

# Proceedings from the Wisconsin Research and Education Network's 2007 Research Forum

## INTRODUCTION

The Wisconsin Research and Education Network (WREN) held its 2007 Research Forum November 1-2, 2007 in the Wisconsin Dells. During the Forum, the abstracts below were presented, representing current research relating to primary care. The Forum was held to facilitate interaction between primary care researchers of all levels in Wisconsin.

A sixth abstract, titled "Women's Knowledge of Commonly Used Contraceptive Methods," was also presented at the forum by author Sarah Hoffmann. The full manuscript was submitted to the *Journal*, and is published in its entirety on page 327.

## Evaluations of the Diagnosis and Treatment of Pneumonia in Outpatient Primary Care Practices

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**Context:** Many articles discuss the importance of ordering a chest X-ray to diagnose pneumonia based on prediction rules of signs and symptoms. It is unclear which signs and symptoms primary care clinicians use to diagnose pneumonia or prompt X-ray in comparison to bronchitis and upper respiratory infections (URIs).

**Methods:** Six hundred and four patients aged 18-80, diagnosed with pneumonia (n=200), acute bronchitis (205), or URIs (199).

**Results:** Race, gender, and chronic obstructive pulmonary disease were significant predictors of pneumonia in both univariate and multivariate analysis. Multiple signs and symptoms were significant individually. A

stepwise regression identified rales/rhonchi, temp >100°F, heart rate, rhinorrhea, cough, and chest pain to best explain the variation in the diagnosis of pneumonia compared to bronchitis and URI ( $R^2=44.11$ ). Thirty-five percent (n=59/175) of patients diagnosed with pneumonia had a negative chest X-ray. Rales/rhonchi, dyspnea, rhinorrhea, chills, chest pain, and temp >100°F best predicted ordering a chest X-ray ( $R^2=38.22$ ). The same variables remained significant as independent predictors of ordering a chest X-ray in binary logistic regression except chills and respiratory rate. Rales/rhonchi ( $P=0.000$ ), heart rate ( $P=0.009$ ), and dyspnea ( $P=0.003$ ) were significant predictors for prescribing antibiotics. These variables remained significant when removing patients with concurrent sinusitis ( $P\leq 0.004$ ). A significant number of bronchitis patients (95%) received antibiotics; removing those with sinusitis, 93% were still prescribed antibiotics. Overall, the most highly predictive symptoms of clinical diagnosis of pneumonia were rales/rhonchi or decreased breath sounds ( $P=0.000$ ).

**Conclusions:** No constellation of signs and symptoms was highly predictive of the clinical diagnosis of pneumonia, use of X-ray, or prescription of antibiotics compared to bronchitis and URI. Symptoms of rales/rhonchi or decreased breath sounds are the best predictors of pneumonia diagnosis.

## Geographic Distribution of Human Blastomycosis by Season in Northern Wisconsin

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**Background:** Blastomycosis is a potentially fatal systemic and cutaneous fungal infection that is contracted by inhalation of spores from an incompletely defined ecological niche. Previous studies have not conclusively demonstrated seasonality for blastomycosis. Seasonality might suggest certain environmental factors.

**Methods:** A retrospective analysis was performed to determine if there is a non-random distribution of blastomycosis, generally and geographically by season, and over time in a highly endemic area. Street addresses and demographic data from a registry of human cases in or near Vilas County, Wis from 1979 to 2006 were geocoded with Map Marker Plus and mapped using Arc-GIS. Controls were 200

randomly selected households from 2001 county tax records. A chi-squared test was used for categorical data, and Mood's Median Test was performed on the geographic distribution data. An individual/moving range control chart was constructed for county cases 1984-2006.

**Results:** The distribution of cases by season of symptom onset, winter (n=47), spring (n=42), summer (n=45), and fall (n=40), was not statistically significant ( $P=0.89$ ). The geographic distribution of cases was similar regardless of season or time period. Overall geographic distribution by season in Vilas County regarding proximity to waterways did not differ ( $P=0.338$ ): winter (n=40, median=172 m), spring (n=39, 247 m), summer (n=41, 138 m), and fall (n=38, 184 m); however summer cases were closer to water than spring cases ( $P=0.044$ ). Three time periods exceeded both control chart upper process/control limits in the past 23 years without change in average moving range.

**Conclusions:** The geographic distribution of blastomycosis cases has remained consistent over time and season, perhaps representing important relatively fixed environmental factors.

### **Mindfulness Meditation for Alcohol Relapse Prevention: A Feasibility Pilot Study**

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**Context:** Relapse prevention in alcohol dependence remains a challenge. Meditation is a promising but not well-studied treatment for alcohol dependence. This study evaluated methods feasibility and gathered pilot data on efficacy of meditation for alcohol relapse prevention.

**Methods:** A 16-week prospective case series in an intensive outpatient addiction treatment was conducted. Study participants were alcohol-dependent adults who attended 8-week meditation course (2-hour weekly sessions) and at-home meditation (30 minutes/day, 6 days/week), adjacent to "standard of care" therapy. Of 19 enrolled subjects, 15 completed the study.

**Results:** The average age of the participants (53% female) was 38.4 years old (standard deviation [SD] 8.6 years). At enrollment, they were abstinent for 30.9 (SD 22.2) days. Those who completed the study attended 82% of meditation course sessions. During the study, they were abstinent on 94.5% (SD 7.4) of days, with 47% reporting complete abstinence and 47% reporting  $\geq 1$  heavy drinking day. Subjects meditated on average 4.6 (SD 1.1) days/week; their severity of depression, anxiety, and stress—documented relapse triggers—decreased ( $P<0.01$ ). Craving severity showed a tendency to improve ( $P=0.08$ ), and degree of mindfulness increased ( $P<0.01$ ). On a Likert scale (10="very important/likely"), subjects rated the meditation course as very important in general (8.7, SD 1.8), useful as a relapse prevention tool (8.5, SD 2.1), and reported that they were very likely to continue meditation practice (9.0, SD 1.5). In qualitative responses, they listed "gaining skills to reduce stress," "coping with craving," and "good group support" as the most valuable aspects of the meditation training. At baseline, salivary cortisol and serum interleukin-6 (IL-6) concentrations were higher than normative values. At 16 weeks, IL-6 level decreased (n=12,  $P=0.05$ ); changes in cortisol level (n=11) were not significant. There have been no adverse events or side effects.

**Conclusions:** Results suggest study methods feasibility and the possibility of efficacy of meditation as an adjunctive therapy for relapse prevention in alcohol dependence.

### **Practitioner Empathy and the Duration of the Common Cold (The PEP Study)**

David P. Rakel, MD, Theresa J. Hoelt, PhD, Bruce P. Barrett, MD, PhD, Betty A. Chewning, PhD, Benjamin M. Craig, PhD, Min Niu; University of Wisconsin-Madison, Madison, Wis

**Objective:** This study assesses the relationship of empathy in the medical consultation to subsequent cold outcomes.

**Methods:** The study included 351 subjects  $\geq 12$  years of age from southern Wisconsin who received either a standard physician visit or an enhanced patient-oriented visit as part of an ongoing randomized controlled trial. The patient-scored Consultation and Relational Empathy (CARE) scale questionnaire assesses several aspects of the doctor-patient interaction with a focus on measuring empathy. CARE scores range from 0 to 50, with 50 being a perfect score. Area-under-the-curve (AUC) cold severity is assessed from twice daily symptom reports using the Wisconsin Upper Respiratory Symptom Survey (WURSS-21) and cold duration is monitored. The cytokine IL-8 was also monitored at study intake and approximately 48 hours later.

**Results:** Eighty-four individuals reported perfect CARE scores. These individuals differed in some demographics, tending to be older and have less education, but reported similar health status, quality of life, and levels of optimism. Cold duration was shorter in the perfect score group (mean 7.05 days versus 7.99 days,  $P=0.026$ ) and the mean WURSS-21 AUC measure was lower among those with a perfect CARE score (mean AUC 237.7 versus 284.6,  $P=0.095$ ). After accounting for possible demographic and perceived stress differences, cold severity and duration were still milder in those reporting a perfect CARE score ( $P<0.05$ ). A perfect score also appears to

correlate with a higher IL-8 level 48 hours after initial consultation.

**Conclusions:** Patients who gave the clinician a perfect CARE score subsequently had milder and shorter colds. These differences remained after accounting for age, gender, race, education, optimism, perceived stress, and time from first symptom to enrollment.

### **Sufficiently Important Difference for the Common Cold**

*Bruce Barrett, MD, PhD; University of Wisconsin School of Medicine and Population Health, Department of Family Medicine, Madison, Wis*

**Context:** Sufficiently important difference (SID) has been defined as "the smallest amount of patient-valued benefit that an intervention would require in order to justify associated costs, risks, and other harms." This study aims to estimate SID for common cold, both in terms of reduction


in length of illness (duration SID), and in terms of reduction of overall global severity (severity SID).

**Methods:** Benefit harm trade-off (BHTO) interviews assessed duration SID among 311 people with common cold, using scenarios based on evidence regarding vitamin C, echinacea, zinc, and pleconaril (an unlicensed antiviral). A second cohort of 253 people with colds participated in BHTO interviews eliciting severity SID.

**Results:** Overall mean duration SID was reduced 52.6 hours in a 7-day cold. Duration SID was 26.1 hours for vitamin C, 36.8 hours for echinacea, 64.8 hours for zinc, and 82.6 hours for the antiviral. Similar patterns emerged for severity SID, where on average respondents wanted a 25% overall severity reduction for vitamin C, 32% for echinacea, 47% for zinc, and 57% for the antiviral. While treatment type and potential side effects did influence response patterns, other factors such

as age, gender, education, income, and severity of illness at time of interview did not. These group averages tell only part of the story, however, as variability among persons was very high, with tri-modal response patterns evident in both studies. Some people would take treatments with benefits at or near 0, and some would not want the treatment even when benefits were large. However, the majority did indicate a SID benefit threshold, below which they deemed benefits too small to justify costs, possible side effects, or inconvenience. Distribution of threshold SIDs across samples resembled a normal curve.

**Conclusions:** People want duration benefits of 26-65 hours reduction in illness duration, or severity benefits in the range 25%-47% reduction in overall severity, in order to justify costs and risks of existing cold treatments. Prescription antiviral cold treatments would require larger benefits.



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