded at the end of the class. Within 24 hours, subjects participated in the second class. Core temperature, heart rate, and RPE were measured in the same manner as they were during the class completed the previous day. Both the basic yoga and hot yoga classes were taught by the same instructor and were designed to use an identical series of poses. During both classes room temperature was determined using a standard room thermometer, and humidity was measured using a sling psychrometer at the beginning of the class, 30 minutes into the class, and at end of class.

**Statistical Analysis**

Differences in heart rate, core temperature, and RPE between the basic yoga and hot yoga classes across time were assessed using repeated analysis of variance (ANOVA) measures. If there was a significant F ratio, pairwise comparisons were made using Tukey post-hoc tests. Alpha was set at $P < .05$ to achieve statistical significance for all analyses. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS, Version 19; SPSS Inc., Chicago, IL).

**RESULTS**

Twenty healthy men ($n = 4$) and women ($n = 16$) between 19 and 44 years of age completed the study. Descriptive characteristics of the participants are presented in Table 1. Average values for room temperature, room humidity, exercise heart rate, core temperature, and RPE for both sessions are presented in Table 2. Heart rate and core temperature responses are graphically presented in figures 1 and 2, respectively. Physiological responses of men and women to the yoga sessions were not significantly different from each other, thus, only group data are presented. Room temperature was approximately 22°F higher during the hot yoga session than during the basic yoga session. The humidity was also significantly higher during the hot yoga than during the basic yoga class. No significant differences in average heart rate or average core temperature were found between the sessions. Ratings of perceived exertion for the yoga sessions were significantly different, with the hot yoga session perceived as more difficult than the basic yoga session.

**Table 1. Descriptive Characteristics of Participants**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>24.4 ± 5.35</td>
<td>31.5 ± 11.12</td>
</tr>
<tr>
<td>Height, cm</td>
<td>168.8 ± 8.35</td>
<td>450.2 ± 25.43</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>67.3 ± 11.62</td>
<td>80.4 ± 4.54</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>23.5 ± 2.54</td>
<td>24.7 ± 2.32</td>
</tr>
<tr>
<td>Maximal heart rate, beats per minute</td>
<td>183 ± 6.1</td>
<td>186 ± 3.8</td>
</tr>
<tr>
<td>$V_o_{2max}$ mL/kg/min</td>
<td>44.9 ± 6.15</td>
<td>55.0 ± 5.41</td>
</tr>
</tbody>
</table>

**Table 2. Data Collected During the Basic Yoga and Hot Yoga Sessions**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Basic Yoga</th>
<th>Hot Yoga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room temperature, °F</td>
<td>70.8 ± 3.44</td>
<td>92.7 ± 1.81*</td>
</tr>
<tr>
<td>Room relative humidity, %</td>
<td>32 ± 5.9</td>
<td>35 ± 2.0*</td>
</tr>
<tr>
<td>Heart rate, beats per minute</td>
<td>103 ± 9.7</td>
<td>105 ± 9.0</td>
</tr>
<tr>
<td>Maximal heart rate, %</td>
<td>56 ± 5.0</td>
<td>57 ± 5.6</td>
</tr>
<tr>
<td>Core temperature, °F</td>
<td>99.3 ± 0.38</td>
<td>99.7 ± 0.32</td>
</tr>
<tr>
<td>Rate of perceived exertion</td>
<td>12.3 ± 0.57</td>
<td>13.6 ± 0.50*</td>
</tr>
</tbody>
</table>

Values represent mean ± standard deviation.

*Significantly higher than that of basic yoga session ($P < .05$).

**DISCUSSION**

One of the main concerns surrounding the practice of hot yoga is the potential adverse effects of exercising in an intentionally hot and humid environment. Many people believe that exercising in this type of environment could dangerously elevate core temperature, leading to heat-related injury. To our knowledge, no other studies have examined the physiological effects of hot yoga. In the present study, the hot yoga session was conducted in a room that averaged 92.7°F and 35% humidity. We found no significant difference in the change in core temperature between the basic yoga and hot yoga sessions. Compared with resting values, core temperature increased by 1.1°F for the basic yoga class and by 0.9°F for the hot yoga class, respectively. In absolute terms, the highest temperature recorded for an individual was 102.4°F. This is well
Overall, the room temperature and humidity were at the lower end of the ranges typically used for hot yoga. The recommended range of temperatures for hot yoga is from 90°F to 105°F, with a humidity of approximately 40%. It is possible that if the room temperature had been in the upper part of the range, more exaggerated differences could have been found. However, anecdotally, participants said that it would be very difficult to exercise for the entire class period if the temperature and humidity were higher than what was used in the current study. Other hot yoga studios conduct classes with temperatures in the range of 85°F to 95°F (29.45°C to 35°C) and humidity within the range of 30% to 35%. Beginner classes start with a temperature of 85°F, and experienced classes start with a temperature of 95°F. It should also be noted that humidity is not usually very tightly controlled; rather, it is influenced by the number of people in the class and the size of the room. A bigger class in a small room elevates humidity to a greater degree than does a small class in a large room.

In summary, it appears that concerns related to abnormally high elevated core temperature during hot yoga classes are unwarranted, at least at the temperatures used in the current study. Further research should be conducted relative to the core temperature responses to classes conducted in the higher temperatures within the recommended range, as well as to the more regimented Bikram yoga classes, which are 90 minutes in duration.

**REFERENCES**

Recreational use of cannabis, already the most commonly abused illicit drug in the United States, is on the rise. Recreational and pharmaceutical use likely will continue to increase with the recent legalization of cannabis in some states. Increased acceptance may, in turn, result in more people who use marijuana regularly into adulthood.

Cannabinoid hyperemesis is a recently recognized paradoxical cyclical vomiting syndrome related to chronic cannabis use. It began to be described in case reports beginning in 2004. It is often misdiagnosed and probably more prevalent than currently realized. The condition is easily diagnosed once physicians are familiar with it. Better yet, it is completely curable with strict abstinence from marijuana. I have made a diagnosis of cannabinoid hyperemesis 3 times within the past year and describe those cases here.

Case 1

A 20-year-old man with a troubled history of polysubstance abuse came to us after several days of intractable nausea and vomiting. He had 10 to 20 episodes per day and was unable to keep any food down. Several similar episodes occurring roughly every 3 to 4 weeks over the course of the year had prompted visits to the emergency department for antiemetics and intravenous fluids but had never before necessitated hospital admission. When questioned, he also disclosed that he had recently begun taking multiple hot showers each day to soothe his nausea—a newly discovered respite for his symptoms.

Laboratory testing revealed a mild leukocytosis. Electrolyte, creatinine, alanine aminotransferase, and lipase concentrations were within normal limits. The results of a computed tomography (CT) scan of the abdomen were unremarkable. A psychiatric consultation found no evidence of a primary eating disorder, although there was concern for mild anxiety and substance abuse. A gastroenterological consultation was ordered, with confirmation of a posited diagnosis of cannabinoid hyperemesis. The patient rejected this explanation and refused to consider marijuana cessation. He discharged from the hospital with the stated intention of starting a marijuana farm in California and has not returned for follow-up.

Case 2

A 25-year-old woman in the 18th week of her first pregnancy sought medical care following several days of intractable nausea, vomiting, abdominal pain, and streaks of blood in her emesis. Her medical record revealed 2 prior such episodes over the previous year. The first episode preceded her pregnancy, and no diagnosis was given. More recently, in the second episode, a diagnosis of hyperemesis gravidarum was made. She had been asymptomatic between episodes. She initially admitted to occasional marijuana use prior to her pregnancy; however, she eventually acknowledged daily use for many years and continued use during pregnancy. When questioned, she also disclosed that she had recently begun taking multiple hot showers each day to soothe her nausea—a newly discovered respite for her symptoms.

Laboratory testing revealed a mild leukocytosis. She had hypokalemia and borderline hyponatremia. Alanine aminotransferase and aspartate aminotransferase concentrations were slightly elevated, and lipase and alkaline phosphatase concentrations were within normal range. Esophagogastroduodenoscopy (EDG) showed esophagitis. She was treated with intravenous fluid, antiemetics, and electrolyte supplementation. A behavioral health consultation found no history of any psychiatric component to her cyclical vomiting. Gastroenterological and obstetrical consultations were ordered.
concluded that cannabinoid hyperemesis was more likely than gestational causes for her cyclical vomiting.

Although determined to stop using marijuana at discharge, the patient was readmitted 3 weeks later for another episode of cyclical vomiting. She admitted continued marijuana use in between episodes. She has had no recurrences and has been abstinent in the 9 months since.

Case 3
A 55-year-old man with a history of hypertension, stroke, anxiety, and a 25-year history of cyclical vomiting syndrome sought assistance after 5 days of his usual constellation of symptoms, including intractable nausea, vomiting, and orthostasis. He denied abdominal pain during this episode, unlike with many previous episodes. A review of the electronic medical record revealed frequent visits to the emergency department—roughly every 4 or 5 months. He initially denied current marijuana use, but he later admitted to smoking as much marijuana as he could afford nearly every day since he was a teenager, with occasional gaps when he either couldn’t afford it or was undergoing drug monitoring. He admitted to spending hours per day in the bath tub with water as hot as could be tolerated, frequently exhausting his hot water supply. On at least one occasion, he scalded himself. He viewed his compulsion for hot baths as a social, financial, and emotional burden. The patient’s medications included several antiemetics for his frequent symptoms, none of which he found helpful. Ironically, at one point he was prescribed a cannabinoid (marinol) for his recurring nausea.

Laboratory tests revealed hyponatremia, hypokalemia, a mild leukocytosis, and acute renal failure with creatinine concentration of 5.83 mg/dL (515.37 μmol/L). His baseline creatinine concentration had been 1.0 mg/dL (88.4 μmol/L), with a peak concentration of 9.8 mg/dL (866.32 μmol/L) on previous admission. Previous extensive evaluations had included multiple endoscopies showing only esophagitis, multiple abdominal computed tomography (CT) scans, ultrasonograms, a gastric emptying study, a hepatobiliary iminodiacetic acid scan, and a small bowel follow-through, the results of which were all normal.

The patient was treated symptomatically and recovered with intravenous fluids, anti-nausea medications, and electrolyte replacement. He was pleased to learn about a unifying diagnosis for his symptoms and was willing and eager to abstain from marijuana if it would end the recurring symptoms.

Three months later, this patient was readmitted with recurrent stroke and pneumonia, and died of multiple organ failure and sepsis. He had no complaints of nausea or vomiting at that time and, according to his family, he had abstained from marijuana and reported no recurrence of symptoms over the prior 3 months. He was likewise able to end his predilection for hot baths.

DISCUSSION
Cannabinoid hyperemesis was first reported in 2004 in a case series in South Australia, an Australian state known for liberal acceptance of casual marijuana use. Shortly after, case reports began surfacing indicating that this phenomenon was not isolated to Australia. As case reports accumulated an attempt to frame diagnostic guidelines was proposed based on common characteristics. An updated version of these guidelines has recently been proposed.

The generally agreed upon key features of this syndrome are:

1. Cyclical episodes of severe nausea and intractable vomiting
These symptoms usually last several days, occurring every few weeks or months. It tends to be worse in the morning and may be preceded by a prodromal period of reoccurring morning nausea before the hyperemesis phase begins. This may be misdiagnosed as a history of psychogenic vomiting, cyclical vomiting, or even an eating disorder.

2. A history of heavy chronic cannabis use
It is not known how much cannabis is required to cause symptoms; however, most patients have used cannabis at least weekly, usually daily, over several years. There is evidence for some cases with reported cannabis use less than 1 year. Cannabis use may be denied at first. I have found success with the approach highlighted by Stephen Sullivan asking “Have you ever tried marijuana to help with the nausea?”

3. Abdominal pain
Most patients report some degree of epigastric or periumbilical colicky abdominal discomfort. This may be partially attributable to the recurrent emesis. Abdominal workups are usually negative, although EGD may show mild esophagitis due to retching. Familiarity with this syndrome may lead to fewer unnecessary workups; however, the absence of evidence for other etiologies for abdominal discomfort is included among the supportive features in the proposed diagnostic guidelines.

4. Temporary relief of symptoms by bathing in hot water
I find this the most interesting, if not pathognomonic, feature of cannabinoid hyperemesis. Rarely, cases have been reported without this feature which may either reflect a true subset not disposed to this behavior, or those diagnosed prior to developing it. The behavior is learned and, once stumbled upon, is continued faithfully—often in bizarre fashion. The patient in Case #3 spoke candidly of the emotional and financial toll his compulsion for hot baths had taken. He spoke of the embarrassment suffered asking his neighbor, or even his ex-wife, to borrow their bathtubs when his own hot water ran out and while he waited for it to return. He spoke of the high cost of his energy bill and of the higher cost of checking into hotels or hospitals when hot water was otherwise unavailable. He lamented missing time with family and friends, ruining his honeymoon, his inability to meet professional obligations, the breakdown of relationships, and the odd reputation he had acquired due to his strong compulsion for spending so much time in a hot bathtub. His case is fairly comparable to other reports. Any patient with cyclical or otherwise unexplained vomiting should be asked if they have tried taking a warm bath to relieve their symptoms.

5. Cessation of symptoms with abstinence from cannabis
If patients stop smoking marijuana, they will eventually have resolution of their symptoms. Generally, if they are abstinent, their current cycle will be their last. Patients vary in their response to the advice to remain abstinent from marijuana: from cynical and resistant (patient in Case #1), to relieved and motivated (patient in Case #3). Like the patient in Case #2, those who continue using cannabis usually have an eventual recurrence of symptoms.

In addition to the key features listed above, a history of polydipsia was common in each of the 3 patients in this series. The patient in Case #1 had been gulping water so frequently and with such urgency that his mother was convinced this unusual thirst was causing his subsequent emesis. The patient in Case #2 had made a reputation for herself among her colleagues for the water bottle she had near her always. Likewise, the patient in Case #3 went so far as to say he didn’t know whether he could survive without the ice water he constantly had with him. This association has been noted in the literature previously, even in the earliest reports, and perhaps is merely a function of “the munchies” exacerbated by the recurrent dehydration from frequent emesis. A mild leukocytosis was also common among these cases, as has been noted by others, for unknown reasons. Not surprisingly, varying levels of electrolyte abnormalities are commonly seen with the frequent emesis and dehydration.

SUMMARY
Cannabinoid hyperemesis is likely a more common than appreciated phenomenon. It may become more prevalent as marijuana use becomes more accepted and chronic use increases. Increased awareness will lead to more prompt and accurate diagnoses and less unnecessary workups. More importantly, patients can be offered a cure for what can otherwise be a physically and emotionally debilitating chronic illness. Emergency physicians and others who commonly treat patients with intractable nausea and vomiting should ask about marijuana use, keeping in mind that patients are often not forthcoming initially. Asking about frequent hot baths to relieve symptoms makes this diagnosis nearly unmistakable.

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Chronic Eosinophilic Pneumonia: A Case Report

ABSTRACT

Chronic eosinophilic pneumonia is a disorder characterized by pulmonary infiltrates and eosinophilia in both the blood and lung tissue. It is most common in middle-aged, nonsmoking women. The disorder responds dramatically to oral corticosteroids, but relapse is common. The case of a 77-year-old woman who was admitted with recurrent episodes of pneumonia that responded to antibiotics and steroids is described, and the clinical features and treatment of chronic eosinophilic pneumonia are reviewed.

CASE REPORT

A 77-year-old woman was admitted to the hospital and received intravenous antibiotics for presumed recurrent bacterial pneumonia. Her symptoms consisted of 1 week of a progressive, nonproductive cough with associated shortness of breath and fatigue. The patient did not appear to be in acute distress. She had a low-grade fever of 99.7°F (37.6°C). Her oxygen saturation was 95% on room air. She had decreased breath sounds over the right upper lung field, but the results of her physical examination were otherwise unremarkable.

The patient had 2 similar episodes within the previous 6 months that had been treated with antibiotics and steroids. It is unclear why she received the steroids for treatment of what was presumed to be pneumonia. Each time her symptoms improved but returned within a few weeks of completing treatment. A chest radiograph from her first episode is shown in Figure 1.

Her medical history was significant for hyperlipidemia and stage 1 T1a N0 M0 mucinous carcinoma of the right breast treated with lumpectomy, sentinel lymph node biopsy, and anastrazole. Daily medications included 2000 units vitamin D, 1 mg anastazole, and 20 mg lovastatin, all by mouth. She had no history of allergies to medications. She was a lifelong nonsmoker, drank no alcohol, and did not use illicit drugs. Her only pet was a cat, and she had never had a pet bird. She had travelled to Arizona about 10 years prior but denied any other travel outside of the area. She never worked on a farm, and she did not have a hot tub. There was a wood stove in her house, and there may have been asbestos in the insulation for the piping of that stove; however, the patient denies any other asbestos exposure.

Her laboratory test results were remarkable for a white blood count of 8500/μL (8.5×10⁹/L) with a mildly low absolute lymphocyte count of 670/μL (0.67×10⁹/L) and a normal absolute eosinophil count of 470/μL (0.47×10⁹/L). Results of electrolyte, liver function, and kidney function tests were normal. Her chest radiograph is shown in Figure 2. A computed tomography (CT) scan showed extensive airspace opacities consistent with infiltrates in both the right and left lung, most prominent in the right upper lobe.

The history of multiple recurrent episodes of pneumonia in a relatively short period suggested a process other than recurrent bacterial pneumonia. The patient was discharged home in stable condition without any additional intervention, and an appointment was arranged with pulmonology for the next day. Following the pulmonology appointment, a bronchoscopy was performed. Bronchoalveolar lavage showed numerous eosinophils and scattered intra-alveolar macrophages. Results of Gomori methenamine silver and fluorescent acid-fast bacterial stains were both negative. She was started on 40 mg prednisone daily by mouth, and her anastrazole was discontinued. She was slowly tapered off prednisone over the next 8 months. Shortly after stopping the prednisone, she developed arthritis-like pain in multiple joints and a cough with some slight wheezing. Repeat chest radiograph showed a new left upper lobe infiltrate, which was believed to be a recurrence of her chronic eosinophilic pneumonia. Oral corticosteroid therapy was restarted, and her symptoms rapidly improved. The patient’s chest radiograph 1 month after starting oral corticosteroid therapy is shown in Figure 3.

DISCUSSION

Approximately 95% of patients have blood eosinophilia, but our patient did not. Her clinical history, imaging findings, and bronchoalveolar lavage findings were consistent with a diagnosis of chronic eosinophilic pneumonia.

Chronic eosinophilic pneumonia was first described as a distinct clinical entity by Carrington and colleagues in 1969. Chronic eosinophilic pneumonia is twice as common in women as it is in men. The peak incidence is in middle age, with 46% of cases occurring between the ages of 30 and 49 years, and 82% of cases occurring over the age of 30 years. In the case series described by Marchand et al, 93.5% of the patients were nonsmokers. The
majority of patients in that study had a history of atopy (62.9%), including asthma (51.6%), allergic rhinitis (23.7%), drug allergy (9.7%), eczema (4.8%), and allergic conjunctivitis (3.2%). The most common symptoms associated with chronic eosinophilic pneumonia were cough (93.4%), dyspnea (91.9%), asthenia (88.3%), fever (77.4%), and weight loss (75.0%).

Extrapulmonary involvement is rare and should prompt consideration of systemic diseases such as Churg-Strauss syndrome or hypeereosinophilic syndrome. When present, extrapulmonary symptoms can include arthralgia, pericarditis, purpura, and elevated serum liver enzyme concentrations. One-third of patients will have wheezes or crackles upon physical examination. Chest radiograph can appear like a “photographic negative of pulmonary edema”; however, this finding is present in only about 25% of patients. Infiltrates are usually peripheral (63%). Blood eosinophilia is typical (95.2% of patients) but not always present. Elevated erythrocyte sedimentation rates (82.5% of patients) and elevated C-reactive protein concentrations (82.8% of patients) are also common. Pathology usually shows an intra-alveolar exudate of eosinophils and histiocytes.

Bronchoalveolar lavage (BAL) eosinophilia is present in all cases, and eosinophil scores account for more than 40% of the BAL differential cell count in more than 80% of patients. A differential cell count of eosinophils of ≥40% has been suggested for the diagnosis of idiopathic chronic eosinophilic pneumonia.

The diagnosis of chronic eosinophilic pneumonia is based on the typical clinical and radiographic features, along with the demonstration of eosinophilia in the tissue or blood. If the diagnosis is in question due to lack of blood eosinophilia, bronchoalveolar lavage can be used to help solidify the diagnosis. Bronchoalveolar lavage has become a widely accepted noninvasive surrogate of lung biopsy, and lung biopsy is seldom needed.

Eosinophilic pneumonia can be idiopathic or secondary to a definite cause, such as drugs or infections (parasites). Common drug causes include nonsteroidal anti-inflammatory drugs (acetylsalicylic acid, ibuprofen, and naproxen). Common parasitic causes include *Toxocara canis* and *Ascaris lumbricoides* in nontropical/subtropical areas.

Chronic eosinophilic pneumonia responds rapidly to oral corticosteroid therapy, with more than 80% of patients reporting improvement within 48 hours. Complete resolution of symptoms within 2 weeks is seen in about two-thirds of patients. Within 1 week of starting therapy, chest radiograph will show complete resolution of the initial infiltrate in almost 70% of patients. Relapse is common in chronic eosinophilic pneumonia. In a case series reported by Jederlinic et al, almost 20% of patients developed recurrence of symptoms while corticosteroids were being tapered, and 60% of patients relapsed after corticosteroid therapy was discontinued. It is recommended that the initial course of corticosteroids be continued for at least 6 months prior to weaning. Most patients require a prolonged course, with the majority receiving more than 18 months of corticosteroid therapy.

Chronic eosinophilic pneumonia is a disorder characterized by pulmonary infiltrates and eosinophilia in both the tissue and blood. It emerges as a subacute illness with respiratory and systemic symptoms progressing over weeks to months. The disorder responds very well to oral corticosteroids, and the overall prognosis is excellent; however, relapse is common, and the majority of patients require prolonged corticosteroid therapy.

REFERENCES

Bacillus Calmette-Guérin sepsis: an unusual complication of intravesical immunotherapy

ABSTRACT

Intravesical bacillus Calmette-Guérin (BCG) is a common immunotherapy used in the treatment of moderate and high-risk noninvasive bladder cancer. Although complications associated with BCG treatment are generally mild, the inadvertent introduction of BCG into the bloodstream—usually through traumatic catheterization—can result in BCG sepsis, a rare but life-threatening condition. We describe the case of a 74-year-old man who developed BCG sepsis in the course of treatment for recurrent bladder cancer.

CASE REPORT

A 74-year-old man was brought to the emergency department from his home by ambulance for profound weakness and confusion. The symptoms had been noted earlier in the day by family but had been getting progressively worse, prompting the evaluation. He was unable to provide meaningful history, but family noted no recent illness or significant complaints. His medical history was notable for coronary artery disease with myocardial infarction, repaired abdominal aortic aneurysm, hypertension, chronic obstructive pulmonary disease, and bladder carcinoma. Prescribed medications were aspirin, a statin, inhaled albuterol, docusate, and hydrocodone as needed.

Initial assessment included hypotension with systolic blood pressures in the 60s mm Hg. This improved with appropriate fluid resuscitation, but he remained hemodynamically unstable with systolic blood pressures in the 90s mm Hg, heart rates in the 110s beats per minute, and fever to 102.9°F (39.4°C). He was actively having rigors and was oriented only to person and place. He was unable to follow commands or answer questions appropriately. He had no focal neurologic deficits. There were no murmurs or rubs, and his lungs were clear to auscultation. His abdomen was nontender. Skin evaluation found no erythema or rash, and joint examination was unrevealing.

Results of initial laboratory studies (Table) revealed mild leukocytosis, as well as an elevated creatinine concentration consistent with acute kidney injury. Sodium, potassium, and chloride concentrations were within reference range. Bicarbonate concentration was slightly low. A coagulopathy was present, with international normalized ratio (INR) of 2.2 and partial thromboplastin time (PTT) of 45 seconds. Fibrinogen concentration was low. Liver function test values were elevated. Imaging studies included a computed tomography (CT) scan of the head, which was negative for hemorrhage, and a chest radiograph, which revealed no infiltrate. Urinalysis revealed greater than 100 white blood cells per high-power field, greater than 100 bacteria per high-power field, 1+ leukocyte esterase, and 3+ blood.

Standard blood and urine cultures were obtained, and initial treatment was started with aggressive fluid resuscitation and initiation of levofloxacin for a clinical picture consistent with urinary tract infection and sepsis. The abnormal liver function test results and coagulopathy were thought to be related to the septic process, with possible disseminated intravascular coagulation.

After initial critical management and stabilization, further history was obtained from family and a review of recent medical records was performed. The day prior to presentation, the patient had received intravesicular instillation of bacillus Calmette-Guérin (BCG) as the third of 3 treatments for recurrent bladder cancer. Results of a pretreatment urinalysis were normal. Notes from that treatment stated that the standard catheter used for treatment could not be inserted, so an alternate catheter type was used. The patient was given one-tenth dose (8.1 mg) of BCG along with 50 million units of interferon.

This clinical history of probable traumatic catheterization prompted suspicion for BCG sepsis. Levofloxacin was continued, and rifampin and corticosteroids were added to the regimen. Isonicotinic acid hydrazide (INH) replaced rifampin after clinical diagnosis was supported with no growth on standard blood and urine cultures. No mycobacterium cultures were obtained, but further evaluation of liver function favored a diagnosis of granulomatous hepatitis related to BCG, with a possible
component of acute ischemic hepatitis. Abnormal INR, PTT, and fibrinogen findings were attributed to liver dysfunction rather than to disseminated intravascular coagulation, given the course of improvement. The patient required dialysis for several weeks due to his acute kidney injury. He completed 4 weeks of targeted therapy as described above, which was then discontinued given his clinical improvement. Slow recovery back to his former state of health was achieved. Because he was no longer a candidate for intravesical BCG, he was monitored clinically but went on to develop metastatic disease.

**DISCUSSION**

The intravesicular instillation of BCG vaccine is the mainstay of therapy for noninvasive bladder cancers. It is a live, attenuated *Mycobacterium bovis* preparation, which is specifically formulated for intravesicular use. The therapeutic mechanism is not well understood, but a T helper response of cytokines is believed to be an integral component. In general, this is a well-tolerated immunotherapy for bladder carcinoma; however, it is associated with complications ranging from common localized symptoms to the rare systemic shock. Complications may occur within the first 3 months (early) or greater than a year after treatment (late). Minor complications have been reported to occur frequently: urinary frequency in 71%, cystitis in 67%, fever in 25%, and hematuria in 23%. Pneumonitis, hepatitis, and generalized symptoms generally occur in the early period after treatment, while late complications generally affect the genitourinary tract, spine, or retroperitoneal tissues. Noncaseating granulomas can often be seen on biopsy of both early and late infections. Serious adverse events are reported in less than 5%, with sepsis occurring very infrequently—in 0.4%, or 1 in 1500, of treated patients.

These adverse systemic effects are likely the result of dissemination of vaccine that has gained hematogenous access through disrupted uroepithelial cells. Contraindications to treatment, which include anticoagulation, a procedure within 1 week, current cystitis or urinary tract infection, and immunocompromised status are aimed at limiting steps to dissemination and complication.

The mechanism of the systemic effect is debated but may be from a true infection, cytokine-mediated hypersensitivity reaction, or a combination of both. Providers often perform screening urinalysis prior to BCG instillation, but this does not appear to decrease the incidence of localized infection. Most complications are seen within days of treatment, but manifestations have been reported years later as well after a change in immune status, such as that resulting from prolonged corticosteroid use.

Early treatment of suspected BCG complications relies on use of antimycobacterial regimens, with such agents as fluoroquinolone or rifampin with isoniazid, for several weeks depending on severity and site of infection. Glucocorticoids are also used for the hypersensitivity component and may be tapered after symptoms improve.

In summary, use of intravesical BCG is generally considered safe, with relatively few complications. Several self-limiting adverse effects may occur, with minor and localized reactions being most common. Distal and disseminated complications can manifest as organ-specific involvement or a systemic collapse. Results of blood tests frequently reveal abnormal liver function. Hemodynamic status is often compromised, as was the case for our patient. The results of blood and urine cultures are usually negative for growth in cases of BCG sepsis. Maintaining a high index of suspicion with any history of intravesical BCG use is critical to diagnosis.

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Denial of pregnancy is considered an uncommon form of denial exhibited by women to either the fact or the implications of their own pregnancy. While thought by many people to be a mere curiosity, it is a real medical condition with potentially very significant manifestations.

Women are described as going through 4 states during the mental preparation for pregnancy: (1) acceptance of pregnancy, (2) attachment to the fetus, (3) preparation for birth, and (4) realistic perception of the neonate. According to Spielvogel and Hohener, women experiencing denial of pregnancy have not gone through 1 or more of these stages. Denial of pregnancy is described in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, as a brief, maladaptive reaction to a significant external stressor that does not meet the criteria for another Axis I mental disorder. It is also described as an unconscious defense mechanism used to reduce emotional conflict or anxiety by disavowal of external realities that are consciously unacceptable.

CASE REPORTS
Case 1
A 23-year-old woman was brought to our emergency department in September 2011 with complaints of vaginal bleeding and pain. She reported having given birth at home that afternoon and had taken the baby to her local fire station as part of the Safe Haven program.

She stated that her last menstrual period was mid-December 2010. She reported using no form of contraception, and she denied sexual assault. This was her first pregnancy. Her medical history was unremarkable, positive for only dermatological conditions and recurrent sinusitis. She had no history of surgical procedures.

Findings from a general physical examination at the time of admission were normal. The uterus was 1 fingerbreadth below the umbilicus. A primary perineal laceration was repaired under local anesthesia. The patient’s blood type was O Rh-negative, but the baby’s blood type was also Rh-negative. The patient refused admission. Counseling was provided to her by social services. No subsequent follow-up occurred.

Case 2
A 25-year-old woman telephoned Labor and Delivery and reported that she had delivered a stillborn infant at home. She had not known that she was pregnant and, hence, had not received prenatal care. She reported not having felt well the day before, and she had spent most of that day on the couch. She thought that she may be constipated, so at 1:30 AM she went to the bathroom and subsequently delivered the baby in the toilet. She stated that she had removed the baby immediately and began cardiopulmonary resuscitation (CPR). She requested assistance from her parents, and she and her parents continued CPR for about 30 minutes before calling 911. The patient and the neonate were transported to the local community hospital. Upon examination, she was pale and tachycardic. The patient was given intravenous fluids and Rh immunoglobulin for Rh-negative blood type. Her hemoglobin was reported to be 5.3 g/dL (53 g/L; reference range 14.0-17.5 g/dL, 140-175 g/L). The patient was transferred to our hospital for transfusion and observation.

This was the patient’s second pregnancy. Her first pregnancy had been delivered 1 year earlier at 38 weeks after induction for preeclampsia and gestational diabetes. The patient indicated that the father of the baby was the father for both pregnancies. She denied sexual assault.

The examination revealed a second-degree perineal laceration, which was repaired under local anesthesia. The patient received a transfusion of 2 units of packed red blood cells. She was discharged the next day. Social services followed up with her during hospitalization, but no physician follow-up occurred.

The emergency department physician in the community hospital indicated that the police had taken the body of the stillborn infant before he had a chance to conduct an examination. Subsequent follow-up information about the infant was unavailable.

DISCUSSION
There is some confusion in the literature as to differences between denied pregnancy and concealed pregnancy. Some consider denied
pregnancy to be a subcategory of concealed pregnancy, and some authors group them together as variations of the same disorder. Some women may fail to disclose or acknowledge their pregnancy but were aware of the pregnancy and, for a variety of reasons, did not seek prenatal care. Furthermore, all women who do not seek prenatal care should not be considered to be experiencing a concealed, or denied, pregnancy.

Miller's classification of denial, described in 2003, appears in many articles in the literature and has broad acceptance:

- Affective denial - lack of the typical maternal bonding that is felt by many women during pregnancy. Although they are aware of the pregnancy, they continue to behave as if they were not pregnant. They do not alter their clothes or lifestyle. They may claim to have had cyclic bleeding or not to have noticed its absence. They make no preparations for the baby's arrival.

- Pervasive denial - the women suppress all awareness of their pregnancy for an extended time, even through childbirth and beyond. Friedman and colleagues reported that 36% of women with pregnancy denial were in this category. A strong association with social isolation is noted with many of these patients. Very few had mental disability or major depression. These researchers speculate that some may have become pregnant secondary to rape, or had considered abortion or adoption.

- Psychotic denial - the sensation of something growing inside the woman can be interpreted as cancer, a blood clot, and fetal movements are described as the woman's organs coming loose inside her body.

Berns describes a continuum of behaviors, ranging from full awareness of pregnancy with concealment, to suspicion of pregnancy, which the patient suppresses, to full-blown denial. Even if a woman is aware of the pregnancy, the concealment may be seen as a maladaptive approach that suggests need for further evaluation and counseling. The first case presented represented the concealed end of the spectrum, in which the patient recognized the pregnancy but avoided receiving care. In the second case, the mother demonstrated a total lack of recognition of the pregnancy until actual delivery.

Concealed pregnancies are more likely to occur in adolescents, whereas denied pregnancies are usually in older women, often who have had previous pregnancies. Recurrence rates have not been determined. In the Cleveland review, 2 of 61 women with denial suffered repeat episodes. An infamous French case was reported several years ago in which a woman was accused of having killed 8 consecutive concealed newborns.

**Incidence**

The highest incidence of denial of pregnancy was described in a French study suggesting a rate of 2.2% of all deliveries. The lowest rate was reported in a population-based British study in 2006 at 1 in 2500, or 0.04%. An American study out of Cleveland (Friedman et al.) determined that it occurred in 0.26% of all deliveries in their review. A rate of 0.21% was reported in a 19-hospital–based German study. These authors remind us that the frequency of occurrence is 3 times greater than that of triplets and more common than Rh disease or uterine rupture.

**Obstetric Considerations**

A French study of 56 cases of pregnancy denial demonstrated that almost half (46%) were already mothers of 1 or 2 children. About half of the patients denied the pregnancy until full term, and the other half ended their denial before term. In a 2002 German study by Wessel and Büscher, diagnosis was made before birth in approximately half of the women, and during labor in the remainder. In a subsequent study reported by Wessel et al in 2003, the maternal age was between 15 and 44 years, with a median of 27 years. Fifty-five percent had at least 1 prior delivery, and only 33% had never previously been pregnant. Only 3 of 65 carried a psychiatric diagnosis of schizophrenia. Four women had a history of addiction, but only 1 with active use. Nirmal et al reported a similar rate of multiparity (58%).

Of course, women in denial of pregnancy receive no prenatal care until identification of the pregnancy becomes known. In the later report by Wessel et al, 3 of 65 (4.6%) deliveries were preivable, 18% were preterm, 26% were small for gestational age, and 3% were post-term. There were 41 spontaneous deliveries (63%), 2 (3%) vaginally-born breech births, and 11 (17%) cesarean or vaginal operative deliveries. Additional studies confirm the significantly higher prematurity rates.

Wessel et al reported that 29% of the infants delivered required newborn intensive care unit (NICU) admission for various reasons. Nirmal et al reported depressed Apgar scores at 1 (20%) and 5 (8%) minutes. Brezinka et al reported 4 stillbirths among 27 women in an Austrian series from 1994. They also reported that 5 of 11 infants carried to term were breech.

Patients may present for emergency care with abdominal pain, bleeding, or a watery discharge. It is important that care providers consider pregnancy in their differential diagnosis. In the author's experience, a patient was taken by ambulance to a local hospital after experiencing a seizure at home. In the emergency department, it was determined that she was pregnant, and the seizure represented eclampsia.

**Psychiatric and Legal Aspects**

Denial of pregnancy is recognized in the psychiatric literature as an adjustment disorder. Speculation arises that the denial may relate to unresolved conflicts regarding sexuality, hostility toward the father of the infant, ignorance about pregnancy physiology and symptoms, or a history of sexual trauma. Patients may fear ostracism in some social groups. Social isolation may be strongly associated with the denial. Friedman et al reported that the women frequently lived with, and received sole social support from, their mothers. Pressures to terminate the pregnancy may cause some women to conceal their pregnancy. Women who have had infants removed from their care in the past may conceal their pregnancies to avoid the same situation.

Specific recommendations for treatment of denial or concealed pregnancies appear to be lacking. Many patients will not have a pre-existent history of major psychiatric diseases, and evaluation to rule out psychosis is important.

Denial of pregnancy has been entered as a legal doctrine. The “Gretchen Defense” was described in a criminal case in Germany.
in which a woman was acquitted for murder after her neonate was found to have expired soon after birth. The French Association for the Recognition of Denial of Pregnancy (AFRDG) is an organization fighting for greater legal recognition of the denial of pregnancy as a disorder (http://www.afrdg.info ).

**Neonatal Considerations**

In the second case described, police intervention prevents us from knowing details as to the status of the fetus/newborn. Estimated gestational age, birth weight, and autopsy results were all withheld, presumably secondary to a criminal investigation. To our knowledge, no charges have been filed.

Denial is described as a substantial risk factor for abandonment and infanticide. Quantification of such occurrences has been poorly reported, probably because of their relatively low occurrence rates and the inability to establish a denominator, especially if the suspicion of successful concealment cannot be verified. Infanticide or neonatal death was found to be the outcome in 6 of 29 women in total denial in the aforementioned French study. A paper from Hong Kong describes 2 cases of newborn death and 2 cases of near-miss newborn death, but no denominator is provided.

Delivery into the toilet has been associated with risks of drowning, and an Australian review listed drowning as the primary cause of death in neonaticide. Skull fractures may occur if the mother is crouching or standing. Delivery in isolation may prevent anyone from providing the most basic care to the newborn, such as stimulation or drying; hypothermia may result.

Active neonaticide may occur through strangulation in an effort to quiet a baby whose cries might alert family of delivery. Alder and Baker found that all women committing neonaticide were deeply fearful of the repercussions of pregnancy. In an Australian study of 32 maternal neonaticide cases, 3 cases were characterized by total denial of pregnancy and birth rather than by a motivation to kill the infant. Women in severe denial are often described as being in a state of shock and emotional disassociation at the time of delivery. Women who have actively contributed to their newborn’s death are often in-dissociative states and usually have difficulty recalling the details of the event and make minimal to no effort to hide their actions.

Safe Haven programs attempt to provide alternatives for women who deliver after concealed pregnancies. Every state and the District of Columbia have safe haven laws in place. The success of such programs can only be estimated because standardized statistics are not gathered. The National Safe Haven Alliance estimates that over 1000 babies have been placed through this program (http://www.nationalsafehavenalliance.org/).

**RECOMMENDATIONS**

Patients who enter prenatal care late are considered to be at higher risk of adverse outcomes. Dating of the onset of pregnancy may be difficult, and an ultrasonogram as early as possible may be of value. Fetal surveillance may be necessary, especially if the due date cannot be reliably determined. Assessment of medications taken during early pregnancy may be important to determine teratogenic risks. Growth should be monitored, based on the reports of a 26% small-for-gestational-age rate. The curiously high rate of breech presentation in 2 reports would support monitoring fetal position in late pregnancy. Psychiatric evaluation and assistance with management for the duration of the pregnancy should be considered, as well.

If the patient receives no prenatal care and presents in labor, careful fetal monitoring should be performed. Education about the mechanisms of labor and assistance of the patient to anticipate labor, delivery, and postpartum care is important, as well. If gestational age is uncertain, a pediatric care provider should be in attendance at the delivery. Postpartum contraception management should be discussed and encouraged, although patients may deny intent to become sexually active after delivery.

Friedman and colleagues’ state that it is crucial that a woman with pregnancy denial be provided a psychiatric consultation prior to discharge, especially if the child is to be released to her care. Furthermore, social services assessment and Child Protective Services may need to be involved in follow-up of the patient and her newborn. Friedman et al found that 22% to 39% of infants were removed from maternal custody, but many women who deny symptoms of pregnancy may not reject the mothering role—rather, they accept the child without reservation. Many patients are intensely embarrassed by their lack of recognition of their pregnancy and feel guilty for putting their baby at risk.

Finally, it is important for providers to approach these patients with empathy and compassion. Denial of pregnancy may be secondary to deep psychological and psychiatric scars that require careful attention. Doctors, midwives, and nurses should provide care with a high degree of concern about their short-term and long-term well-being. Theoretically, these efforts should be of benefit to these women during this time of crisis in their lives.

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Dehiscence of Larynx in a Patient Treated with Bevacizumab for Colon Carcinoma

ABSTRACT

Bowel perforation and nasal septal perforations have been reported in literature with the use of bevacizumab due to its antiangiogenic properties. We report the case of a 68-year-old gentleman with prior history of radiation treatment for laryngeal cancer treated with standard chemotherapy and bevacizumab for metastatic colon cancer found to have chondroradionecrosis and dehiscence of larynx. Although the exact mechanism is unclear, patients with prior radiation therapy receiving bevacizumab may need monitoring with special attention to the previously irradiated areas.

Bevacizumab is a cytotoxic monoclonal antibody with antiangiogenic properties used to treat various malignancies. Bowel perforation and nasal septal perforations with its use have been reported.1,2 To our knowledge, this is the first reported case of chondroradionecrosis of the larynx in a patient treated with bevacizumab for metastatic colon cancer.

CASE HISTORY

A 68-year-old man with a 4-week history of rectal bleeding, small stools, occasional constipation, and mild anemia visited our clinic. Colonoscopy revealed a 6-cm friable mass that occupied 75% to 99% of the circumference of the patient’s rectum. Biopsy revealed an infiltrative type low-grade colonic type adenocarcinoma. A computed tomography (CT) scan of his chest, abdomen, and pelvis revealed widespread liver metastasis. Due to the non-obstructing nature of the rectal cancer and hepatic metastasis, the patient underwent primary chemotherapy with oxaliplatin, 5-fluorouracil, and leucovorin (m-FOLFOX 6), and bevacizumab in November 2011. Of note, the patient had previously been diagnosed with squamous cell carcinoma of the larynx (T1N0M0) in 1990 and had received a full course of external beam radiation therapy. At that time, he experienced residual posterior glottic stenosis and baseline hoarseness.

After 16 weeks of chemotherapy, repeat CT scans showed that his primary and hepatic metastases had a very good partial response, but the patient noticed a worsening hoarseness, mild epistaxis after blowing his nose, and pain in the left side of his neck. A thorough ear, nose, and throat (ENT) evaluation did not show nasal septal perforation, and a flexible fiberoptic examination to his right nostril was performed. The patient’s nasopharynx, oropharynx, hypopharynx, and supraglottis all appeared normal. He had a posterior glottic stricture and very poor vocal fold abduction on both sides. He also had extensive neovascularization of the vocal folds consistent with post-radiation changes, but there was no sign of recurrent laryngeal cancer.

A CT scan of sinuses showed dehiscence at the level of larynx (Figure 1, coronal view; and Figure 2, sagittal view of the laryngeal dehiscence shown by arrow). Over the next few weeks the patient experienced increasing stridor and was hospitalized for a compromised airway. To protect his airway, a tracheostomy was performed. Bevacizumab was discontinued. He had ongoing ENT follow-up, and he continued on 5FU and leucovorin for his colorectal cancer.

DISCUSSION

Angiogenesis plays a crucial role in tumor growth, progression, and metastatic spread. Bevacizumab, a vascular endothelial growth factor (VEGF) inhibitor, has been used in the treatment of several malignancies, including metastatic colorectal cancer, renal cell cancer, breast cancer, and, recently, ovarian cancer. Bevacizumab can induce bleeding and thrombosis, both arterial and venous, but the mechanism is not well understood. Recent reports have suggested that bevacizumab also can induce nasal septal perforation, with an estimated incidence of 7%.3 Fakih et al published the first report of nasal septal perforation in 2006.4 Other observed toxicities of bevacizumab include hypertension, proteinuria, mild to moderate bleeding, delayed wound healing. Perforation of the bowel associated with bevacizumab has been well reported, with an incidence ranging from 0.3% to 2.4% in clinical trials.5 Possible explanations include VEGF inhibition, endothelial
cell dysfunction, and disruption of VEGF feedback systems.\textsuperscript{3-5}

We believe that our patient developed laryngeal dehiscence as a consequence of bevacizumab treatment in the setting of a previously irradiated larynx. Radiation-induced injury to the larynx likely rendered it at high risk of perforation. The initial mechanism could have been mucosal irritation due to chemotherapy, resulting in tiny mucosal breaks that could not granulate,\textsuperscript{4} combined with post-radiation changes from 10 years earlier and secondary to bevacizumab-induced reduced blood supply to the less vascular chondrocytes, in turn leading to necrosis and laryngeal dehiscence. It is unclear whether duration of exposure to the antiangiogenic properties of bevacizumab is related to the observed complication. Although the exact mechanism is unclear, patients with prior radiation therapy receiving bevacizumab may need monitoring with special attention to the previously irradiated areas.

REFERENCES

Many of us fondly recall our college days—sitting in the student union with books open, or hitting the study session hard in the back of the library or a quiet dorm room. Much is the same on campuses today, but with the potentially serious addition of the use of prescription stimulants as a study drug. In a recent study published by Drug and Alcohol Dependence, researchers from University California Berkeley and Oregon State University reported that as high as a quarter of all college students have abused prescription stimulants, known on campus by such innocuous nicknames as “Vitamin R,” “Skippy,” “Pineapple,” “R-Ball,” “Smarts,” and “Kiddie Cocaine.”

Stimulant medications are well known in our society. Drugs such as methylphenidate (Ritalin, Concerta), dextroamphetamine (Dexedrine), and amphetamine/dextroamphetamine (Adderall) are the mainstay of prescription medication used to treat attention deficit disorder (ADD) and attention deficit hyperactivity disorder (ADHD). Common in the general population, the estimated prevalence of ADHD in American adults is between 7.8% and 8.3%.3,4 Medications used to treat ADD and ADHD increase alertness, attention span, and energy. They also may elevate blood pressure, heart rate, and respirations. These drugs augment levels of catecholamine and dopamine neurotransmitters by driving their release from the synaptic cleft and, inhibiting their reuptake, and by suppressing that of the catabolic monoamine oxidase (MAO) system.5 The effects of these medications have been extensively studied, and experts believe that they have a good understanding of how they work. For patients who are appropriately diagnosed and treated, these medications are safe and effective and can be transforming, greatly enhancing a person’s quality of life. Between 1993 and 2003, prescriptions for stimulant medications tripled,6 and with more availability comes the increased risk for diversion and abuse of stimulants.

Neuroscience and psychology experts Dr David Rabiner of Duke University and Dr Sean Esteban McCabe of the University of Michigan have extensively researched academic doping, defining that up to 30% of college students use stimulants for academic purposes. For some universities, that might even be a low estimate.7,8 Wilens and colleagues9 reported a non-prescription stimulant abuse rate for both academic enhancement and recreation to be from 5% to 9% in grade school through high school and from 5% to 35% in college-aged adults. McCabe et al10 reported that the majority of abusers obtain drugs from peers. Jardin et al11 showed that 11% to 22% of ADHD patients with legitimate prescriptions sell or abuse their medications. Interestingly, White et al12 described a similar pattern—but much lower rates—of abuse in postgraduate doctoral degrees (EdD, PhD, DO, MD, and JD).

One study1 found that students have a preexisting positive viewpoint toward stimulant use and expect to gain significant benefits from the added focus, boost in attentiveness, and increase in alertness. Likewise, based on their review of the literature, Sansone and Sansone13 concluded that students hope to feel more alert and energetic, decrease restlessness or psychological distress, improve athletic performance, control their weight, or to enhance the effects of other recreational substances.

Some colleges assist students with a diagnosis of ADHD with accommodations such as additional time to take tests or complete assignments, testing environments free of distractions, audio recordings of lectures and books, access to professors’ notes, and additional clarification of directions,14 advantages that motivate some students to feign or simulate the symptoms of ADHD. Five studies15-19 in PubMed and PsycINFO databases report consistent findings and conclude that (a) ADHD symptom checklists are easily faked; (b) fairly sophisticated testing materials are required to demonstrate inconsistencies in testing that would indicate feigning ADHD; and (c) it takes very little time for an individual to prepare for and defeat an ADHD testing/screening measure.20 A Google search reveals nearly 900 hits on “how easy is it to fake ADHD.”

So what can be done? College students are exposed to a great deal of misinformation. Many believe that stimulants are performance enhancers, a belief reinforced by the terms smart drugs and smart doping. Unfortunately the media have supported this myth, as have many Websites. Many parents place pressure for academic performance on this age group and therefore condone the nonmedical use of stimulant medication as a study...
aid. Even Dr Brian Doyle, Clinical Professor of Psychiatry and Family Community Medicine at Georgetown University Medical School, has downplayed this problem: “It doesn't seem to be causing too much trouble since most [students] use the drugs not to get high but to function better. When exams are over, they go back to normal and stop abusing the drugs.” Professor John Harris, the director of the Institute for Science, Ethics and Innovation at the University of Manchester and the Editor-In-Chief of the Journal of Medical Ethics, also defended the use of smart drugs on the grounds that it was “not rational to be against human enhancement.” These beliefs persist despite the facts.

Characteristics displayed by non-prescribed users have been noted in number of studies published in peer-reviewed literature and reveal that nonmedical prescription stimulant users skip class more frequently, spend less time studying, and typically have lower grade point averages than non-users. Users are more likely than other students to be heavy drinkers and to use other illicit drugs. Academic enhancement is not the only motivation for nonmedical stimulant use; many students use stimulants to enhance the effects of other substances. Users also are more likely than non-users to meet Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria for dependence on alcohol and marijuana.

So should we consider illegal stimulant use as a possible substance abuse disorder? Or would a formal ADHD evaluation, including testing, be a preferred approach? This approach does not condone the use of prescription stimulants unless clearly indicated.

Stimulant medications are not without risk. Use can result in anxiety, anorexia, confusion, depression, insomnia, panic attack, restlessness, hallucinations, tremor, coma, or even death. Given the risks, patients prescribed stimulants for diagnosed conditions need frequent monitoring and periodic medical evaluations. It is currently recommended that patients taking these medications be seen at 3- to 6-month intervals.

Selling or sharing stimulant medications not only poses health risks, but it also has legal ramifications. These are schedule II controlled substances. Persons caught in possession of illegal stimulants or caught selling or sharing legally prescribed stimulants can be charged with a felony punishable by prison time and hefty fines, which vary by state. They may also be held responsible if the person to whom they sold or gave the medication experiences complications or dies from the medication.

Based on their comprehensive review of the current literature, Arria and DuPont23 recommend the following strategies for the prevention of nonmedical use of prescription stimulants:

- dispel popular myths by disseminating research findings;
- promote awareness of the legal risks;
- encourage physicians to increase vigilance to ensure proper and safe use of medications and to continue research regarding the relative benefits of abuse-resistant formulations of stimulant stimulants;
- empower parents to take a central role in the prevention of nonmedical use of prescription stimulant use;
- develop multidisciplinary campus action plans to reduce abuse;
- destigmatize college students who do not divert their medications or engage in illicit drug use, and encourage peers to discuss the potential negative consequences of nonmedical use; and
- develop early intervention strategies to assess risk, and prevent progression to serious substance abuse and dependence problems.

Additional steps that can be taken include careful monitoring of patients for misuse of prescription stimulants, promoting clear indications for clinical use of ADHD medications, educating health professionals about the best ways to screen and diagnose ADD and ADHD, utilizing informed consent that cautions against sharing or selling prescription medication, and educating parents and responsible others regarding stimulant use and abuse. Many states, including Wisconsin, have implemented a prescription drug monitoring program that maintains websites that a provider can access to determine whether a person is obtaining an excessive amount of a controlled substance.24

In talking with students who have witnessed stimulant abuse first hand, many adopt a no tolerance policy (oral communications with University of Wisconsin School of Medicine & Public Health students during their rotations at Gundersen Health System). They are appropriately alerting academic administrators of suspected abuse.

Peer group pressure and recognition of stimulant abuse is another important step in its control. Education regarding the perceived versus actual benefit of these drugs may prevent misuse. Moreover, coupling medical risk with actual legal risk is a necessary component of education. Once patients understand that diversion and misuse of stimulant medications represents real danger to themselves and their friends, we may then garner their participation in preventing and ameliorating this real and growing problem.

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The Baby Condemned to Live

**AUTHOR’S NOTE**

Neonatal ethics consults in the intensive care unit are some of the most intellectually and emotionally challenging types of cases I face. Such consults are categorically unique since the patients are always newborns whose tiny size makes them distinctly delicate. One could argue that neonatal ethics consults are unique for another reason: they commonly involve a heightened sense and range of emotions that tend to quickly expose the fragility of relationships between families, providers, institutions and, sometimes, whole communities. The purpose of this column is to create an additional ethics-based learning opportunity by providing additional narrative, insight, self-reflection, and analysis of one of my previous ethics consultations.

It is nine o’clock on a Friday morning. The physician’s voice on the other end of phone is soft spoken but has a quiver of worry that catches my attention. When I arrive at the neonatal intensive care unit (NICU), I quickly understand why. The patient is only hours old and has multiple congenital abnormalities, a malformed frame, and is ventilator-dependent with poor oxygenation. Just before the baby was born, her mother—36 weeks pregnant—was emergently transported to the hospital after experiencing vaginal bleeding at home. Had this child been born in a different environment or a less capable hospital, it is likely she would not have lived long enough to merit my involvement.

I am told that this baby had a sibling who died a year ago under similar medical circumstances. The sibling lived only a few hours, and the parents expect the same for this baby. Not wanting to fight God’s will or subject this baby to what her parents believe would be a quality-compromised life, this baby’s parents, who are Amish, ask to withdraw treatment, anticipating that she, too, would die. Her care providers agree that withdrawing treatment at this point would result in her death. They also acknowledge that she may not survive despite medical intervention. If she survives, it is uncertain for how long. She will also suffer significant cognitive and physical challenges for the rest of her life. What is unknown, however, is whether her death is inevitable.

The support she received was adequately applied this ruling to children and neonates. In 2002, the Wisconsin Court of Appeals argued that neonatal ethics consults are unique for another reason: they commonly involve a heightened sense and range of emotions that tend to quickly expose the fragility of relationships between families, providers, institutions and, sometimes, whole communities. The purpose of this column is to create an additional ethics-based learning opportunity by providing additional narrative, insight, self-reflection, and analysis of one of my previous ethics consultations.

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The patient is only hours old and has multiple congenital abnormalities, a malformed frame, and is ventilator-dependent with poor oxygenation. Just before the baby was born, her mother—36 weeks pregnant—was emergently transported to the hospital after experiencing vaginal bleeding at home. Had this child been born in a less equipped facility, I probably would have agreed that stopping treatment is reasonable.

It takes me a moment to grasp the weight and irony of the physician’s words. He and I both know it is too late. Where there should be joy in mankind’s triumph over nature’s attempted fatal attack on an innocent mother and child, instead there is only frustration and sadness in the realization that this time our collective medical advances and capabilities have done more harm than good. I momentarily stare out the fifth floor NICU office window. It is a beautiful, cool, sunny spring day. I gaze enviously at the Mississippi River; it has no concern over our present dilemma. In this moment, I wish I was anywhere but the NICU.

In 1997, the Wisconsin Supreme Court ruled that guardians cannot withhold or withdraw life-sustaining treatment, including ventilator support, from wards who did not previously express their treatment preferences or who are not in a persistent vegetative state. In 2002, the Wisconsin Court of Appeals applied this ruling to children and neonates.

The ruling intends to protect vulnerable populations from subjective, third-party interpretations about the quality of one’s life. As I have argued elsewhere, medical treatment that would effectively treat a child’s condition should not be withdrawn or withheld solely based on a perception about the child’s quality of life. At the onset of the consult, it was unknown whether the baby’s abnormalities were compatible with life. The support she received was adequately working to keep her alive. Honoring the wishes of this baby’s parents to stop treatment therefore would have been illegal in Wisconsin, and may have potentially subjected the baby’s family, her medical providers, and the institution to significant legal
burden and risk. At that point, without any other information about the baby's condition and prognosis, I could not ethically recommend the withdrawal of treatment.

“Don’t the parents get a say about what happens to their child?” the baby’s father asks me.

“On some things,” I reply. “Parents can consent to treatment, and make decisions about different treatment plans being offered. But they can’t make a decision to stop treatment that’s working to keep their baby alive unless it is clear that the patient will die soon regardless of our interventions. We will get a better sense of your daughter’s life expectancy only with additional testing.”

“Is this because we’re Amish?”

“No,” I reply quickly. “This is what I would tell any parents in your situation. I understand your frustration. I would be frustrated too. I understand you do not want to continue with treatment, but we have laws that, as an institution, we must follow. Unfortunately, that also means that if you do not wish to continue with treatment, we will have to contact child protective services to establish a temporary guardian.”

“Oh, well I guess you have to do what you have to do.”

“So we’ll go ahead and get started on the guardianship process,” says a social worker.

“If that’s what you need to do to get your tests . . .”

The father slumps back in his seat. He is deflated. He incredulously stares at the floor. Several rooms away, his wife is recovering and has no idea what just transpired.

I usually replay this moment in mind when I think about this case. I grapple with what I would do if I were in the father’s position. I understand—and sympathize with—the parent’s reasoning for wanting to discontinue treatment. But then I also think about how—as a non-disabled person—I am biased in my perception of how I perceive “quality of life,” and that a decision to withdraw treatment resulting in a fatal outcome would be at least partly based on this bias and likely would not consider or fully appreciate how the child might come to perceive her quality of life should she survive.

There is, I believe, a legitimate criticism from persons living with disabilities toward non-disabled persons: non-disabled persons tend to view physical or mental disabilities as abnormal deficiencies that represent challenges to be overcome; something to fight against. Just the term disability has a negative connotation to it that implies an undesirable or less-well state of being. For those living with disabilities, this general perception creates a constant barrier that makes it difficult—if not impossible—for them to be viewed as equal in value to non-disabled persons. It is not uncommon to view a disability as something that must be compensated for rather than celebrated as a unique gift or trait of an individual. Especially in health care, disability is traditionally seen as bad—it is something medical professionals believe should be corrected if possible to minimize the impact on the person’s life. From this view of disability it does not surprise me when decisions to withhold or withdraw life-sustaining treatments from disabled persons are questioned by disability rights advocates.

Still, I feel terrible for this father, partly because he is Amish. He does not—or do other members of the Amish community—place any governing authority in “English” laws. To him, my explanation of why we cannot honor the wishes of he and his wife is hollow, and he simply cannot grasp why we cannot respect their decision to stop treatment. I also feel terrible for him because I am also a father who has previously navigated the world of the NICU with my 2 oldest children. I tell this father I have shared a similar struggle. It is unclear to me whether sharing this information will help, or make things worse, as we move forward.

Everyone leaves the room. The father goes to speak with his wife. The providers briefly huddle to solidify the plan for establishing temporary guardianship and getting the diagnostic tests. I then leave to write my chart note. When I arrive in my office, my pager rings. It is the social worker from the NICU asking me to please come back to the NICU ASAP.

“Can you come back to the NICU now,” she asks, somewhat frantically.

“Sure. What happened?”

“The mother’s midwives are angry, and are becoming aggressive.”

“Aggressive how?”

“They’re shouting that we don’t know what we’re talking about, and that parents have rights to decide about treatment for their children.”

“Oh. I’ll be right there.”

I stop working on the note I never really started. Over the next hour I am sternly told by 2 midwives—who are not Amish—how we are wrong about the state’s laws and that continuing to treat this baby against her parents’ wishes is an injustice. I am told how we are culturally insensitive and incompetent. I listen. I try to carefully explain the state’s law about why we cannot currently stop this baby’s treatment, citing the court cases on which they are based. I then shock these strong advocates by agreeing with them. While sitting in a room where everyone has something to say but is struggling to find the words—where the room is darkened by a thick tapestry of emotions—I tell the patient’s family I agree that in cases like this, it would be ethically preferable for the Wisconsin courts to allow for an expedited review process to help determine the legality of discontinuing treatment when the prognosis is poor but the outcome is uncertain. I tell them if they want to fight this battle, I will stand with them. I believe they understand, and so they appear encouraged and dissatisfied at the same time—they know I will do what I can to help, but also that I stand firm in my original assessment that ethically, the right thing to do is to get the prognostic information the physician needs to determine whether there is a viable treatment path forward. At this point, there is not much left to say, and the meeting ends.

It is now Noon. I grab a quick lunch and bring it back to my office so I can finish my chart note. Despite the dynamics of the case, the note itself is relatively standard and is a style I adopted during my bioethics fellowship. I discuss the medical issues as briefly as I can, then state the ethical problem. Next I describe the situation(s) in which I was involved. Lastly, I provide my assessments and recommendations. In this case, there are 3.

First, as I discussed with the baby’s family, I note the problems
with withdrawing treatment. But I also point out that treatment limits are medical judgments. Second, I recommend prognostic testing so providers can determine whether the baby's condition is compatible with life. Lastly, I state that treatment does not need to continue indefinitely. Should it become clear that treatment is or will be ineffective in sustaining the baby's life—such that treatment is no longer beneficial and death is predictable and likely unavoidable—it would be ethically justifiable not to escalate treatment and focus interventional efforts on simply keeping the baby comfortable. This is one way to describe the concept of medical futility without actually using the term medical futility. For cases like this one, giving a basic description of the concept rather than simply saying ‘medical futility’ provides a framework for making treatment withdrawal decisions.

Later in the afternoon, after I add my note to this baby’s growing medical record, I head back up to the unit for an update. I hear things have gone from bad to worse. Prognostic testing was ordered, but a guardian had yet to be appointed. An attempt was made by the father to block the sonographer from entering the room. The security team was needed to deescalate the situation. This level of aggressiveness is atypical of the Amish and highlights for me the fragility of the bridges we try to build with members of communities whose values differ from our own, and how one broken bridge risks washing away all the other previous bridges built around it. The sonogram was done against the family’s wishes.

It would have been interesting to see this case challenged in court. The Amish do not have medical insurance, and they will not morally accept government financial assistance through programs such as Medicare or Medicaid. They are, therefore, “self pays.”

NICU stays are not cheap. From my own experience they can run tens of thousands to millions of dollars. Questions about what role treatment costs should play in medical decision-making challenge conventional, ethically accepted treatment decision-making models. The idea that treatment costs can or should drive a treatment decision is still taboo. But cases involving Amish patients—as well as other similar groups who would fall into a category of self-pay—raise important questions about economic justice in relation to medical treatment. What is the authority of US courts to force families to pay for medical treatments or services they morally oppose? If the answer is that US courts have such authority, would the execution of this authority constitute Constitutionally unfair economic discrimination against self-pay groups like the Amish? If the answer is that US courts have very little or no authority to force payment from patients or families for unwanted medical services, would similar concerns about economic justice apply to health systems or taxpayers who would then likely absorb the cost of continued treatment? With the current legal requirements in Wisconsin for patients without known treatment preferences to continue receiving treatment, these are questions the Wisconsin court system may still have to face at some future point.

The current case ended as tragically as it began. Late in the day the baby’s respiratory drive got much worse. She was unable to maintain her breathing even with the help of the ventilator. With his head hung low, the physician came out of the baby’s room and said there was nothing he could do to reverse the baby’s decline.

Both the mother and father were in another room. A decision was made not to escalate treatment, to discontinue our interventions, and to offer the baby’s parents the opportunity to hold their child before she dies. A day’s worth of hurt and anguish was ending in a way that reminded all of us that despite our differences, we have many common bonds. An exhausted mother and father looked grateful to hold their child. The door was then closed, the blinds were drawn, and a green leaf was placed on the door as part of the institution’s grief protocol to indicate the loss of life and the family’s need for privacy. Nobody was satisfied with the charted course of this case, yet in the end, finally, there was relief.

REFERENCES
La Crosse Encephalitis

For nearly 4 decades, Gundersen Health System was at the forefront of La Crosse virus and La Crosse encephalitis research. Beginning in 1965, pediatrician Cameron Gundersen, MD, embarked upon a quest to identify the virus, to discover the means by which the virus spread, to prevent the disease through eradication of the breeding grounds of *Aedes triseriatus* (the mosquito that carries the virus to humans), and to develop a rapid method of diagnosis.

Gundersen was joined at points along the way by colleagues pathologist Bernard Kalfayan, MD, hematologist and former Gundersen director of medical research Martin J. Smith, MD, and medical technologist Kay (Brown) Case, MT (ASCP), as well as by researchers from the State of Wisconsin, Yale University, the University of Wisconsin-La Crosse, and Colorado State University. Dissemination of the research findings involved publication of articles in major professional journals and presentations at national conferences, as well as local efforts to control the disease through education.

**PREVENTION**

*Aedes triseriatus* is a treehole-breeding mosquito. Thompson and Gundersen found that in the hardwood forests around La Crosse, trees are likely to produce holes at their bases where rainwater collects, water in which this treehole-breeding mosquito deposits its eggs. Thompson and Barry Beaty, PhD, a specialist in diseases carried by mosquitoes, discovered that the disease-carrying larvae overwintered in dry tires and, with spring rain, hatched into adult mosquitoes. Dr Gundersen, along with Gundersen Clinic pathologist Bernard Kalfayan, MD, and University of Wisconsin-La Crosse biologist James Parry, PhD, went to the homes of patients to search for possible *Ae triseriatus* breeding grounds. They found mosquito larvae not only in treeholes, but anywhere there was standing water. Prevention was the priority, so they spearheaded a successful campaign to destroy *Ae triseriatus* breeding grounds, thereby preventing spread of the dangerous disease.

Gundersen medical staff worked with La Crosse County public health officials to educate the community and encouraged the public to eliminate sources of standing water in their yards—including the ubiquitous tire swing, which served as an ideal mosquito breeding site. Citizens responded favorably, and area doctors saw a sharp decrease in encephalitis cases following the public education campaign. According to Dave Geske, La Crosse County vector control manager, “Recognition of the virus was key—the basis of everything. Without that, the other discoveries would not have been possible, at least not then.”

“In controlling Lyme and West Nile today,” says Geske, “we use the same skills that Gundersen, Thompson, and Beaty taught in the 60s and 70s to control both what’s here now and for new arrivals. More mosquito species are coming into the country, so the work becomes even more important. The science keeps on working for us.” Geske contends that Dr Gundersen’s contribution to controlling the LAC virus was his attention not only to the scientific, but also to the political. He was able to get the counties to work together to benefit everyone, “Essential,” Geske says, “because disease vectors don’t honor county lines.”
DIAGNOSIS

With symptoms similar to other diseases, La Crosse encephalitis required a rapid method of diagnosis in order to guide patient care and to obviate the need for other, perhaps invasive, diagnostic procedures, eg, brain biopsy in patients whose symptoms suggest herpes-virus encephalitis. In 1977, a research group that included Gundersen, Case, Beaty, and T.I. Dykers, PhD, of Colorado State University, began work that resulted in an advanced blood test that dramatically reduced the time needed to identify the La Crosse encephalitis virus.5-8

“... To put this in perspective,” says Beaty, “results [from older tests] were almost never available in time to assist the physicians in prescribing patient care. This was truly a landmark contribution to the field.” Dave Geske concurs, pointing out that the ability to rapidly diagnose the virus means that doctors can alert public health officials when there’s a problem, and officials can, in turn, respond quickly to control habitat.

LEGACY

As a result of Gundersen research efforts, La Crosse encephalitis cases are less common today, can be identified and treated more quickly than before, and result in death only rarely (less than 1% mortality rate). According to William A. Agger, MD, director of medical research, Gundersen Medical Foundation, “This is the type of research that we are proud of because it helps our community control a serious medical problem. La Crosse encephalitis is known in some cases to cause permanent seizure activity and even a rare death in infected children. Because of the discoveries of the epidemiology and control of this disease and the follow-up with public health, incidence of this serious, potentially fatal disease has been greatly reduced.”

Even with many of the major research questions answered, Gundersen researchers continued to publish significant articles about the LAC virus and La Crosse encephalitis. In 1993, Case, Smith, and R. M. West, PA-C, published an article in the Journal of Infectious Diseases,10 in which the authors acknowledged the “expert technical assistance” of Bernard Kalfayan. Dr Kalfayan was the Gundersen pathologist who, in 1960, performed the autopsy of a 4-year-old girl who died from an unidentified viral infection and forwarded specimens of the girl’s brain tissue to the State Laboratory of Hygiene—the very tissue from which Thompson first isolated the LAC virus.

REFERENCES


**Purpose:** To determine the incidence of nonunion after isolated arthroscopic ankle arthrodesis.

**Methods:** Electronic databases and relevant peer-reviewed sources, including OvidSP/Medline (http://ovidsp.tx.ovid.com) and Google, were systematically searched for the terms “arthroscopic ankle arthrodesis” AND “nonunion”. Additionally, we manually searched common American, British, and European orthopaedic and podiatric literature for relevant articles. Studies were eligible for inclusion only if they included the following: isolated ankle arthrodesis, greater than 20 ankles, minimum mean follow-up of 12-months, a 2-portal anterior arthroscopic approach, fixation with 2 or 3 large-diameter cannulated cancellous screws, and the nonunion rate with no restriction on cause.

**Results:** After considering all the potentially eligible articles, 7 (25.9%) met the inclusion criteria. A total of 244 patients (244 ankles)-148 (60.7%) male and 96 (39.3%) female patients, with a weighted mean age of 49.2 years-were included. For those studies that specified the exact follow-up, the weighted mean was 24.1 months. A total of 21 nonunions (8.6%) were reported, with 14 (66.7%) being symptomatic and requiring further intervention.

**Conclusions:** The results of this systematic review reveal an acceptable incidence of nonunion of 8.6%. However it is important to recognize that of these nonunions, 66.7% were symptomatic. This supports the belief that regardless of approach, nonunion of an ankle arthrodesis is problematic. In light of this finding, additional prospective studies are warranted to compare directly the incidence of nonunion between open, minimum incision, and arthroscopic approaches with a variety of fixation constructs.

**Level of Evidence:** Level IV, systematic review of level IV studies.


**Background:** Current antibiotic therapy for Clostridium difficile infection (CDI) with monotherapy or combination therapy with various antibiotics including metronidazole, vancomycin, rifaximin and nitoxanide do not always control infection. This can result in progression to or worsening of severe CDI infection. In addition, recurrent CDI is as high as 30% in patients who responded to initial treatment. Fecal microbial transplant (FMT) is a promising treatment for CDI with success rates reported over 90% in most series. The principle behind FMT is restoration of normal colonic flora in an otherwise disrupted environment usually related to recent antibiotic use. Most studies on FMT involve patients with recurrent or recalcitrant CDI with very few case reports on FMT in the acute setting or for severe CDI. The purpose of this study was to evaluate the success rate of FMT at our institution, particularly in the acute setting.

**Methods:** After IRB approval was obtained, a retrospective review of all patients who underwent FMT between January and April 2013 was completed. FMT was administered predominantly via colonoscopy but nasogastric tube and enema were used in patients with severe CDI.

**Results:** A total of 8 patients received FMTs during the study period. Five patients (62.5%) had recurrent CDI and underwent FMT in the outpatient setting. Three patients (37.5%) had severe CDI requiring hospitalization and treatment with IV antibiotics as well as FMT. There was 100% success of FMT in patients with recurrent CDI treated on an outpatient basis while there was no success of FMT in patients treated during acute severe CDI. Of the three patients who failed FMT, one patient subsequently underwent a subtotal colectomy and eventually died. The second patient seemed to be improving initially but died within one month of discharge. The third patient underwent two separate FMTs and was hospitalized with sepsis following second FMT and required a prolonged course of antibiotics.

**Conclusion:** FMT is an effective treatment for recurrent CDI. It is a safe and feasible treatment for patients with severe CDI. However, the efficacy and timing of FMT during a severe infection require further investigation to understand factors that predict success of FMT.


**Objective/BG:** The incidence of contrast induced nephropathy (CIN) after administration of intravenous (IV) iodinated contrast media (CM) is poorly characterized despite being one of the main feared adverse events associated with it. We investigated the incidence of CIN in patients with elevated baseline serum creatinine after undergoing computed tomography (CT) using IV CM. This was prior to the routine use of pre-hydration to prophylax against...
CIN.

Materials and Methods: Using the electronic medical records at a community hospital, we retrospectively identified patients undergoing CT utilizing IV CM with elevated serum baseline creatinine who developed elevations in their serum creatinine. We identified risk factors for the rise in serum creatinine in these patients.

Results: 193 patients with a baseline serum creatinine greater than 1.5mg/dL underwent 236 CT studies utilizing IV low osmolar contrast media (LOCM). 9 of the 193 patients had a rise in serum creatinine greater than 0.5mg/dL up to 1 month later. None of these 9 patients had contrast exposure as the only risk factor for their rise in serum creatinine.

Discussion: The role of IV CM in causing CIN and, thus, acute kidney injury may be overestimated. Further study needs to be done into whether CIN is a true entity in patients receiving IV CM for routine studies with no other risk factors for kidney injury warranting the expense, risks, and inconvenience of IV pre-hydration.


Background: In 2011 our team realized a deficiency in nursing knowledge of stroke patient care and Stroke Core Measures, after discovering that our stroke education scores were 84% overall for the year.

Significance: There is a need to increase bedside nursing knowledge and competency with Stroke Core Measures and best practice.

Purpose: An innovative stroke rounding process was launched following hospital-wide education regarding stroke patient care and the Stroke Core Measures with the purpose of increasing bedside nursing knowledge and competency with these topics.

Methods: A rounding worksheet was created using the Stroke Core Measures. Stroke rounds are completed three times weekly by the Neuroscience Nurse Educator, Clinical Nurse Leader, and bedside nurse. A discussion with the nurse includes chart review, completion of a rounding worksheet, and individualizing stroke care plan goals. This may progress to obtaining additional orders and/or consulting additional disciplines.

Results: Preliminary data for the second quarter of 2012 identifies that stroke education scores increased to 100% as of the end of April. Review of the stroke rounding worksheets identified that initiation of stroke education is occurring earlier in patients’ hospitalizations. Anecdotal reports from nurses indicate increased knowledge of Core Measures and comfort in caring for stroke patients. A formal facility-based survey to nursing will be completed prior to presentation in 2013. Success with rounds in the stroke unit precipitated the process in critical care. Both units now are utilizing the process and have received positive feedback from nursing staff.

Clinical Implications: Based on the success of this initiative, the following implications could be extrapolated: 1) Regular review of Stroke Core Measures improves nursing knowledge of best practice for stroke patients, 2) Regular review of Stroke Core Measure STK-8 Stroke Education encourages early provision of patient education, and 3) Regular discussion of patient care issues improves the care planning process and documentation.


PURPOSE: Due to steep learning curves, limited patient population, and attendant prolonged operative times, laparoscopy has not been widely adopted for the treatment of endometrial cancer. However, since the US Food and Drug Administration’s 2005 approval of the da Vinci robotic system for gynecologic use, this minimally invasive approach has been increasingly used in the treatment of gynecologic malignancies, including endometrial cancers.

Incorporation of robotic surgery into treatment of endometrial cancer patients in academic institutions has been evaluated, but reports of its utilization in community institutions are few. We report the experience of Gundersen Lutheran Medical Center, a 325-bed community hospital, implemented a robotic surgery program in 2007, in which two board-certified gynecologic surgeons with additional training in surgical and medical care of gynecologic oncology patients work in collaboration with gynecologic oncologists from the University of Wisconsin - Madison.

METHODS: After obtaining a Health Insurance and Portability and Accountability Act (HIPAA) waiver, we retrospectively reviewed the medical records of all patients undergoing a surgical procedure for endometrial cancer performed by 1 of 2 Gundersen gynecologic surgeons at Gundersen Lutheran Medical Center from 2007 through 2011. From each record, we captured body mass index (BMI), length of hospital stay (LOS), history of previous abdominal surgery, total operative time, estimated blood loss (EBL), uterine weight, number of lymph nodes collected, pathologic grade and International Federation of Gynecology and Obstetrics (FIGO) stage, medical
comorbidities, postoperative complications, and adjuvant therapies received. Patients were divided into 4 groups based on surgical approach (transabdominal, robotic, laparoscopic, or vaginal), and their demographic and clinical outcomes were compared. We also compared the percentage of procedures performed by surgical approach by year.

RESULTS: One hundred sixty-six patients were treated surgically for endometrial cancer at Gundersen Lutheran Medical Center from 2007 through 2011—60 transabdominal, 82 robotic, 17 laparoscopic, and 7 vaginal. The groups’ average BMI, comorbidities, and history of previous abdominal surgery were not significantly different.

Total operative time was not significantly different in the transabdominal, robotic, or laparoscopic groups, but that of the vaginal group was significantly shorter. Patients undergoing vaginal surgery did not undergo lymphadenectomy, which likely accounts for their shorter total operative time. Also, a trend toward decreased total operative time was noted in the robotic surgery group over the course of the study period.

Excess blood loss was significantly higher in the transabdominal group (mean 325 cc) than in the robotic (mean = 124 cc), laparoscopic (mean = 182 cc), and vaginal (mean = 199 cc) groups (P <.001). Although not statistically significant, there was a trend (P <.069) toward decreased need for blood transfusion in the robotic group, in which no transfusions were required. Length of stay was significantly higher in the transabdominal group (mean = 3 days) than in the laparoscopic, vaginal, and robotic groups, each with a mean of 1 day (P <.001).

A shift was noted in surgical approach over time. In 2007, the majority of procedures were transabdominal, but in 2011, the majority were robotic (77% vs 80%, respectively; P = .001).

DISCUSSION: Prior to implementation of a robotic surgery program in our institution, the transabdominal approach was used for definitive surgical treatment of endometrial cancer in the majority of cases. However, in 2011, the robotic approach was used most often.

Although patients in our institution did undergo laparoscopic staging of endometrial cancer, the percentage of patients treated with laparoscopy remained low. This is likely due to the increased technical difficulty encountered with lymphadenectomy in this subgroup of morbidly obese patients.

The average EBL and LOS were significantly lower in the robotic group than in the transabdominal group, allowing the majority of women at our community institution to return home and back to their functioning lives more quickly given the shift to this minimally invasive approach.

CONCLUSION: A robotic approach to treatment of endometrial cancer has become a clinically appropriate alternative to the transabdominal approach in academic institutions. Our study shows that this evolution can be replicated in a community-based institution with implementation of a robotic surgery program.


Purpose: The complete rupture of a tendon can cause long lasting deleterious effects to the function of the foot and ankle. While primary end-to-end repair remains the goal, large defects that include avulsion from the tendon’s insertion makes this approach not feasible. The use of tendon allograft can be used to augment the repair and bridge the gap; however, the course of the tendon may make anatomic realignment difficult through the soft tissues without causing iatrogenic trauma. Alternate solutions, such as creating an intraosseous tunnel, may warrant consideration. The use of tendon allograft, such as the semitendinosus tendon, is well reported in the literature for the repair of large tendon defects. Many different approaches have been recorded regarding securing the graft to both ends of the in situ tendon and to bone. Little has been reported, however, about the technique utilized to reestablish an anatomic tendon course and attachment with large proximal retraction of the tendon.

Case Study: We present an otherwise healthy 54-year old female who was treated through conservative measures at an outside facility over the course of several months for peroneal tendinitis. Additionally, she complained of pain to her third metatarsal-cuneiform and fourth metatarsal-cuboid articulations and received two separate local corticosteroid injections over the course of several months which provided significant pain relief allowing her to begin training for a triathlon. She suffered a significant inversion ankle injury and felt an immediate painful popping sensation to the lateral ankle. Initial magnetic resonance imaging (MRI) findings were positive for a complete tear of her peroneus longus tendon with avulsion from its insertion to the first metatarsal base and retraction of the proximal portion to the retromalleolar space. She then underwent surgical exploration of the tendon tract which revealed findings that correlated to the MRI as well as an intact peroneus brevis tendon. The tendon defect was too large for primary repair, therefore semitendinosus allograft was utilized. In order to reestablish the tendon’s anatomic insertion site and avoid iatrogenic trauma to vital neurovascular structures in the plantar vault of the foot, an intraosseous tunnel was created through the midfoot avoiding the articular surfaces of the involved tarsal bones. The tendon allograft was passed through this tunnel from medial to lateral and the distal aspect was secured to the...
BACKGROUND: Intra-articular calcaneal fractures present a tough challenge to the foot and ankle surgeon. The amount of articular disruption as well as the number of fracture fragments makes anatomical alignment difficult to achieve. A large lateral extensile approach has traditionally been the gold standard to allow for adequate visualization and manipulation of the fracture fragments; however this dissection technique is not without the risk for iatrogenic complications. An arthroscopic assisted reduction with percutaneous fixation maintains direct visualization of the entire articular surface for precise realignment. While the lateral extensile approach for open reduction and internal fixation of calcaneal fractures is well documented in the literature, the arthroscopic assisted reduction with percutaneous fixation technique has not been reported frequently. What information there is points to a reduction in post-operative complications and an increase in patient satisfaction.

Case Study: We present a series of four intra-articular calcaneal fractures in three patients that were treated with arthroscopic assisted reduction and percutaneous fixation. All four patients had Sanders class III or IV intra-articular fractures confirmed with computerized tomography (CT) scan and were treated with immediate Sir Robert Jones compression dressing. Once the acute edema was resolved, operative intervention was initiated. The patients were placed supine on the operative table and a single portal was created overlying the lateral subtalar joint for the dry arthroscopic camera. This allowed direct visualization of the articular destruction and fracture fragments while limiting the amount of damage to the already delicate soft tissues. Through the use of a Schantz pin through the calcaneus, the fracture lines were distracted and manipulated into correct anatomical alignment. Various fixation techniques were then utilized, including fully threaded screws and locking plates, to reestablish the morphology of the calcaneus. The articular surface of the subtalar joint was directly visualized throughout the manipulation to confirm the alignment. Finally, two large bore screws were placed through the calcaneus for increased stability. The patients were then placed in a post-operative splint and remained non-weight bearing.

Results: All four patients had radiographically confirmed reestablishment of the proper Boehler’s angle and morphology of the calcaneus post-operatively. All four went on to uneventful healing to the fracture site. There were no nerve related injuries about the peri-surgical incision regions. There was no surgical wound dehiscence, infections or hypertrophic scar formation.

Discussion: Intra-articular calcaneal fractures present a tough challenge to the foot and ankle surgeon. The amount of articular disruption as well as the number of fracture fragments makes anatomical alignment difficult to achieve. A large lateral extensile approach has traditionally been the gold standard to allow for adequate visualization and manipulation of the fracture fragments; however this dissection technique is not without the risk for iatrogenic complications. An arthroscopic assisted reduction with percutaneous fixation maintains direct visualization of the articular surface while avoiding such complications as wound dehiscence, infection and nerve damage. As shown by the case series, correct anatomical realignment can still be achieved with this limited incisional approach.

Results: The patient was placed in an initial post-operative splint and had minimal pain with oral narcotic analgesics and muscle relaxants. She remained non-weight bearing but was allowed to begin passive range of motion exercises in a removable boot at three weeks post-operative. At six weeks post-operative she was able to wean back to supportive shoe gear and full weight bearing. At over one year follow-up the patient retains adequate pain free muscle strength with proper antagonistic function between the tibialis anterior and peroneus longus muscles as well as a stable first ray.

Discussion: As demonstrated through this case presentation, the use of an intra-osseous tunnel allows for the recreation of anatomic course and insertion of a complete peroneus longus tendon rupture. This technique allows the avoidance of vital neurovascular structures located in the plantar vault of the foot while maintaining physiologic tension and function.
in breast cancer. A combination of TC every 3 weeks has emerged as a common chemotherapy regimen used for treatment of node-negative or lower-risk node-positive breast cancer. We tested whether it is feasible to deliver TC on a dose-dense schedule, with therapy completed within 10 weeks.

**PATIENTS AND METHODS:** We enrolled women with early stage breast cancer on a single-arm phase II study of adjuvant dose-dense TC through a regional oncology network. All women completed primary surgery before accrual, and subsequent therapy with TC was deemed appropriate by the treating physician. Planned treatment was docetaxel 75 mg/m\(^2\) plus cyclophosphamide 600 mg/m\(^2\) every 2 weeks for 4 cycles with subcutaneous pegfilgrastim 6 mg administered 24 to 48 hours after the administration of each chemotherapy cycle.

**RESULTS:** Of 42 women enrolled, 41 were evaluable using prespecified criteria. Of these, 37 (90.2%) completed therapy within 10 weeks and 34 (83%) completed therapy at 8 weeks without dose modification. Rates of neuropathy were similar to that reported previously. The rate of neutropenic fever was low (2.5%). Rash and plantar-palmar erythrodythesia were common and reached grade 3 in 4 subjects (9.8%).

**CONCLUSION:** Dose-dense TC is feasible with tolerability profiles similar to standard TC and a low likelihood of neutropenic fever. This study supports further clinical development of this 8-week adjuvant chemotherapy regimen.


**Background:** Needs assessment. In late 2007, Ashley Furniture Industries (AFI) had 2,233 of their employees participate in a health risk assessment (HRA) along with biometric screening. The summary of the HRA biometric screenings provided AFI management with their own employees' obesity prevalence rate which was 40% (AFI, 2008) exceeding that of the national average of 34.3% (Flegal, Carroll, Ogden, & Curtin, 2010). The AFI management team used this information in determining that their employees not only need but would benefit by participating in programs to improve their health and well-being. Significance and consequences: Studies support that obesity is a significant contributor to rising healthcare costs. Because some of this cost is shouldered by employers, they are often motivated to look for strategies to reduce these costs. Many health conditions are potentially responsive to health intervention (heart disease, cancers, obesity, or respiratory diseases).

**Purpose:** Obesity is epidemic in the United States. It leads to serious health consequences which in turn add to the healthcare costs for individuals and businesses alike. The purpose of this project is to evaluate whether a 12-week worksite physical and nutritional educational program had an effect on body mass index, physical activity and fruit and vegetable intake among the study population.

**Methods:** The 12-week program included weekly challenges; one focused on nutrition and another focused on physical activity. Strategies utilized included team competition and cash incentives. In addition, a web-site was developed in which Body Mass Indices (BMI) and weights were entered allowing participants to be monitored and track their own progress. Pre and post-surveys along with self-reported dietary information and participation in challenges were used to collect data. Official weigh-in sessions took place at week zero and at the conclusion of the program.

**Results and Interpretation:** Physical activity was increased 4-fold, fruit and vegetable intake showed a 19.8% increase, and participants achieved a statistically significant 10% shift to a lower BMI category (p<0.0001). These data demonstrate that this worksite wellness program positively impacted the study population and should translate to improved health and lower costs of healthcare for AFI.

**Clinical Implications:** This program showed that favorable health and wellness changes can be made in the Ashley Furniture Industries population. It gives the participants the tools necessary to adopt permanent lifestyle changes. It also motivates Ashley Furniture Industries to consider reproducing this program in hopes of improving the health of their workforce and reduce healthcare costs.


Inferior vena cava (IVC) syndrome is caused by compression of the IVC. This syndrome is characterized by abdominal discomfort, anasarca below the level of the diaphragm, abdominal ascites, hepatomegaly, shortness of breath, and increased risk for infection and thrombosis. IVC syndrome most commonly occurs in the setting of thrombosis. IVC syndrome can also occur in patients with neoplastic hepatic masses and has been reported in association with biloma.

We present a 60 year old female who developed IVC syndrome in the setting of multiple giant hepatic hemangiomas.
The authors performed a systematic review of electronic databases and relevant peer-reviewed journals, thus the authors undertook a systematic review. C.N. van Dijk, MD, PhD, utilizing posterior medial and posterior lateral portals, this risk can be potentially reduced. With the standard technique described by others, the risk of damage to the regional neural structures has been implicated. Although quicker recovery times and return to activity have been cited, posterior ankle impingement syndromes are often associated with lingering symptoms. The authors present a case of a 55-year-old male with a history of hepatitis C and tobacco dependence who had a pantalar arthrodesis with metallic screw reinforced antibiotic-loaded polymethylmethacrylate cement for added stability.


**Case Study:** The authors present a 55-year-old hepatitis C positive, tobacco-dependent man who had a pantalar arthrodesis with severely compromised anterior soft tissues who underwent revision ankle arthrodesis from a posterior approach to treat a plantarflexion malunion by another provider. This procedure resulted in an anterior ankle wound requiring negative pressure wound therapy. One year later, the patient presented to the senior author with continued pain, recurrent plantarflexion malalignment with nonunion and a draining sinus that probed to bone and hardware. Staged revision surgery involved first, a posterior approach through the previous incision for hardware removal, bone biopsy and implantation of antibiotic-loaded polymethylmethacrylate cement beads. The biopsies returned with acute osteomyelitis and avascular necrosis of the resected talus.

**Results:** Following complete resection of the infected bone, the second surgery involved a retrograde intramedullary compression nail supplemented with metallic screw reinforced polymethylmethacrylate cement for added stability. The patient went on to stable, well aligned arthrodesis without recurrence of wound or infection at 18-months follow-up.

**Discussion:** When performing limb salvage in an immunocompromised host with an infected, malaligned nonunion and compromised soft tissue envelope, the use of a protocol-driven approach is critical. High volume pulsed irrigation, complete resection of all infected tissues and implantation of antibiotic-loaded polymethylmethacrylate cement beads will prepare the operative site for reconstruction. Salvage arthrodesis with a retrograde intramedullary compression nail offers a reliable, reproducible option once the infection is eradicated. The use of metallic screw reinforced antibiotic-loaded polymethylmethacrylate cement provides immediate stability to this construct.

**Complications following posterior hindfoot endoscopy:** a systematic review. Presented at American College of Foot and Ankle Surgeons 71st Annual Scientific Conference, Las Vegas, Nevada, February 11-14, 2013.

**Purpose:** Posterior hindfoot endoscopy has recently gained popularity as surgical treatment for os trigonum and posterior ankle impingement syndromes. Although quicker recovery times and return to activity have been cited, the risk of damage to the regional neural structures has been implicated. With the standard technique described by C.N. van Dijk, MD, PhD, utilizing posterior medial and posterior lateral portals, this risk can be potentially reduced. No consensus regarding the incidence of complications with this technique has been previously described, thus the authors undertook a systematic review.

**Methodology:** The authors performed a systematic review of electronic databases and relevant peer-reviewed journals.
sources including MEDLINE (http://ovidsp.tx.ovid.com) and a general scientific search engine (http://google.com). Additionally, we hand searched common American, British and European Orthopaedic and Podiatric medical journals for relevant manuscripts. Only manuscripts published in peer reviewed journals that involved complications following posterior hindfoot endoscopy with standard posterior medial and posterior lateral portals were included.

The authors performed the above systematic review with no restriction on date or language, using an inclusive text word query “endoscopic” OR “arthroscopic” AND “os trigonum” OR “posterior impingement” OR “Stieda's process” where the all upper-case words represent the Boolean operators employed. Every manuscript was reviewed in its entirety and consensus was employed for final inclusion with the lead author (MPD) being the moderator.

**Results:** The search for potentially eligible information yielded a total of 290 references, of which six (2.1%) were included. A total of 194 patients (195 feet) involving 117 men (60.3%) and 77 women (39.7%), were included. The weighted mean age was 33-years (Range: 13 to 71-years) and the weighted mean follow up was 28-months (Range: 6 to 76-months). Complications occurred in 16 patients (8.2%), that included: nine (56.3%) cases of transient incisional anesthesia, two (12.5%) wound healing problems, two (12.5%) reoperations for recurrent symptoms, one (6.3%) traumatic sural neurona, one (6.3%) report of anesthesia about the medial heel and one (6.3%) ankle arthrofibrosis. All nerve related symptoms except the traumatic sural neurona, which required surgical resection, resolved within four months. Of note, no injury to the tibial nerve was reported.

**Discussion:** A systematic review of peer-reviewed material evaluating the incidence of complications following posterior hindfoot endoscopy as described by C.N. van Dijk, MD, PhD was undertaken. The results of our systematic review reveal the incidence of complications is 8.2%. Of the complications, 68.8% were nerve related, the vast majority of which were transient. In conclusion, the posterior hindfoot can be safely accessed with minimal complications when performed properly by experienced foot and ankle surgeons.


14. Ellis RL. **Screening mammography guidelines and frequently asked questions.** Gundersen Health System Noon Conference; La Crosse, Wisconsin, 2013.


**Background:** Newly registered nurses frequently report acts of disrespect and destructive conflict. New nurses experience high levels of stress and illness after transition to the practice setting. Data indicate that 27% to 53% leave their job in the first year of work.

**Significance:** This evidence-based program was designed to foster effective communication in high-stress conflict situations in health care settings.

**Purpose:** The specific aim of this evidence-based practice program was to identify “lessons learned” from the implementation of a conflict skill building program for new nurse residents.

**Methods:** The program consisted of a modified Conflict Engagement program with integrated elements from Crucial Conversations and the literature on civility in nursing practice. The program was delivered as a six-hour workshop with one-hour monthly practice sessions. Participants completed a pre-workshop questionnaire including a demographic section and the Conflict Dynamic Profile-Individual instrument. Facilitator notes from monthly debriefing meetings provided additional insights on process experiences and outcomes.

**Results:** There were 39 nurse residents completing the survey. Their mean age was 25 years and 59% were baccalaureate prepared. 92% worked in the inpatient hospital setting. On a scale of 1 to 10 with 10 indicating a high level of confidence, participants rated their confidence in engaging in conflict with peers as 5.7 and their confidence in engaging in conflict with physicians as 4.2. New nurses scored high in the constructive conflict skills of perspective taking, delay responding and adapting. However, nurses reported that their first instinct was to fix the problem rather than to develop creative solutions with another. Participants also scored high on yielding and self-criticizing, which are destructive strategies in dealing with conflict.

**Clinical Implications:** Nurse Residents benefited from opportunities to practice the use of all constructive engagement strategies, which provided the nurses with more options for effectively dealing with conflict. Key lessons learned while conducting the program include: starting the program after new nurses become familiar with unit practice and colleagues; using real-life conflict scenarios to engage learners; conducting practice sessions with role play; and utilizing success stories to support the goal of constructively dealing with conflict.

16. Fotaria Y, Rathgaber SW, Pearson SB. **Endoscopic protection from left versus right-sided colon cancer.**
Purpose: We sought to determine if the protective effect of prior endoscopy was different for left vs right-sided colon cancer within our integrated health system.

Methods: All patients diagnosed with primary colorectal-adenocarcinoma between January 2006 and March 2013 were retrospectively reviewed. Patients were excluded if they had a history of inflammatory bowel disease, an inherited cancer syndrome, or age less than 50 years at diagnosis. Patients with transverse colon tumors were excluded. Staging and location of tumors were confirmed by pathologic examination of surgical specimens. Patients were categorized by left or right-sided cancer and by prior protective endoscopy within 6 months to 10 years before diagnosis or no prior protective endoscopy. Protective endoscopy was defined as colonoscopy completed to the cecum for right-sided cancer and colonoscopy or flexible sigmoidoscopy for left-sided cancer. Groups were analyzed for survival, stage, age, sex, and BMI. Comparison of the prevalence of right and left-sided cancers utilized the Mantel-Haenszel Chi-Square test. Survival curves were generated using the Kaplan-Meier method and survival times were compared using the Log-rank test. Comparisons of BMI and age utilized the student’s t-test.

Results: 357 patients were included. 197 (55.2%) cancers were left-sided; 160 (44.8%) cancers were right-sided. 133 (31.6%) had a protective endoscopy. Fewer patients with left-sided cancer had prior endoscopy than right-sided cancer (25.4% vs 39.4%, p<0.005). Cancer was diagnosed at an older age in patients with prior endoscopy (74.7 vs 70.2 years, p=0.0002). Trends occurred in the prior endoscopy group toward earlier cancer stage (p<0.083) and improved survival (p<0.074). BMI had no effect on any category.

Conclusion: There is statistically significant difference in prior endoscopy rates between left and right-sided colon cancer patients. This suggests that endoscopy is more protective for left-sided colon cancer than right-sided colon cancer within this integrated health care system. A prior ‘protective’ endoscopy may also result in earlier stage at diagnosis, improved survival, and older age at diagnosis.


Background: It is common knowledge that the nursing profession is stressful. In addition to the typical stressors that are found in work environments, such as deadlines, politics, and social flittering, the nursing role provides stressors that are unique and particularly wearing. As with anything, nurses will respond to and cope with stressors in their own unique way.

Significance: Developing means for dealing with stress at the workplace would allow for nurses to function at a more optimal level.

Purpose: To create a space which utilizes multiple healing modalities in order to provide an outlet for nurses and ancillary staff in Gundersen Lutheran’s Critical Care Unit (CCU). This will allow them to cope with typical role stressors as well as the more recent stressors related to transitioning to a new hospital. Providing such a means for self-care would enhance staff morale, staff retention, colleague engagement, and outlook for the future vision.

Methods: In order to create a space that would benefit all who would use it, a literature review utilizing CINAHL, MEDLINE, and Alt HealthWatch databases for articles pertaining to the creation of healing spaces, multiple healing modalities, nurse stress, and nurse burnout, was performed. Six articles and one book met the necessary criteria. The room was then created with additional support and advice from experienced and knowledgeable staff.

The intention of the room was to be a space that allowed staff to step away from the turmoil and stress and to center themselves, to find a little moment of peace. As such, the space was created with multiple healing elements. It was also created with the intent to evolve through staff’s interaction with the space, making it entirely their own.

Results: Though only recently completed, staff feedback on the space has been overwhelmingly positive. These are a few of the comments shared by the staff: “I didn’t even know that I wanted… No, that I needed a space like this.” “Just looking at the room makes me feel better.” “I spent two minutes in the room earlier today. It felt like fifteen and I was surprisingly refreshed.” “Thank you!” “We’re going to have something like this in the new hospital, right?”

Clinical Implications: It is imperative that nurses take on the responsibility of creating an environment that allows for holistic healing, transpersonal interactions, and intimate engagement within the community of staff and patients. In other words, each person must be active in practicing holistic self-care. Creating a healing space is but one mean to this end. Collaboration with each other, leadership, and administration will allow for more innovative ideas to become reality. Then these can evolve to become a part of the broader attempts to create an optimal healing environment for all.

18. Gkotsoulias EN, Simonson DC, Borkosky SL, Roukis TS. The safety of endoscopic tarsal tunnel decompression: a systematic review. Presented at American College of Foot and Ankle Surgeons 71st Annual Scientific Conference,
Las Vegas, Nevada, February 11-14, 2013.

**Purpose:** Open surgical decompression of the tarsal tunnel is the gold standard for impingement of the tibial nerve or its branches within the tarsal tunnel. Complications associated with this approach can be significant and prolonged periods of non-weight bearing are required. An alternative approach that allows for minimal soft tissue trauma and shorter recovery time to ambulation is therefore desirable. Endoscopic tarsal tunnel decompression may provide such an alternative.

**Methodology:** The authors performed a systematic review of electronic databases and relevant peer-reviewed sources including OvidSP/MEDLINE and a general search engine. The authors hand searched each identified manuscript for pertinent references. Only manuscripts that included clear information regarding the safety of endoscopic tarsal tunnel decompression with follow-up of at least 12-months were included.

The authors performed the above systematic review with no restriction on date or language, using an inclusive text word query “tarsal tunnel” AND “endoscopic” where the all upper-case word represents the Boolean operator. The authors hand searched each identified manuscript for pertinent references and contacted authors of potentially relevant manuscripts for clarification of data when necessary. Every manuscript was reviewed in its entirety and consensus was employed for final inclusion with the senior author (TSR) being the moderator.

**Results:** Four studies were identified in the literature, involving a total of 47 patients. Of these, 40 patients met our inclusion criteria. The weighted mean follow-up was 27-months. There were no documented complications relating to iatrogenic nerve injury, infection or wound healing problems despite initiating ambulation within one week of surgery. Two patients (5%) developed recurrence at more than two years post-operative and one patient (2.5%) did not show improvement.

**Discussion:** A systematic review of peer-reviewed material relating to the safety of endoscopic tarsal tunnel decompression for impingement of the tibial nerve or its branches was undertaken. Based on the inclusion criteria, four studies of fair methodological design were included. As the data of our systematic review demonstrates, endoscopic tarsal tunnel decompression is a safe procedure with a low rate of recurrence or failure and also allows for near immediate ambulation. However, additional prospective investigations comparing open and endoscopic approaches to tarsal tunnel decompression are warranted.


**Background:** We performed this study to determine whether or not MGUS follow up preceding the diagnosis of multiple myeloma, Waldenstrom's macroglobulinemia, and lymphoplasmacytic lymphoma (collectively referred to as MM) results in fewer major complications at cancer diagnosis and longer survival.

**Methods:** Data were obtained from the US Surveillance Epidemiology and End Results (SEER) database linked to Medicare claims from 1994-2005. MGUS follow-up was defined as having a diagnosis claim 4-15 months prior to MM diagnosis. Major complications such as acute kidney injury (AKI), dialysis requirement, cord compression, fracture, and hypercalcemia presenting within 3 months before or after MM diagnosis were obtained from Medicare claims. We excluded patients with smoldering MM (defined as no treatment/complication claims and no MM death within 3 and 12 months of diagnosis, respectively) in the complication analyses. For patients with smoldering MM, survival time was measured from the date when the disease became active.

**Results:** Of the 17,457 MM patients included in our study, 51% were males and the median age was 77 years. Overall, 6% of the patients had MGUS follow-up preceding MM diagnosis. Unadjusted complication rates at MM diagnosis were lower in the group with MGUS follow-up compared to those without: any (49 vs 58%; P < .001), AKI (20 vs 24%; P = .01), dialysis (6 vs 8%; P = .28), cord compression (6 vs 8%; P = .09), fracture (26 vs 33%; P < .001), and hypercalcemia (12 vs 19%; P < .001). After multivariate modeling considering socio-demographic factors, diagnosis era, cancer type, comorbidities, and SEER site, MM patients with prior MGUS follow up had significantly fewer major complications at the time of diagnosis (OR: 0.678; 95% CI: 0.568-0.796). They also had better disease-specific survival (median 38 vs 29 months, P < .001; HR: 0.845 95% CI: 0.764 - 0.936) as well as overall survival (median 23 vs 19 months, P < .001; HR: 0.869, 95% CI: 0.798-0.946).

**Conclusions:** Our population-based study supports the clinical significance of MGUS. Patients being followed for MGUS leading up to MM diagnosis may present with fewer major complications and have a longer survival compared to those presenting with de novo MM. Future studies to determine the optimal schedule and cost effectiveness of MGUS follow up are warranted.

Background: Recent reports in the literature have shown four phase dynamic computed tomography (CT) to be a valid alternative to ultrasound (US) or sestamibi scintigraphy (SS) for localization of parathyroid adenomas (PA). However, increased cost and radiation exposure has limited its widespread use. The objective of this study was to evaluate the effectiveness of CT in identifying and localizing PAs in patients not adequately localized with US/SS.

Methods: In August 2012, surgeons at our institution began using CT to localize PAs that were not adequately localized with US/SS. After IRB approval, a retrospective review of the medical records of patients who underwent CT from August 2012 through June 2013 was completed. These patients were compared to those with negative findings on US/SS who underwent four gland exploration (4GE) without a preoperative CT from January 2009 through September 2012. Statistical analysis included Fisher’s exact test and Wilcoxon Rank Sum.

Results: Thirty-three patients underwent parathyroidectomy after US/SS failed to localize a PA; 20 with 4GE and 13 with preoperative CT. Overall, 79% were female. There was no difference between the 4GE and CT groups with respect to age, sex, BMI, or ASA class. Overall mean operative times were 90.7 and 98.3 minutes in the 4GE and CT groups, respectively (P=0.726). A unilateral neck exploration adequately removed 8/20 (40%) PAs in the 4GE group and 8/13 (62%) PAs in the CT group (P=0.226). Pathology was concordant with SS and US in 12/31 (39%) and 8/28 (28%) patients, respectively. Pathology confirmed the results of CT in 10/13 (77%) patients. There was 1 false negative CT, and one patient with a negative CT had a papillary thyroid carcinoma. Two patients had false positive CTs (1 with benign tissue, and 1 with an inadequate tissue sample to evaluate). Sensitivity and PPV for CT was 90% and 0.82, respectively. There were no laryngeal nerve injuries, surgical site infections, or bleeding complications.

Conclusions: In patients with failed localization after US/SS, CT scan was able to accurately localize PA in the majority of patients. Localization did not significantly change operative times, complications or ability to perform the surgery with a unilateral neck exploration. However, we do anticipate that with increased patient numbers and experience the clinical significance of localization will become more apparent.

Background & Purpose: Currently there is a lack of literature supporting conservative interventions in the management of anterior medial hip pain secondary to tears of the acetabular labrum. Current reports have recommended surgical intervention with little evidence demonstrating long-term benefits. There was little consideration given to manual therapy for the treatment of such pathologies in the reports that supported conservative management. Manual interventions have demonstrated favorable outcomes in similar cohorts with intra-articular hip diagnoses. This case report describes the conservative management of a patient with a confirmed acetabular labral tear managed conservatively with physical therapy, including both manual therapy and exercise.

Case Description: A 29-year-old female triathlete presented with a 2.5-year history of right anterior medial hip pain. Magnetic resonance arthrogram confirmed a labral tear with a paralabral cyst. Arthroscopic surgery had been recommended by 2 independent surgeons. Past physical therapy, including exercise and education, achieved poor outcomes. The patient reported constant pain rating of 2/10 on the numeric pain rating scale and 5/10 with prolonged sitting and squatting activities. Hip pain associated with sagittal plane motions prevented her from running, biking, and training for triathlons. Examination demonstrated significant loss in hip flexion and internal rotation (IR) range of motion (ROM) along with pain and weakness during strength assessment of the involved hip. Functional outcome measures included the Lower Extremity Functional Scale (LEFS) and Harris Hip Score (HHS). Physical therapy interventions were provided for a total of 10 sessions over a 10-week period. Interventions included thrust and nonthrust manual therapy techniques to the lumbopelvic and hip regions to improve sagittal and transverse plane hip ROM and mobility. A progressive strengthening and running program was included.

Outcomes: At discharge, the global rating of change was reported as +7 ("a very great deal better"). The LEFS improved 19 points and the HHS improved 16.3 points. All these exceeded the minimal clinically important difference of each measure. Other improvements included an increase of pain-free hip flexion (+30°) and IR (+10°) ROM and an increase in pain-free squat test (+10°). Bilateral hip strength improvements were demonstrated with...
handheld dynamometry measures. All outcomes were maintained at 3- and 6-month follow-up as the patient continued a graded training program to return to triathlon competition.

Discussion: Limited research has been provided regarding the use of manual physical therapy in the treatment of patients with acetabular labral tears. Due to limited research, current management of these conditions relies heavily on surgical management despite any long-term supportive studies. This case provides a framework to develop further clinical trials in describing more conservative treatment options for patients with noted acetabular labral tears of the hip.


Background: Nationally, the Baby Boomer generation makes up approximately 52% of the Healthcare workforce. Currently, Gundersen Lutheran Health System has 4 generations of nurses working together. The fastest growing population of nurses is Generation Y or the Millennials.

Significance: Different generations have different core values and experiences. Currently the Baby Boomer generation, also called wisdom worker nurses, are verbalizing that the younger generation of nurses is not listening to them. Generation Y or newly graduated nurses are verbalizing that the older generation of nurses is not listening to them. Generational conflict can enhance the future of nursing or contribute to unhealthy working environments.

Purpose: An avenue was lacking in which new nurses could link with seasoned or wisdom worker nurses. An event was created to bring these two generations together for dialogue about conflict and ways in which this work can be furthered in the future.

Methods: A four hour program was held twice in which new nurse residents were brought together with wisdom workers to discuss reflective questions as separate generations and then as intergenerational groups. A passing of the light from wisdom workers to the newly graduated nurse residents occurred at the end of the program.

Results: A total of 57 nurses participated in the two sessions with 36 newly graduated nurses and 21 wisdom worker nurses attending. Themes were identified from the three reflective questions. New Nurses identified wisdom workers as excellent clinical resources, willing to teach and share past experiences but were resistant to change, lacking in technological skills, can be burned out and frustrated with new staff. Wisdom Workers identified new nurses as being open to new ideas, risk takers, viewing failure differently, masters of technology, overestimating their ability to multi-task, and not as dedicated.

Clinical Implications: Open dialogue resulted in respectful discourse on both the satisfying and challenging aspects of intergenerational workforces. Prioritizing the need for avenues to have intergenerational discussions about values, beliefs and relationships was apparent. Understanding these intergenerational differences is needed to connect as team members and foster collegiality.


Background: Nurses are encountering an increasing number of patients having orthognathic surgery. Knowledge of this patient population is important to deliver patient-centered care.

Significance: Nurses need to understand the reasons that patients have this surgery as well as best practices for inpatient and discharge care.

Purpose: To identify best care practices for patients undergoing orthognathic surgery.

Methods: Literature review conducted and expert opinion solicited to develop recommendations for best practice.

Results: When nurses are knowledgeable of potential risks and complications, they can minimize those risks for the patient.

Clinical Implications: Improved outcome for the patient and better care for patients and their families.


Background: Literature and experience supports that care transitions for patients are often fraught with complications such as patient’s misunderstanding medication regimen or new diet.

Significance: Poor transition planning and lack of support after an acute hospital stay can lead to patient
readmissions. Literature supports that patients with heart failure, myocardial infarction, and pneumonia are most likely to readmit within 30 days of hospital discharge.

**Purpose:** The purpose of this project was to reduce hospital readmissions by supporting patients who were at high risk to readmit beginning at discharge and through the first 2-4 weeks in their home.

**Methods:** This pilot study consisted of a partnership between 2 Clinical Nurse Leaders on the Cardiopulmonary Unit and 2 Student Nurses in their public health practicum. The Clinical Nurse Leader and Student Nurses selected 2 patients, per student, who were at high risk to readmit based on internal Gundersen Lutheran criteria. The partners along with the patient and family created an individualized plan to support discharge. This plan focused on the patient’s comprehension of their diagnosis and discharge plan of care using Teachback methodology and components of the Prochaska and DiClemente Stages of Change Model. The students provided Clinical Nurse Leader assisted home visits 2 times each week for 2-4 weeks with until the patient met their goals. The Clinical Nurse Leader leveraged technology by using a video calling application to be virtually present during each visit.

**Results:** Ten (10) patients were admitted into the program over 10 weeks. Of these 10 patients only 1 patient was readmitted. Out of 9 patients surveyed, 8 strongly agreed that this program was helpful in preventing them from returning to the hospital.

**Clinical Implications:** Providing cost effective interventions to improve transitions of care and reduce readmissions positively impacts both the Hospital Organization and the patient’s served. The partnership with a School of Nursing also facilitated student nurses understanding of the fundamentals of coordinating patient’s care, patient education, and provides a basic understanding of linking national and organizational patient care goals to practice.


**Background:** Patients trust that nurses will partner with them to co-create the best environment in which to heal. Essential oils used for pain management, to minimize post-operative nausea and vomiting (PONV) and to reduce anxiety contribute to this healing environment. Essential oils were implemented at Gundersen Lutheran in January 2012.

**Significance:** Gundersen Lutheran nurses have embraced Dr. Jean Watson as their nursing theorist. She reminds us that we should “Embrace altruistic values and practice loving kindness with self and other” (Caritas Process 1). We must be authentically present with our patients and families in order to co-create the best environment for them to heal, offering ourselves and other caring-healing modalities (Caritas Processes 2, 4, 8 and 9; Transpersonal Caring Moment).

**Purpose:** To document patients’ perceptions of the use of essential oils as a caring, healing modality.

**Methods:** Data was collected from a convenience sample of patients who underwent joint replacement surgery between July and September, 2012, utilizing patient interviews, Likert rating scales and open-ended questions.

**Results:** 39 patients undergoing hip (69%), knee (23%) and shoulder (8%) surgery participated. 24 (62%) were female; 22 of the 32 patients (69%) chose to use essential oils when asked.

**Clinical Implications:** Use of essential oils is just one option that is part of the holistic journey for patients and staff. Essential oils are available throughout the patients’ hospital stay and should be offered as an adjunct to usual care more than once. Patients, who may be reluctant to try essential oils on admission, may want to try essential oils at a later time and benefit from the experience. If a patient finds the use of essential oils a benefit, nurses need to provide education for using the oils after discharge.


**Background:** Current health care demands ask us to do more with the same or less resources. HeartMath workshops support us in changing times.

**Significance:** HeartMath teaches us how to be coherent - a state of being where heart, mind and emotions are operating in sync and balanced. Dr. Jean Watson’s Human Caring Theory, including Caritas Processes, helps us understand the philosophy of caring. Together, HeartMath and Caritas are building a foundation of how we care for ourselves and others.

**Purpose:** In a two-day HeartMath workshop (four hours each day), participants learn about authentic care for self and others, decreasing stress and increasing resilience. Techniques for establishing and maintaining coherence.
are practiced. Participants build self-care practice plans for themselves. Successes and challenges are discussed, and additional resources are shared.

**Methods:** Post-workshop surveys are sent to participants to assess participant three to six month outcomes.

**Results:** Of 122 participants, 54% responded. 86% indicated regular use (daily or >2 times/week) of HeartMath techniques. Twenty wellness outcomes were assessed, including: "more calm" (70.8%), "more focus and concentration" (47.9%) and "less anxiety" (45.8%). Participants were asked: "On a scale from 1 to 10 where 1 is low (would not recommend) and 10 is high (highly recommend), how likely is it that you would recommend this program to your colleagues?" 1027 answered the question, and 86% rated their likelihood to recommend the program from 7-10.

**Clinical Implications:** HeartMath is highly recommended by participants. HeartMath education will be incorporated into new leader on-boarding and New Employee Orientation. Enhancements to the program will continue to be made based on data from post-workshop survey research.

29. Karturi S, Go RS. **Level of scientific evidence underlying ACCP guidelines.** Proceedings from the 2013 Scientific Meeting of the American College of Physicians, Wisconsin Chapter, Wisconsin Dells, Wisconsin, September 6-7, 2013.

**Purpose:** The level of scientific evidence underlying the American College of Chest Physicians (ACCP) guidelines has not been systematically investigated. This study describes the category of evidence for each recommendation under specific guidelines. The guidelines that have been evaluated include 1) Lung cancer, 2) Antithrombotic guidelines and 3) Pulmonary rehabilitation guidelines.

**Methods:** The ACCP uses GRADE format to describe the strength of recommendation for various guidelines. We have evaluated guidelines which share the same evaluation technique. The guidelines evaluated have been described above. The ACCP definition of the level of evidence for each recommendation under a specific guideline is as follows: (1a)-Strong recommendation, high-quality evidence; (1b)-Strong recommendation, moderate-quality evidence; (1c)-Strong recommendation, low-quality or very low-quality evidence; (2a)-Weak recommendation, high quality evidence; (2b)-Weak recommendation, moderate-quality evidence; (2c)-Weak recommendation, low-quality or very-low quality evidence.

**Results:** Of the 877 recommendations found in the 3 guidelines, Category 1A, 1B, 1C, 2A, 2B and 2C were 7.9%, 25.2%, 15.2%, 0.1%, 10.7 and 40.9% respectively. A total of 603 recommendations were found in Antithrombotic guidelines of which majority (52.6%) of the recommendations were category 2C. In the subset of surgically related recommendations for antithrombosis (N=76), at least 70% was category 2C. Majority of the recommendations in Lung cancer guidelines (N=278) were category 1C (27%) and 2c (28%), while category 1A recommendations was only 10%. Only 20 recommendations were available for pulmonary rehabilitation of which 35% were category 1A.

**Conclusions:** Of the ACCP recommendations evaluated in this study, it appears that the guidelines have been developed from lower levels of evidence (strong recommendation and low quality of evidence). Given the widespread clinical application and decision making in day today practice, one has to be aware of the strength of evidence under each recommendation. It also underscores a need for further research to expand the evidence base in pulmonary medicine.


**Research Objectives:** To examine the resources used in patients with heart failure who received Palliative Care Services (PCS) compared to patients receiving usual care (non-PCS) hospitalized between June 15, 2005 and June 15, 2006.

**Methods:** All consecutive hospital admissions between June 15, 2005 and June 15, 2006 at were queried in the EMR for ICD-9 codes including HF in the top three admission & discharge diagnosis. A total of 1041 patients with possible HF at admission and each of these records was individually reviewed. There were a total of 611 patients for this study that were divided into two groups: patients with HF without palliative care input (N=504) and patients with CHF who had received input by the palliative care team either by consult or direct admission onto the palliative care service (N=107).

**Results:** This study demonstrated that patients with PCS involvement were significantly less likely than the non-
PCS patients in to require the resources of the intensive care unit (p<0.015). Those patients with PCS involvement were found to have statistically significantly less average total hospital charge (p=0.002), average total radiology charge (p<0.004), and average total Physician charges (p<0.001). In addition, statistically a larger portion of the PCS patients were admitted to hospice (p<0.001).

**Conclusions:** The PCS was associated with decreased use of acute hospital resources for patients admitted with HF. Palliative care aims to relieve suffering and improve quality of life for patients. This study shows, similar to previous studies in patient with end-stage cancer, the development of a PCS was associated with the decreased use of acute hospital resources for patients admitted with HF.


**Initial Presentation:** A 43 year old female presented to the Emergency Department of our institution with the chief complaint of cough and minimal shortness of breath for five days duration. She denied fevers, chills, sweats, malaise, and/or any other global symptoms. Chest radiograph revealed a suspected right lower lobe infiltrate and her vitals were significant only for mild tachycardia. She was started on treatment for community acquired pneumonia with Levaquin, supplemental oxygen and IV fluids and admitted to the floor.

**Hospital Course:** The patient’s medical history was significant for hypertension, recurrent cystitis, and a granulosa cell tumor, for which she had undergone surgery for and completed chemotherapy 3 months prior. Within the first 24 hours the patient’s clinical picture remained the unchanged. She never mounted an increased leukocytosis and had no improvement in her tachycardia with fluid resuscitation. Echocardiogram was obtained showing normal EF and no global ischemia or impaired cardiac function. Due to failure to improve, a chest CT and pulmonary consult were ordered. Her CT showed diffuse ground glass opacities concerning for diffuse infection vs. diffuse alveolar damage. An infectious disease consult was placed for further guidance and the patient was started on anti-fungals as well as additional antibiotics for broader coverage. She was also started on steroids for PCP coverage and suspected Bleomycin induced lung injury. A bronchoscopy with bronchial-alveolar lavage was performed which yielded no findings on gram stain and all cultures had no growth. All rheumatological assays also remained negative and the patient was diagnosed with bleomycin induced lung injury. During an eighteen day hospital course, the patient developed acute respiratory failure which was refractory to all treatments and therapies available and attempted. Care was withdrawn on day eighteen, as her prognosis had been determined as terminal and futile and family chose not to pursue further care/treatment.

**Discussion:** This case represents the known complication of pulmonary fibrosis secondary to Bleomycin toxicity. Although rare, this complication is often fatal and should be considered in patients with prior therapy presenting with respiratory complaints.


**Purpose:** Chainsaw injuries can have devastating effects on soft tissue and bone alike. Prompt exploration, assessment and repair of the involved tissues in the operating room is necessary due to the contaminated nature of these injuries and high velocity trauma.

**Case Study:** We present a 54-year-old tobacco-dependent woman with a history complicated by Raynaud’s disease who suffered a traumatic chainsaw injury to the medial ankle. Following cursory evaluation and ligation of exposed vessels at an outside hospital, the patient was transferred to our facility for definitive care. She was taken to the operating room revealing a longitudinal laceration about the medial ankle with exposed and severed posterior tibial artery, posterior tibial veins and tibial nerve, as well as an incomplete laceration of the flexor hallucis longus tendon.

**Results:** After obtaining hemostasis and identification of all lacerated soft tissues, thorough irrigation and debridement of the wound was performed. Both the posterior tibial artery and veins were devitalized and deemed non-reconstructable. Intra-operative Doppler examination revealed audible signal to the medial and lateral plantar, anterior tibial and peroneal arteries with no evidence of ischemia. Therefore, ligation of the severed vessels was completed. Under loupe magnification the two segments of the tibial nerve were freshened and sutured into collagen based nerve conduits. The flexor hallucis longus tendon underwent retubularization. At 18 months post-operative the patient has regained sensation to the proximal two-thirds of the plantar foot with a Tinel’s sign to the digital level. No sudomotor changes, musculoskeletal deformities or weakness were noted at the most recent follow-up. The patient continues with use of gabapentin and tramadol for occasional neurogenic symptoms.

**Analysis and Discussion:** Traumatic lacerations involving chainsaws are devastating injuries, especially when they involve a neurovascular bundle. The current patient presented with a complicated medical history including...
Raynaud’s disease, tobacco dependence, and transected neurovascular structures. Prompt evaluation and treatment allowed for primary repair of the lacerated tibial nerve with a collagen based nerve conduit that restored meaningful sensation to the plantar foot in this patient.


**Purpose:** Septic ankle arthritis is a rare, often devastating infection with a high potential for morbidity. Delay in treatment can lead to cartilage erosion, painful synovitis and osteomyelitis. Septic ankle arthritis deserves prompt recognition and intervention. The literature is replete with studies of septic arthritis of the hip and knee treated with arthroscopic debridement; however, studies involving the ankle are limited. Therefore, to determine the efficacy of arthroscopic irrigation and debridement for the treatment of septic ankle arthritis, the authors conducted a systematic review and present a retrospective case series.

**Methodology:** The authors performed a systematic review of electronic databases and relevant peer-reviewed sources including OvidSP/MEDLINE. The authors hand searched each identified manuscript for pertinent references. Only manuscripts that included clear information regarding septic ankle arthritis treated with arthroscopic irrigation and debridement were included. In addition, the authors performed a retrospective analysis of all patients with septic ankle arthritis treated with arthroscopic irrigation and debridement by the senior author over a 16-month period.

The authors performed the above systematic review with no restriction on date or language, using an inclusive text word query of “arthroscopic” OR “arthroscopy” AND “septic” OR “sepsis” AND “arthritis” where the all upper-case words represent the Boolean operators employed. The authors hand searched each identified manuscript for pertinent references. Every manuscript was reviewed in its entirety and consensus was employed for final inclusion with the lead author being the moderator.

**Results:** Our systematic review yielded a total of 253 references with eight (3.2%) meeting our inclusion criteria with a total of 14 ankles (14 patients). The weighted mean age was 42-years (Range: 3-months to 72-years) for included studies. The most common infectious agent was Methicillin sensitive Staphylococcus aureus (28.6%). The mean time to presentation was 35-days (Range: 2 to 128-days). Ultimate endpoint resulted in one total ankle replacement and two ankle arthrodeses, without evidence of persistent infection. For the patients treated at our facility a total of five ankles (five patients) were included. The weighted mean age was 53-years (Range: 32 to 77-years) including three men and two women. The most common organism identified was Methicillin sensitive Staphylococcus aureus (60%). All cases resolved without recurrence of infection after one arthroscopic debridement. The mean time to presentation was 15-days (Range: 8 to 30-days). Ultimate endpoint resulted in one planned ankle arthrodesis, without evidence of persistent infection.

**Discussion:** Clear, high-level evidence based medicine does not exist in the current literature regarding arthroscopic treatment of septic ankle arthritis despite its high potential for morbidity. However, when diagnosed appropriately with prompt arthroscopic irrigation and debridement, many of the sequelae associated with septic arthritis can be avoided with a single operative session. As identified in this systematic review and retrospective case series, Methicillin sensitive Staphylococcus aureus is the most common organism which provides insight to empiric antibiotic therapy in addition to proper surgical intervention.


**Background:** Readmissions cause significant distress to patients and families and are costly to organizations. Hospitals are challenged to develop effective strategies aimed at reducing potentially preventable readmissions.

**Significance:** One in five Medicare patients is readmitted within 30 days of discharge. There are a variety of programs aimed at improving transitions of care and reducing readmission rates. The literature suggests that early patient-provider contact after discharge can reduce readmissions.

**Purpose:** The goal of the program was to develop, implement and evaluate a follow-up phone call process for patients at high risk for readmission. The primary purpose was to improve outcomes of care by supporting patients and families through the first week following hospital discharge. The secondary purpose was to maximize reimbursement through decreasing the 0–7 day unplanned readmission rate.

**Methods:** Clinical Nurse Leaders (CNLs) identified patients through use of the LACE index (length of stay, acuity, comorbidities, ED visits in past 6 mo.) scoring tool and called those patients found to be at high risk for readmission with a cumulative score of 10 or greater. Evaluation data were collected on patients discharged from 4 medical/surgical units from October 2012 through February 2103.
Results: Findings revealed that 62% of patients called had questions after discharge. Interventions included providing nursing advice for 37% of patients, consulting an interdisciplinary team member for 44% of patients, and reviewing after care instructions for 85% of patients. Perception of the calls shows a high level of satisfaction with the service. The cost for the calls is predicted to be $15,000 annually which could be recovered with prevention of only two readmissions per year. The patient stories captured through the calls reveal qualitative evidence of the benefit of early connection to health professionals post-discharge.

Clinical Implications: Data suggest that the use of the LACE index identifies patients dealing with significant health issues during the first week after hospital discharge. Phone calls can fill the gap in care and support patients with extremely complex situations. Contacts with primary care providers can lead to more seamless connections and improved continuity of care practices.


Introduction: Treatment of acute ischemic stroke in rural populations presents unique challenges. Longer time to travel to a medical facility and stroke center and limited experience with stroke and iv-tPA by providers raise concerns about the safety of administration. The outcomes of rural stroke patients remain understudied. It remains to be demonstrated that iv-tPA can be effectively used in a rural health care setting because major differences in access to care and familiarity with use of tPA exist. Gundersen Health System and its Primary Stroke Center serve 19 counties in a largely rural area of southwestern Wisconsin, northeastern Iowa, and southeastern Minnesota, an area of 14,000 square miles. The purpose of our study was to compare the 90-day outcomes of stroke patients in our rural service area who received iv-tPA with those of patients in the pivotal NINDS clinical trial that led to approval of iv-tPA.

Methods: The electronic health records (EHR) of patients with acute ischemic stroke according to ICD-9 code who were diagnosed by a treating neurologist and treated with iv-tPA from 2006 to 2012 were retrospectively reviewed. Patients who had 30- and 90-day follow-up, as well as modified Rankin scale scores at 90 ± 14 days recorded in the EHR were included. Patients who died within 90 days after treatment were included, and their information up to point of death was utilized. Extensive health data from prior health history and in-hospital events were also collected. These patients' outcomes were compared with those of historical controls.

The primary outcome measure was favorable outcome, defined as a 90-day modified Rankin scale score of 1 or less, compared with that of the historical controls. Secondary outcome measures included rates of intracranial hemorrhage and the association of outcomes with prior medical history and number of in-hospital complications.

Results: Fifty-seven patients who experienced acute ischemic stroke received iv-tPA during the period under review. Of these, 16 patients were excluded because iv-tPA was not administered within 3 hours of onset. Thirteen additional patients were excluded because their modified Rankin assessment was not completed within 90 ± 14 days. The remaining 28 patients comprise the rural group and were retained for analysis. Of the patients in the rural group, 36% (10 of 28) had favorable outcomes at 90 days, compared with 39% (66 of 168) in the historical control group (P = .764). No difference was seen in the mortality rate between the rural group (29% [8 of 28]) and the historical control group (17% [29 of 168]) (P = .157).

The rate of symptomatic intracranial hemorrhage in our study patients was not significantly different from that of the historical controls (17.86% vs 7.14%; P = .0742). Patients who experienced no in-hospital complications were more likely to have favorable outcomes than those who had at least one complication (73% vs 27%; P = .002). Rural patients with favorable outcomes were on average significantly younger than those who had unfavorable outcomes (59.9 ± 11.6 years vs 73.2 ± 14.6 years; P = .02). Significantly fewer patients in the rural group received iv-tPA within 90 minutes of symptom onset compared with historical controls (1 of 28 vs 162 of 168; P < 1.0 × 10-6). Prior stroke, history of diabetes, hypertension, congestive heart failure, myocardial infarction, atrial fibrillation, and symptomatic carotid stenosis were not associated with a difference in outcome.

Conclusion: Patients in a rural hospital setting who were administered iv-tPA for acute ischemic stroke within 3 hours of onset experienced 90-day outcomes similar to those of historical controls. Reducing the number of in-hospital complications may result in improved patient outcomes. Prospectively obtaining 90-day outcomes for this group would allow for more inclusive analysis and improve validity of measurements.


Case: A 76-year-old female with no significant past medical history was transferred from an outside facility for weakness, abnormal urinalysis and anion gap metabolic acidosis. She endorsed a more than twenty pound weight
loss in the last few months. She also complained of left thigh and leg pain and diarrhea for the last 2 days. On examination, she was pale, tachycardic and tachypneic. Skin examination revealed extensive bruising, discoloration and blisters on both flanks, perineum, and left thigh with associated crepitus on auscultation and palpation. Initial investigations revealed white blood count of 6.2 g/dL, hemoglobin of 7.2 g/dL, MCV of 62, INR of 1.6, and creatinine of 1.6 mg/dL. CPK was over 13,000 IU/L and lactate was 9 mmol/L. Computed tomography scan en route to the operating room revealed extensive myofascial gas in the abdomen and thigh with a perforated cecal neoplasm. Blood and tissue cultures were ultimately positive for Clostridium septicum. Despite immediate aggressive operative and antimicrobial management she died within hours of presentation.

**Discussion:** Clostridial myonecrosis is a rare but life threatening infection that spreads rapidly. Clostridium species produce exotoxins which contribute to its virulence. Risk factors include diabetes mellitus, malnutrition, intravenous drug abuse and malignancy. Approximately 1000 cases have been reported in the United States. C. septicum is an uncommon pathogen representing about 1% of clostridial infections, but often causes spontaneous (non-traumatic) gas gangrene and is associated with colon malignancy. Hematologic seeding and metastasis to distant sites occurs, as seen in our patient. Treatment includes prompt recognition followed by aggressive supportive cares, penicillin and clindamycin antimicrobial therapy, and aggressive surgical debridement often requiring amputation. This case illustrates the association between colon malignancy and C. septicum infection, as well as the fulminant nature of the disease despite prompt aggressive antibiotic administration and surgical debridement.

38. Newberry SM, Schaper AM, Steffes DR. **Civilty in nursing education.** Presented at Nursing Research on the Green, Viterbo University, La Crosse, Wisconsin, April 25, 2013.

**Background:** Clark (2009) extends the definition of incivility to incorporate both the behaviors (rude and disruptive) and their effect, that is, psychological or physiological distress.

**Significance:** Academic incivility encompasses behaviors that disrupt or interfere with the teaching and learning environment (Clark & Springer, 2010). Incivility can progress from low risk behaviors, such as eye rolling to develop into threatening behaviors if left unaddressed. Incivility in nursing education is documented as a mild to moderate problem that increases with personal and environmental stressors.

**Purpose:** To determine the degree of Incivility in Nursing Education at this particular School of Nursing.

**Methods:** Undergraduate students and faculty at a Midwest university were asked to complete the Incivility in Higher Education scale.

**Results:** The majority of students and faculty identified disruptive student behavior as a mild problem, 56% and 54% respectively. Disruptive faculty behavior was perceived by students as no problem (41%) or a mild problem (45%). Faculty perceived disruptive faculty behaviors as mild (56%) or moderate problem (32%). Each term cohort reported unique contributors to student incivility. Term 2 students reported being treated unfairly, not respected. In response, students act out defensively and may be unaware of appropriate respectful behavior toward faculty. Term 3 students identified ineffective teaching style as a major contributor to uncivil behavior, reporting that faculty was “out of touch” requiring long hours of classroom work. Term 4 students reported feeling belittled and disrespected by both peers and faculty. Responses on how to create a culture of civility included increased awareness of uncivil and bullying behaviors, a committee and policy to address incivility, civility expectations to be shared in orientation and in classes, the inclusion of classes on de-stressing and coursework focused on teaching students “best practice” for handling conflicts.

**Clinical Implications:** Focused attention on creating a culture of civility needs to be a priority of every school of nursing as uncivil behaviors in nursing education may extend to incivility in the workplace.


**Introduction:** Although Sweet’s Syndrome (SS) and Pyoderma Gangrenosum (PG) are thought to be two distinct entities, they share many characteristics. Both are rare autoimmune complications of pro-inflammatory disorders that exhibit cutaneous and extracutaneous manifestations. We present a rare case of subcutaneous Sweet’s demonstrating how PG and SS represent a spectrum of similar disease rather than two distinct entities.

**Case Report:** A 20 year-old woman presented to an emergency room for new onset left breast swelling, warmth, erythema and a solitary maculopapular lesion. Subsequently she developed fevers and was treated with vancomycin and zosyn for mastitis. Despite antibiotics for 11 days, she continued to have fevers. A CT was done demonstrating small bowel edema, splenomegaly and mild gallbladder thickening. Lab studies revealed elevated transaminases, total bilirubin and alkaline phosphatase. Wound and blood cultures returned negative. Punch and core biopsies were done. On hospital day 8 she underwent laparoscopic cholecystectomy for presumed cholecystitis. She was discharged
home but returned 3 days later with worsening fevers, acute renal failure and significant purulent discharge from biopsy sites and lesion on her breast. Antibiotics were resumed and wound cultures were obtained. WBC, ESR, and CRP were elevated. Serologies for vasculitis, hepatitis, SLE, RA, HIV, Lyme’s and anti-phospholipid antibody syndrome were negative. Review of pathology revealed extensive necrotic tissue without microbial invasion. There was significant neutrophilic infiltration of the subcutaneous tissue with fat necrosis. The differential included PG and SS. A diagnosis of SS was made based on clinical findings and after significant debate. Corticosteroids were started with rapid improvement of her renal function, fevers and purulent discharge.

Discussion: Beyond being interesting for the rarity of the diagnosis, our case provides evidence that PG and SS are not distinct clinical entities. Both syndromes affect 3-10 persons per million per year, are typically, but not necessarily, caused by pro-inflammatory conditions, and can exhibit pathergy. Clinical findings for both are caused by massive neutrophilic infiltration of dermal tissue and respond to corticosteroids. Diagnostic criteria for both syndromes are very similar. Merging PG and SS could impact future studies of neutrophilic dermatoses by simplifying the classification criteria for inclusion and exclusion.


Background: The NIH established criteria that patients must satisfy before undergoing bariatric surgery. Many insurance companies have established their own criteria for approval or deny bariatric coverage altogether. Recent reports have indicated significantly more admissions for digestive-related diagnoses in bariatric surgical patients compared to a nonsurgical cohort, however; the nonsurgical cohort had higher admission rates for cardiovascular and respiratory-related conditions. Given the variability in the literature, our objective was to evaluate all-cause hospital admissions and charges among patients who were denied laparoscopic Roux-en-Y gastric bypass (LRYGB) for insurance reasons compared to those who underwent LRYGB.

Methods: After IRB approval, our electronic medical record system was queried for all-cause hospital admissions among patients who attended an initial visit for bariatric surgery from January 2000-December 2012, but were denied by insurance, and those who underwent LRYGB from September 2001-December 2012. Patients with <30 days of follow-up were excluded. Statistical analysis included Wilcoxon Rank Sum test.

Results: There were 1194 patients who underwent LRYGB and 225 patients who were denied. Mean follow-up was 4.4 and 5.9 years in the LRYGB and denials groups, respectively (P<0.001). There were 2924 admissions in 721 patients in the LRYGB group, and 685 admissions in 146 patients in the denials group over the follow-up period.

<table>
<thead>
<tr>
<th>Variable</th>
<th>LRYGB group</th>
<th>Denials group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex, female; n (%)</td>
<td>966 (80.9)</td>
<td>177 (78.7)</td>
<td>0.436</td>
</tr>
<tr>
<td>Mean Age, years</td>
<td>44.6</td>
<td>41.9</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Mean BMI, kg/m2</td>
<td>47.9</td>
<td>45.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>487 (40.8)</td>
<td>74 (32.9)</td>
<td>0.026</td>
</tr>
<tr>
<td>Type II diabetes mellitus, n (%)</td>
<td>417 (34.9)</td>
<td>47 (20.9)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Dyslipidemia, n (%)</td>
<td>365 (30.7)</td>
<td>60 (26.7)</td>
<td>0.241</td>
</tr>
<tr>
<td>Obstructive sleep apnea, n (%)</td>
<td>448 (37.5)</td>
<td>48 (21.3)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Mean no. admissions per patient</td>
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<td>4.7</td>
<td>0.020</td>
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<td>Median total charge amount for admissions, $</td>
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<td>3425.35</td>
<td>0.186</td>
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<tr>
<td>Median total charge amount per patient, $</td>
<td>6521.05</td>
<td>6855.54</td>
<td>0.640</td>
</tr>
</tbody>
</table>

Conclusions: Although more comorbidities were observed in the LRYGB group initially, the patients denied LRYGB had more hospital admissions over the follow-up period. The charges for admissions were similar between the two groups.


Background: Gastrointestinal stromal tumors (GISTs) are mesenchymal tumors that arise from the interstitial cells of Cajal, and occur throughout the stomach and the rest of the gastrointestinal tract. Tumors arising in the proximal stomach and gastroesophageal junction can pose a challenge to excise. We present 3 cases of proximal gastric GISTs that are removed laparoscopically with the assistance of upper endoscopy.
Case summary: The first patient is a 53-year-old male with a submucosal mass found in the posterior cardia. Endoscopic identification of the mass was necessary, and this mass was then resected through an anterior gastrostomy. The second patient presented with a GIST in the proximal body of the stomach. Due to the size and location of this mass, a laparoscopic hemigastrectomy was performed. The third patient is a 45-year-old male who had a GIST at the gastroesophageal junction. This was not amenable to wedge resection, and a laparoscopic transgastric, endoscopically assisted enucleation of the GIST was performed.

Conclusion: A variety of GISTs have been found at various locations in the stomach. Here we demonstrate three different techniques for removing proximal gastric GISTs. The combination of laparoscopy and upper endoscopy allows for safe and complete resection of these tumors.


Purpose: The level of scientific evidence underlying the American College of Chest Physicians (ACCP) guidelines has not been systematically investigated. This study describes the category of evidence for each recommendation under specific guidelines. The guidelines that have been evaluated include 1) Lung cancer, 2) Antithrombotic guidelines, and 3) Pulmonary rehabilitation guidelines.

Methods: The ACCP uses multiple formats to describe the strength of recommendation within their own system. We have evaluated guidelines which share the same evaluation technique. The guidelines evaluated have been described above. The ACCP definition of the level of evidence for each recommendation under a specific guideline is as follows: (1a)-Strong recommendation, high-quality evidence; (1b)-Strong recommendation, moderate-quality evidence; (1c)-Strong recommendation, low-quality or very low-quality evidence; (2a)-Weak recommendation, high-quality evidence; (2b)-Weak recommendation, moderate-quality evidence; (2c)-Weak recommendation, low-quality or very-low quality evidence.

Results: Of the 877 recommendations found in the 3 guidelines, Category 1A, 1B, 1C, 2A, 2B, and 2C were 7.9%, 25.2%, 15.2%, 0.1%, 10.7%, and 40.9%, respectively. A total of 603 recommendations were found in Antithrombotic guidelines, of which the majority (52.6%) of the were category 2C. In the subset of surgically related recommendations for antithrombosis (N=76), at least 70% were category 2C.

Majority of the recommendations in Lung cancer guidelines (N=254) were category 1C (42.5%), while category 1A recommendations were only 15%.

Only 20 recommendations were available for pulmonary rehabilitation, of which 35% were category 1A.

Conclusions: Of the ACCP recommendations evaluated in this study, it appears that the guidelines have been developed from lower levels of evidence (strong recommendation and low quality of evidence). Given the widespread clinical application and decision making in day-to-day practice, one has to be aware of the strength of evidence under each recommendation. It also underscores a need for further research to expand the evidence base in pulmonary medicine.


Purpose: With highly complex surgery requiring prolonged exposure to room air, foreign materials can provide a nidus for opportunistic infectious organisms to adhere, leading to delayed post-operative infections. Staphylococcus lugdunensis is one such organism. Achilles tendon ruptures represent such surgical interventions where the use of soft tissue augmentation and suture material is frequently employed, leaving the patient at risk for infection. Staphylococcus lugdunensis is a gram positive, coagulase-negative facultative anaerobic organism that forms a biofilm which allows it to adhere to foreign materials resulting in latent infection. Staphylococcus lugdunensis infection following Achilles tendon repair has not been previously reported.

Case study: We present a 42-year-old man who underwent acute open end-to-end primary repair of his ruptured Achilles tendon augmented with a Lindholm-type turn-down flap. Immediate post-operative healing was unremarkable. At greater than three years post-repair he presented to our department for evaluation of a “bulge” near his repair site which expressed caseous drainage multiple times daily. Clinical evaluation revealed a 2-mm x 2-mm ulceration overlying the medial aspect of the Achilles tendon 2-cm proximal to the insertion. No cardinal signs of an acute infectious process were identified. Radiographs demonstrated increased density within the pre-Achilles fat pad and Achilles tendon. Magnetic resonance imaging (MRI) revealed a large mass to the medial aspect of the Achilles tendon repair tracking through the tendon. The Achilles tendon itself remained intact with normal signal.
Results: The patient underwent excision of the ulceration and underlying mass with debridement of all infected tissues and involved suture. Intraoperative cultures revealed *Staphylococcus lugdunensis* that was susceptible to all drugs tested and histopathologic evaluation identified fibrous soft tissue with cutaneous sinus tract and associated inflammatory tissue. The patient was placed on a short course of an oral first generation cephalosporin per Infectious Disease recommendation. He had an uneventful recovery with complete incisional healing and maintenance of his Achilles tendon repair.

Discussion: As demonstrated in this case report, *Staphylococcus lugdunensis* represents a rare but concerning opportunistic bacteria that can cause delayed, occult post-operative infection. Despite being rare, this should be treated, as with all infections, with aggressive debridement and wide resection of all involved tissues and foreign material.


Total ankle replacement initially came into favor in the 1970s as an alternate to ankle arthrodesis for treatment of advanced ankle arthritis. First generation implants resulted in an unacceptably high incidence of failure frequently requiring attempted revision. Current generation implants, compared to those available decades ago, demonstrate promise focusing on normal ankle joint anatomy and function with greatly improved materials and surgical technique. Mobile bearing technology allows for increased implant conformity with restriction of implant constraint that theoretically reduces wear and loosening. Nevertheless even with advancements in technology and implant engineering, incidence of implant failure remains a problem still requiring attempted revision. Debate has existed and published reports vary greatly concerning the incidence of failure and revision of the Scandinavian total ankle replacement system (STAR). Accordingly, we undertook a systematic review to identify the revision rate of the STAR. A total of 20 reports with a pooled 2,507 STAR ankles met inclusion criteria. The incidence of revision was 10.7% for the entire cohort at weighted mean follow-up of 64 months. Data exclusive of the inventor and current manufacturer faculty or disclosed consultants identified a 13.1% revision rate. Meanwhile, data from national joint arthroplasty registries revealed a revision rate of 18.2%. The most frequent etiology of failure was aseptic loosening. Further appropriately weighted cohort studies with comparison groups, prospective studies and continued evaluation using national joint arthroplasty registries are warranted; in addition to direct comparison of the STAR system to other commonly used contemporary total ankle replacement systems.


Purpose: Failure of total ankle replacement requiring revision is a known complication. Ultimate revision options include component exchange, customized component exchange, conversion to an alternate total ankle replacement, ankle arthrodesis and amputation. The use of customized components is beneficial in severe cases because it allows for simultaneous correction of significant malalignment and bone loss. We present a case of a failed “Alvine Total Ankle Prosthesis” revised with custom stemmed tibia and talar components with adjunctive lateral ankle stabilization for associated unstable varus ankle deformity. Currently, limited published data is available regarding the use of custom stemmed tibia and talar components for revision total ankle replacement.

Case Study: A 69-year-old man underwent primary total ankle replacement using an “Alvine Total Ankle Prosthesis” in 1998, secondary to post-traumatic arthrosis. Ultimately, failure of the initial implant occurred with subsidence of both metallic components and varus angulation of the talar component resulting in gross lateral ankle instability. Various treatment options were reviewed including functional bracing, customized component exchange, conversion to an alternate total ankle replacement or tibio-talo-calcaneal arthrodesis.

Results: The patient failed functional bracing, was determined to not be a candidate for conversion to an alternate total ankle replacement and refused tibio-talo-calcaneal arthrodesis. Thus, we determined that custom stemmed tibia and talar components with modified Evans lateral ankle stabilization was most appropriate. A specific CT scan imaging sequence of the entire hindfoot and ankle to determine the necessary height augmentation, sizing and angulation of custom components was performed. An anterior cortical window was created in the distal tibia, the stemmed tibia component was cemented in situ and the anterior cortical window was replaced being secured with a plate and screws that were also used to stabilize the Evans tendon transfer. The custom stemmed talar component was then cemented in situ with a +1 polyethylene insert to provide ligament tensioning.

Discussion: The patient experienced an uneventful post-operative course. At 16-months follow-up, the patient has a well-aligned, pain free ankle with acceptable range of motion and stability. Given the limited published data on custom stemmed tibia and talar components for revision total ankle replacement, annual surveillance will be
undertaken to closely monitor the durability of this approach.


**Introduction:** Long-term survivors in multiple myeloma (MM), described as those surviving >10 years since their diagnosis, are uncommon. There is paucity of data describing this subgroup of patients and how they differ clinically from the rest.

**Methods:** Patients with MM diagnosed from 1998 to 2000 were identified in the National Cancer Data Base (NCDB). We obtained data associated with socio-demographics, type and location of care facility, as well as the use high dose chemotherapy/autologous stem cell transplant (ASCT) as initial treatment option. Four cohorts were created based on overall survival (OS): subgroup 1 (OS: < median); subgroup 2 (OS: median to 2X-median), subgroup 3 (OS: 2X-median to <10 years) and subgroup 4 (OS: >10 years).

**Results:** There were 27,987 MM patients. The median OS for the whole group was 26.7 months. Among them, 2,196 (7.9%) were long-term survivors. Subgroups 1, 2, and 3 comprised 54.8%, 19.0%, and 18.3% of the remaining patients, respectively. Majority were males (54.3%) with a mean age at diagnosis of 67.2 years (range, 19-90). Compared to the other subgroups (1/2/3), the long-term survivor subgroup had a significantly higher proportion of patients with high educational level (37.8% vs 28.4%/31.6%/33.9%; \( P < 0.001 \)), high annual household income (41.5% vs 31.0%/34.2%/36.4%; \( P < 0.001 \)), residence in a metro area (79.2% vs. 77.8%/78.7%/78.3%); \( P=0.003 \), initial treatment at an academic center (46.6% vs 28.1%/34.6%/39.0%; \( P < 0.001 \)), and had ASCT as part of initial therapy (16.5% vs 2.5%/6.4%/10.9%; \( P < 0.001 \)). Multivariable analyses showed that younger age, non-Black race, lower educational level, non-Medicare/Medicaid primary payor, treatment at academic centers, and receipt of ASCT as part of initial treatment were significant independent predictors of survival > 10 years. In contrast, sex, ethnicity, type or geographic location of residence, and median annual household income were not significant.

**Conclusions:** In the US, approximately 1 in 13 MM patients diagnosed in 1998-2000 are long-term survivors. There are disparities in long-term outcomes according to socio-demographic characteristics, type of treatment facility, and receipt of ASCT as part of initial therapy.


60. Roukis TS. **So many implants for hallux rigidus: Do they all work?** Presented at Texas State Podiatric Medical Association Annual Conference, Horseshoe Bay, Texas, June 27-30, 2013.

61. Roukis TS. **When amputation is not a failure: It's all about pressure-altered biomechanics and how to fix it.** Presented at American College of Foot and Ankle Surgeons 71st Annual Scientific Conference, Las Vegas, Nevada, February 11-14, 2013.


64. Roukis TS. **Complication associated with total ankle replacement.** Presented at American College of Foot and Ankle Surgeons Total Ankle Arthroplasty Surgical Skills Course, Henderson, Nevada, October 11-12, 2013.

65. Roukis TS. **INBONE total ankle replacement prosthesis systems.** Presented at American College of Foot and Ankle Surgeons Total Ankle Arthroplasty Surgical Skills Course, Henderson, Nevada, October 11-12, 2013.


**Background:** Endovascular abdominal aortic aneurysm repair (EVAR) has become the standard approach for repair of suitable abdominal aortic aneurysms (AAA). Our objective was to review the outcomes and postoperative surveillance technique in uncomplicated EVAR at our community teaching hospital.

**Methods:** A retrospective review of AAA criteria, complications, and imaging surveillance was conducted for patients who underwent EVAR from 2004-2012 with ≥1 postoperative imaging study. DUS was the primary imaging modality after uncomplicated EVAR, with computed tomographic angiography (CTA) reserved for patients with suspicious findings such as a new endoleak or increase in sac size.

**Results:** One hundred ninety-seven patients underwent EVAR during the study period; 13 did not have follow-up imaging. Mean follow-up was 3.7 years for the 184 patients who met inclusion criteria. Mean age was 74.8 years and 86% were male. Mean AAA size was 5.9 cm. There were no 30-day mortalities. Postoperative complications included graft limb occlusion in 10 (5%) and bleeding requiring transfusion in 19 (10%) patients. There were no patients with graft infections or colon ischemia. Thirty-five endoleaks (7 type I, 27 type II, and 1 type IV) were detected in 32 patients. Nineteen (54%) endoleaks were identified on DUS alone and because the aneurysm sac was stable or smaller, CTA was not obtained. None of these patients suffered subsequent undetected endoleak or rupture. Fifteen (43%) endoleaks were identified initially on DUS and confirmed by CTA, and 4 of these patients had secondary interventions. One (3%) endoleak was identified on CT only. There was one false positive and three false negative endoleaks on DUS. One patient with a false negative result had an endoleak identified on subsequent CTA and underwent coil embolization. The other two patients’ follow-up deviated from our protocol due to severe co-morbidities including renal disease, and therefore, CTA was not obtained. One of these patients presented with rupture and death. Postoperative surveillance was completed by DUS alone without CTA in 125 (68%) patients.

**Conclusions:** EVAR has become the standard of care for eligible infrarenal AAA repair at our institution. In our experience we have maintained a low complication rate and demonstrated that DUS was safe and effective for initial and follow-up surveillance after uncomplicated EVAR.


Civility and conflict in the workplace have implications for healthy work environments and the retention of nurses. Nurses, aged 55 and older, were invited to participate in a celebration of experienced nurses as seasoned Wisdom Workers (SWW) (Jeste et al., 2010). SWW identified generational differences among the current challenges they
face in sharing their wisdom with new nurses (NNs). Similarly, NN residents identified generational differences as challenging and leading to conflict in the workplace. To explore ways in which SWWs and NNs could foster wisdom development, SWWs were invited to join a celebration honoring NNs’ completion of the residency program.

SWWs and NNs, meeting as separate cohorts, reflected on the most satisfying and challenging aspects of working with the other generation. NNs perceived SWWs as excellent clinical resources. NNs highlighted “parenting” qualities of the SWW including building their self-esteem, protecting them, offering support and demonstrating patience. From the SWW perspective, NN were valued for their enthusiasm and energy. NNs were seen as risk-takers, open to new ideas, viewing failure as a learning opportunity and being masters of technology. However, NNs perceived the SWWs’ resistance to change, including the use of new technology, as frustrating. NNs voiced concern that some of the seasoned nurses were “burned out”. SWWs viewed the NNs preferred communication style of texting compared to face-to-face communication as a challenging difference. SWWs questioned the multi-tasking abilities of NNs and the generational differences in work-life balance priorities. Each generational cohort identified questions that needed to be answered to define the future of collaborative nursing practice. In small group work, SWWs and NNs together created personal definitions of nursing that they would take forward in their careers. Both generations appreciated the time spent together in open dialogue, an imperative for conflict competence and creating a culture of civility.


Description/Overview: In 2010 the American Nurses Association’s Conflict Engagement Program was implemented for informal nurse leaders in a Midwest community medical center. Incivility was identified as a major factor leading to destructive conflict. Examples of nurse-to-nurse incivility were shared along with unexpected examples of uncivil behaviors by nursing staff toward faculty and students, and nursing faculty and student incivility toward staff. Lessons learned from that program led to a multi-faceted approach to create and sustain a culture of civility in nursing education and practice. A previously established collaborative relationship with a local school of nursing allowed for the conduct of a research project to assess incivility in nursing education experienced by undergraduate students and faculty. Examples of incivility in nursing education were used in a modified Conflict Engagement Program for new nurse residents. The modified residency program included a four-hour workshop and one-hour monthly meetings. Monthly meetings were held to increase the new nurses’ awareness of incivility in the workplace, designate time for reflection and sharing of experiences with incivility, and support skill development to address incivility using constructive conflict engagement strategies. Nurse residents identified generational differences as contributing to conflict in both academia and practice. To foster perspective taking, which is a core strategy in constructive conflict engagement, an opportunity for open dialogue on generational conflict was created for the nurse residents and seasoned, nurse wisdom workers. The most satisfying and challenging aspects of working with the other generation were identified. Each generational cohort identified questions that would define the future of intradisciplinary, collaborative practice. Small intergenerational workgroups created personal definitions of nursing to guide their future practice. Segments of the intergenerational dialogue will be shared to open audience discussion of questions that need to be answered to create healing work environments for all generations of nurses.

Learner Objective #1: define incivility as experienced by nursing students, new nurse residents and nurse wisdom workers

Learner Objective #2: list three key venues for supporting a culture of civility to engage nursing students, nurse residents and nurse wisdom workers

71. Schaper AM, Spies Ingersoll SS, Steffes DR. The science of music as medicine. Presented at Nursing Research on the Green, Viterbo University, La Crosse, Wisconsin, April 25, 2013.

Background: The use of caring, healing modalities, such as music, enhances the delivery of patient-centered care.

Significance: There is a strong literature base supporting the use of music therapy to enhance good patient outcomes, but research on the effectiveness of listening to music is mixed.

Purpose: Develop clinical implications for the use of music listening as a caring, healing modality.

Methods: Integrative review of the literature conducted.

Results: Music may not be a healing modality for everyone. For patients who are interested in music, strategies to enhance the effectiveness of music listening include: goal identity linked to music selection, uninterrupted listening time, multiple listening sessions, and music in combination with other healing modalities.

Clinical Implications: During the nurse-patient interaction, the nurse can engage the patient in identifying their music listening goals (desired outcomes) and create a specific plan for music listening sessions within the context
of their care environment.


Objective: We sought to measure the prevalence of illicit drug use in our obstetric population, to identify the drugs being used, and to determine whether a modified version of the 4Ps Plus screening tool could serve as an initial screen.

Study Design: In this prospective study, urine samples of 200 unselected patients presenting for initiation of prenatal care in a Wisconsin private practice were analyzed for evidence of the use of illicit drugs.

Results: Of 200 patients, 26 (13%) had evidence of drugs of abuse in their urine samples. Marijuana (7%) and opioids (6.5%) were the most commonly identified drugs. Adding 5 questions about drug or alcohol use to the obstetric intake questionnaire proved sensitive in identifying patients with high risks of having a positive drug screen.

Conclusion: The rate of drug use in our low-risk population was higher than expected and may reflect increasing rates of drug use across the United States. Enhanced screening should be performed to identify patients using illicit drugs in pregnancy to improve their care. Medical centers and communities may benefit from periodic testing of their community prevalence rates to aid in appropriate care planning.


Purpose: Trauma to the ankle may result in the development of soft tissue impingement. This can produce significant pain and is not always recognized by advanced imaging modalities. In rare instances, the soft tissue impingement can be extensive, forming a “web” across the anterior ankle recess. Arthroscopy of the ankle is not only valuable in the treatment of this uncommon malady, but also provides a dependable diagnostic approach to an otherwise evasive finding.

Literature Review: We present a case of an arthroscopic diagnosis and debridement of post-traumatic webbing of the anterior ankle recess. While this finding was first described in the literature in 1984, there is limited published data available regarding the identification and treatment rendered solely via arthroscopy.

Case Study: A 36-year-old man sustained a work-related inversion ankle injury two years prior to our clinical assessment. Despite extensive conservative modalities and multiple advanced imaging studies, the patient continued to have chronic pain of unknown etiology. He was then referred to our department for arthroscopic evaluation.

Results: The patient underwent arthroscopic synovectomy and debridement of the left anterior ankle recess. A web of soft tissue extending from the medial malleolus to the lateral malleolus was identified. Under dynamic flexion and extension, this web directly impinged within the anterior ankle recess. Following complete resection, the impingement was relieved. Histopathologic analysis demonstrated dense fibrous tissue containing cartilage and bone with reactive and degenerative changes.

Discussion: The patient had an uneventful recovery and returned to his pre-injury functional status and unrestricted employment. At most recent follow-up, he continued with resolution of his chronic pain, however long-term follow-up is necessary to determine procedural longevity.

74. Smith Houskamp E. A case study investigating the development, implementation, and perceptions of transformational leadership practices of the Clinical Nurse Leader. Presented at Nursing Research on the Green, Viterbo University, La Crosse, Wisconsin, April 25, 2013.

Background: The hospital setting is a complicated, challenging, and complex environment in which to deliver high-quality, lower-cost care. It is particularly vulnerable to what is often termed “care fragmentation.” The Clinical Nurse Leader (CNL), the first new nursing role advanced nationally in decades, is an innovative strategy uniquely positioned to address teamwork and strengthen leadership at the bedside to improve patient outcomes for a reduced cost at the microsystem level. The CNL is less than five years old and limited research has been conducted, particularly around the development, implementation, and perceived transformational leadership aspects of the role. Consequently, to address the research gap, this study investigated the above aspects on five inpatient units.

Methods: Case study utilizing mixed methodology

Results: Generally, licensed personnel and those with higher education perceived the CNL leadership practices statistically higher. Shift (days, evenings, nights), hours (8 or 12), or amount of overtime staff worked did not
appear to impact perceptions of CNLs’ leadership practices.


**Background:** Gundersen Luther Health System (GL) Interdisciplinary Patient Care Committee (IPCC) (2010)---Committee supported an interprofessional project Interprofessional Education Collaborative (IPEC) (2011)---Educate practitioners, scholars, and researchers to work together and with patients for relationship-centered health care World Health Organization (WHO) (2010)---Interprofessional education (IPE) is necessary to prepare a “collaborative practice-ready” health workforce better able to respond to local health needs.

**Significance:** Interprofessional education and collaboration has numerous benefits to nursing and others. -Institute of Medicine (IOM) Future of Nursing Report (2011) #2 and #8 indicates the need for the nurse to lead and expand collaborative improvements and collect and do analysis of interprofessional healthcare workforce data. -WHO (2010) believes in the team based approach to health care and that when 2 or more professions work together it can improve health outcomes.

**Purpose:** Evaluate the Educational Program- •A satisfactory learning experience •Development of core competencies in interprofessional practice •Understanding the key concepts of Patient and Family Centered Care, Health Literacy, Cultural Awareness, Communication/Conflict, Collaboration •Knowledge transfer (3-month follow up)

**Methods:** Program Evaluation Research -IRB Approval -Sample population: Purposeful Convenience sample -Data collection: Post Program Survey via Qualtrics 3-month follow up survey -Instruments: Demographics Questionnaire W(e)Learn Interprofessional Program Assessment W(e)Learn Interprofessional Collaborative Competencies Attainment Survey -Data analysis: Descriptive Statistics Paired t-test Content Analysis.

**Results:** A seven point scale was used to rate the learners satisfaction with the program. Overall participants were satisfied with the program. With the exception of opportunities to practice, respondents moderately to strongly agreed program assessment measures were met. The assessment evaluated the participants’ core competencies of interprofessional practice. There were strongly significant increases in competencies domains of communication, collaboration, roles & responsibilities, patient centered care, and conflict management. Even though, they were all rated extremely high, it is interesting to note, collaboration was rated the highest and communication was rated the lowest when strong communication skills are necessary for effective collaboration.

**Clinical Implications:**
- Participants represented diverse professions to support learning from and with each other
- Qualitative data demonstrated increased awareness of overt and subtle behaviors of non-ideal care
- With the exception of lack of an opportunity to practice interprofessional competencies, participants indicated high satisfaction with the program
- Self-rated core competencies significantly improved after viewing video simulations and participating in small group discussions
- This project set the stage for ongoing continuous coordinated collaborative care at Gundersen Lutheran.


**Introduction:** We report a case in which clear cell renal cell carcinoma (RCC) invaded the left atrium via the right pulmonary vein and was treated non-surgically with temsirolimus.

**Case History:** A 56-year-old woman came to our clinic in March 2009 with gross hematuria and left flank pain. Computed tomographic (CT) scan showed a 9 × 7 × 6.5 cm mass arising from the left kidney. Patient underwent an open radical nephrectomy and pathology reports confirmed a unifocal, grade 4 clear cell RCC contained within the renal capsule. The patient had a stable course until August 2010 when a chest CT scan showed a left upper lobe mass and a right lower lobe nodular density biopsy of which showed a metastatic clear cell RCC strongly positive for CD10 marker. Patient was given seven cycles of sunitinib followed by a left upper lobectomy. Patient had a stable course until July 2012 when she complained of worsening shortness of breath. A chest CT scan showed right hilar lymphadenopathy with invasion of the right inferior pulmonary vein and lobulated tumor thrombus in the left atrium. Patient was started on weekly Temsirolimus and continued for 14 weeks. A follow up CT scan showed partial regression of the intrathoracic disease with dramatic improvement in dyspnea.

**Discussion:** Most cases of cardiac metastasis from RCC involve the vena cava or right atrium. Left heart metastases are relatively uncommon, and involvement of the pulmonary vein is an extremely rare and challenging scenario, with only four cases reported to date. Surgical resection is the preferred modality of treatment and all of the four reported
cases with pulmonary vein/left atrial metastases were treated with resection of the left atrial mass accompanied by pneumonectomy. Our cardiothoracic surgeons deemed our patient’s disease inoperable and radiation therapy was avoided due to risk of catastrophic pulmonary vein rupture and known resistance to radiation therapy. Therefore, we opted for a conservative mammalian target of rapamycin (mTOR) inhibitor therapy (temsirolimus). To our knowledge, this is the first reported instance of using temsirolimus for left atrial/pulmonary vein metastases due to any cause.

Conclusion: Inoperable cardiac and pulmonary venous metastases can be treated with temsirolimus with satisfactory results.


Background: Ventral hernias in high-risk situations remain a formidable problem despite great advances in the materials and techniques used for repair. Although there are multiple products and placement options, placement of prosthetic mesh into the retrorectus space (Rives-Stoppa type sublay repair) offers multiple benefits: proximity to vascular supply of rectus muscle to clear potential mesh infections and separation of mesh and bowel, providing a sturdy matrix for permanent ingrowth. Previous reports in high-risk situations have cited acceptable wound infection, hernia recurrence, and operative mortality rates in challenging patients. Our goal was to evaluate our early experience with retrorectus placement of prosthetic mesh in high-risk situations.

Methods: A single center retrospective review of all ventral hernia repairs from January 2012-May 2013 was performed. Hernias repaired with retrorectus placement of prosthetic mesh were included in the analysis.

Results: One hundred sixty ventral hernia repairs were completed over the study period; 14 involved placement of prosthetic mesh in the retrorectus space. Among these 14 patients, 57% were women, mean age was 60.4 years, and mean body mass index was 32.4 kg/m2 (range 20.2-41.6 kg/m2). Four (29%) patients were current smokers and 5 (36%) had a history of tobacco use. Four (29%) patients had renal disease and 9 (64%) were ASA class 3. Two patients were on immunosuppressive medications perioperatively. Previous ventral hernia repairs were attempted in 4 (29%) patients. Wound class was 1 in 10 (71%) patients, 2 in 3 (21%) patients, and 3 in 1 (7%) patient. Mean fascial defect was 7.8 cm, (range 3.5-13.5cm) and mean loss of domain was 9.5% (range 0.2-32.0%). Three hernia repairs involved parastomal hernias. Mean follow-up duration was 8.1 months. Two patients (14%) experienced hernia recurrence (1 midline and 1 parastomal recurrence). Postoperative complications included wound infection (n=1), wound necrosis (n=1), and mesh-associated abscess (n=1). All mesh infections were cleared without removal of prosthetic mesh or development of fistulas. Mean length of hospital stay was 4.5 days. Mortality was nil.

Conclusion: Our experience after 17 months shows retrorectus placement of prosthetic mesh does provide a durable hernia repair in complex patients. Patient comorbidities combined with the large field dissection required to complete this repair resulted in higher postoperative wound complications, yet all cleared without mesh explant or ongoing issues.


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