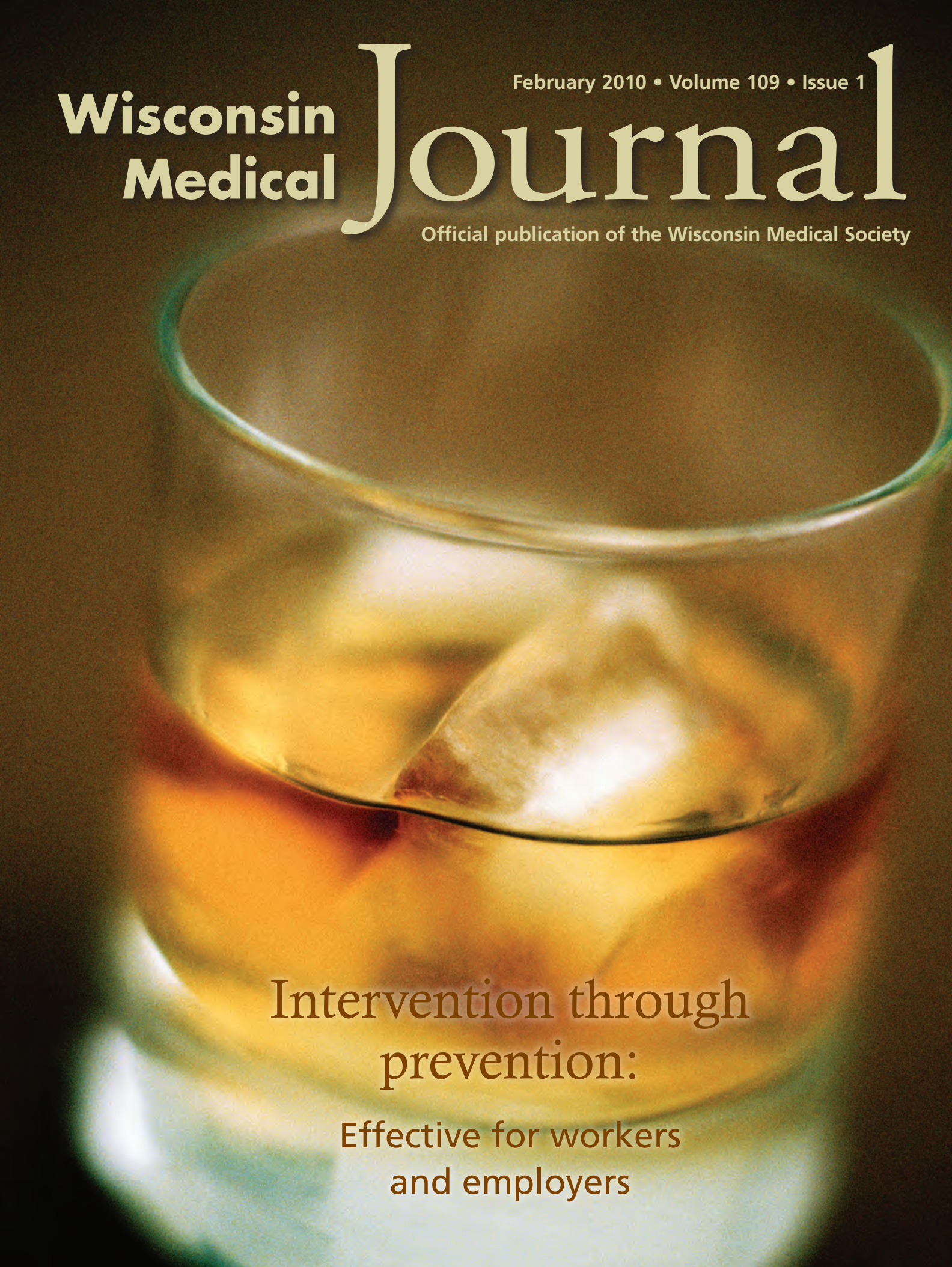
February 2010 • Volume 109 • Issue 1

Wisconsin Medical Journal

Official publication of the Wisconsin Medical Society



Intervention through prevention:

Effective for workers and employers

Wisconsin Medical Society
Insurance & Financial Services, Inc.

SOCIETY INSURANCE
Uncommon Insurance®

IS YOUR DATA PROTECTED?

Healthworks® from Society Insurance®, a comprehensive property and casualty insurance package specifically designed for the needs of the medical community, now offers Security Breach Services™ through Identity Theft 911®. This new service could save you a lot of money and your reputation in the event that sensitive patient and /or employee information is compromised.

Security Breach Services delivers a multifaceted solution for an information security breach incident that exposes any personally identifiable information from your clinic's patients and /or employees. Designed by the nation's leader in identity management and fraud education, Security Breach Services offers a comprehensive solution that enhances any incident response plan-ready to be mobilized at a moment's notice. To learn more simply call 866.442.3810 and talk to one of our agents about obtaining Healthworks with Security Breach Services from Society Insurance, or visit www.wisconsinmedicalsociety.org/insurance.

For a **Healthy Solution** Think **U.S. Bank**

U.S. Bank provides the benefits of working with a strong and stable financial institution, along with extensive knowledge of the medical industry, giving us a thorough understanding of your business financial needs. We offer financing for:

- Acquisitions
- Expansions
- Debt refinance
- Buy-ins
- Start-ups
- Equipment

In addition, now is the perfect time to take advantage of low rates to refinance or purchase Commercial Real Estate.

Find out how U.S. Bank can help you find the business solution that best meets your needs today!

Commonly Financed Equipment

- Nerve Conduction Systems
- Office Furniture
- Vehicles
- X-ray Machines
- Computers
- EMR Software
- And Much More!

For more information contact us today!

Milwaukee & Ozaukee County • **Zach TeWinkel • 414-765-5498**
Waukesha & Washington County • **Mike Ward • 262-780-5027**
Racine & Kenosha County • **Steve Donovan • 262-638-8014**
Dane County • **Pete Musha • 608-270-4483**

All of us serving you™

usbank

usbank.com

*Subject to normal credit approval. Application-only process targets four-hour credit decision; longer times may apply if additional documentation is required. Next- day funding available with proper documentation. U.S. Bank Business Equipment Finance Group, is not offering legal, tax, accounting or financial advice. Customers are encouraged to consult with their tax and accounting advisors for a clear understanding of how various equipment financing products could impact their specific business conditions. Member FDIC.

Official publication of the Wisconsin Medical Society

COVER THEME
Intervention through prevention: Effective for workers and employers

This issue of the Wisconsin Medical Journal *features an article that evaluates how employers might benefit from paying for screening, brief intervention, and referral to treatment (SBIRT) services for all employees. The authors determined that providing SBIRT services would be cost-effective overall by aiding worker attendance and productivity.*

Cover design by Mary Kay Adams-Edgette.

The mission of the *Wisconsin Medical Journal* is to provide a vehicle for professional communication and continuing education of Wisconsin physicians.

Volume 109 • Issue 1

The *Wisconsin Medical Journal* (the *Journal*) (ISSN 1098-1861) is the official publication of the Wisconsin Medical Society and is devoted to the interests of the medical profession and health care in Wisconsin. The managing editor is responsible for overseeing the production, business operation and contents of the *Journal*. The editorial board, chaired by the medical editor, solicits and peer reviews all scientific articles; it does not screen public health, socioeconomic, or organizational articles. Although letters to the editor are reviewed by the medical editor, all signed expressions of opinion belong to the author(s) for which neither the *Journal* nor the Wisconsin Medical Society take responsibility. The *Journal* is indexed in Index Medicus, Hospital Literature Index, and Cambridge Scientific Abstracts.

Send manuscripts to the *Wisconsin Medical Journal*, 330 E Lakeside St, Madison, WI 53715. Instructions to authors are available at the Wisconsin Medical Society Web site: www.wisconsinmedicalsociety.org, call 866.442.3800, or e-mail wmj@wismed.org.

SUBSCRIPTION RATES
Members: included in membership dues. Non-members: $99. Current year single copies, $12 each. Previous years single copies, when available, $10 each.

Periodical postage paid in Madison, Wis, and additional mailing offices.

Published every other month, beginning in February.
Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized August 7, 1918. Address all correspondence to the *Wisconsin Medical Journal*, PO Box 1109, Madison, WI 53701. Street address: 330 E Lakeside St, Madison, WI 53715; e-mail: WMJ@wismed.org

POSTMASTER
Send address changes to: *Wisconsin Medical Journal*, PO Box 1109, Madison, WI 53701

ISSN 1098-1861
Established 1903

Thank you to WIS*Med*PAC and WIS*Med*DIRECT 2009 contributors–2010 efforts underway!

Thanks to the support of the following individuals, Society physicians continue to build their political activism. By contributing to WIS*Med*PAC, you help support legislative and judicial candidates with a strong commitment to health care. WIS*Med*PAC pools members' resources, thereby increasing physicians' ability to influence public policy. Join your colleagues statewide in contributing to WIS*Med*PAC. You will be investing in your future, the future of your patients, and the future of medicine.

Champions of Medicine ($1000 or more)

John F. AufderHeide, MD
Timothy L. Bartholow, MD
Steven C. Bergin, MD
Richard A. Dart, MD
George M. Lange, MD, FACP
Robert H. Lehner, Jr, MD
Kenneth J. Pechman, MD, PHD
Susan L. Turney, MD, MS, FACP, FACMPE
Sridhar V. Vasudevan, MD

Ambassador's Club ($500-$999)

John T. Bolger, MD
Timothy T. Flaherty, MD
John W. Hartman, MD
David M. Hoffmann, MD
Charles E. Holmburg, MD, FACP
Norman M. Jensen, MD, MS
Jeffery W. Kalenak, MD
Arne T. Lagus, MD
JoAnn K. Lee, MD
Bruce M. Neal, MD, FACS
Sandra L. Osborn, MD
Ganesh N. Pulla, MD
William E. Raduege, MD
Gregory A. Shove, MD
Kenneth B. Simons, MD
Paul A. Wertsch, MD
Kurt Wilhelm, II, MD
Jeffrey H. Zapolsky, MD
Valerie A. Zapolsky, MD

Sustaining Members ($200-$499)

Mark Kenyon Belknap, MD
Michael S. Birndorf, MD
Mary Jo Freeman, MD,FACP
Thomas S. Haas, DO
Ruth Heitz, JD
Barbara A. Hummel, MD
Charles V. Ihle, MD
Robert J. Jaeger, MD, FACOG
Kevin A. Jessen, MD
David H. Klehm, MD
Chris N. Larson, MD
Paul A. Larson, MD
Scott Linton, MD
William J. Listwan, MD
Timothy G. McAvoy, MD
Edith A. McFadden, MD, MA, FAAOA
George C. Mejicano, MD, MS
Karen L. Meyer, MD
Michael M. Miller, MD
Jean M. Riquelme, MD
Fernando A. Riveron, MD
Jeffrey E. Rodzak, MD
Martha (Molli) Rolli, MD
Thomas D. Sandager, MD
Daniel R. Sherry, MD
David B. Tange, MD, FACP
Stephen B. Webster, MD
John D. Wolski, DO

Sponsor Members ($150-$199)

Curtis C. Baltz, MD
John J. Beck, MD
Roy A. Brandell, MD
Rachael L. Chambers, DO
Robert A. Coe, MD
David K. Falk, MD
Robert Foulks, Jr, CPA, CAE
Larry L. Heller, MD
Andrea C. Hillerud, MD
Donald W. Ketterhagen, MD
James G. Klamik, MD
Ralph H. Knudson, MD
Edward L. Knuteson, MD
Mahendr S. Kochar, MD, MACP
Tanner F. Lang, MD
Peter J. McCanna, MD
Robert A. McDonald, MD
Kenneth W. Merkitch, MD
Steven K. Nakata, MD
Todd R. Peebles, MD
Sarah J. Pratt, MD
David M. Saarinen, MD
Evan K. Saunders, MD
Peter N. Smith, MD, FACC
Jeanine M. Swenson, MD, FAAP
Thomas J. Wilkins, MD, FAAPMR

Friends (Up to $149)

Arthur E. Angove, DO
Calvin S. Bruce, MD
Henry Ta-Shen Chang, MD
Noel N. Deep, MD
Carl S L Eisenberg, MD
Jay A. Gold, MD, JD, MPH
Erik A. Gundersen, MD, MA
Jerry L. Halverson, MD
Susan Harte
Ikar J. Kalogjera, MD
Steven S. Kantor, MD
Susan K. Kinast-Porter, MD
Don S. Lee, MD, MPH
Michael W. Lischak, MD
Thomas J. Luetzow, MD
Anne M. Miller, MD
J. P. Mullooly, II, MD
Nancy Nankivil
Jeffrey Nelson
James H. Rupple, MD
Dennis K. Ryan, MD
David L. Scherwinski, MD
Kate Suttner
Her-Lang Tu, MD
Donald W. Vangor, MD
Jose A. Villacrez, MD
Tosha B. Wetterneck, MD
James A. Wright, MD

Make *your* 2010 contribution! Visit www.wisconsinmedical-society.org/wismedpac or call 608.442.3764.

WIS*Med*PAC WIS*Med*DIRECT

Changes in store for the *Wisconsin Medical Journal*

John J. Frey, III, MD
Medical Editor, Wisconsin Medical Journal

Looking ahead, 2010 represents not only a new decade but some new approaches for established institutions like the *Wisconsin Medical Journal.* The change to a new online format last year has found the *Journal,* to no one's surprise, being read online by more and more people. Those of us who still like the feel of pages between our fingers continue to have access to print versions, but over the next few years, the balance will undoubtedly continue to shift toward the Twitter™ and Facebook generation of doctors and other health care professionals so that we can continue to help keep the *Journal* vital and available.

The Wisconsin Medical Society, like all volunteer professional organizations, is facing a number of strategic issues. The *Journal* continues to be supported by a Society that values research, public health, and academic publishing. The *Journal* is one of the few remaining state medical journals and one of the very few that contains peer-reviewed original research. We are in the same league as the *New England Journal of Medicine,* although we don't appear to be able to overtake it any time soon. Nevertheless, as I am always pointing out to folks who contact the *Journal,* we are among the relatively small number of peer-reviewed, indexed (in PubMed), free full-text online journals. That status has been helpful for authors from our academic health centers all over the state both in gaining a forum for their work and helping their careers as well. We publish a great deal of research from junior faculty, fellows, and students as well as from accomplished senior faculty and leaders. We also, happily, continue to publish work from practicing physicians and other health care professionals in communities and groups throughout the state.

The Journal *is one of the few remaining state medical journals and one of the very few that contains peer-reviewed original research.*

The work of the Editorial Board and reviewers for the *Journal* continues to be a service to the authors and readers that is given generously from their own time. We thank them all, and encourage others to consider serving as a reviewer. To learn about becoming a reviewer, see page 6.

In the coming year there will continue to be some changes. The *Journal* will be published 6 times yearly rather than 8, which addresses the realities of cost and production time. We will remain committed to getting manuscripts to press in a timely fashion and likely will expand the number of articles published in each issue. We may move a number of things, such as extensive references, large tables, or description of research instruments such as surveys to the online format only. Finally, we will experiment this year with a short form of manuscript designed to report practice and community innovations that are being tested throughout the region. We are looking for studies that try new ideas to improve quality, safety, satisfaction, cost, and any number of other aspects of medical practice as we move into a new era of health care reform. Wisconsin should be the leader in clinical practice as well as research and public health.

Look for the changes this year and let us know your thoughts. In addition to this feedback, we encourage you to consider submitting a manuscript, or even a report for the new section. After all, this is your *Journal.*

Wisconsin Medical Journal

CALL FOR PAPERS, REVIEWERS

The *Wisconsin Medical Journal* is a peer-reviewed, indexed scientific journal published 6 times a year by the Wisconsin Medical Society (Society). The *Journal's* mission is to provide a vehicle for professional communication and continuing education to its readers—the Society's 12,000 members, as well as physicians and other health care professionals from around the country and even the world who access the *Journal* electronically. It is available in full text on-line through the Society's Web site and is linked to PubMed through the National Library of Medicine.

The *Journal* invites original research, case reports, review articles and essays about medical issues relevant to readers. Accepted manuscripts are published on a space-available basis. Submission guidelines are posted on the Society's Web site at www.wisconsinmedicalsociety.org/wmj in the "For Authors" section.

The *Journal* also seeks physicians to add to our list of highly qualified reviewers who can be objective, insightful, and respond in a timely manner. Reviewers receive manuscripts electronically and are asked to complete their review within 3 weeks. Interested physicians should e-mail their name, contact information including preferred e-mail address, specialty including at least 3 areas of expertise or interest, and the frequency they are willing to serve as reviewers to wmj@wismed.org. Manuscript review is an important collegial act and is essential to the integrity of the *Journal*.

Visit wisconsinmedical-society.org/wmj or e-mail wmj@wismed.org for information about submitting manuscripts or serving as a reviewer, or to access our virtual *Wisconsin Medical Journal* on-line.

Wisconsin Medical Society
Your Doctor. Your Health.

Tim Bartholow, MD

Society's 'Leadership 15' using WHIO data to find areas to reduce cost, improve quality

Tim Bartholow, MD

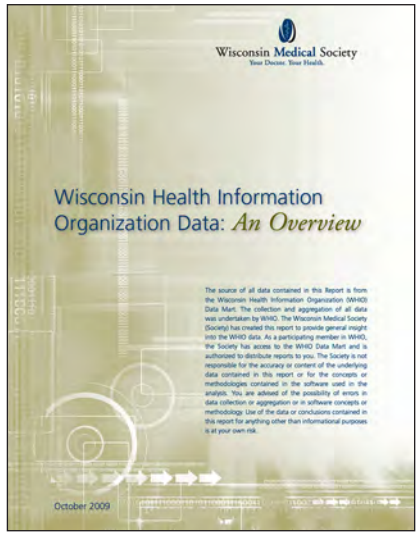
1.6 million Wisconsin lives and nearly 7.3 million episodes of care. When the Wisconsin Health Information Organization's (WHIO) data mart version 2 went live in August 2009, the Wisconsin Medical Society (Society) had already spent months reviewing this data, and saw in it the potential to help reduce waste in our health care system and improve the quality of patient care.

Wisconsin consistently is ranked at the top when it comes to providing high quality care—most recently by the Agency for Healthcare Research and Quality—and at the same time, Wisconsin physicians provide some of the lowest cost care in the nation. But there is always room to get even better.

As a physician who spent 16 years practicing family medicine, I saw patients whose deductibles went from $1000 5 years ago to $6000-$10,000 during the past few years. And these were patients who were well insured. I also saw patients with small group or individual policies like farmers—50-year-old patients who were otherwise well—paying $1000 a month for insurance with $10,000, $12,000, even $15,000 deductibles—if they could get insurance at all. On behalf of our patients, we need to find ways to reduce costs so that they aren't forced to make choices between medical care and other necessities.

The WHIO data mart represents a predominantly fully insured population and is based on 27 months of pooled claims data from 5 health insurers: Anthem, Humana, UnitedHealthcare, Wisconsin Education Association Trust, and WPS Health Insurance.

Both clinic and individual physician data are in the data mart, and we expect new insurers to be added in the future. In fact, by April of 2010, the data mart will represent 50% of Wisconsin residents. In the future, new data will be added when the data mart is updated every 6 months. (For the Society's overview of the WHIO data mart, visit www.wisconsinmedicalsociety.org/_WMS/communications/whio/whio_overview_102909.pdf.)



The Society's overview of the WHIO datamart is at www.wisconsinmedicalsociety.org/_WMS/communications/whio/whio_overview_102909.pdf

The Society believes that, used with the understanding of its limitations, the WHIO data mart has the potential to be an excellent tool to help direct quality and efficiency efforts.

With that goal in mind, we have launched an initiative called Leadership 15, which brings together physicians from each of 4 key areas: orthopedics, cardiology, gastroenterology, and behavioral health, and representatives from the purchaser/employer community. Over the next few months, these 4 workgroups are delving into this data to identify where the greatest variations exists and work-

Author Affiliation: Wisconsin Medical Society, Madison, Wis.
Corresponding Author: Tim Bartholow, MD, Senior Vice President of Member Services, Policy Planning and Physician Professional Development, Wisconsin Medical Society, 300 E Lakeside St, Madison, WI 53715; phone 608.442.3800; fax 608.442.3802; e-mail tim.bartholow@wismed.org.

ing to develop recommendations for reducing cost while maintaining or improving quality.

We believe this work is unprecedented. Physicians traditionally have not seen a price tag on every physician order, nor do we want all of our care to be about cost. We also have not historically sat down together with doctors from other groups and geographies to talk about best cost practices. But as the business community seeks ways to reduce costs, it's important that quality isn't compromised. So physicians must lead these efforts.

The WHIO data allows us to examine both cost and quality over an entire episode of care, down to the individual physician level. This transparency helps us understand where we're spending dollars every day. We can see that Physician A uses fewer hospital days and Physician B uses more with similar outcomes, but the price tag varies by thousands of dollars. And this leads doctors to ask: "If I cost more than my colleague, yet additional value is not obvious, isn't it my duty to use those health care dollars more carefully? And when I don't, aren't there some who go without or pay more?"

I encourage you to stay tuned for more information about this work as it unfolds. When the Leadership 15 workgroups have finished their analysis, they will identify and recommend improvement efforts, and the Society will communicate these findings through the *Journal* and other media. We are confident this effort will lead to lasting improvement in our health care system and will ultimately result in even higher quality, cost efficient care for the patients of Wisconsin.

Thank you to our reviewers

The *Wisconsin Medical Journal* would like to thank those who served as manuscript reviewers this past year. Manuscript review is an important collegial act and is essential to the integrity of the *Journal.* We are grateful for their help in ensuring authors receive prompt, objective, and insightful feedback on their work.

Bruce P. Barrett, MD, PhD
Dennis J. Baumgardner, MD
Leonelo E. Bautista, MD, MPH
John W. Beasley, MD
Jason M. Bellak, MD
Steven C. Bergin, MD
Robert D. Blank, MD, PhD
Bridget Booske, PhD, MHSA
Randall T. Brown, MD, MPH
Byron J. Crouse, MD
Kevin J. Dahlman, MD
Richard A. Dart, MD
Jeffrey P. Davis, MD
Seth L. Foldy, MD
Philip F. Giampietro, MD
Mark Gideonson, MD
Craig L. Gjerde, PhD
Jay A. Gold, MD, JD, MPH
Nancy C. Gutknecht, ND
Bonnie Halvorsen, CAE
Cynthia L. Haq, MD
Paul P. Hartlaub, MD, MSPH
Nancy E. Havas, MD
Kay A. Heggestad, MD
Cindy P. Helstad, PhD, RN
Richard L. Holloway, PhD
Paul Hunter, MD
Mateusz P. Karwowski, MD
Mahendr S. Kochar, MD, MACP
Connie K. Kraus, PharmD, BCPS, RPh
John S. Kuo, MD
Kenneth Kushner, PhD
Gregory L. Landry, MD
Peter M. Layde, MD, MSC
Mark Linzer, MD
Leigh S. LoPresti, MD
Kathleen R. Maginot, MD
Joseph J. Mazza, MD
Jamie McCord, MD
Fergus E. McKiernan, MD
Jill R. Meilahn, DO
George C. Mejicano, MD, MS
Joshua A. Meskin, MD
Thomas C. Meyer, MD
Megan A. Moreno, MD
John Mullahy, PhD
Marlon P. Mundt, MA, MS
Paul Nannis
Sonya Naryshkin, MD
Erin S. O'Connor, MD
Glen R. Olds, MD
Nancy A. Pandhi, MD
Andrew E. Petroll, MD
Diane M. Puccetti, MD
William E. Raduege, MD, SC
Peter S. Rahko, MD, FACC
Philip N. Redlich, MD, PhD
Richard H. Reynertson, MD
Kirsten S. Rindfleisch, MD
Jonathan Rubin, MD
Nathan J. Rudin, MD
Kenneth G. Schellhase, MD, MPH
Thomas L. Schlenker, MD, MPH
Sarina B. Schrager, MD
Dennis Schultz, MD, MSPH
Joanne A. Selkurt, MD
Charles L. Shabino, MD
Vinod B. Shidham, MD, FRCPath, FIAC
Peter Sigmann, MD
Tim Size
Jeffrey A. Stearns, MD
C. Todd Stewart, MD
Richard H. Strauss, MD
Geoffrey R. Swain, MD
Andrew C. Urquhart, MD
James M. Vergeront, MD
Mark V. Wagner, MD, MPH
Jacqueline J. Wertsch, MD
Deborah P. Wubben, MD
Steven H. Yale, MD
Craig C. Young, MD
Kyna J. Zacharias
Michael C. Zacharisen, MD

WISCONSIN MEDICAL JOURNAL

A Cost-Benefit Analysis of Wisconsin's Screening, Brief Intervention, and Referral to Treatment Program: Adding the Employer's Perspective

Andrew Quanbeck, MS; Katharine Lang; Kohei Enami; Richard L. Brown, MD, MPH

ABSTRACT

Objective: A previous cost-benefit analysis found Screening, Brief Intervention, and Referral to Treatment (SBIRT) to be cost-beneficial from a societal perspective. This paper develops a cost-benefit model that includes the employer's perspective by considering the costs of absenteeism and impaired presenteeism due to problem drinking.

Methods: We developed a Monte Carlo simulation model to estimate the costs and benefits of SBIRT implementation to an employer. We first presented the likely costs of problem drinking to a theoretical Wisconsin firm that does not currently provide SBIRT services. We then constructed a cost-benefit model in which the firm funds SBIRT for its employees. The net present value of SBIRT adoption was computed by comparing costs due to problem drinking both with and without the program.

Results: When absenteeism and impaired presenteeism costs were considered from the employer's perspective, the net present value of SBIRT adoption was $771 per employee.

Conclusions: We concluded that implementing SBIRT is cost-beneficial from the employer's perspective and recommend that Wisconsin employers consider covering SBIRT services for their employees.

INTRODUCTION

Approximately 15.5 million Americans suffer from alcohol abuse and dependency.[1] Most societal approaches to the problem of alcohol abuse have focused on the most severe cases, even though a wide spectrum of at-risk, problem, or dependent drinkers are more likely to cause serious personal and social harms.[2] Alcohol disorders result in myriad costs to the individual and society at large, including alcohol-related crime, violence, motor vehicle accidents, injuries, and deaths. Problem drinking also leads to less-recognized though significant issues such as decreased workplace productivity, absenteeism, and adverse psychological effects on the drinker's family, peers, and coworkers.[3]

Of the $10.5 billion spent on alcohol treatment in the United States in 2003, 74% was publicly funded by state/local governments, Medicare/Medicaid, and other federal sources.[4] Private sources (including private insurance and out-of-pocket expenditures) accounted for the remaining 26% of spending on alcohol treatment. Policymakers confront the challenge of allocating limited public funds in the most cost-effective manner possible to treat alcohol problems. One approach that seeks to meet this challenge is Screening, Brief Intervention, and Referral to Treatment (SBIRT). SBIRT aims to reduce or eliminate consumption by a wide spectrum of at-risk, problem, and dependent drinkers through screening during standard medical appointments. An analysis of 360 clinical trials of alcohol treatments, supplemented by 30 years of alcohol research, concluded that Screening and Brief Intervention (SBI, a component of SBIRT) is the most cost-effective alcohol treatment available.[5] A previous study of SBIRT in Wisconsin (named Project TREAT) indicated significant reductions in the total amount of alcohol consumed and the frequency of at-risk and problem drinking among patients receiving SBIRT services. The study also found SBIRT to be highly cost beneficial from a societal perspective, with benefits (in the form of reduced health care expenditures, legal costs, and injury/accident costs) outweighing costs by a ratio of 39:1.[6] According to the National Commission on Prevention Priorities, alcohol SBIRT services are ranked 4th among clinical preventive services for cost-effectiveness and clinically preventable burden (after

Authors' Affiliation: University of Wisconsin—Madison, Madison, Wis.

Corresponding Author: Andrew Quanbeck, MS, 1513 University Ave, Mechanical Engineering 4161B, Madison, WI 53706; phone 608.890.1016; fax 608.890.1438; e-mail andrew.quanbeck@chess.wisc.edu.

daily aspirin use, childhood immunizations, and smoking cessation advice). [7]

Given a shift toward evidence-based approaches to health care, the demand for SBIRT services is increasing nationwide. In 2007, the Office of Personnel Management announced that federal health insurance will cover SBIRT services for the 5.6 million individuals under this plan. According to the 2008 *eValue8* ™ survey administered to 150 US health plans by the National Business Coalition on Health, 58% are willing to pay for SBIRT. In Wisconsin, national plans that cover SBIRT include Aetna, CIGNA, and Anthem Blue Cross and Blue Shield.[8] While the benefits of SBIRT seem clear from a societal perspective, the service has not been widely implemented yet throughout the health care system. The purpose of this analysis is to consider the costs and benefits of SBIRT implementation from the employer's perspective: Should employers be willing to pay for SBIRT services?

STUDY SETTING

Wisconsin struggles with alcohol problems. Between 2002 and 2006, alcohol abuse rates among the Wisconsin population ages ≥12 ranged from 9% to 11%, compared to the national rate of 8%. In addition, Wisconsin per capita driving-under-the-influence arrests are 1.5 times that of the United States as a whole, and the rate of drinking and driving is the highest in the nation at 26%.[9] According to a 2008 needs assessment project report by the Wisconsin Department of Health Services (DHS), the state's health care, social services, and criminal justice systems incur more than $2.6 billion each year due to alcohol-related injuries, hospitalizations, arrests, treatments, and deaths.[10] A study of alcohol use in primary care settings in south central Wisconsin revealed that 20% of patients screened were positive for risky, dependent, or abusive drinking patterns (referred to as "problem drinking") in accordance with guidelines set out by the National Institute on Alcoholism and Alcohol Abuse: >14 drinks/week for men, >7 drinks/week for women, or binge drinking.[11] Using these criteria, 1 in 5 Wisconsin residents are drinking more than they should.

In an effort to combat alcohol abuse and problem drinking, in 2006 the DHS was awarded a 5-year grant to provide SBIRT services in 20 primary care clinical sites across the state.[12] Providers use the World Health Organization's Alcohol, Smoking, and Substance Involvement Screening Test, which was developed to detect and manage alcohol abuse and other substance problems.[13] The patient undergoes a brief screening, which consists of 4 questions asked once a year during routine health care visits. Individuals who score positive for problem drinking are given a brief intervention consisting of 1-3 consultations. If necessary, patients may consent to referral to more intensive outpatient or residential treatment.

While SBIRT has been demonstrated to be cost beneficial from a societal standpoint,[6] research on the program's impact on employers has been limited. Of the adult population with an alcohol problem, 82% are employed.[14] Problem drinking may reduce the productivity of labor force participants by causing absenteeism, diminishing the quality of work, and lowering coworkers' morale. A study by Ames et al shows that, after controlling for drinking patterns, job characteristics, and personal background, drinking on the job and hangovers predict work-related problems.[15] A study by Gmel and Rehm showed that heavy drinking, abuse, and dependence reduces productivity among a firm's employees.[3]

This analysis focuses on 2 types of productivity losses that may be caused by problem drinking: absenteeism (days where problem drinking causes an employee to miss work), and impaired presenteeism (days where an employee comes to work, but functions less productively due to inebriation or hangover). The cost of absenteeism to an employer is conventionally estimated by applying the daily wage rate of the absent worker. However, the literature suggests that the conventional approach underestimates the true cost of absenteeism to a firm. The cost of employee absenteeism depends upon the ease of finding a replacement for the absent worker, the extent to which the worker plays a team role, and the time sensitivity of the worker's output.[16] While the daily wage rate provides a lower bound, a multiplier (≥1) must generally be applied to reflect the true cost of absenteeism to a firm.

The cost of impaired presenteeism due to problem drinking may be substantial to a firm, though less apparent than costs due to absenteeism. To the authors' knowledge, no empirical estimates exist for cost reductions due to SBIRT in the form of reduced presenteeism. The literature suggests that impaired presenteeism costs due to chronic conditions such as alcohol misuse may be substantial, and potentially much greater in magnitude than absenteeism costs.[17] While a day of absenteeism is more costly than a day of impaired presenteeism, impaired presenteeism costs tend to overshadow absenteeism costs in the long term because there are many more days of impaired presenteeism.

Marginal problem drinkers—those who are clinically in need of treatment, but do not receive it—may account

for significant hidden expenses to employers. Although several studies have demonstrated quantifiable effects of alcohol on the workplace,[18-20] and researchers have begun to study how SBIRT may benefit employers,[14] uncertainty remains about how SBIRT may impact productivity. In this study, we employ Monte Carlo simulation techniques to estimate the potential for SBIRT to reduce absenteeism and impaired presenteeism costs to an employer. Monte Carlo simulation is used widely in the discipline of systems engineering to conduct "what-if" analyses of complex systems. In Monte Carlo simulation, the investigator first specifies relevant parameters and constructs a mathematical model of the system under study. Ranges of values for input parameters are modeled across multiple simulation runs, to study how varying parameter levels affect model outputs.

Simulation modeling is an appropriate technique to employ in systems that do not lend themselves readily to study through experimental design. In this analysis, we extend the cost-benefit framework laid out in Project TREAT[6] to include the employer's perspective. The analysis presented here is predicated on the ideas that (1) absenteeism and impaired presenteeism costs are real and potentially significant to an employer, (2) problem drinking can lead to absenteeism and impaired presenteeism, (3) SBIRT can reduce levels of problem drinking and, therefore, SBIRT may reduce absenteeism and impaired presenteeism costs to an employer.

METHODS

We conducted a cost-benefit analysis for employers using a model to present the business case for investing in employee health.[21] The employer bears program costs and productivity benefits in the form of reduced absenteeism and impaired presenteeism. We developed a simulation model to compare the costs of problem drinking to an employer with and without SBIRT services. Each impact category is monetized on a per employee basis, adjusted for inflation.

A theoretical employer is specified with a pre-intervention prevalence of problem drinking of 20% (defined as >14 drinks/week for men, >7 drinks/week for women, or binge drinking). This figure is based on a sample of 19,372 patients screened for alcohol use in clinics within 100 miles of Madison, Wis.[11] We assume that SBIRT is 57% effective in eliminating problem drinking among employees, based on the reduction rate observed in Project TREAT.[6] An average hourly wage rate of $18.46 is assumed based on statistics from the Wisconsin Department of Workforce Development.[22] In the model, employees are screened at a rate of 25% per year during annual checkups by their primary care physicians. Though clinics might incur startup costs in delivering SBIRT services, no startup costs are assumed for employers. Costs and benefits are modeled over a 4-year time horizon, which corresponds to the follow-up period in Project TREAT.[6] Benefits may wane for employers over time because of staff turnover. It is assumed that staff members will leave the theoretical organization at an annual rate of 23.9% over the 4-year analysis period, which is the US industry-average turnover rate.[23] Costs and benefits are discounted using a standard social discount rate of 3.5%[24] that is applied at the end of each year. We assume a fixed screening and treatment cost of $247 per employee[6] (ie, screening costs for non-problem drinkers are included in the average intervention cost for problem drinkers). Total absenteeism costs to the firm are calculated by multiplying the rate of missed work days due to problem drinking[14] by 1.28 times the average daily wage rate.[16] A multiplier of 0.10 times the daily wage rate is used to estimate the cost of impaired presenteeism due to problem drinking. The 0.10 multiplier was determined through interviews conducted as part of the Pauly study on impaired presenteeism,[17] where managers were asked to estimate the extent to which alcohol problems reduce employees' ability to work. Model parameters are summarized in Table 1.

RESULTS

The primary outcome of the analysis is net present value (NPV), which is calculated by subtracting program costs from program benefits and discounting appropriately over time. Benefits and costs of SBIRT adoption are summarized in Table 2. After discounting and adjusting for staff turnover, absenteeism costs were reduced by $175 per employee over the 4-year modeling period; impaired presenteeism costs were reduced by $823 per employee. Therefore total benefits were $175+$823=$997 per employee. Screening costs amount to $227 per employee (slightly less than the $247 per employee figure listed in Table 1 due to discounting).

Subtracting implementation costs from benefits results in a net present value of $771 per employee. Represented another way, the ratio of benefits to costs is 4.4:1 ($997/$227). Projects with a NPV >0 and a ratio of benefits to costs >1 are worthwhile investments from the theoretical employer's perspective.

DISCUSSION

These results suggest that the net benefit from implementing the SBIRT program would be positive and substantial. To test the sensitivity of the model to the

Table 1. Model Parameters

Category	Description
Intervention costs	$247 per employee
Reduction in problem drinking due to SBIRT	57%
Annual staff turnover	23.9%
Baseline incidence of problem drinking	20%
Hourly wage rate	$18.46
Baseline absenteeism costs	1.28 times the daily wage per absence due to problem drinking
Baseline impaired presenteeism costs	0.10 times the daily wage for problem drinkers

Table 2. Net Present Value (NPV) Due to Screening, Brief Intervention, and Referral to Treatment (SBIRT)

Cost Category	Cost/Benefit (per Employee)
Absenteeism cost reduction	$175
Impaired presenteeism cost reduction	$823
Implementation cost	$227
NPV	$771

specification of parameters summarized in Table 1, 1000 Monte Carlo trials were run. The model is relatively sensitive to estimates for the decrease in problem drinking due to SBIRT, baseline prevalence of problem drinking, and the multiplier applied to impaired presenteeism. NPV increases with increasing levels of reduction in problem drinking, higher levels of baseline problem drinking, and higher multipliers for impaired presenteeism. The model is largely insensitive to the other parameters.

The model is most sensitive to the estimate used for the reduction in problem drinking due to SBIRT. For modeling purposes, important assumptions were made with respect to the relationship between problem drinking reduction and absenteeism and impaired presenteeism costs: we assume that these costs will be reduced proportionally with the decrease in problem drinking among the firm's employees. This central assumption warrants further scrutiny.

In the model, employees who screen positive for problem drinking receive a brief intervention. In Project TREAT,[6] the baseline rate of self-reported problem drinking in the intervention group was 46.7%, and the 12-month rate was 20.1%, corresponding to a 57% decrease in problem drinking (the reduction persisted over the 4-year follow-up period as well). For modeling purposes, therefore, it was assumed that the intervention is 57% effective in reducing absenteeism and impaired presenteeism costs from baseline.

In Project TREAT,[6] a significant reduction in problem drinking was observed in the control group as well as the intervention group. This effect is not well understood, but consensus is that the improvement among controls is a combination of 2 effects: (1) an intervention effect of eligibility screening, where patients with problem drinking habits begin taking stock of the negative consequences of their drinking as a result of being asked about it, and (2) regression toward the mean. The relative contribution of these effects is unknown. An alternative approach to calculating the effect rate would be to compare the intervention group to the control group at each point in time. The effect rate would then be calculated as follows:

$$\frac{\text{(Percent reduction in problem drinking in the SBIRT treatment group)}}{\text{(Percent reduction in problem drinking in the control group)}}$$

Using this approach yields an effect rate of 0.37 (rather than 0.57). All else equal, NPV is substantially reduced (but still positive) to $421 per employee when an effect rate of 0.37 is employed in the model. Figure 1 illustrates the relationship between the estimated problem drinking reduction rate and NPV across a range of values. The "break-even" point (at which NPV=0) occurs at a problem reduction drinking rate due to SBIRT of 13%. In other words, if SBIRT reduces problem drinking by at least 13% among a firm's employees, it will be cost beneficial from the firm's perspective (Figure 1).

If SBIRT has no effect on problem drinking rates (and therefore no effect on absenteeism and impaired presenteeism costs), NPV falls to a minimum of -$227 per employee, simply reflecting the cost of screening. Conversely, if SBIRT is 100% effective in eliminating problem drinking among the workforce, NPV would rise to a maximum level of $1523 per employee.

We attempted to be conservative in our estimates of parameters and modeling assumptions. We chose to focus solely on absenteeism and impaired presenteeism costs in our analysis, and did not include potential benefits to employers (such as reduced health care costs, emergency department visits, and costs to dependents) that have been estimated elsewhere.[14] The cost-benefit ratio of 4.4:1 calculated in this analysis is modest compared to the 39:1 ratio published in Project TREAT's[6] analysis from a societal perspective. In both cases, the

potentially significant benefits of SBIRT outweigh the program's relatively low costs. There appears to be a business case for employers to pay for SBIRT if the program can lower problem drinking rates among employees, even if problem drinking is not eliminated altogether.

CONCLUSION

This study presents one of the first attempts to model the potential productivity benefits of SBIRT from the employer's perspective. We employed simulation techniques based on empirical estimates for model parameters because we believe it would be challenging (for a number of reasons, privacy concerns being paramount) to incorporate the employer's perspective within the context of a randomized clinical trial. Across a variety of modeling assumptions, NPV of SBIRT implementation is positive from the employer's perspective.

We believe that simulation modeling is the best method currently available to determine costs and benefits of SBIRT from the employer's perspective. While this study provides a framework for analyzing the costs and benefits of implementing SBIRT to a theoretical firm in Wisconsin, the methods of this study may be generalizable to different types of firms across different states. Further research is needed.

Acknowledgments: We would like to thank David Weimer, PhD, for his guidance in formulating our analytic plan. We are indebted to Michael Fleming, MD, MPH, and his coauthors on the paper *Brief Physician Advice for Problem Drinkers: Long-Term Efficacy and Benefit-Cost Analysis*, as their study provided a framework for our analysis. We are grateful to researchers at George Washington University Medical Center for developing the excellent website ensuringsolutions.org, and encourage anyone interested in obtaining more information on the topic of alcohol problems to visit their site. We also wish to thank Sean Nicholson, PhD, for his advice.

Funding/Support: Research done by Andrew Quanbeck, MS, is supported by funding from the National Institute on Drug Abuse and the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment. Kohei Enami's research is supported by a Merck Quantitative Sciences Fellowship in Health Economics. The authors are entirely responsible for the research conducted in this paper.

Financial Disclosures: Richard L. Brown, MPD, MPH, owns Wellsy's LLC, which provides software, consulting, training, and clinical support to enable health care providers to deliver systematic SBIRT services.

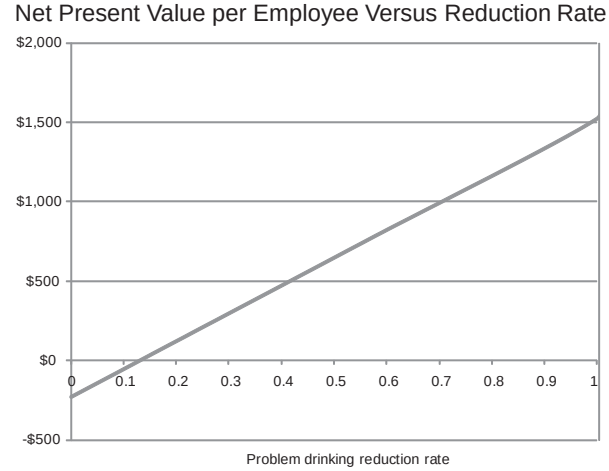


Figure 1. The relationship between the estimated problem drinking reduction rate and net present value (program benefits minus program costs) across a range of values.

REFERENCES

1. Substance Abuse and Mental Health Services Administration (SAMHSA). Results from the 2007 National Survey on Drug Use and Health: National Findings. http://oas.samhsa.gov/nsduh/2k7nsduh/2k7Results.pdf. Accessed January 6, 2010.
2. Institute of Medicine. *Broadening the Base of Treatment for Alcohol Problems.* Washington DC: National Academy Press; 1990.
3. Gmel G. Harmful alcohol use. *Alcohol Res Health.* 2003;27(1):52-62.
4. Mark TL, Levit KR, Coffey RM, et al. National Expenditures for Mental Health Services and Substance Abuse Treatment, 1993–2003. SAMHSA Publication No. SMA 07-4227. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2007. 11 May 2009. http://mentalhealth.samhsa.gov/publications/allpubs/sma07-4227/. Accessed January 21, 2010.
5. Miller WR, Wilbourne PL. Mesa grande: a methodological analysis of clinical trials of treatments for alcohol use disorders. *Addiction.* 2002;97:265-277.
6. Fleming MF, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL. Brief physician advice for problem drinkers: long-term efficacy and benefit-cost analysis. *Alcohol Clin Exp Res.* 2002;26(1):36-43.
7. Partnership for Prevention. Rankings of Preventive Services for the US Population. http://www.prevent.org/content/view/43/71/. Accessed January 6, 2010.
8. Laine S. Many Health Plans Will Now Pay for Substance Use Screening and Brief Intervention. The Pew Charitable Trusts. http://www.pewtrusts.org/news_room_detail.aspx?id=38196. Accessed January 6, 2010.
9. Wisconsin Department of Health Services, Division of Public Health and Division of Mental Health and Substance Abuse Services. *Wisconsin Epidemiological Profile on Alcohol and Other Drug Use,* 2008 (P-45718). July 2008.
10. Wisconsin Department of Health Services. Wisconsin Substance Abuse Needs Assessment Project. http://dhs.wisconsin.gov/SubstAbuse/needsassessment.htm. Accessed January 6, 2010.
11. Manwell LB, Fleming MF, Johnson K, Barry KL. Tobacco, alcohol, and drug use in a primary care sample: 90-day prevalence and associated factors. *J Addict Dis.* 1998;17(1):67-81.
12. Univeristy of Wisconsin Department of Family Medicine. Wisconsin Initiative to Promote Healthy Lifestyles. http://wiphl.com. Accessed January 6, 2010.
13. World Health Organization. The ASSIST Project. http://www.who.int/substance_abuse/activities/assist/en/index.html. Accessed January 6, 2010.

14. George Washington University Medical Center. Workplace Screening & Brief Intervention: What Employers Can and Should Do About Excessive Alcohol Use. http://www.ensuringsolutions.org/resources/resources_show.htm?doc_id=673239&cat_id=963. Accessed January 6, 2010.
15. Ames GM, Grube JW, Moore RS. The relationship of drinking and hangovers to workplace problems: an empirical study. *J Stud Alcohol.* 1997;58(1):37-47.
16. Nicholson S, Pauly MV, Polsky D, Sharda C, Szrek H, Berger ML. Measuring the effects of workloss on productivity with team production. *Health Econ.* 2006;15(2):111-123.
17. Pauly MV, Nicholson S, Polsky D, Berger ML, Sharda C. Valuing reductions in on-the-job illness: 'presenteeism' from managerial and economic perspectives. *Health Econ.* 2008;17:469-485.
18. Mullahy J, Sindelar JL. Alcoholism, work, and income. *J Labor Econ.* 1993;11(3):494-520.
19. Kenkel DS. Self-insurance and worksite alcohol programs: an econometric analysis. *J Stud Alcohol.* 1997:211-219.
20. Harwood HJ, Fountain D, Livermore G. *Costs of Alcohol and Drug Abuse in the United States.* National Institute on Drug Abuse, Bethesda, MD. NIH publication 1992; 98–4327.
21. Nicholson S, Pauly MV, Polsky D, et al. How to present the business case for healthcare quality to employers. *Appl Health Econ Health Policy.* 2005;4(4):209-218.
22. Wisconsin Department of Workforce Development. http://www.dwd.state.wi.us. Accessed January 6, 2010.
23. U.S. Bureau of Labor Statistics. Job Openings and Labor Turnover Survey. http://www.bls.gov/jlt. Accessed January 6, 2010.
24. Moore MA, Boardman AE, Vining AR, Weimer DL, Greenberg DH. 'Just give me a number!' practical values for the social discount rate. *J Policy Anal Manage.* 2004;23(4):789-812.

WISCONSIN MEDICAL JOURNAL

A Study of Clinician Adherence to Treatment Guidelines for Otitis Media with Effusion

Stella U. Kalu, MD; Matthew C. Hall, MD

ABSTRACT

Objectives: This study evaluated clinician compliance with recommendations in the 2004 American Academy of Pediatrics (AAP) guidelines on otitis media with effusion (OME) related to documentation of presence, laterality, resolution, persistence, and surveillance for hearing loss or speech delay.

Methods: Retrospective chart review of 363 children aged 2 months to 12 years diagnosed with OME was performed. An electronic survey was used to measure physician awareness and knowledge of specific recommendations in the 2004 AAP clinical practice guidelines on OME.

Results: We found a high level of documentation practices at the initial diagnosis of OME (laterality 95%) but poor documentation of follow-up factors (duration 14.9%). Documentation was not found to improve after release of the 2004 AAP guidelines. The survey found physician knowledge lacking in terms of the decibel hearing level stratification of management and antibiotic use, although better for the use of pneumatic otoscopy as a primary diagnostic method and adenoidectomy and myringotomy as accepted treatments.

Conclusion: Documentation practices of clinicians studied remained unchanged after release of the 2004 guidelines. More research is needed to delineate reasons for poor adherence of pediatric health care professionals to the 2004 OME guidelines, and ways to enhance communication of guideline changes to practicing health care professionals.

Author Affiliations: Department of Pediatrics (Kalu), Department of Infectious Disease (Hall), Marshfield Clinic, Marshfield, Wis.
Corresponding Author: Matthew C. Hall, MD, Marshfield Clinic, Department of Infectious Disease, 1000 N Oak Ave, Marshfield, WI 54449; phone 715.389.5499 or 715.387.5193; fax 715.389.3808; e-mail hall.matthew@marshfieldclinic.org.

INTRODUCTION

Otitis media with effusion (OME) is the presence of middle ear fluid without symptoms or signs of acute inflammation.[1] OME is a common clinical entity with a poorly understood pathophysiology that is thought to be related to poor Eustachian tube function, with or without a preceding middle ear infection (acute otitis media [AOM]).[2-4] Although OME is a common illness before age 5, the majority of children experience a self-limited process that resolves spontaneously within 3 months.[1] Up to 25% of children may experience recurrent episodes of OME,[5] with recurrent or persistent OME being associated with hearing loss[6-7] and associated effects on speech and language development.[8]

Over the past 15 years the clinical management of OME has become more evidence-based.[2,9] In May 2004, a revision of the American Academy of Pediatrics (AAP) OME clinical practice guidelines was published.[2] The 2004 guidelines provided new recommendations regarding physician documentation, discussing the components of documentation by physicians at each assessment, as well as referral for sub-specialist care.[2] Documentation of laterality, severity, duration, and other associated symptoms such as hearing loss and delays in language and speech milestones help define the prognosis of OME and also determine the appropriate timing of interventions.[2] The guidelines also identify the need for clear mechanisms to enhance communication between primary health care professionals and specialists, and identify better documentation as being one such mechanism.[2]

Our anecdotal observations of clinical practice led us to question how well these guidelines were followed, especially in terms of follow-up visit documentation of severity, duration, and other associated symptoms. To our knowledge, no one has assessed physician documentation in the context of these guidelines. The publication of guidelines continues to increase,[10-13]

and research on whether and how providers use these tools needs to be conducted. One study of interest found that 21% of pediatricians never used guidelines, 44% used them sometimes, and only 35% routinely consulted guidelines.[12]

We conducted a medical record chart review to determine the extent of and current rate of physician compliance with documentation pertaining to diagnosis, management, and surveillance of complications related to OME. We hypothesized that documentation may have improved due to the release of updated AAP guidelines. We chose to review charts for patients from 2 months to 12 years old for this portion of our study. We also assessed physician knowledge of selected areas of the AAP guidelines via an electronic survey; the diagnostic method of OME, recommendation on risk stratification, antibiotic use, and use of hearing level criteria for patient care decisions. Our paper focuses on physician adherence to guidelines that are published by respected medical associations.

METHODS

This study was conducted at a clinic serving northcentral Wisconsin. The population served is predominantly white (97.4%) and resides in a mostly rural area. The clinic system is linked by an electronic medical record that provides easy accessibility to the medical records of all patients seen within the system. The clinic maintains a clinical practice guideline website that is available to providers via the clinic's intranet. It includes OME, although this guideline had not been updated to reflect the 2004 AAP revision at the time of this study.

Using the International Classification of Diseases, 9th Revision (ICD-9) codes, we identified children diagnosed with OME from January 2003 through April 2004 (pre-guidelines) and from January 2005 through June 2006 (post-guidelines). The specific ICD-9 codes 381.4 and 381.01 were used for OME, and 382.9 was used for AOM. The diagnosis of OME was considered as documentation by a physician from the clinic in the medical record. One author performed all chart abstraction, conferring with a second author on individual charts as needed for clarification. Data from abstracted charts included date of birth, gender, date of diagnosis, documentation of laterality, resolution of effusion, and other symptoms such as presence or absence of hearing loss, presence or absence of delays in language, and referral to sub-specialty. To confirm accuracy of the data abstraction process, 10% of charts were abstracted a second time by trained chart abstractors from an associated research center.

Children aged 2 months to 12 years were included. The initial diagnosis of OME had to occur either between January 2003 through April 2004 or January 2005 through June 2006 for the patient to be included in the study. To allow time for dissemination of the AAP guidelines, patients seen from May 2004 (release of AAP guideline update) through December 2004 were excluded. Charts with an encounter coded with an ICD-9 code for OME but no corresponding documentation of OME in the medical record, either in the examination or assessment, were excluded. Children seen in the clinic system only for subspecialty care were also excluded.

Survey

To measure physician knowledge of the 2004 AAP guideline recommendations, a survey instrument was developed and disseminated to the 173 board certified pediatricians and family physicians practicing at the clinic. The survey was distributed electronically via the online survey resource SurveyMonkey™ (www.surveymonkey.com). Physicians received an e-mail requesting their participation in the survey and providing a link to the online survey. A reminder was sent 6 weeks later. This survey consisted of 8 questions: 4 questions designed to assess provider awareness of the 2004 AAP guideline content, 2 questions to obtain demographic data, and 2 questions to address knowledge of the institution's intranet guidelines on OME (Table 1).

Data Analysis and Statistical Methods

Descriptive statistics were presented on documentation of the information related to OME and the physician's knowledge of the 2004 AAP guidelines. Chi-square and Fisher's exact tests were used to assess differences in documentation of clinical information related to OME before and after release of the guidelines. A 2-sample t-test was used for the continuous variables, and $P<0.05$ was considered statistically significant. All statistical analyses were conducted using SAS 9.1 (SAS Institute, Cary, NC).

RESULTS

Record Analysis Results

Using ICD-9 codes, 455 patients with OME were identified (220 pre- and 235 post-guideline update) during the study period. Of these, 363 were included in the study, 38 were excluded from the pre-update period and 54 from the post-update period based on the exclusion criteria described previously.

Of the 363 children in this study, 203 (56%) were male. The children ranged from 0.2 to 11.4 years of

Table 1. Survey Questions[a]

Question	Response Choices	Physician Responses (%)
1. The current clinical guidelines on management of otitis media with effusion on the [specific clinic name] Intranet are based on guidelines instituted in:	a. 1994	12
	b. 2000	33
	c. 2004	50
	d. 2006	5
2. The [specific clinic name] Intranet clinical practice guidelines are based on the most current guidelines from the AAP.	a. Yes	34
	b. No	5
	c. I don't know	47
	d. They usually are	14
3. Current guidelines recommend the following, as management of a child not at risk for speech or language delays with effusion present for 3 months.	a. Watchful waiting	57
	b. Observation or antibiotic therapy	29
	c. Antibiotic therapy	12
	d. Antibiotics plus steroids	2
4. Based on current guidelines, appropriate management for a child with bilateral effusion for 3 months who also has a 20 decibel hearing level is:	a. Repeat hearing test in 3-6 months	9
	b. Consider surgical intervention within the next 1-3 months if effusion persists	42
	c. Immediate referral to otolaryngology	49
	d. Immediate evaluation by a speech language pathologist	0
5. Current guidelines recommend this, as the primary method for diagnosis of otitis media with effusion:	a. Tympanometry	29
	b. Pneumatic otoscopy	71
	c. Acoustic reflectometry	0
	d. Tuning fork tests	0
6. According to current clinical practice guidelines, there is no strong evidence to recommend all but which of the following as acceptable treatment for otitis media with effusion?	a. Complementary and alternative medicine	17
	b. Antihistamines and decongestants	7
	c. Corticosteroids	8
	d. Adenoidectomy plus myringotomy	68
7. What is your area of specialty?	a. General pediatrics	27
	b. Pediatric sub-specialty	12
	c. Family practice	59
	d. Other specialty	2
8. How long have you practiced?	a. <5 years	8
	b. 5-10 years	12
	c. 10-15 years	19
	d. ≥15 years	61

[a] Survey questions electronically sent to physicians via the online survey provider SurveyMonkey™

age. There were no significant differences in mean age or gender between the children diagnosed prior to and after the release of the guidelines (Table 2).

The presence of effusion was noted on examination about 89.8% of the time, with no difference between those analyzed before or after the AAP Guidelines were updated (Table 2). Documentation of laterality was also similar pre- and post-guideline release (95%). A documented plan for follow-up rarely occurred, though most patients were seen for other reasons within 3 months of the initial diagnosis (76%). No documented follow-up occurred for 11% both before and after the guideline update.

Most follow-up visits did not address duration or laterality of the OME as would be expected with visits for other reasons (14.9% and 30.4% respectively) as seen in Table 2. During follow-up, duration of OME was documented only 14.9% of the time, with a trend of fewer instances for the post-guideline release group (18.5% pre- to 11.3% post-guideline update). Of the 322 children with follow-up visits, 42 patients (11.6%) had effusion that persisted after 3 months. However, documentation of the presence or absence of complications related to persistent OME only occurred in 60.5% for hearing loss and 34.9% for language delay. A significant minority had no documentation of the resolution of persistent OME (11%). None of the children who had a persistent effusion after 3 months evaluation was younger than 6 months of age. As would be expected, AOM was documented as preceding OME in most

Table 2. Demographics and Comparison of Documentation

	Entire Group N=363	Pre release n=182	Post release n=181	*P*-value
Age in years (mean+standard deviation)	3.8+2.8	3.7+2.5	4.0+3.1	0.41
Male gender	203 (55.9%)	109 (59.9%)	94 (51.9%)	0.13
Documentation at initial diagnosis				
Documentation of acute otitis media within 12 months prior to effusion	220 (60.6%)	122 (67.0%)	98 (54.1%)	0.01
Documentation of effusion in physical exam	326 (89.8%)	168 (92.3%)	158 (87.3%)	0.11
Documentation of effusion in diagnosis/assessment	326 (89.8%)	166 (91.2%)	160 (88.4%)	0.38
Documentation of laterality of effusion	345 (95.0%)	175 (96.2%)	170 (93.9%)	0.34
Follow-up visit for effusion				
No follow-up	41 (11.3%)	20 (11.0%)	21 (11.6%)	0.45
<3 months	276 (76.0%)	143 (78.6%)	133 (73.5%)	
>3 months	46 (12.7%)	19 (10.4%)	27 (14.9%)	
Follow-up Visits	**n=322**	**n=162**	**n=160**	
Documentation of duration of effusion	48 (14.9%)	30 (18.5%)	18 (11.3%)	0.07
Documentation of laterality of effusion in the follow-up visits	98 (30.4%)	54 (33.3%)	44 (27.5%)	0.26
Documentation of effusion resolution				
Resolution	279 (86.7%)	138 (85.2%)	141 (88.1%)	0.50
Persistence	42 (13.4%)	23 (14.2%)	19 (11.9%)	
No documentation	1 (0.31%)	1 (0.6%)	0 (0%)	
Persistent Effusion	**n=42**	**n=23**	**n=19**	
Documentation of presence/absence of hearing loss	26 (60.5%)	14 (58.3%)	12 (63.2%)	0.75
Documentation of presence/absence of language delay	15 (34.9%)	9 (37.5%)	6 (31.6%)	0.69
Documentation of referral to a subspecialty	24 (55.8%)	13 (54.2%)	11 (57.9%)	0.81
Documentation of eventual resolution of persistent effusion	38 (88.4%)	22 (91.7%)	16 (84.2%)	0.64

of the children (overall 61%), although this differed between the pre- and post-guideline update groups (67% versus 54.1%, *P*=0.01).

Survey Results

The physician knowledge survey was sent to 173 pediatric and family practice physicians in the clinic's database. There were 60 responses obtained, representing a response rate of approximately 35%. Of the respondents, 59% were family physicians, 29% were primary care pediatricians, and 12% were in other pediatric specialties. Sixty-one percent had been in practice for ≥15 years, 19% had been in practice for 10-15 years, 20% had been in practice for <10 years, of which 8% had practiced for <5 years.

More than half (57%) of the physicians identified "watchful waiting" as the best choice of therapy options offered for the management of a child who was not at risk for speech or language delays with a bilateral effusion for 3 months, 29% chose observation or antibiotics, 12% chose antibiotics alone for the management of the child, and 2% chose antibiotics and steroids. When presented with a scenario of a child with bilateral OME and 20-decibel hearing loss (dB HL), 49% of physician respondents said they would immediately refer to otolaryngology, 42% recommended surgery in 1-3 months if effusion persisted, and 9% recommended a repeat hearing test in 3 months.

Regarding the recommended primary method of OME diagnosis, 71% of respondents chose pneumatic otoscopy while 29% chose tympanometry. When asked to identify a guideline-recommended therapy as acceptable for treatment for OME, 68% chose adenoidectomy and myringotomy, while 17% chose complementary and alternative medicine (CAM). Seven percent chose antihistamine and decongestant therapy, and 8% chose corticosteroids.

DISCUSSION

Adequate documentation is necessary for optimal patient care,[14] and the 2004 AAP Practice Guidelines for OME addressed "documentation" in 2 recommendations.[2] Although we found a relatively high rate of documentation of pertinent variables surrounding the initial diagnosis of OME, the continuity of care for OME was not well documented. This was true for the key clinical complications of persistent OME, hearing loss, and language delay. Even duration of OME was documented for only 1 in 7 children with OME.

A key reason for deficient documentation may be

the lack of routine planned follow-up for OME. At the initial visit at which OME was found, an observation or management plan was essentially never documented. The subsequent visits were for other medical reasons including both well-child evaluations and illness visits. Thus, the management of OME seems to be incidental to receiving other care. This may relate to the fact that OME is usually asymptomatic, most often resolves spontaneously, and, when complications like language delay occur, the process evolves over a long period of time. These factors may result in clinicians not being diligent with follow-up care of OME.

AOM is known to precede OME,[2,15] and we found a high rate of AOM (60.6%) in the 12 months preceding the diagnosis of OME. Our chart review included identifying a previous AOM office visit (within 12 months) but did not assess for evidence of persistent effusion following the AOM. This information suggests that previous middle-ear disease is quite common in children who develop OME, but we are not able to comment on follow-up management of OME that directly results from an episode of AOM. AOM prior to OME was higher prior to release of the guidelines (67% versus 54%, P=0.01), though there is no obvious reason for this.

Our study of documentation practices related to OME has certain limitations, one of which is that our study involved a single organization in one region of the country, with our findings not necessarily being representative of other practice settings. In addition, for logistic reasons, we were unable to track the documentation practices of each individual health care professional pre- and post-guideline release. We opted to view documentation practices from a group perspective. This was also a retrospective chart review with limitations related to coding of diagnoses and chart abstraction. We carefully performed these portions of the study, limiting these issues as much as possible.

Our e-mail survey response rate of 35% is similar to previous survey studies.[16-17] Although surveys distributed by e-mail may have lower response rates, there is some evidence for enhanced response rates.[16-17] The majority of respondents were family medicine physicians and had been in practice for >10 years, which is representative of the clinic's pediatric health care professionals.

A majority of respondents recognized pneumatic otoscopy as the primary mode of OME diagnosis (71%). This compares to a previously published study reporting 90% of pediatric providers using pneumatic otoscopy to identify an effusion.[18] The 2004 guidelines emphasize the importance of an accurate diagnosis of OME and upgraded pneumatic otoscopy as a primary diagnostic tool for detecting OME from being a "recommendation" to a "strong recommendation."[2,9] In contrast to the 1994 guidelines, the 2004 update recommended evaluation and therapy based on criteria of dB HL, in addition to the presence or absence of structural abnormalities of the tympanic membrane and speech or language delays.[2,9] Our survey found this to be an area of knowledge deficit, as only 9% of the respondents recognized a repeat hearing test for a child with bilateral effusion that had 20dB HL as appropriate follow-up.

Although the 2004 guidelines are clear in recommending observation of OME ("watchful waiting") for the child not at risk for speech or language delays,[2,9] a significant minority of respondents to our survey (43%) chose a management option that included antibiotics. This demonstrates a continued lack of clarity and understanding on the issues surrounding antibiotic use. Complementary and alternative medicine (CAM) was selected as an acceptable treatment choice with 17% of respondents. This finding may reflect the increasing trend towards CAM in pediatric care,[19-21] even when compared to a more standard treatment, such as in this survey question. More research into the use of CAM seems warranted.

Surveys are limited with the uncertainty that respondents are representative of the larger group being surveyed. Our survey response rate and demographics suggest that our survey results are accurate for this specific clinic's pediatric health care professionals. Whether the survey results from these professionals can be generalized is unknown, but our survey findings suggest the need for similar studies in other settings.

CONCLUSION

We found clinician documentation practices lacking OME follow-up. There remains a need for objective measurements of the impact of good documentation on OME outcomes. Physician knowledge of some of the components of the AAP OME guidelines also appear to be deficient, such as dB HL stratification of management and antibiotic use. More research is needed to identify reasons for deficient areas in knowledge, and ways to communicate guidelines to health care professionals.

Acknowledgments: We thank Mary Jo Knobloch, MPH, and Marie Fleisner for assistance with manuscript editing, Bickol N. Mukesh, PhD, for data analysis, and Lorelle Benetti for database management. We thank the Marshfield Epidemiologic Research Center for providing epidemiologists for validating data abstraction. We also thank the Office of Scientific Writing and Publication for editorial assistance in the preparation of this manuscript.

Funding/Support: This work was supported by a grant from Marshfield Clinic Division of Education's Resident Research Fund and supported by staff from the Marshfield Clinic Research Foundation.
Financial Disclosure/Conflict of Interest: None declared.

REFERENCES

1. Shekelle P, Takata G, Chan LS, et al. Diagnosis, Natural History, and Late Effects of Otitis Media with Effusion. 2003. Rockville, MD, Agency for Healthcare Research and Quality. Evidence Report/Technology Assessment No. 55 (Prepared by Southern California Evidence-based Practice Center under Contract No 290-97-0001, Task Order No. 4).
2. American Academy of Family Physicians, American Academy of Otolaryngology-Head and Neck Surgery, American Academy of Pediatrics Subcommittee on Otitis Media With Effusion. Otitis media with effusion. *Pediatrics.* 2004;113:1412-1429.
3. Corbeel L. What is new in otitis media? *Eur J Pediatr.* 2007;166:511-519.
4. Rovers MM, Schilder AG, Zielhuis GA, Rosenfeld RM. Otitis media. *Lancet.* 2004;363:465-473.
5. Tos M. Epidemiology and natural history of secretory otitis. *Am J Otol.* 1984;5:459-462.
6. Fria TJ, Cantekin EI, Eichler JA. Hearing acuity of children with otitis media with effusion. *Arch Otolaryngol.* 1985;111:10-16.
7. Sabo DL, Paradise JL, Kurs-Lasky M, Smith CG. Hearing levels in infants and young children in relation to testing technique, age group, and the presence or absence of middle-ear effusion. *Ear Hear.* 2003;24:38-47.
8. Renko M, Kontiokari T, Jounio-Ervasti K, Rantala H, Uhari M. Disappearance of middle ear effusion in acute otitis media monitored daily with tympanometry. *Acta Paediatr.* 2006;95:359-363.
9. American Academy of Pediatrics The Otitis Media Guideline Panel. Managing otitis media with effusion in young children. *Pediatrics.* 1994;94:766-773.
10. Belamarich PF, Gandica R, Stein RE, Racine AD. Drowning in a sea of advice: pediatricians and American Academy of Pediatrics policy statements. *Pediatrics.* 2006;118:e964-e978.
11. Paradise JL. Treatment guidelines for otitis media: the need for breadth and flexibility. *Pediatr Infect Dis J.* 1995;14:429-435.
12. Flores G, Lee M, Bauchner H, Kastner B. Pediatricians' attitudes, beliefs, and practices regarding clinical practice guidelines: a national survey. *Pediatrics.* 2000;105:496-501.
13. Christakis DA, Rivara FP. Pediatricians' awareness of and attitudes about 4 clinical practice guidelines. *Pediatrics.* 1998;101:825-830.
14. Wood DL. Documentation guidelines: evolution, future direction, and compliance. *Am J Med.* 2001;110:332-334.
15. Rosenfeld RM, Kay D. Natural history of untreated otitis media. *Laryngoscope.* 2003;113:1645-1657.
16. Seguin R, Godwin M, MacDonald S, McCall M. E-mail or snail mail? randomized controlled trial on which works better for surveys. *Can Fam Physician.* 2004;50:414-419.
17. McMahon SR, Iwamoto M, Massoudi MS,et al. Comparison of e-mail, fax, and postal surveys of pediatricians. *Pediatrics.* 2003;111:e299-e303.
18. Roark R, Petrofski J, Berson E, Berman S. Practice variations among pediatricians and family physicians in the management of otitis media. *Arch Pediatr Adolesc Med.* 1995;149:839-844.
19. Jean D, Cyr C. Use of complementary and alternative medicine in a general pediatric clinic. *Pediatrics.* 2007;120:e138-e141.
20. Sawni A, Thomas R. Pediatricians' attitudes, experience, and referral patterns regarding complementary/alternative medicine: a national survey. *BMC Complement Altern Med.* 2007;7:18.
21. Shakeel M, Little SA, Bruce J, Ah-See KW. Use of complementary and alternative medicine in pediatric otolaryngology patients attending a tertiary hospital in the UK. *Int J Pediatr Otorhinolaryngol.* 2007;71:1725-1730.

WISCONSIN MEDICAL JOURNAL

Trends in Bariatric Surgery for Morbid Obesity in Wisconsin: A 6-Year Follow-Up

Dana S. Henkel, MS, PA-C; Patrick L. Remington, MD, MPH; Jessica K. Athens, MS; Jon C. Gould, MD

ABSTRACT

Background: The prevalence of morbid obesity is increasing throughout Wisconsin and the United States. In 2004, we published a study, "Trends in Bariatric Surgery for Morbid Obesity in Wisconsin." We determined that surgery rates were increasing but felt the demand exceeded the capacity of the surgeons. This is a 6-year follow-up.

Methods: Data was gathered from 3 sources: the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System, the Wisconsin Hospital Association, and a survey administered to Wisconsin bariatric surgeons.

Results: From 2003-2008, an average of 2.8% of Wisconsin adults were morbidly obese. Although the number of bariatric surgeries performed in Wisconsin remained steady (1311 surgeries in 2003 and 1343 in 2008), the types of procedures shifted from open gastric bypass (73% in 2003) to laparoscopic gastric bypass (80% in 2008). The rate of surgery was 1 for every 100 morbidly obese adults. The majority of surgeons surveyed (70%) report that a lack of insurance benefits is the biggest barrier to performing bariatric surgery.

Conclusion: The prevalence of morbid obesity continues to increase in Wisconsin compared to our previously published data. Bariatric surgery volumes have remained stable but the type of procedure has changed. Approximately 1% of bariatric surgery candidates have surgery each year.

Author Affiliations: University of Wisconsin School of Medicine and Public Health, Madison, Wis (Henkel); Population Health, University of Wisconsin School of Medicine and Public Health Institute, Madison, Wis (Remington, Athens); Surgery, University of Wisconsin School of Medicine and Public Health, Madison, Wis (Gould).

Corresponding Author: Jon C. Gould, MD, H4/726 Clinical Science Center, 600 Highland Ave, Madison, WI 53792-7375; phone 608.263.1036; fax 608.265.8810; e-mail gould@surgery.wisc.edu.

INTRODUCTION

Obesity continues to be a national epidemic. The prevalence of obesity (Body Mass Index [BMI]≥30kg/m^2) increased by 24% from 2000-2005, while the prevalence of morbid obesity (BMI≥40) increased twice as fast.[1] Obesity affects many aspects of health with associated comorbidities including diabetes, hypertension, and sleep apnea.[2-3] Studies have shown this leads to a reduced life expectancy in the obese population, especially younger adults.[4] Furthermore, the health care dollars spent on treating the obese are in the billions and are projected to increase dramatically in the future.[5]

Many strategies are available to treat and prevent obesity including lifestyle modification, pharmacotherapy, and surgery. A review by Bray[6] of weight loss through the use of lifestyle modification and pharmacotherapy revealed 10% excess weight loss in obese subjects. This limited weight loss is in contrast to a recent review of the bariatric literature that reveals a 26% excess body weight loss 1 year after bariatric surgery, with good preservation at 5 years.[7] The Swedish Obese Subjects (SOS) study,[8] a prospective, match-controlled study, also showed that bariatric surgery was superior to conventional methods for sustained weight loss and resolution of comorbidities. Bariatric surgery has become an increasingly acceptable form of treatment for morbid obesity. In 1991, the National Institute for Health established that patients with a BMI ≥40 or BMI ≥35 with high risk comorbidities as appropriate candidates for bariatric surgery.[9] The American College of Surgeons and American Society for Metabolic and Bariatric Surgeons adhere to these guidelines when choosing appropriate candidates for surgery. Furthermore, the Centers for Medicare and Medicaid Services (CMS) has established payment for certain bariatric procedures under these guidelines as long as the patient has undergone unsuccessful weight loss treatment and the procedure is performed at a Medicare-approved facility.[10] Since the advent of these guidelines, the total number of surgeries performed for weight loss has increased. Zhao

reports an 804% increase in the number of bariatric procedures from 1998-2004.[11] Furthermore, although bariatric surgery is expensive up-front, recent data suggests that costs can be recouped in 2-4 years.[12]

The prevalence of obesity in Wisconsin increased from 21% in 2003 to 26% in 2008.[13] In 2004, the authors of this manuscript published a study titled "Trends in Bariatric Surgery for Morbid Obesity in Wisconsin,"[14] which evaluated the number of bariatric surgeries performed from 2001-2002 in Wisconsin relative to morbid obesity trends during the same time period. A survey of practicing bariatric surgeons was also conducted to assess the current practice and future trends as identified by those surgeons. At that time we found that approximately 80,000 adults were morbidly obese, and there was roughly 1 bariatric surgery for every 200 morbidly obese Wisconsin adults.[14] The current study is a 6-year follow-up to the previous study.

METHODS

Data for this study were gathered from 3 sources and were similar to the previous study. First, the Wisconsin-specific prevalence of morbid obesity was estimated using publicly available data from the Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS)[13] and population estimates from the CDC Wide-ranging OnLine Data for Epidemiologic Research (WONDER) database.[15] Second, the Wisconsin Hospital Association (WHA) provided data to examine the recent trends in bariatric surgeries performed in Wisconsin. Third, a survey was developed and administered to Wisconsin bariatric surgeons to assess their current bariatric surgery practices and predict future trends. All data analyses and statistical calculations were performed using SAS version 9.2 and Microsoft Excel software. Detailed information about our sources and methods is below.

The prevalence of morbid obesity (defined as BMI ≥40) was estimated using the Wisconsin BRFSS data from 2003-2008 as well as the census data for 2005 (the midpoint for the data set). BRFSS is a monthly telephone questionnaire designed by the CDC to gather data on behaviors that affect health.[13] The BRFSS allows a large sample to calculate prevalence. For this study, the self-reported height and weight from BRFSS was used to calculate a BMI and establish a percentage of people surveyed with a BMI ≥40. A BMI ≥40 was used as the focus of this study as well as the previous study because the National Institutes of Health (NIH) has designated patients with a BMI ≥40 or BMI ≥35 with comorbidities as appropriate candidates for bariatric surgery.[9] By applying the average percentage of people surveyed with a BMI ≥40 from 2003-2008 to the 2005 Wisconsin census data, an estimate of the population of Wisconsin with morbid obesity (ie, BMI ≥40) was determined. This was then stratified by age and gender.

The number of bariatric surgeries performed in Wisconsin from 2003-2008 was analyzed from WHA discharge data. WHA collects data from all hospitals in Wisconsin, except the Veterans Hospital. Data are collected on all inpatient and outpatient surgeries, including self-pay patients, and information is recorded related to principal diagnosis, procedure, age, sex, and other variables related to the medical record.[16] For this study, bariatric surgery CPT codes or comparative ICD-9 diagnosis codes were used to generate data sets according to year, gender, and age range. WHA data from 2008 were only collected through the third quarter; therefore, all the results were multiplied by 1.33 to produce a representative sample for the entire year. The CPT codes used for this study were 43846 open gastric bypass (OGB) with roux limb 150 cm or less, 43644 laparoscopic gastric bypass (LGB) with roux limb 150 cm or less, 43842 vertical-banded gastroplasty (VBG), and 43770 laparoscopic adjustable gastric band (LAB). Using the number of bariatric surgeries performed and the estimated populations with BMI ≥40, rates of surgery were calculated for the population of morbidly obese.

Finally, the study involved a 24-question survey mailed to 49 bariatric surgeons practicing in Wisconsin in summer 2009. Surgeons were identified through the Association for Morbid Obesity Support Group at www.obesityhelp.com. This website provides the most complete list of bariatric surgeons practicing in Wisconsin and was also used in the previous study.

RESULTS

Prevalence of Morbid Obesity in Wisconsin 2003-2008

The rates of morbid obesity in Wisconsin during 2003-2008 are presented in Table 1. During 2003-2008, an average of 2.8% of Wisconsin adults were morbidly obese (95% confidence interval [CI]: 2.6%-3.0%), with morbid obesity rates increasing from 2.2% in 2003 to 3.4% in 2008. Rates of morbid obesity were higher among women (3.4%; 95% CI: 3.1%-3.6%) compared to men (2.3%; 95% CI: 2.0%-2.5%). The rate of morbid obesity increased with age during 2003-2008, with the peak at ages 55-64 for both genders (Figure 1). After the age of 65, the rate of morbid obesity drops and resembles that of the 18- to 34-year-old age group.

Table 1. Morbid Obesity and Bariatric Surgery Rates in Wisconsin

	BRFSS 2003-2008 (Average of all years)			WHA Discharge Data 2003-2008 (Average of all years)	
Age	No. People Surveyed	% Surveyed with BMI >40[a]	Estimated Population BMI >40[a]	No. Surgeries	Procedures/ Population BMI >40[ab]
			Males		
18-34	2522	1.9% (1.3%-2.4%)	12,000 (8,600-15,400)	33	28 (21-38)
35-54	6051	2.2% (1.8%-2.6%)	18,600 (15,500-21,700)	126	68 (58-82)
55-64	2791	3.7% (3.0%-4.4%)	10,600 (8,600-12,600)	41	39 (33-48)
65+	3240	1.9% (1.4%-2.3%)	5,700 (4,200-7,100)	11	20 (16-26)
Total	14,604	2.3% (2.0%-2.5%)	46,853	211	45 (40-50)
			Females		
18-34	3520	2.9% (2.4%-3.5%)	17,900 (14,500-21,300)	247	138 (116-171)
35-54	7814	3.8% (3.4%-4.3%)	31,700 (28,200-35,200)	621	196 (176-220)
55-64	3562	4.8% (4.1%-5.5%)	13,800 (11,800-15,800)	145	105 (92-123)
≥65	5358	2.2% (1.8%-2.6%)	9,000 (7,400-10,600)	29	32 (27-39)
Total	20,254	3.4% (3.1-3.6%)	72,279 (66,955-77,602)	1042	144 (134-156)
Total Both Genders	**34,858**	**2.8% (2.6%-3.0%)**	**118,560 (111,249-125,871)**	**1253**	**106 (100-113)**

[a] 95% Confidence Interval
[b] Per 10,000
Abbreviations: BRFSS, Behavioral Risk Surveillance System; WHA, Wisconsin Hospital Association.

Trends in Bariatric Surgery in Wisconsin

According to the WHA database, except for 2004, the total number of bariatric surgeries performed in Wisconsin has remained fairly steady, with 1311 surgeries performed in 2003 and 1343 performed in 2008. However, the type of surgery performed changed dramatically, as shown in Figure 2. In 2003 and 2004, the majority of bariatric surgeries performed were open gastric bypasses (73% and 42% respectively.) By 2005, laparoscopic gastric bypass was clearly the most common surgery, with an average of 80% of all surgeries performed by this method from 2005-2008. Also, in the 2005-2008 time period, the number of open gastric bypasses declined dramatically, with only 3 performed in 2008. Furthermore, there was a steady increase in the number of laparoscopic adjustable bands (1% of surgeries in 2004 and 25% in 2008). Finally, vertical banded gastroplasties consisted of more than 26% of surgeries in 2003-2004, and then declined in 2005 to remain at approximately 3%.

The majority of bariatric surgeries performed during 2003-2008 were on patients aged 35-54. Less than 1% of all bariatric surgeries were performed among adolescents ages 13-17 and only 3% were among those aged ≥65. Rates of gastric bypass per 10,000 morbidly obese are represented in Table 1. Morbidly obese women were more likely to have bariatric surgery than men in all age categories, with an average of 83% of bariatric surgeries performed on women. Overall, approximately 1 of 100 morbidly obese adults had bariatric surgery in Wisconsin.

Survey Results

Forty-nine practicing bariatric surgeons were identified in Wisconsin. After initial and follow-up mailings, a total of 20 surveys were returned, for a yield of 41%. Responses are summarized in Table 2. The average number of years of bariatric practice was 11.3, with a median of 7.5 (range 1.5-37 years). Comparing 2007 to 2008, 55% of surgeons increased the number of bariatric surgeries they performed. Most of the surgeons (55%)

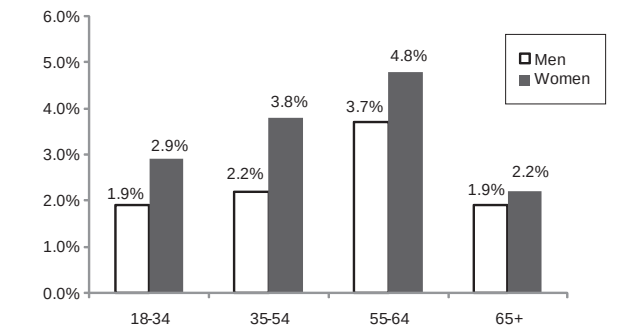


Figure 1. Percent morbid obesity by age and sex in Wisconsin during 2003-2008.

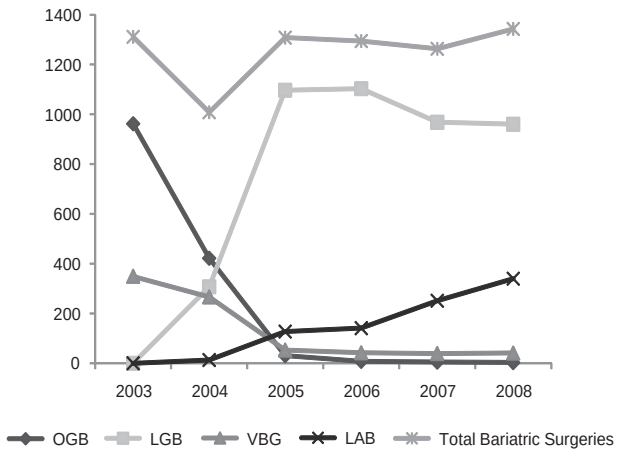


Figure 2. Bariatric surgeries performed from 2003-2008. Data from Wisconsin Hospital Association; total number and by type.

Abbreviations: OGB, open gastric bypass; VBG, vertical banded gastroplasty; LGB, laparoscopic gastric bypass; LAB, laparoscopic adjustable gastric band.

predict an increase in the number of bariatric surgeries they will perform in 2009, with 73% of those surgeons predicting a <25% increase in their practice.

In 2008, the set of surgeons returning the survey reported performing 1486 bariatric surgeries. The types of surgeries reported were 64% laparoscopic gastric bypass, 14% open gastric bypass, 17% laparoscopic adjustable bands, and 5% other procedures including gastric sleeve, biliopancreatic diversion, and revision.

In the next 12 months, 25% of surgeons plan to add another bariatric surgeon to their practice and 85% plan to continue practicing bariatric surgery. Only 50% of responding surgeons have a practice certified as a Center of Excellence by the American College of Surgeons or American Society of Bariatric and Metabolic Surgery. To be certified as a Center of Excellence, a bariatric program must meet 10 requirements and complete a full review process.[17] Of those surgeons not certified, 80% acknowledge not having enough cases as the reason for not being certified. On the other hand, 95% of respondents offer a comprehensive weight-management program in addition to surgery.

The most common motivating factor (95% response) to perform bariatric surgery was personal interest. The majority of surgeons obtained their bariatric training through courses (75%) and residency (65%).

Most bariatric surgeons (70%) pinpointed a lack of insurance approval for surgery as the biggest barrier. Surgeons reported wide variability in the percentage of "eligible candidates" for surgery who have an insurance plan that would cover a bariatric procedure. This ranged from 7 of 19 surgeons who reported that nearly all (90%) eligible candidates have insurance benefits to 5 of 19 who reported that <50% of eligible candidates have insurance plans that provide bariatric surgery benefits. In addition, the majority of surgeons (19 of 20) report turning away <10% of patients who would otherwise be candidates (morbidly obese) due to medical or psychiatric conditions.

DISCUSSION

We estimate there are approximately 120,000 adults with morbid obesity in Wisconsin today, an increase of 50% over the past decade.[14] Together with those with a BMI of 35-40 and a coexisting comorbidity, these individuals qualify for bariatric surgery. This finding reflects other studies on trends in morbid obesity in this country and confirms that morbid obesity is a fast-growing epidemic.[1] Rates of morbid obesity continue to be higher among women compared to men. Our data show that morbid obesity now peaks at the ages of 55-64 for both genders, which differs from the previous study, which showed a peak prevalence of morbid obesity in the 35-54 age group for both genders.[14] This may mark a trend in morbid obesity with its associated health problems in the aging population.

Currently, there are 49 bariatric surgeons in Wisconsin who are listed on obesityhelp.com. According to our survey results, 55% of the surgeons predict an increase in their practice, yet the majority of those surgeons (74%) predict only a small (<25%) increase. If all eligible candidates could have bariatric surgery, each surgeon would have to perform more than 2400 surgeries. This is an unlikely goal considering the number of bariatric surgeries performed over the last 6 years has stayed relatively stable. It's likely that if eligible patients had access to insurance benefits for this procedure, the number of surgeries would increase dramatically.

Analyzing the WHA database for Wisconsin surgeries, there were 963 gastric bypasses performed in 2008

compared to only 182 gastric bypasses in 2001.[14] This is more than a 5-fold increase in the number of gastric bypasses alone. Over the last several years, gastric bypass has become the standard in bariatric surgery. The SOS study concluded that while all bariatric procedures promote modest weight loss at 1 year, gastric bypass was the best, with 38% weight change compared to 26% and 21% for VBG and LAB, respectively.[8] Furthermore, a meta-analysis by Buchwald[18] of bariatric surgery reveals gastric bypass to be more effective for resolution of diabetes compared to VBG and LAB. These findings may guide bariatric surgeons to perform more gastric bypass rather than other types of surgeries.

Although the total number of bariatric surgeries stayed relatively stable between 2003 and 2008 (except for a decline in 2004 due to unidentified factors), the types of bariatric surgeries performed changed dramatically. First, OGB was the most common type of bariatric surgery in 2003, with 962 performed, but by 2008, only 3 were recorded. Recent prospective studies comparing OBG versus LGB have shown, even in the face of a steeper learning curve, that LGB was the preferable method due to fewer short-term post-operative complications[19-20] and abdominal wall hernias.[20] This may be 1 explanation for the trend. Another possible explanation is that the code for LGB was not established until 2004. It is possible that the majority of bypasses performed prior to this were done laparoscopically but not reflected in CPT coding. Second, LAB became more common after 2003, with a 26-fold increase by 2008. Possible explanations for the lack of LAB use before 2003 are its FDA approval in 2001, time needed for surgeon training, and acquisition of proper codes for the procedure. The LAB is attractive to many patients because it is less invasive and easier to reverse compared to other bariatric procedures. However, this procedure has been shown to have more long-term complications and less weight loss at 1 year than gastric bypass.[7] This may limit the numbers of this procedure being performed in the future. Finally, the number of VBGs declined in 2005 and remained at around 3% of all surgeries throughout 2008. Interestingly, the surgeons did not report any VBG but did note gastric sleeve and biliopancreatic diversion surgery. These other bariatric surgeries should be considered for study in the future.

Compared to the WHA data, our survey data shows some discrepancy in the number of bariatric surgeries performed. According to the WHA data, 1343 surgeries were performed in 2008, while surgeons reported 1486. Considering only 41% of physicians returned the survey, this difference could be much larger. Furthermore, in 2008, surgeons reported 14% of their procedures to be OGB while WHA recorded around 0.2% of the procedures to be OGB. Reasons for this discrepancy could include over-reporting by surgeons, use of different codes, or coding as secondary procedures, which was not analyzed by WHA data. Furthermore, the surveys may report surgeries that were performed by an assistant surgeon and actually duplicate the primary surgeon's response and falsely elevate the number of self-reported bariatric surgeries in the state. Therefore, the survey data cannot be analyzed as objectively as the WHA numbers.

This study reveals that women were more likely to have bariatric surgery than men, similar to our previous findings of around 80%-85%. This study revealed the majority of bariatric surgeries performed during 2003-2008 were on patients aged 35-54, which was no different from our previous study.[14] Adolescents ages 13-17 were found to make up less than 1% of all bariatric surgeries performed. Schilling et al[21] reported that most hospitals

Table 2. Survey Results from Bariatric Surgeons, N=20

Years Practicing Bariatric Surgery in Wisconsin	
Average	11.3
Median	7.5
Range	1.5-37
Type of Bariatric Surgeries Performed in 2008	
Laparoscopic gastric bypass	64% (n=915)
Open gastric bypass	14% (n=205)
Gastric band	17% (n=241)
Other	5% (n=68)
Number of Bariatric Surgeries (2008 Compared to 2009 Estimates)	
Predict increase	55%
Predict decrease	20%
Predict no change	25%
Plan to Add Another Bariatric Surgeon to Group in Next 12 Months	
Yes	25%
No	75%
Motivating Factors to Provide Bariatric Surgery (Multiple Responses Allowed)	
Personal interest	95%
Consumer need	80%
Practice/group need	65%
Desire to use advanced technology	35%
Financial reasons	5%
Other	5%
Biggest Barrier to Performing Bariatric Surgery	
Insurance approval	70%
Competing professional obligations	20%
Other	10%

performing bariatric operations on adolescents did less than 4 bariatric procedures annually on this age group. Our data shows that throughout Wisconsin, only ≤2 bariatric procedures are performed on adolescents each year. Another age group analyzed for this study was the elderly, age ≥65, which made up approximately 3% of all surgeries. Evidence suggests that while bariatric surgery in the elderly (>60 years of age) is associated with higher morbidity and in-hospital mortality, the procedure is safe in properly selected individuals.[22]

During 2003-2008, morbid obesity was more prevalent among females of all age groups, although compared to the 1999-2001 data, morbid obesity increased more rapidly in males. We previously reported twice as many morbidly obese females than males,[14] though our new data shows only 1.5 times as many morbidly obese females as males (Table 1). The rate of bariatric surgery in morbidly obese women was greater than men in all age categories, as was the case in our previous study.[14] Finally, although the rate of bariatric surgery nearly doubled in the morbidly obese across all ages and genders since 2002, the current rate only treats 1 out of 100 morbidly obese adults in Wisconsin.

There are several limitations to our study. First, the data reported here may under-represent the true prevalence of morbid obesity. Self-reported height and weight from the BRFSS database was used to calculate BMI. There is a tendency to under-report weight and over-report height,[23-24] which will result in a lower prevalence than if height and weight were otherwise measured. Second is the uncertainty related to the number of open versus laparoscopic gastric bypasses performed prior to 2004 due to the lack of separate codes for these procedures. Also, only 4 bariatric codes were analyzed, and the data does not reflect every type of bariatric surgery performed in Wisconsin. A limitation of comparing our results to our previous data is the previous study only looked at gastric bypass while our data looks at several types of bariatric surgeries. Some analogies can be made, however, since gastric bypass was the most common surgery performed during 2003-2008. Finally, there was only a 41% return rate for our survey, leaving a small surgeon sample size as well as questions of over-reporting of surgeries to make generalizations from the data collected.

CONCLUSION

Our findings indicate a continuing increase in the prevalence of morbid obesity in Wisconsin. While not the entire solution to the obesity epidemic, bariatric surgery is an important option to make readily available to patients struggling to control their weight and associated health conditions. Since 2002, Wisconsin has seen an increase in the number of bariatric procedures performed, and the surgeries have shifted from OGB to LGB. Although the rate of bariatric surgeries relative to Wisconsin's morbidly obese population has doubled since our previous study, only 1% of surgical candidates are having bariatric surgery each year. With barriers to surgery such as insurance approval, it's likely the needs of this population are not being met.

Acknowledgments: We would like to thank Julie Callies and Steve Brenton at the Wisconsin Hospital Association for providing the hospital discharge data. We also appreciate all of the surgeons who took the time to fill out and return the survey; without your participation this project would have been incomplete. Also, a special thanks to Aimee Mastrangelo in the University of Wisconsin Department of Surgery for all your help getting the surveys mailed out and collected.

Funding/Support: None declared.

Financial Disclosures: None declared.

REFERENCES

1. Strum R. Increases in morbid obesity in the USA: 2000-2005. *Public Health.* 2007;121:492-496.
2. Kushner RF, Noble CA. Long-term outcomes of bariatric surgery: an interim analysis. *Mayo Clin Proc.* 2006;81(10suppl):S46-S51.
3. DeMaria DJ, Carmody BJ. Perioperative management of special populations: obesity. *Surg Clin North Am.* 2005;85:1283-1289.
4. Fontaine KR, Redden DT, Wang C, Westfall AO, Allison DB. Years of life lost due to obesity. *JAMA.* 2003; 289(2):187-193.
5. Wang Y, Beydoun MA, Liang L, Caballero B, Kumanyika SK. Will all Americans become overweight or obese? estimating the progression and cost of the US obesity epidemic. *Obesity.* 2008;16(10):2323-2330.
6. Bray GA. Lifestyle and pharmacological approaches to weight loss: efficacy and safety. *J Clin Endocrinol Metab.* 2008;93(11):S81–S88.
7. Tice JA, Karliner L, Walsh J, Petersen AJ, Feldman MD. Gastric banding or bypass? a systematic review comparing the 2 most popular bariatric procedures. *Am J Med.* 2008;121(10):885-893.
8. Sjostrom L, Lindroos A, Peltonen M, et al. Lifestyle, diabetes, and cardiovascular risk factors 10 years after bariatric surgery. *N Engl J Med.* 2004;351:2683-2693.
9. National Institutes of Health Consensus Development Panel. Gastrointestinal surgery for severe obesity. *Ann Intern Med.* 1991;115:956-961.
10. Centers for Medicare and Medicaid Services. CMS Manual System. http://www.cms.hhs.gov/Transmittals/downloads/R1233CP.pdf. Accessed January 8, 2010.
11. Zhao Y, Encinosa J. Bariatric Utilization and Outcomes in 1998 and 2004. Statistical Brief #23. Rockville, MD: Agency for Healthcare Research and Quality; 2007.
12. Cremieux PY, Buchwald H, Shikora SA, Ghosh A, Yang HE, Buessing M. A study on the economic impact of bariatric surgery. *Am J Manag Care.* 2008;14(9):589-596.
13. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Data. http://www.cdc.gov/brfss. Accessed January 8, 2010.

14. Erickson JL, Remington PL, Peppard PE. Trends in bariatric surgery for morbid obesity in Wisconsin. *WMJ.* 2004;103:32-37.
15. Centers for Disease Control and Prevention. Bridged-Race Population Estimates. http://wonder.cdc.gov/Bridged-Race-v2007.HTML. Accessed January 8, 2010.
16. Wisconsin Hospital Association. Information Center WIpop Manual. http://www.whainfocenter.com/wipop.htm. Accessed January 8, 2010.
17. Surgical Review Corporation. Bariatric Surgery Center of Excellence Requirements. http://www.surgicalreview.org/pcoe/tertiary/tertiary_provisional.aspx. Accessed January 8, 2010.
18. Buchwald H, Avidor Y, Braunwald E, et al. Bariatric surgery: a systematic review and meta-analysis. *JAMA.* 2004; 292(14):1724-1737.
19. Lujan JA, Frutos MD, Hernandez Q, et al. Laparoscopic versus open gastric bypass in the treatment of morbid obesity: a randomized prospective trial. *Ann Surg.* 2004;236(4):433-437.
20. Hutter MM, Randall S, Khuri SF, Henderson WG, Abbott WM, Warshaw AL. Laparoscopic versus open gastric bypass for morbid obesity: a multicenter, prospective, risk-adjusted analysis from the National Surgical Quality Improvement Program. *Ann Surg.* 2006;243(5):657-666.
21. Schilling PL, Davis MM, Albanese CT, Dutta S, Morton J. National trends in adolescent bariatric surgical procedures and implications for surgical centers of excellence. *J Am Coll Surg.* 2008;207(3):458.
22. Varela JE, Wilson SE, Nguyen NT. Outcomes of bariatric surgery in the elderly. *Am Surg.* 2006;72(10):865-869.
23. Elgar FJ, Stewart JM. Validity of self-report screening for overweight and obesity. evidence from the Canadian Community Health Survey. *Can J Public Health.* 2008;99(5):423-427.
24. Gorber SC, Tremblay M, Moher D, Gorber B. A comparison of direct vs self-report measures for assessing height, weight, and body mass index: a systematic review. *Obes Rev.* 2007;8(4):373-374.

WISCONSIN MEDICAL JOURNAL

Pilot Study of Adolescent Attitudes Regarding Ski or Snowboard Helmet Use

Andrew R. Peterson, MD; M. Alison Brooks, MD, MPH

ABSTRACT

Introduction: The number of head injuries from skiing and snowboarding accidents is increasing among adolescents. Ski helmets reduce the risk of head injury. This study explored adolescent attitudes regarding helmet use.

Methods: This pilot study included 11 high school students participating in a 1-hour focus group.

Results: There was agreement that head injury is unlikely compared to other injuries, and use of helmets is determined by level of difficulty of the activity. Peer use makes personal use more acceptable and likely. Helmet cost is a minor barrier. Personal experience with a head injury increases use. Mandatory helmet use was viewed positively by most of the subjects.

Conclusions: This pilot study suggests that, similar to bicycle helmet promotion programs, ski and snowboard helmet campaigns should focus on delivering a positive image of helmet use and peer acceptance.

INTRODUCTION

The incidence of head injury is increasing in skiing and snowboarding, particularly among adolescents,[1-2] and traumatic brain injury remains the leading cause of death.[3] There is evidence that helmets reduce risk of head injury in skiing and snowboarding.[4-6] One observational study found that only one-quarter of 11- to 17-year-olds wear a helmet while skiing or snowboarding.[7] This pilot study's objective was to explore adolescent attitudes about ski and snowboard helmet use.

Author Affiliations: Department of Pediatrics, University of Wisconsin–Madison, Madison, Wis (Peterson, Brooks); Department of Orthopedics and Rehabilitation, University of Wisconsin–Madison, Madison, Wis (Brooks).
Corresponding Author: M. Alison Brooks, MD, MPH, 621 Science Dr, Madison, WI 53705; phone 608.263.6477; fax 608.263.0503; e-mail brooks@ortho.wisc.edu.

METHODS

A convenience sample of adolescents was recruited from 1 private urban high school in Seattle, Washington. Informational letters were distributed, and informed consent of parents and adolescents was obtained. Eleven adolescents chose to participate and were compensated for their time. Topic questions were used to generate discussion. The 1-hour focus groups were conducted at the school after hours and moderated by the second author. The sessions were tape recorded and later transcribed. A research assistant operated the tape recorder and took notes. No props were used. The authors independently reviewed the focus group transcripts and identified a list of major discussion themes. The authors then reviewed the transcripts together to identify which themes had frequent participant agreement or consensus. Representative responses for each major theme were chosen for inclusion in this paper.

RESULTS

Participants included 7 female and 4 male high school students. Six were skiers; 5 were snowboarders. All skiers self-rated as intermediate or expert and had greater than 5 years experience. All snowboarders self-rated as beginners and had 3 years experience or less. Of the participants, 9 reported bike helmet use and 4 reported ski helmet use. Parents or grandparents purchased all of the participants' ski helmets.

When asked about likelihood of head injury, the most frequent responses were "everything except the head," "broken bones," "arms, legs, stuff like that," "knees and shins," and "it seems like you'd have to work really hard to land on your head."

When asked about reasons to wear a helmet, there was agreement that more advanced skiers and snowboarders had greater need to wear protective equipment. "Now that I'm getting better, I'm trying new things and there's more risk, so you [*sic*] would wear a helmet." "I just started doing more rails. Now that I'm

doing kind of more dangerous things, I kind of consider wearing a helmet more than I used to." A few adolescents identified particular groups with more or less risk and the need to wear a helmet. "The people who weren't wearing helmets in the Olympics I thought looked really stupid, actually. They're doing really stupid hard tricks."

Several adolescents had personal experience with a head injury or knew someone who had suffered a head injury. There was agreement that such an experience made them more likely to consider wearing a helmet. Responses included "I crashed into a guy, but I was wearing my helmet, and there was a big dent in my helmet, so I guess just seeing that dent was kind of like, wow, good thing I was wearing that," and "My friend's older brother went skiing and fell and cracked his helmet. He also broke his arm but his head was OK because of the helmet. It was actually on a rail, and he fell back and hit his head. After that I couldn't argue with my mom about it." One adolescent admitted that previous experience did not change behavior. "Well, I got injured and I still don't wear it. I know this is like [*sic*] really stupid."

There was agreement that they were more likely to wear helmets if their peers were also wearing helmets. Responses included "I am more comfortable wearing a helmet when my friends are wearing a helmet," and "I am embarrassed if I see a group of people my age that aren't wearing helmets, and I'm walking by with a big helmet."

A few adolescents stated they were more willing to wear a helmet at a resort where ski helmet use was more accepted. Responses included "I ski at [specific place]. Everyone there wears helmets, so it's not like it really bothers me at all," and "Up in Canada… everyone wears helmets." One adolescent expressed his likelihood of wearing a helmet would be influenced by ski patrol or ski instructors. "They're kind of like the image of safety on the mountain. They know what they're doing, and they're the teachers, so if they tell you to wear a helmet, I'm sure you'd wear a helmet."

There was consensus that helmets seemed expensive when purchased individually but inexpensive when compared to total cost of equipment packages. "It might be good to just have the helmet included in the package. Then the cost wouldn't seem as much 'cause you're spending like [*sic*] a thousand bucks or whatever for the ski package."

When asked about mandatory ski helmet rules, most said it would not affect their choice of ski area and would improve the acceptance of helmet use. Responses included "I wouldn't change where I'm going just because I'd have to like [*sic*] wear a helmet," and "It would eliminate the problem of people worrying if they looked weird to everyone else." A few adolescents did view mandatory use negatively. One said "If they made it a rule on the hills, I would have a problem with it. Lots of people would stop going to that particular place."

DISCUSSION

This pilot study provides insights into adolescent attitudes toward ski or snowboard helmet use. There was agreement that:

- Head injury is unlikely compared to other injuries.
- The use of helmets is determined by level of difficulty of the activity.
- Peer use makes personal use more acceptable and likely.
- Helmet cost is minimal compared to the total cost of the ski package.

Adolescent attitudes and behaviors also appeared to be influenced by exposure to a head injury (self, family, or friend) and the belief that helmets do protect against head injury. Mandatory helmet use was viewed positively by most of the adolescents.

These findings are similar to those of bike helmet focus groups.[8] The perceived likelihood of head injury and need for a helmet was related to the "level" of activity. The main concern about wearing helmets when others were not was due to feeling self-conscious, not fear of ridicule. There is minimal resistance to helmet use, even mandatory use. Adolescents were more likely to have a positive attitude about helmet use if other participants and the ski environment also displayed a positive and accepting attitude.

The primary limitation of this pilot study is small sample size and generalizability. However, the information gathered through this research may be useful to generate ideas and strategies for promoting adolescent helmet use and further study. It is not standard practice to include a helmet in packages for purchase or rental, which typically include skis/snowboard, poles, and boots. Levy argues that not including helmets may send a message that they are not important equipment for skiing and snowboarding.[9] Based on the diffusion of innovation theory, the acceptance of helmets should accelerate as more adolescents adopt helmets and feel more social pressure to use one, or rather, less social pressure not to wear one.[10] Mandatory use for specific ages or terrain may be beneficial. Over time, one would expect ski helmets to become standard safety equipment, similar to bike helmets and seat belts.

A positive culture of helmet use appears to be the strongest incentive for adolescents to use their own helmet when skiing or snowboarding. As one adolescent expressed, "I don't think you should try and scare kids into it. After a while people are like, well, that's exaggerating. Make it positive to wear helmets."

Funding/Support: The project described was supported by the National Institute of Health Award Number K12 HD055894 from the Eunice Kennedy Shriver National Institute of Child Health & Human Development. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute of Child Health & Human Development or the National Institutes of Health.
Financial Disclosures: None declared.

REFERENCES

1. Ackery A, Hagel BE, Provvidenza C, Tator CH. An international review of head and spinal cord injuries in alpine skiing and snowboarding. *Inj Prev.* 2007;13(6):368-375.
2. Hagel BE, Pless B, Platt RW. Trends in emergency department reported head and neck injuries among skiers and snowboarders. *Can J Public Health.* 2003;94(6):458-462.
3. Xiang H, Stallones L, Smith GA. Downhill skiing injury fatalities among children. *Inj Prev.* 2004;10(2):99-102.
4. Hagel BE, Pless IB, Goulet C, Platt RW, Robitaille Y. Effectiveness of helmets in skiers and snowboarders: case-control and case crossover study. *BMJ.* 2005;330(7486):281.
5. Mueller BA, Cummings P, Rivara FP, Brooks MA, Terasaki RD. Injuries of the head, face, and neck in relation to ski helmet use. *Epidemiology.* 2008;19(2):270-276.
6. Sulheim S, Holme I, Ekeland A, Bahr R. Helmet use and risk of head injuries in alpine skiers and snowboarders. *JAMA.* 2006;295(8):919-924.
7. Lawrence L, Shaha S, Lillis K. Observational study of helmet use among children skiing and snowboarding. *Pediatr Emerg Care.* 2008;24(4):219-221.
8. Howland J, Sargent J, Weitzman M, et al. Barriers to bicycle helmet use among children. Results of focus groups with fourth, fifth, and sixth graders. *Am J Dis Child.* 1989;143(6):741-744.
9. Levy AS, Hawkes AP, Rossie GV. Helmets for skiers and snowboarders: an injury prevention program. *Health Promot Pract.* 2007;8(3):257-265.
10. Andersen PA, Buller DB, Scott MD, et al. Prevalence and diffusion of helmet use at ski areas in western North America in 2001-02. *Inj Prev.* 2004;10(6):358-362.

WISCONSIN MEDICAL JOURNAL

All Red is Not Always Bacterial Cellulitis: A Case of Löfgren's Syndrome

Gagan Kumar, MD; Nilay Kumar, MD, MPH

ABSTRACT

Löfgren's syndrome is a rare variant of sarcoidosis characterized by the triad of hilar adenopathy, acute polyarthritis, and erythema nodosum. It can be the first presentation of underlying sarcoidosis. Also, the initial presentation of Löfgren's syndrome may be confused with cellulitis. This is a self-limiting disease with a very good prognosis. Non steroidal anti-inflammatory drugs (NSAIDs), along with supportive care and close monitoring, are the mainstay for treatment.

CASE

A 53-year-old man presented with progressively worsening pain and erythema in the right foot for 2 weeks. He was seen by his primary care physician for this condition and was empirically started on antibiotics (500mg of oral cephalexin 2 times daily) for 10 days to treat presumed cellulitis. He did not have any significant contributory past medical history. Despite the antibiotic treatment, the erythema worsened over the next week and spread toward the leg. He then developed episodic fever spikes to 101°F and a painful effusion in the right ankle joint. He revisited his primary care physician after completing the antibiotic course and his antibiotic was changed to trimethoprim-sulfamethoxazole to cover for community-acquired, methicillin-resistant *Staphylococcus aureus* cellulitis. The erythema continued to worsen and progressed to his shins. He then developed new tender nodular erythematous lesions in his bilateral lower extremities. Despite continued antibiotic therapy, the patient continued to have low-grade fevers and was admitted to inpatient medical service for further evaluation. He did not recall any trauma or significant travel history prior to his symptoms.

On admission, the patient had a temperature of 101°F, but was otherwise hemodynamically stable. On examination he appeared comfortable. He had a confluent erythematous macular lesion on the dorsal aspect of right foot and right shin and 2-3 cm circular erythemaous macular lesions on his left shin (consistent with erythema nodosum [EN]). Also noted was an effusion involving the right ankle joint that was tender to palpation, with somewhat limited range of motion without any distal neurovascular compromise. The rest of his systemic examination was unremarkable. He was noted to have leucocytosis of 13.2×10^9 cells/L with 91% neutrophils. His inflammatory markers were elevated with an erythrocyte sedimentation rate (ESR) of 48 and C-reactive peptide of 17.2. Complement levels were normal. His chest X-ray and urine analysis were normal. Blood cultures were drawn on admission and continued to test negative.

He was started on the broad spectrum antibiotics vancomycin and piperacillin/tazobactam. As the lesions continued to worsen, a skin biopsy was performed that revealed features suggestive of panniculitis. Special stains were performed and tested negative for microorganisms. The diagnosis of EN was also suggested but could not be made definitively due to insufficient subcutaneous tissue in the specimen.

An infectious disease consultation was obtained. An array of further testing was done that included antistreptolysin-O (ASO) titres for streptococcus, serum quantiferron for mycobacterium, polymerase chain reaction (PCR) for mycoplasma, enzyme linked immunosorbent assay (ELISA) for HIV 1 and 2, and fungal antigen. These all came back negative. Blood cultures and wound cultures did not show any bacterial or fungal growth. The antibiotics were discontinued on the second day.

For further evaluation of systemic causes for EN noted on the patient's legs, a computed tomography

Author Affiliations: Hospital Medicine, Froedtert & The Medical College of Wisconsin, Milwaukee, Wis.
Corresponding Author: Gagan Kumar, MD, Assistant Professor, Section of Hospital Medicine, Froedtert & The Medical College of Wisconsin, Clinical Cancer Center, 5th Fl, 9200 W Wisconsin Ave, Milwaukee, WI 53226; phone 414.805.0820; fax 414.805.0855; e-mail gkumar@mcw.edu.

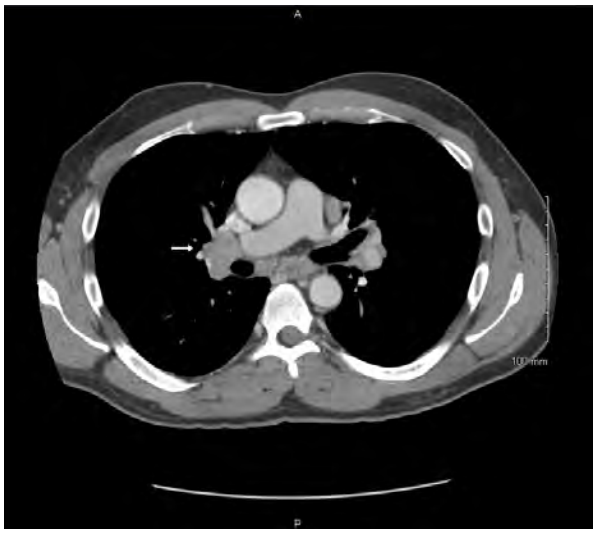


Figure 1. Contrast-enhanced computed tomography (CT) of chest showing hilar lymphadenopathy.

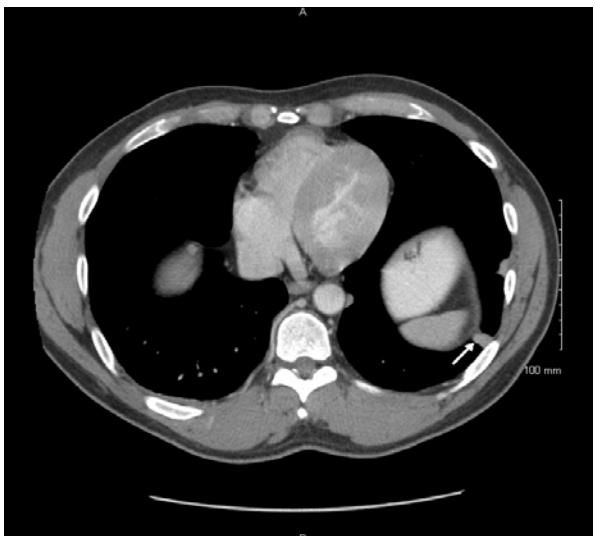


Figure 2. Contrast-enhanced computed tomography (CT) of chest showing sarcoid nodules.

(CT) scan of his chest and abdomen were done to exclude lymphoma and sarcoidosis. The CT scan revealed multiple mediastinal and hilar lymph nodes and pulmonary nodules suggestive of sarcoidosis. For definitive diagnosis, a mediastinoscopy and biopsy, along with video-assisted thoracic lung surgery (VATS) and wedge biopsy, was performed (Figures 1 and 2). The histopathology on the tissue sample showed non-necrotizing granulomas consistent with sarcoidosis. In light of the new findings, the patient was diagnosed with Löfgren's syndrome and started on ibuprofen 400mg by mouth twice daily. The patient showed significant improvement with this therapy and was discharged home with instructions to follow up with his primary care physician in 1 month. His lesions continued to respond very well to the treatment, and his fevers and the effusion in the right ankle also resolved.

DISCUSSION

Löfgren's syndrome was first described by Sven Löfgren in 1953. The syndrome consists of triad of EN with bilateral hilar lymphadenopathy and arthralgia or arthritis. It is currently considered a variant of sarcoidosis. The periarticular ankle inflammation associated with bilateral hilar lymphadenopathy is considered a variant of Löfgren's syndrome.[1] Other symptoms include fever (38%), cough (13%), hepatomegaly (6%), hypercalcemia (2%), and salivary gland hypertrophy (1%).[2]

A biopsy is needed for definitive diagnosis for sarcoidosis and Löfgren's syndrome and to rule out other conditions such as fungal infection, tuberculosis, lymphomas, and bronchogenic carcinoma, among others that can cause hilar lymphadenopathy with EN. The histopathology of the lymph nodes reveals non-caseating granulomas. Angiotensin converting enzyme (ACE) level is elevated in 50% of patients[2] with EN but is nonspecific and can be elevated in hepatitis, lymphomas, and other conditions. The ACE levels can be useful as a follow-up marker for resolution of disease. Other tests, such as Ga^{67} scan, are not specific for sarcoidosis and are not clinically useful.[2] The workup should include a CT scan of the chest to evaluate hilar lymphadenopathy.

Although rare and a diagnosis of exclusion, Löfgren's syndrome should always be considered in patients with EN. In a study of 106 patients with biopsy proven EN, 22% of the patients were found to have Löfgren's syndrome or sarcoidosis.[3] Other etiologies to consider while evaluating a case of EN are viral upper respiratory tract infection (20%), Group A beta hemolytic streptococci (7%), tuberculosis (5%), drugs like penicillin and sulpha drugs (3%), inflammatory bowel disease, and malignancy.[3] Idiopathic cause constitutes one-third of the causes.[3]

NSAIDs are the mainstay of treatment along with bed rest. Steroids can be used in serious arthritis, hypercalcemia, and granulomatous skin lesions.[4] The prognosis of Löfgren's syndrome is excellent; in 1 of the largest studies of 186 patients, only 8% of patients had significant disease at the end of a 2-year follow-up.[1]

CONCLUSION

Löfgren's syndrome can present as erythematous lesion in lower extremities with fever and mild leucocytosis

and can be difficult to differentiate from cellulitis in early stages. Poor response to antibiotics, typical skin lesions, and presence of arthritis or arthralgia should raise the suspicion of this entity and skin biopsy should be performed to confirm it. Workup for infectious etiologies like group A streptococcus, mycobacterium, fungal, and viral causes should be performed. Prognosis is good and relapse is uncommon. The treatment of choice is NSAIDs.

Funding/Support: None declared.
Financial Disclosures: None declared.

REFERENCES

1. Mañá J, Gómez-Vaquero C, Salazar A, Valverde J, Juanola X, Pujol R. Periarticular ankle sarcoidosis: a variant of Löfgren's syndrome. *J Rheumatol.* 1997;24(1):239.
2. Mana J, Gomez-Vaquero C, Montero A, et al. Lofgren's syndrome revisited: a study of 186 patients. *Am J Med.* 1999;107:240-245.
3. Garcia-Porrua C, Gonzalez-Gay MA, Vazquez-Caruncho M, et al. Erythema nodosum: etiologic and predictive factors in a defined population. *Arthritis Rheum.* 2000;43:584-592.
4. Ohta H, Tazawa R, Nakamura A, et al. Acute-onset sarcoidosis with erythema nodosum and polyarthralgia (Löfgren's syndrome) in Japan: a case report and a review of the literature. *Intern Med.* 2006;45(9):659-662.

Proceedings from the 2009 Annual Meeting of the American College of Physicians, Wisconsin Chapter

The Wisconsin Chapter of the American College of Physicians held its annual meeting in the Wisconsin Dells, Wis, September 11-13, 2009. Internal Medicine residents from each of Wisconsin's 5 residency programs (Gundersen Lutheran Health System, Marshfield Clinic, the Medical College of Wisconsin, University of Wisconsin Hospital and Clinics, and University of Wisconsin Milwaukee Clinical Campus [Aurora Sinai Medical Center]) presented their research and/or unusual clinical experiences via posters and vignettes.

PRESENTED POSTERS

Ocular Melanoma Metastasizing to Liver

Paragkumar Amin, MD; Aurora Health Care, Milwaukee, Wis

Case: A 77-year-old Hispanic man who had recently arrived from Mexico presented with generalized weakness and easy fatigability of 3-week duration, which increased to the extent that he was unable to walk. He had vague abdominal discomfort mostly in the right upper quadrant (RUQ) and epigastrium, which increased with standing and pressure. He was also experiencing nausea, weight loss (7-8 lbs), jaundice, and occasional itching. History of gastric esophageal reflux disease (GERD) and ocular tumor status post-enucleation 4-5 years prior. On physical exam, patient had a left prosthetic eye, scleral icterus, and abdominal tenderness in the RUQ with massive hepatomegaly extending 8-10 cm below the costal margin. Rectal exam revealed external hemorrhoid and guaiac positive brown stool. He was somewhat obtunded and had mild tremors in both hands. There was no lymphadenopathy or skin lesion. Initial lab work revealed total billirubin 12.7, direct 10.5, alkaline phosphate 304, aspartate aminotransferase (AST) 107, alanine aminotransferase (ALT) 68, lipase 324, and negative hepatitis panel. X-ray of the abdomen showed 3.9 cm sized calcified round density in left upper lobe. Computed Tomography (CT) scan showed mottled enhancement and irregular contour of left lobe. Biopsy showed malignant cells that on immunohistochemistry were found to be consistant with metastatic malignant melanoma. Malignant cells were also found in paracentesis fluid, which was found to be metastasis from the ocular melanoma. During hospitalization, he was treated conservatively with lactulose and proton pump inhibitors (PPIs) but continued to feel weak. The patient denied any further aggressive workup and opted for comfort care.

Discussion: Ocular melanoma has a unique predilection for the liver, which has been attributed to the lack of lymphatic drainage to the eye and tendency to spread hematogenously. The liver has been reported as initial site of metastasis in more than 50% of patients. Among patients who develop metastasis, the liver is involved in 71%-94% of cases. It can metastasize up to 15 years after the primary tumor. Hepatic metastasis is identified as poor prognostic marker for response to treatment and survival. Median survival after diagnosis of liver metastasis ranges from 2 to 9 months. Diagnosis is confirmed with biopsy and immunohistochemistry, which is positive for vimectin and human melanoma black (HMB)-45. Metastatic disease has been proven to be resistant to most available chemotherapy and immunotherapy regimens. This has led to the evolution of new regional treatment modalities like hepatic artery chemotherapy embolization and regional immunotherapy. Follow-up of ocular melanoma patients should include liver enzymes and ultrasonography. Results of melanoma vaccine are promising but further studies are needed.

Ouch! My Back Isn't Worth Beans!

Tracy Blichfeldt, MD, Steven Pearson, MD, FACP, Balaji Srinivasan, MD; Gundersen Lutheran Medical Foundation, La Crosse, Wis

Case: A 39-year-old man presented with acute onset thoracic back pain after turning in bed. He denied recent trauma. His past medical history was significant only for injuries sustained in a motor vehicle collision at age 22. His medications included occasional Excedrin. On physical exam, his blood pressure was 159/93 and vertebral thoracic tenderness to palpation. The remainder of the exam was normal. Laboratory results demonstrated kidney disease (creatinine of 5.98 mg/dL and blood urea nitrogen [BUN] 48 mg/dL). His electrolytes were normal. He was anemic (hemoglobin 12 g/dL). Urinalysis showed 3+ albumin, 3+ blood, with 17 red blood cell (RBC)/highest possible frequency (hpf). A CT scan of his thorax revealed new thoracic compression fractures of T 4, 5, and 6. Further work-up of his kidney disease revealed nephrotic range proteinuria, normal complement levels, negative antinuclear antibody (ANA), antineutrophil cytoplasmic antibody (ANCA), anti-glioblastoma multiforme (GBM) antibody, cryoglobulins, antistreptolysin O-antibody, human immunodeficiency virus (HIV) serology, and hepatitis panel. Immunofixation showed no monoclonal protein. He had normal calcium, hyperphosphatemia, and secondary hyperparathyroidism (parathyroid hormone [PTH] of 265 pg/mL).

He had a slight vitamin D deficiency. Renal ultrasound revealed small kidneys. Renal biopsy showed sclerotic glomeruli with cellular crescents due to immunoglobin A (IgA) nephropathy. He was started on dialysis and has been dialysis dependent since. Further work-up of his osteoporosis included a normal thyroid-stimulating hormone (TSH) and free testosterone levels. A dual X-ray absorptiometry (DEXA) scan showed a T-score of -3.5 in the lumbar spine consistent with osteoporosis.

Fracture risk is increased in patients with chronic kidney disease (CKD) as they can develop renal osteodystrophy. This is a term that traditionally has been used to describe the abnormalities in bone morphology that develop in CKD. Phosphate retention in CKD inhibits bone resorption by osteoclasts and arrests generation of osteoclasts. CKD causes a deficiency of calcitriol, which has a suppressive effect on bone formation and resorption. These both stimulate PTH secretion that, in turn, stimulates bone resorption and high turnover rates (eg, osteitis fibrosa cystica). There can also be low-turnover lesions (adynamic bone disease and osteomalacia).

A DEXA scan, used to diagnose osteoporosis, cannot accurately predict fracture risk in CKD as it cannot distinguish between the types of renal osteodystrophy, since it is a disease of bone quality and not only bone density. Instead, the gold standard for diagnosing the type of renal osteodystrophy is tetracycline-labeled quantitative bone histomorphometry.

Not the Typical Right Lower Quadrant Pain

Daniel Cabrera, MD; University of Wisconsin – Madison Hospital and Clinics, Madison, Wis

Case: A healthy 21-year-old man presented with recurrent episodes of right lower quadrant (RLQ) pain. The pain was described as intermittent and alternated between crampy and sharp. The only other accompanying symptom was bouts of non-bloody diarrhea. One year prior, the patient presented to the emergency department (ED) with similar symptoms, that prompted abdominal CT showing multiple mesenteric lymph nodes without appendicitis. Since that time, the patient had recurring symptoms lasting about 7 days approximately every 3 months. Prior to presenting, the patient was on no medications, had no allergies, and his family and social history were noncontributory. Physical exam was remarkable for diffuse abdominal tenderness primarily in the RLQ. There was no rebound, guarding, or hepatosplenomegaly. Labs on admission were significant for an elevated white blood cell count (WBC) of 14.7 with 26% eosinophils.

CT of the abdomen, when compared to the study from the previous year, demonstrated an interval increase in the size and predominance of mesenteric lymph nodes. The patient underwent negative stool testing, and a tissue transglutaminase antibody was found to be unremarkable. Upper endoscopy and colonoscopy were eventually performed showing no gross irregularities. Mucosal biopsies taken during the procedures revealed increased eosinophils within the lamina propria of the duodenum and right colon. The patient was diagnosed with eosinophilic enteritis. He was started on oral glucocorticoids ,and his symptoms quickly resolved along with normalization of the CBC. Tryptase and total IgE levels were within normal limits and genetic testing revealed no CHIC-2 mutation.

Conclusion: This case demonstrates 1 of the many presentations of the rare eosinophilic gastrointestinal disorders (EGIDs), which are defined as disorders causing eosinophilic-rich inflammation within any part of the gastrointestinal tract. Primary EGIDs are those causing eosinophilic-rich inflammation in the absence of known causes of eosinophilia. EGID patients commonly present with failure to thrive, abdominal pain, irritability, gastric dysmotility, vomiting, diarrhea, dysphagia, microcytic anemia, and hypoproteinemia. Patients with primary EGID are commonly atopic and often have an immediate family member with EGID. Diagnosis is made by microscopic evaluation of biopsy samples and hypereosinophilic syndromes should be exluded. Steroids are often the mainstay of treatment.

A Perplexing Pneumonia

Michael Curley, MD, Janaki Shah, DO, John Bellizzi, MD; Medical College of Wisconsin, Milwaukee, Wis

Introduction: Interstitial lung disease (ILD) must be considered in the differential for unexplained pulmonary infiltrates. Acute fibrinous and organizing pneumonia (AFOP) is a recently described and rare ILD pattern that can lead to significant morbidity and mortality. The preferred approach to treatment of AFOP has yet to be established.

Case: An 83-year-old woman presented with a 2-week history of progressive dyspnea on exertion. A chest radiograph revealed infiltrates in the left and right upper lobes. Antibiotics were started for presumed community acquired pneumonia. On the third day in the hospital, she developed spiking fevers and a CT scan demonstrated significant progression of her pulmonary process. Her antibiotic regimen was broadened and an antifungal agent was added, yet she continued to have fevers and progressive hypoxia. A bronchoscopy was subsequently performed and bacterial, mycobacterial, and fungal studies were negative.

In the setting of worsening radiographic findings and respiratory failure, a video-assisted thorascopic surgery (VATS) was performed and tissue from a right lower lobe nodule was obtained. Histologic examination revealed AFOP. Antibiotics were discontinued and stabilized her condition. While the patient initially declined steroids, systemic glucocorticoids were started due to persistent dyspnea following discharge. Her symptoms dramatically improved. A repeat radiograph demonstrated nearly complete resolution of her pulmonary process just 1 week after initiation of steroids.

Discussion: In the setting of progressive pulmonary infiltrates, a comprehensive differential must include interstitial lung processes. Bronchoscopy or VATS is often necessary to obtain a definitive diagnosis in such cases. AFOP is a newly recognized histologic pattern of interstitial lung disease. Its distinctive pattern is intra-alveolar deposition of "fibrin balls" and a patchy distribution. Fulminant disease with rapid progression to death and a subacute presen-

tation with eventual stabilization are the 2 most common clinical disease patterns. While the role of steroids in AFOP is debatable, there have been documented cases of significant clinical improvement with this therapy, as was seen in our patient.

'I'm Going Soft in My Old Age'

Emily Fish; UW School of Medicine and Public Health, Madison, Wis

Case: A 60-year-old man with a long-standing history of arthralgias and rib fractures presented for evaluation of joint stiffness and aching of various bones and muscles. He also reported lower extremity weakness causing falls. Physical exam revealed multiple areas of costal point tenderness, vertebral tenderness, and bilateral gastrocnemius tenderness. Otherwise, the exam was unremarkable. Labs were significant for alkaline phosphatase 416 U/L, serum phosphate 1.9mg/dL, 25-OH vitamin D 16ng/mL, PTH 98pg/mL, urine phosphate 85ng/dL, and human leukocyte antigens (HLA) B27 negative.

Plain films of the pelvis and lower extremities revealed prominent pelvic trabeculae suspicious for Paget's disease, as well as fractures of the bilateral proximal fibulas. Nuclear medicine study revealed multiple areas of increased bone turnover in the femurs, radiuses, and ribs, as well as an area of increased uptake in the R posterior femur. Magnetic resonance imaging (MRI) of the right thigh showed a heterogenous soft tissue mass correlating with the area of increased uptake. Needle biopsy of the thigh mass revealed a phosphaturic mesenchymal tumor.

Discussion: Tumor-induced osteomalacia (TIO) is a rare disorder, with an occult nature that delays its recognition, often 2.5 years after the onset of symptoms. Tumor secretion of FGF23 is implicated in the inhibition of renal phosphate transport. The presentation above is typical with reports of longstanding, progressive muscle and bone pain, weakness, and fatigue. TIO should be suspected in a patient with osteomalacia or rickets in the setting of hypophosphatemia, renal phosphate wasting, and inappropriately low serum calcitriol. Treatment is focused on removal of the tumor, which results in healing of the bony abnormalities. Ocreotide is an alternative treatment in cases where the tumor cannot be localized.

Young Male with Acute Campylobacter Myocarditis

Akshatha Gowda, MD, Rachel Hawker, MD; Gundersen Lutheran Medical Foundation, La Crosse, Wis

Case: A 20-year-old man was transferred from an outside facility where he presented with sudden onset retrosternal pleuritic chest pain. The pain lasted for 2 hours and had resolved by the time he arrived at the hospital. His associated symptoms included epigastric discomfort, diarrhea, vomiting, mild diffuse headache, myalgia, and intermittent profuse sweating over the previous 6 days. He had a history of sick contacts with family members who had a mild form of gastroenteritis. He is a dairy farmer and has been in contact with cows and dogs.

His 12-lead electrocardiogram (EKG) showed J-point elevation in the inferior leads. Troponin T, creatinine kinase (CPK), and C-reactive protein (CRP) were significantly elevated. Stool cultures grew *Campylobacter jejuni* on day 2. Cardiac MRI showed a pattern typical of myocarditis with left ventricle ejection fraction of 50%. The patient was initiated on metoprolol, captopril, and erythromycin. His CRP and CPK trended down, reaching near normal levels by day 5. He was discharged in a stable clinical condition after a 6-day hospital stay.

Discussion: In developed countries, viral infection is the most common cause of myocarditis, with the most frequently identified viruses being adenovirus and enterovirus (including coxsackievirus). *Campylobacter jejuni* is one of the most common causes of human gastroenteritis in the world, but there has been no accurate estimate of the incidence of *Campylobacter jejuni* myocarditis with <20 reported cases worldwide. The diagnosis of myocarditis is difficult to establish because the clinical presentation is highly variable. Although endomyocardial biopsy is the gold standard technique, due to the complicated nature of this procedure, contrast-enhanced MRI is increasingly popular. It can not only definitively diagnose myocardial involvement but can also detect the extent and degree of inflammation. Management of myocarditis includes treatment of the underlying cause, minimization of hemodynamic load of the heart, and management of associated complications.

GAVE Syndrome: A Tale of Two Patterns

Papia Kar, MD, Subhashis Mitra, MD, Camille F. Torbey, MD, FACP; Marshfield Clinic, Marshfield, Wis

Background: We present 2 cases of gastric antral vascular ectasia (GAVE).

Case 1: A 57-year-old white man with cirrhosis presented with hematemesis. Examination showed a pale and jaundiced individual with ascites and pedal edema. Hemoglobin was 8.8gm/dl. An esophagogastroduodenoscopy (EGD) showed diffuse punctate vascular malformations in the antrum compatible with GAVE, with signs of active bleeding, which was treated with Argon plasma coagulation (APC). His bleeding subsided and hemoglobin remained stable.

Case 2: A 68-year-old white woman with hypertension and diabetes mellitus presented with dyspnea on exertion. Examination revealed conjunctival pallor and hemoccult positive stool. Hemoglobin was 6.6 gm/dl. She underwent EGD, which showed areas of vascular malformation alternating with normal mucosa in the antrum, consistent with GAVE. The lesions were treated with APC. Biopsy showed dilated blood vessels within the lamina propria.

Discussion: GAVE, or watermelon stomach, causes 4% of non-variceal upper gastrointestinal bleeding. The term "watermelon stomach" is derived from the characteristic endoscopic appearance of longitudinal rows of flat, reddish stripes radiating from the pylorus to the antrum, which represent ectatic and sacculated mucosal vessels. GAVE has been associated with cirrhosis of the liver, connective tissue disorders, chronic renal failure, hypertension, diabetes mellitus, and acute myeloid leukemia.

Two subsets of GAVE have been described based on endoscopic findings. Cirrhosis is linked with diffuse, punctate lesions, whereas non-cirrhotic patients are likely to have typical watermelon appearance. The majority of non-cirrhotic patients are female, with mean age of 73 years, whereas cirrhotic patients with GAVE tend to be younger and male. Histological features include capillary ectasia and thrombosis within the mucosa and fibromuscular hyperplasia of lamina propria. Endoscopic ablation, APC, is the first-line treatment. Surgical antrectomy should be reserved for unresponsive cases. Endoscopic subtypes have no significant influence on the response to treatment and mortality.

Colchicine Induced Toxic Epidermal Necrolysis

Julia Leo, DO; Aurora Health Care Milwaukee, Wis

Case: An 85-year-old woman with history of gout on colchicine presented with warm, erythematous skin and diffuse, pruritic bullae for 1 day. The patient's history was limited due to her advanced dementia, however she stated the rash was only painful after she itched it. She was brought to the ED from her nursing home after the nurses became concerned that her lower extremity edema had increased, and her "water blisters" were rupturing when they attempted to move the patient. Initially she had warmth and erythema of the extremities and trunk, on the lower extremities to a greater extent than upper extremities. Tense bullae were seen mostly in the flexural areas of the lower extremities. Larger, flaccid blisters were seen scattered throughout the trunk and extremities. Large flaccid lesions heavily populated the bilateral lower extremities as well as the posterior trunk. Areas of sloughing were concentrated on the bilateral lower extremities, scattered areas of sloughing included under the right breast, trunk, and right forearm. The total surface area of affected skin was approximately 40%-50%, and was Nikolsky's sign positive. No mucosal lesions or purulent conjuctivitis were noted. Fever of 38°C and leukocytosis of 13,600 were present. Punch biopsies were performed on the lower extremities. All samples were taken from the margins of active blisters and showed both vacuolar interface injury and subepidermal vesiculations. There was patchy necrosis of the epidermis, often above the blister roof. In the dermis, there was perivascular infiltrate, that was lymphocytic with melanphages and other scatter eosinophils. A 4mm punch biopsy was used for direct immunofluorescence. Non-specific staining of necrotic epidermis, antibodies to immunoglobin M (IgM), C3, and fibrin were seen. The findings were most consistent with erythema multiforme spectrum including Stevens-Johnsons syndrome (SJS) and toxic epidermal necrolysis (TEN), not characteristic for autoimmune blistering diseases. It was concluded that her colchicine was causing these lesions.

Discussion: TEN is a rare condition generally triggered by medications like antibiotics, anticonvulsants, nonsteroidal anti-inflamatory drug (NSAIDs), and allopurinol. There have only been case reports implicating colchicine. TEN involves mucocutaneous lesions in 90% of cases. The reaction usually starts with fever and generalized warmth and erythema of the skin, then progressing to bullae formation and sloughing of the epidermis with full thickness necrosis at times. TEN is differentiated from SJS by the surface area of affected skin. TEN is more severe, with at least 30% of the skin affected. These patients are treated in a burn unit and require adequate supportive care similar to the needs of a burn patient such as monitoring of fluid and electrolytes, as well as reducing risk of infection.

Chronic HCV and the Lymphoproliferative Effect

Eric F. Martin, Alexandra Harrington, Michael Lankewicz; Medical College of Wisconsin, Milwaukee, Wis

Background: Mixed cryoglobulinemia (MC) is a common consequence of chronic Hepatitis C virus (HCV) infection. Although MC is well-controlled by treating the underlying HCV, undertreated or undiagnosed HCV may lead to a myriad of MC-related extrahepatic manifestations.

Case: A 48-year-old Hispanic woman presented with new-onset painful purpuric lesions to bilateral hands associated with generalized arthralgias and weakness. Her past medical history includes HCV and end-stage renal disease (ESRD) secondary to membranoproliferative glomerulonephritis (MPGN) for which she is currently on hemodialysis (HD), chronic steroids, and mycophenolate. Her HCV has gone largely untreated due to prior cardiopulmonary arrest thought to be due to pegylated-interferon and ribavirin. On admission, she was afebrile with an elevated blood pressure. Physical examination revealed a somnolent female with tender, well-demarcated, bright violaceous lesions to bilateral hands and hyperpigmentation of the lower extremities with several amputated toes. Labs revealed stable BUN/Chromium (Cr), low complement levels, trace cryoglobulinemia, and a monoclonal spike on protein electrophoresis. Bone marrow biopsy showed a collection of atypical B-cells concerning for low-grade lymphoma. She was discharged home after receiving 5 sessions of plasmapheresis, which resulted in marked improvement of the vasculitic lesions, and was started on rituximab. She was readmitted several weeks later for painful digital necrosis, which again improved after several sessions of plasmapheresis. Although her HCV remains untreated, HD was successfully stopped after completion of 4 doses of rituximab.

Discussion: Clinical manifestations of MC typically include the classic triad of purpura, arthralgias, and weakness, but may also include renal, liver, and lung involvement as well as peripheral neuropathy and widespread vasculitis. MC is associated with a 20%-30% increased risk of non-Hodgkin lymphoma. Interferon-alpha and ribavirin remain the standard treatment of HCV-associated MC. Although asymptomatic MC is generally untreated, severe manifestations of MC often require emergent plasmapheresis, high-dose steroids, immunosuppressants, and rituximab. Although rituximab has been shown to be effective against many MC-related manifestations, including low grade B-cell lymphoma and MPGN, it is associated with frequent relapse as long as the viral antigenic trigger, namely HCV, remains.

Back Pain: The Yeast Connection

Subhashis Mitra, MD, Papia Kar, MD, Matthew C. Hall, MD; Marshfield Clinic, Marshfield, Wis

Case: A 47-year-old diabetic Native American man presented with a 6-week history of progressive swelling and pain in the midback region. He also reported low-grade fever and chills along with significant weight loss. Physical examination revealed a well-defined, smooth, nontender swelling in the left paraspinal region at T7-8 level. Pain was localized slightly lateral to the swelling at the same level. CT scan of chest revealed a 3.9 x 4.1 x 2.7 cm left paraspinal mass, fracture of the posteromedial left 8th rib and multiple tiny 1-1.5 mm miliary nodules throughout both lung fields. Subsequent MRI of the spine showed a 6.5 x 3.3 cm mass in the left paravertebral region extending from T7 to T8 along with involvement of the adjacent vertebral bodies with evidence of extension into the canal by way of the T7-8 and T8-9 neural foramen.

CT-guided fine needle aspiration of the mass was performed. Cytology showed large yeast consistent with blastomyces species and a fungal culture grew *Blastomyces dermatitidis.* A percutaneous drain was placed under CT guidance for drainage of abscess. Treatment was initially started with amphotericin B and itraconazole; however, the patient developed side effects to both medications. Due to concerns for central nervous system (CNS) involvement, he was subsequently started on voriconazole, which was continued for 12 months. During follow-up, the patient's symptoms steadily improved, and repeat imaging after 9 months documented improvement in radiological findings.

Discussion: Blastomycosis is a fungal infection endemic to the Great Lakes region of North America, which most commonly manifests as pulmonary disease but dissemination to other sites such as skin, bones, genitourinary, and CNS can occur especially in immunocompromised patients. Miliary blastomycosis is relatively rare and is often associated with disseminated disease. Bone involvement can occur in up to 25% of extra pulmonary cases and vertebrae and ribs are among the most common bones affected. Contiguous paraspinal abscesses are potential complications of blastomycosis involving vertebrae. Amphotericin B remains the initial drug of choice for severe disseminated blastomycosis. Newer azoles like voriconazole have been successfully used, especially in CNS blastomycosis.

Ischemic Colitis in a Patient with Hemophilia

Stefanie Ruffolo; Medical College of Wisconsin, Milwaukee, Wis

Case: A 37-year-old woman presented with a 1-day history of severe, colicky left lower quadrant abdominal pain that was accompanied by 2 episodes of nonbloody, non-bilious emesis. She also reported passing 1 black bowel movement followed by several liquid stools that were associated with bright red blood per rectum. The patient had a history of hemophilia A and menorrhagia that periodically required infusion of factor concentrate on several occasions in the past. She denied any symptoms of recent fever or chills, exposure to sick contacts, dietary changes, recent travel, or use of NSAIDs, alcohol, or illicit drugs. Abdominal exam was most remarkable for extreme tenderness to palpation in the left lower quadrant (LLQ). Clinical concern about an acute abdominal process led to an emergent CT scan that showed only mild wall thickening of the descending colon. Subsequent flexible sigmoidoscopy showed an area of erythema and friability in the watershed area between the splenic flexure and descending colon compatible with a diagnosis of ischemic colitis.

The colon is relatively vulnerable to ischemia since it receives comparably less blood flow than the rest of the gastrointestinal (GI) tract. Ischemic colitis may develop as a result of non-occlusive changes in the systemic circulation or local occlusion of a mesenteric blood vessel due to systemic embolism, local thrombus formation, or vasoconstriction. Although uncommon in the general population, ischemic colitis occurs with greatest frequency in elderly patients with additional atherosclerotic risk factors. One recent case control study determined that age >60 years, hemodialysis, hypertension, diabetes mellitus, hypoalbuminemia, and constipation-inducing medications predicted the presence of ischemic colitis in patients experiencing lower abdominal discomfort. When ischemic colitis occurs in younger individuals, more unusual etiologies should be considered, including the presence of an underlying hypercoagulable state, use of cocaine, oral contraceptives, carbon monoxide poisoning, or marathon running.

This patient demonstrated none of the traditional risk factors that have been associated with the development of ischemic colitis. Published reports of ischemic colitis occurring in hemophilia patients without the simultaneous administration of coagulation factors or anti-fibrinolytic agents are exceedingly rare. This case emphasizes the importance of maintaining a broad differential diagnosis, even in patients who present with seemingly common clinical complaints.

Hyperbilirubinemia Gone Awry

Adarsh K. Varma, MD, Michael R. Lucey, MD, Alexandru I. Musat, MD; University of Wisconsin Hospitals and Clinics, Madison, Wis

Case: A 31-year-old man who is a bodybuilder presented with 6 weeks of RUQ abdominal pain, general malaise, nausea, vomiting, and watery diarrhea. A complete blood count (CBC) and basic metabolic panel (BMP) were within normal limits and the patient was diagnosed with viral gastroenteritis and was discharged.

The patient re-presented 4 weeks later with continued symptoms, but now noted dark-colored urine, scleral icterus, and diffuse pruritus. Liver function tests revealed total bilirubin 6.7 (0.2-1.0 mg/dL), direct bilirubin 5.4 (0-0.2 mg/dL), AST 31 (7-40 U/L), ALT 78 (7-40 U/L), alkaline phosphatase 177 (38-126 U/L), gamma-glutamyl transpeptidase (GGT) 44 (9-50 U/L), and lipase 212 (10-140 U/L). A CT scan of the abdomen revealed gallbladder wall thickening and a stone in the common bile duct. The patient subsequently underwent endoscopic retrograde cholangiopancreatography (ERCP), which revealed an essentially normal biliary tree without obstructing stones.

Ten days later, the patient developed

intractable pruritus with diffuse jaundice, and total and direct bilirubin levels rose to 22.8 and 18, with no major changes in other liver function tests. Studies of intrinsic causes of liver disease were sent (viral hepatitis serologies, genetic causes, autoimmune etiologies, tumor markers) and returned unremarkable.

Given concern for cholecystitis, cholangitis and/or liver disease, the General Surgery Department performed open cholecystectomy with open liver biopsy and obtained biliary cultures, with gallbladder pathology revealing acute cholecystitis, sterile cultures, and liver biopsy displayed features consistent with centrilobular cholestasis. Post-operatively, the patient continued to suffer from intractable pruritus with total bilirubin levels rising to 35.

The patient used NitroTech supplements for bodybuilding (concern for hypervitaminosis A) and had received a prolonged course of ampicillin-sulbactam (concern for iatrogenic ductopenia) after the ERCP. These were discontinued and the patient was placed on ursodeoxycholic acid, cholestyramine, and polyethylene glycol, with no improvement noted.

Taken together, the clinical picture of a rapidly rising direct hyperbilirubinemia, consistently normal GGT levels, exclusion of all other causes of intrinsic liver disease, and centrilobular cholestasis on liver biopsy, all supported a diagnosis of benign recurrent intrahepatic cholestasis precipitated by acute cholecystitis. As the patient's intractable pruritus was unresponsive to medical therapy, the patient subsequently underwent serial plasma exchange with complete resolution of symptoms noted along with normalization of liver function tests. The final diagnosis was benign recurrent intrahepatic cholestasis responding to serial plasma exchange.

DISPLAYED POSTERS

Disseminated Adenovirus in a Kidney Transplant Patient

Parin Desai, Ashraf El-Meanawy; Medical College of Wisconsin, Milwaukee, Wis

Background: Adenovirus infection typically manifests as either a respiratory, gastrointestinal, or ocular illness. In the immunocompromised host, presentations can be more severe. We present a case of disseminated adenovirus infection resulting in acute renal failure and hemorrhagic cystitis.

Case: A 65-year-old woman with ESRD secondary to diabetes mellitus was transferred to our institution after being treated at an outside institution for presumed urinary tract infection (UTI). She had a baseline creatinine of 0.9-1.0 mg/dl, but it was 4.9 on initial presentation. The presumed UTI was treated with levofloxacin, but the creatinine did not return to baseline. On admission to our hospital, her vital signs were stable; her physical exam was unremarkable except for moderate distress and gross blood within her urinary catheter bag. Laboratory data showed WBC 15,000, BUN 98 mg/dl, and creatinine 4.2 mg/dl. Due to persistent elevation of her creatinine, a biopsy was done on day 3 in the hospital. Pathology was consistent with acute interstitial nephritis; intravenous (IV) methylprednisolone was tried for 3 days, but without success. Further workup was then done, including viral staining of the biopsy, and adenovirus was positive. Immunosuppresive agents were withdrawn with the exception of a half dose of tacrolimus. Adenovirus polymerase chain reaction (PCR) of both blood and urine was determined, showing 1x107 copies/ml in the urine and 64,500 copies/ml in the blood. A trial of antiviral therapy was then initiated. One dose of cidofovir was given, and within 3 days, her viral load dropped, hematuria resolved, and her physical complaints resolved. She was discharged with stable creatinine of 2.3 mg/dl.

Discussion: Adenovirus is a double-stranded deoxyribonucleic acid (DNA) virus with 49 distinct types that are stable to physical agents and adverse pH media, permitting prolonged survival in the body. In the immunocompetent host, typical manifestations are self-limited respiratory, gastrointestinal, or ocular illnesses. However, in immunocompromised patients, morbidity is increased and mortality reported is as high as 48%. When adenovirus infection becomes systemic, appropriate therapy is necessary for halting the progression of the disease. Our case demonstrates the importance of early diagnosis and treatment of adenovirus in the immunocompromised host.

The End of End-Stage Renal Disease

Abhishek Deshmukh, MD, Ehab Saad, MD, Anushayanthan Alfred, MD; Medical College of Wisconsin, Milwaukee, Wis

Background: Calciphylaxis is a poorly understood and highly morbid syndrome of vascular calcification and skin necrosis associated with ESRD. The management of calciphylaxis is controversial and not well-defined.

Case: A 66-year-old woman with a history of ESRD secondary to diabetes mellitus and hypertension on peritoneal dialysis for the past 7 years was admitted for fever and painful skin lesions on her lower extremities. Her lesions started as multiple bruises initially and subsequently transformed over 2 months into multiple, black-colored, exquisitely tender necrotic lesions on her lower extremities. She was treated initially for cellulitis with vancomycin but did not show any clinical improvement with initial antibiotics. Subsequent punch biopsy of her skin lesions showed calcification within the media of small- and medium-sized arterioles with extensive intimal hyperplasia and fibrosis consistent with calciphylaxis. Further evaluation showed intact PTH level was 150 pg/ml; serum phosphate was 5.5 mg/dl; and serum calcium 8.4 mg/dl. She was managed with wound care, phosphate binders, and low calcium dialysate. Her peritoneal dialysis was stopped, and she was started on HD. The frequency of HD was increased to 4 times a week, and sodium thiosulphate was given as an infusion with each dialysis session.

Discussion: Bryant and White first reported an association of calciphylaxis with uremia in 1898. It affects 1%-4% of patients with ESRD, with mortality rates nearing 80%. The pathogenesis of calciphylaxis remains obscure, but it is typically seen when the calcium-phosphate product exceeds 60-70 mg^2/dL^2. Skin biopsy is the gold standard for diagnosis. Bone scintigraphy has emerged as a highly sensitive tool in diagnosing calciphylaxis and as an adjunct to track prognosis in treated

adults. Secondary infection of the skin wounds is the most common cause of death. Medical care is mainly supportive including discontinuation of parenteral iron therapy, calcium supplementation, and vitamin D supplementation. Other measures include dietary alteration, use of noncalcium/nonaluminum phosphate binders, calcimimetics, and low-calcium bath dialysis. Some benefit may be achieved with increasing the frequency or duration of dialysis sessions. Anecdotal case series show improvement of calciphylaxis with the use of intravenous sodium thiosulphate. It acts by increasing the solubility of calcium deposits.

Fulminant Budd-Chiari as the First Manifestation of Polycythemia Rubra Vera

Helen Fasanya; University of Wisconsin, Madison, Wis

Background: Budd-Chiari syndrome is a rare and potentially fatal disorder caused by obstruction to hepatic venous flow. The classic, but not specific, presentation is abdominal pain along with ascites and hepatomegaly on physical exam. Etiology is most commonly secondary to hematologic disorders, inherited thrombotic diathesis, and other hypercoagulable states. When it occurs, Budd-Chiari syndrome most often presents as acute or subacute liver disease; fulminant presentation is rare and requires prompt intervention, which often includes liver transplantation.

Case: A 51-year-old woman with medical history significant only for depression, rosacea, and osteoarthritis presented to an urgent care clinic with a chief complaint of upper abdominal pain accompanied by nausea, vomiting, diarrhea, and lightheadedness as well as a decrease in urine output and slowly increasing abdominal girth. She had been in her normal state of health until about 2 months prior when she began to feel fatigued. A diagnosis of acute gastroenteritis was made and she was treated with intravenous hydration and antiemetics. No blood work was obtained at the time. Due to lack of symptom relief, worsening abdominal distention and new onset jaundice, she consulted her primary care physician 2 days later. Her physician obtained an abdominal CT, that revealed massive hepatomegaly and ascites. A subsequent ultrasound showed portal vein thrombosis and right hepatic vein occlusion. Evaluation for hematologic disorders was pending, and appropriate therapy with anticoagulation was not initiated until 4 days after presentation. Subsequently, the patient was transferred to our institution for management of hepatic encephalopathy and progressive liver failure. Upon presentation, initial hematocrit (Hct) was 52, AST 2383, ALT 1012, Ammonia level 60, Model for End-Stage Liver Disease (MELD) score was 37, and she was placed on the liver transplant list. Hematologic work-up was positive only for Jak-2 mutation, leading to a diagnosis of polycythemia rubra vera. Further history revealed that the patient had been taking oral contraceptive pills. She underwent orthotopic liver transplant on the third hospital day and, apart from developing retroperitoneal hemorrhage secondary to anticoagulation therapy, she had a good recovery phase and has since done well.

Discussion: The exact incidence rate of Budd-Chiari syndrome is unknown but has been reported to be 0.2-0.5 per million inhabitants per year. Because it is uncommon, the diagnosis and vital treatment of Budd-Chiari can be missed or delayed. This case illustrates the importance of prompt diagnosis and intervention in patients with Budd-Chiari syndrome.

Antepartum Pancreatic Adenocarcinoma

Benjamin Hall, MD; University of Wisconsin Hospital and Clinics, Madison, Wis

Background: Pancreatic adenocarcinoma is the fourth-leading cause of cancer death, with annual mortality rate greater than 33,000. The presentation of pancreatic adenocarcinoma during pregnancy is rare. There have only been 7 case reports in the literature of antepartum pancreatic adenocarcinoma, of which 2 had favorable outcomes for mother and fetus.

Case: A 37-year-old gravid 3 para 1 female who was 17 weeks pregnant presented to her primary care physician with a 2-week history of right upper back pain, acholic stools, darkened urine, and dyspepsia with nausea and vomiting. An ultrasound showed multiple small gallstones without evidence of cholecystitis. An ERCP was performed, showing biliary dilatation secondary to a mass at the head of the pancreas. An endoscopic ultrasound with fine needle aspiration demonstrated cells consistent with pancreatic adenocarcincoma. After weighing the risks and benefits of a Whipple procedure, with or without elective termination of the pregnancy, the patient elected to proceed with surgery while preserving the fetus. The patient's pancreaticoduodenectomy resected a poorly differentiated, grade 3 mass > 5 cm that had invaded into the patient's duodenum. The surgical margins were clear. Thirty-three lymph nodes were sampled, 18 of which were positive for malignancy. Six weeks after surgery, gemcitabine chemotherapy was instituted. The patient delivered a healthy 4 lb 9 oz male at 34 weeks of pregnancy. At the time of this report, the patient has been found to have hepatic lesions concerning for metastases.

Discussion: This case illustrates the dilemmas of treating a patient with pancreatic adenocarcinoma during pregnancy. Pancreatic adenocarcinoma should remain in the differential for patients with jaundice and sudden onset back pain, including during pregnancy. With the aggressive nature of pancreatic adenocarcinoma, timely therapy is of importance to delay progression and/or metastases of the tumor. A review of the literature shows that only 2 patients (of 7 case studies) were alive at the study conclusion. Of these 2 cases, patient follow-up was limited. Six of the 7 cases indicated successful delivery of a healthy fetus. Overall, the diagnosis of antepartum pancreatic adenocarcinoma is a devastating diagnosis with a very poor maternal prognosis that historically has not precluded favorable fetal outcomes.

Acute Heart Failure Secondary to MPO-ANCA Microscopic Polyangiitis

Yusuf Kasirye, MD, Jian Khamo-Soskos, MD, Ihab B Abdalrahman, MD; Marshfield Clinic, Marshfield, Wis

Case: An 82-year-old woman presented with a 5-month history of fevers, chills, dry cough, night sweats, weight loss,

and swelling in the lower extremities. No hemoptysis, wheezing, or chest pain was present. Five months earlier, she had been started on Prednisone 20mg daily for suspected mixed connective tissue disease. Physical exam was unremarkable other than bilateral pedal edema. Lower extremities Doppler showed proximal deep venous thrombosis (DVT). Chest CT showed pulmonary embolism. Anticoagulation was started.

Prednisone taper was started. At the 15 mg level, she developed dyspnea from flash pulmonary edema. Brain natriuretic peptide (BNP) was elevated at 2360. Troponin was transiently elevated but normalized within 24 hours. Repeat echocardiography (echo) showed marked decline in left ventricle systolic function with wall motion abnormalities. Ejection fraction dropped from 70% 2 weeks earlier to 30%. Due to supratherapeutic international normalized ratio (INR) (6.9) and elevated creatinine, coronary angiogram was postponed and a nuclear study performed, revealing an old infarct but no inducible ischemia. She was started on diuretics and improved. Her cerinuclear neutrophil cytoplasmic antibody (P-ANCA) returned positive for myeloperoxidase (MPO). Sural nerve and deep muscle biopsy showed active necrotizing vasculitis of small arteries and arterioles with no granulomas. Diagnosis of microscopic polyangiitis (MPA) was made. She was started on cyclophosphamide and high-dose steroids, to which she responded.

Discussion: MPA is a necrotizing systemic vasculitis with few or no immune deposits affecting small vessels (ie, capillaries, venules, and arterioles). It commonly affects glomerular and pulmonary capillaries. Cardiovascular complications, although rare, can occur in MPA. In a study of 85 MPA patients, 17.6% presented with heart failure and 10% with pericarditis. Myocardial infarction, conduction disturbances, and cardiomyopathy have been also documented. This is attributed to vasculitis within the myocardial small vessels. This patient had acute heart failure in the presence of active MPO with no other explanation. This case fits well into acute cardiac failure probably secondary to MPO.

Immunocompetence and Dialysis: Mutually Exclusive Propositions

Jian Khamo-Soskos, MD, Yusuf Kasirye, MD, Narayana Murali MD; Marshfield Clinic, Marshfield Wis

Background: Rhodotorula sp is ubiquitous and an uncommon pathogen. Since its recognition as human mycoses in 1960, less than 5 cases of Rhodoturala peritonitis and 103 cases of fungemia have been reported in the literature.

Case: We report a case of an otherwise healthy 35-year-old man on peritoneal dialysis since February 2008, with recent history of culture negative peritonitis in September 2008 treated per International Society of Peritoneal Dialysis (ISPD) protocol. In November 2008, he returned with recurrent abdominal pain, milky peritoneal dialysate, normal CBC, elevated peritoneal neutrophil count of 3300 cells/mL (normal <200 cells/mL), no eosinophilia, unremarkable gram stain, negative tuberculosis (TB) QuantiFERON gold test, and a benign abdominal imaging study except for previous left nephrectomy and evidence of residual right ureteropelvic junction (UPJ) obstruction. Fungal cultures available a week later confirmed Rhodotorula sp. Acid-fast bacillus (AFB) cultures were negative. Cefazolin and ceftazidime were discontinued with initiation of caspofungin followed by oral voriconazole. Peritoneal catheter was removed immediately, and patient was subsequently started on HD.

Discussion: This vignette underscores that even young and healthy-appearing patients on dialysis are immunocompromised. It also emphasizes the importance of evaluating for fungal infections in culture negative peritonitis, and draws attention to the recent change in ISPD and the Infections Diseases Society of America (IDSA) guidelines recommending removal of peritoneal dialysis catheter immediately in fungal peritonitis.

Recent systematic reviews suggest *Rhodotorula fungemia* is more common than perceived. In the last 2 decades it has garnered increasing attention from systematic reviews as an "emerging pathogen," particularly in the immunocompromised manifesting as endocarditis, meningitis, catheter-related fungemia and endopthalmitis with up to 20% mortality. However it may occur even in the absence of neutropenia or profound immune suppression. Although fungal peritonitis is uncommon in the general population, it is important to emphasize that age-adjusted incidence ratio of fungal peritonitis in dialysis patients is extremely high.

Too Little... But Not Too Late!

Laura Main, DO; Gundersen Lutheran Medical Foundation, La Crosse, Wis

Case: A 30-year-old woman with known HIV for 8 years presented to the infectious disease clinic with fatigue, weakness, and shortness of breath. Symptoms had progressed over the previous 3 days. Review of systems was positive for chills and night sweats. She was up-to-date on immunizations and had no animal or outdoor exposures. She was an immigrant from Honduras, but had no recent travel outside of the United States. The patient was found to be markedly anemic and thrombocytopenic, with a hemoglobin of 4.5 and a platelet count of 52. Review of her peripheral smear demonstrated microspherocytes without a significant number of schistocytes, as well as giant platelet forms. This was consistent with autoimmune hemolytic anemia and thrombocytopenia, thus indicating Evans syndrome. Treatment with high-dose IV methylprednisone and IV immunoglobulin was initiated, and the patient was supported with transfusions of packed red blood cells and platelets once cross match was obtained. This resulted in stabilization of hemoglobin and platelet counts, and steroids were transitioned to prednisone. The inciting factor was not determined, but thought to be an unidentified infection, despite negative blood and sputum cultures and tropical infectious disease workup.

Conclusion: Evans syndrome is an autoimmune disease defined by the combination, either simultaneously or sequentially, of immune thrombocytopenia and autoimmune hemolytic anemia. No specific underlying immune defect has been identified, but evidence suggests abnormalities in both cellular and

humoral immunity. Researchers have speculated abnormalities of lymphocyte subsets and immunoglobulin synthesis, supporting the concept of aberrant immunoregulation in this condition. Infection is considered to be the most likely precipitating cause in susceptible individuals. Diagnosis is confirmed by the presence of autoimmune hemolytic anemia and thrombocytopenia with a positive direct antiglobulin test and absence of known underlying etiology. The clinical course is often chronic and relapsing. Treatment is often ineffective but typically consists of high dose steroids; some patients may also require IV immunoglobin. In refractory cases, immunosuppressive medications, including Rituxan, and splenectomy have been used. The cause of death is generally bleeding, especially intracranial hemorrhage, or sepsis.

Assessment of Decision-Making Capacity in an Incarcerated Patient with Suspected Lung Cancer

Dejan Micic, Shobhina Chheda, MD, MPH; University of Wisconsin School of Medicine and Public Health, Madison, Wis

Background: Impaired decision-making in hospitalized patients often goes undetected. However, the ability to establish a patient's capacity to consent or refuse treatment is critical in respecting the patient's autonomy. The refusal of treatment by a patient who is incarcerated may heighten concern regarding capacity for decision-making.

Case: A 56-year-old incarcerated man with no documented psychiatric history reported symptoms including a cough lasting 3 months and recent development of hemoptysis. The patient endorsed fever, night sweats, weight loss, and a history of smoking. An outpatient examination included a CT scan, which revealed a large cavitary lung lesion. One week later he was found minimally responsive and was transported to an outside hospital where antibiotic coverage was administered. However, the patient refused further diagnostic evaluation. His ability to make medical decisions was brought into question, and his sister consented for CT guided biopsy of the lung mass for which he was transferred to our institution. Initially, the patient agreed to cooperate on several occasions; however, at the time of procedure refused for varying reasons. Following manipulative behavior by the patient, the psychiatrist's re-evaluation confirmed that the patient did not demonstrate the capacity to make decisions. Though the patient understood the situation and its consequences, he was unable to communicate a clear thought process behind his decision. Given the patient's incarcerated status and his unwillingness to cooperate, a decision was made in conjunction with the ethics committee to pursue guardianship. As the patient was medically stable, he was transferred back to the correctional facility for this process.

Conclusion: This case illustrates the difficulty in detecting impaired decision-making capacity. The prison population presents complex issues of trust and respect for patient autonomy in medical decision making circumstances. Assessments of competence using systematic approaches in hospitalized patients would be of significant benefit to patients and clinicians.

Hemophilic Pseudotumor

Justin Mitchell, Vanessa Peterson, MD, Ann Maguire, MD; Medical College of Wisconsin, Milwaukee, Wis

Case: A 73-year-old man with a history of hemophilia A presented with an erythematous, warm and tender 6 x 3 x 2 cm mass located over the lateral aspect of his distal right fibula. The patient reported that a cystic lesion had been present in this location for the past 35 years; this lesion remained stable until 1 year prior to admission when the integrity of the skin was compromised and the mass began to show signs of a localized infection with a gradual increase in its size and firmness. Approximately 4 weeks prior to presentation, a CT scan of the leg demonstrated a large, heterogeneous fluid collection with characteristics of a chronic hematoma extending from the popliteal fossa, caudally towards the calf. Following an incision and drainage procedure, and empiric outpatient treatment with amoxicillin, the mass became more ulcerated, painful, erythematous, and swollen. He was treated with vancomycin and piperacillin sodium/tazobactam for the soft tissue infection and showed significant improvement. Subsequent imaging with ultrasound and a repeat CT scan demonstrated a multi-loculated, encapsulated mass in the lateral compartment of the right leg with blood products in various stages of evolution. A clinical diagnosis of pseudotumor was entertained and orthopedic surgery was consulted for more definitive drainage and resection of the mass. The patient was given multiple doses of recombinant factor VIII to prevent significant blood loss. Following surgical drainage, the patient continued to improve with physical therapy. There has been no recurrence of the infection or the mass as of the writing of this report.

Pseudotumors are chronic, encapsulated, slowly expanding hematomas that typically occur in patients with underlying bleeding diatheses or coagulation disorders. These masses usually occur in soft tissues and their constitutive elements can include areas of new bone formation as well as various blood products. For reasons that are not well explained, pseudotumors are an uncommon and unusual complication of hemophilia. Hemophilic pseudotumors have been reported to occur in only 1%-2% of all patients with severe forms of this disease; they are found almost exclusively in men between the ages of 20-70.

Conclusion: This case demonstrates a need for increased awareness of this possible complication that can occur in patients with hemopbilia. Although no standard treatment protocols have been validated, some authorities argue for a conservative approach including immobilization and factor replacement, while others advocate for more aggressive management with surgical debridement. Pseudotumor location and degree of functional compromise must be evaluated in determining the surgical risk versus benefit.

Adult Still's Disease

Harpreet Parmar, MD; Aurora Sinai Medical Center, Milwaukee, Wis

Case: A 25-year-old Hispanic woman presented to the ED with a 2-day history of fevers and chills accompanied by dyspnea, headaches, sore throat, nausea, vomiting, neck pain, and myalgias. During the exam, the patient was tacycardic and febrile with a temperature of 103.7°F, and hypotensive with pressures of 90/50. Patient was lethargic but

alert and oriented. Physical exam was within normal limits except for tender cervical and positive Brudzinski's sign. Kernig's sign was negative and there was no photophobia. Lumbar puncture was performed in the ED, and patient was started on IV ceftriaxone and vancomycin. Initial labwork included WBC of 13.3 with 19 bands, lactic acid of 3.0, and potassium of 3.0. Monospot was negative. Patient was admitted to the intensive care unit (ICU) for severe sepsis caused by bacterial meningitis. Patient continued to spike diurnal fevers up to 104°F. WBC rose to 20,000. Results from lumbar puncture were negative, and blood cultures were negative despite re-culturing patient during febrile episodes. Patient was treated with broad spectrum antibiotics. QuantiFERON gold for TB negative, Legionella urine negative, and D-dimer was elevated at 36.3. A CT scan of the chest was negative for pulmonary embolism. A CT of abdomen and pelvis showed mild thickening of common bile duct, followed by normal hepatobiliary iminodiacetic acid (HIDA) scan. Despite treatment, patient still had muscle aches, fever of 104ºF and leukocytosis of 20,000. Tagged WBC scan demonstrated an abnormal uptake around pericardium, however, transesophageal echocardiography (TEE) was negative for vegetation or pericardial effusion. Further laboratory results revealed erythrocyte sedimentation rate (ESR) 86 and C-reactive protein (CRP) 39.1, with Ferritin of 31000 and lactate dehydrogenase (LDH) 1659. Both ANA and rheumatic factor (RF) were negative. The patient was diagnosed with adult Still's disease (ASD) as the cause of her fever. Antibiotics were discontinued, and the patient was started on prednisone. Her fever subsided, WBC trended to normal, and arthralgias resolved.

Discussion: Fever of unknown origin is classically defined as temperature >38.3ºC, illness >3 weeks, and failure to obtain diagnosis despite 1 week of inpatient investigation. Major etiologies of fever of unknown origin include non-infectious inflammatory 22%, infection 16%, malignancy 7%, and no diagnosis 51%. The etiology of ASD is unknown. The incidence is estimated at 0.16 per 100,000. Diagnosis is made through the Yamaguchi Criteria requiring 5 features with at least 2 major diagnostic criteria. A ferritin >3000 ng/ml has been observed with ASD. This degree of hyperferritinemia is not observed with other rheumatic disease and correlates with disease activity. Ferritin has been used as a serologic marker to monitor treatment response.

Unusual Presentation of Lemierre Syndrome: Liver Abscesses and Portal Venous Thrombosis Due to Fusobacterium Varium

Ismael Tura, MD, Kristina Jones, MD, Christopher Mildenberg, MD; Aurora Sinai Medical Center/Aurora Health Care, Milwaukee, Wis

Case: A 58-year-old man presented with diffuse abdominal pain associated with watery diarrhea. His symptoms started with fatigue, myalgia, fever, and chills. He had severe shortness of breath at rest and with exertion. Two days before admission, he noticed yellowish eye discoloration and unintentional weight loss. On examination, the patient was in respiratory distress with respiratory rate 20-28, saturating 99% on 2-liter oxygen, pulse 88 and blood pressure (BP) 107/70. He had icteric sclera and dry oral mucosa with poor dentition. He also had decreased air entry on left posterior chest with dullness on percussion at the same site. Abdomen was positive for fluid thrill. Lab work recorded WBC 32, hemoglobin 13.2, Hct 37.5, BUN 75, creatinine 2-4, bilirubin 19.2, alkaline phospate 304, AST 304, ALT 162, amylase 186, lipase 1090, albumin 2.4, sodium (Na) 134, potassium (K) 4, bicarbonate 21, anion gap 23, lactate 3.1, partial thromboplastin time (ptt) 14.6, and INR 1.5. A CT scan of the left side of the chest showed pleural effusion with consolidation. A CT of abdomen showed multiple liver abscess and portal vein thrombosis. Initial blood culture and CT-guided liver abscess aspirate grew *fusobacterium varium.* He was covered with zosyn and flagyl.

Discussion: Fusobacterium sp are normal flora of oropharyngeal, gastrointestinal, and genitourinary tract of healthy humans. The following combination were used by many authors to define Lemierre Syndrome (LS): (1) history of angina/illness in the preceding 4 weeks or compatible clinical findings, (2) evidence of metastatic lesion in lungs and/or another remote site, and (3) evidence of internal jugular vein thrombophlebitis or isolation of fusobacterium from blood culture or a normally sterile site. LS variant has been reported in literature with the same presentation as our patient, but the isolation of *fusobacterium varium* with his atypical clinical presentation makes him very unusual. The patient showed unusual presentation of LS involving gastrointestinal tract. From our literature search, this is the first case of *fusobacterium varium* sepsis with portal vein thrombosis and liver abscess. This report underscores the fact that LS is a very rare, but often fatal, disease. Oropharyngeal presentation with metastasis to the lung is a very common presentation, however, the LS variant with metastasis to liver, brain and other parts of body should be considered.

VIGNETTES

Shortness of Breath Drives Hunter from Woods

A. Cabán Cardona, MD, M. Kleiman, MD; Medical College of Wisconsin, Milwaukee, Wis

Case: A 70-year-old man presented with shortness of breath and diaphoresis that began 3 days before admission while deer hunting. He recalled finding a tick on his scrotum 3 weeks earlier. Ten days later, he saw his physician with complaints of abdominal pain and chills. Lyme disease titers at that time were negative. At 1-week follow-up, he had slight improvement but later developed fatigue, fever, chills, non-productive cough, myalgias, slight leg swelling, and worsening shortness of breath. He denied rash, headache, sore throat, vomiting, and abdominal pain. On physical exam, he was diaphoretic, tachycardic with a pulse of 106 and febrile with a temperature of 38.9ºC. He had increased work of breathing as well as scrotal tenderness and lower extremity edema. Laboratory studies were significant for a platelet count of 120,000 that decreased to 55,000 in 2 days as well as leukopenia, anemia, and

elevated liver aminotransferase levels. Subsequent chest radiograph and CT were negative for infiltrate and pulmonary embolism. Tick-borne illness was a major diagnostic consideration and serologies for babesiosis and ehrlichiosis were ordered. Serologies resulted in a very positive anaplasmosis titers of immunoglobin G (IgG) 1:4096 and immunoglobin M (IgM) 1:1260. He was started on doxycycline and discharged in improved condition.

Discussion: Human granulocytic anaplasmosis is a febrile illness caused by the obligate intracellular organism, *A. phagocytophilum.* It is transmitted by deer ticks (*Ixodes scapularis*), which are commonly found in the upper Midwest and northeastern United States. Symptoms develop between 4 and 8 days after exposure. Clinical manifestations include fever, malaise, myalgias, chills, and headache. Nausea, vomiting, and diarrhea are less frequent, as are cough, confusion, and rash. Most patients develop leukopenia, thrombocytopenia, and elevated serum levels of hepatic aminotransferases. Such findings in a febrile patient with recent tick exposure are key to diagnosis. Severe complications occur most often in the elderly and include adult respiratory distress syndrome, a toxic shock-like syndrome and life-threatening opportunistic infections. The most sensitive and specific means of confirmation is seroconversion or a 4-fold change in antibody titer during the convalescent phase. Doxycycline is first-line treatment and usually results in rapid improvement within 24-48 hours.

Revenge of the Cinchona Tree

Dustin Deming, MD; University of Wisconsin, Madison, Wis

Case: A 51-year-old woman with a history of alcoholic cirrhosis, chronic obstructive pulmonary disease (COPD), and insomnia was admitted with 1 day of acute abdominal pain and vomiting. She had been well prior to her current presentation, except for an earache recently, for which she took some leftover amoxicillin. She reported that she first noted acute shortness of breath followed by sharp pain in her abdomen that migrated up to her chest. This progressed to recurrent emesis. On admission she was noted to be aneuric and have a creatinine level of 3.3. She was mildly anemic and severely thrombocytopenic. Fourteen hours later, she was noted to be pancytopenic. Her reticulocyte count was low for her degree of anemia. She had evidence of hemolysis, including an elevated LDH, decreased haptoglobin, and elevated bilirubin. She responded well to transfusion. Her creatinine continued to rise and her mental status became significantly altered. A direct Coombs test and indirect Coombs test were positive. A peripheral smear did show schistocytosis and a few large platelet forms. She eventually required HD.

The differential diagnosis includes disseminated intravascular coagulation (DIC), idiopathic thrombocytopenic purpura (ITP), thrombotic thrombocytopenic purpura (TTP), hemolytic uremic syndrome (HUS), Evans syndrome, bone marrow suppression (toxic/infectious/inflammatory/infiltrative), and drug toxicity, among others. This clinical scenario has features that provide evidence for and against all of these possibilities. After further questioning of the patient's husband, it was found that the patient may have taken the husband's quinine. Apparently the patient's bottle of amoxicillin looked exactly like her husband's quinine. To prove this, quinine-specific platelet autoantibodies were tested for and found to be present. These data suggest that the most likely diagnosis was quinine-induced HUS. After 2 months the patient's renal function and cell counts returned to normal.

Verapamil Overdose: A Change of Course After ECMO

Elwaleed Elnagar, MD; Aurora Sinai Medical Center/Aurora Health Care, Milwaukee, Wis

Case: The patient is a 34-year-old woman with degenerative joint disease, anxiety, and migraine headaches who was admitted after ingesting 30-40 pills of verapamil, estimated to be 3.0-3.6 grams. The patient was complaining of chest pain upon arrival in the ED. She stated that she had been taking a pill every 1-2 hours. She felt generally weak, short of breath, and diaphoretic. Physical examination showed a well-nourished patient who appeared uncomfortable and diaphoretic. Initial vital signs showed a BP of 66/40 with a regular pulse of 52. A 12-lead EKG showed complete heart block with ventricular escape rhythm. Chest X-ray was unremarkable. She was admitted to the ICU after stabilization in the ED where she was intubated for hypoxic respiratory failure. She underwent a cardiac catheterization as well that returned negative. She was started on IV fluids, insulin, and dextrose infusion, calcium infusion, glucagon bolus followed by an infusion, and atropine. Her blood pressure continued to decline and she was started on vasopressors. Her oxygenation continued to drop despite maximum mechanical ventilatory support and she went into multiorgan systems failure with acute respiratory failure (ARF), fulminant hepatic failure, cardiogenic shock, and paralytic ileus in addition to the respiratory failure. She underwent continuous veno-venous hemofiltration (CVVH) for ARF. Extra corporeal membrane oxygenation (ECMO) was started 36 hours after admission to the ICU, when the PO_2 was 46 mmHg on 100% O_2 on mechanical ventilation. It resulted in dramatic improvement and change of course in 72 hours when it was discontinued. After approximately 2 weeks, she recovered her kidney and liver functions, and was successfully extubated. Her ileus also resolved. The patient was then transferred to inpatient rehabilitation services, where she recovered fully and was discharged home.

Discussion: The patient was started on ECMO only after her course deteriorated rapidly despite maximum support. Previous research described the use of percutaneous cardiopulmonary bypass as a therapy for cardiac arrest in an adult patient intoxicated with verapamil. They concluded that in patients with cardiac arrest attributable to massive verapamil overdose, percutaneous extracorporeal cardiopulmonary bypass could provide adequate tissue perfusion and sufficient cerebral oxygen supply until the drug level is reduced and restoration of spontaneous circulation can be achieved.

Hypocalcemic Cardiomyopathy with Significant Ultrasenstive Troponin I Elevation Mimicking Acute Myocardial Infarction

Mohsen ElRamah, MD; Aurora Sinai Medical Center, Milwaukee, Wis

Case: A 49-year-old woman with a history of billroth II procedure performed 5 years ago for peptic ulcer disease that was followed by chronic nutritional deficiencies, presented to the ED with muscles spasms, shortness of breath, and diffuse chest pain for 2 days. No history of CAD or cardiomyopathy was present. Initial vital signs showed BP 100/70, heart rate 110, temperature 107°F, respiratory rate 25, and pulse oxygen 94%. Physical exam revealed normal heart sounds with no murmurs, clear lungs, no jugular-venous distention (JVD) and 2 plus pitting edema in the lower extremities.

Shortly after presentation, she developed severe respiratory distress and laryngeal spasm, and was intubated. She became hypotensive and was started on norepinphrine. Chemistry panel showed calcium of 4.8 mg/dl, ionized calcium .68mmol/l, potassium 2.5mg/dl, albumin 1.7 gm/dl, creatinine 1.6mg/dl, lactate 2.5mmol/l, WBC count 13.7, hemoglobin 10.5g/dl, and platelet count 320. EKG showed prolonged QTc 736 ms and no ischemic changes. Cardiac enzymes showed CPK 5926, creatine phosphokinase MB (CK-MB) 186.4, myoglobin 16194 and ultrasensitive tropnin I 55. Chest X-ray was normal. Patient was started on broad-spectrum antibiotics, and her electrolyte imbalance was treated aggressively. A 2-D echo showed left ventricular ejection fraction (LVEF) of 25% with severe global hypokinesis. Hyperthermia resolved over the next day. She was extubated 3 days later and weaned off pressers. Work-up revealed no sepsis and her antibiotics were discontinued. Electrolyte imbalances were corrected. Cardiac enzymes trended down. Vitamin D level was undetectable and PTH was 927. A repeat echo 6 days later showed LVEF of 55%. Patient had cardiac catheterization, which revealed normal coronaries.

Discussion: Hypocalcemic cardiomyopathy is a rare disease, with 25 reported cases in literature; however, the exact causal relationship has not been established. Hypotheses are based on the physiologic role of calcium in excitation contraction coupling and the absence of other causes of cardiomyopathy. Congestive heart failure in reported cases showed dramatic response after correction of hypocalcaemia. This patient had a unique presentation with significantly high ultrasensitive Troponin I elevation. It was not clear what may have predisposed her to have acute or chronic hypocalcaemia. No common causes such as sepsis, hemodialysis, acute pancreatitis, transfusion of citrated blood, or recent parathyroidectomy were identified.

Though causal relationship between hypocalcemia and acute cardiomyopathy cannot be established, this patient's clinical course, echocardiographic/cardiac catheterization findings, and dramatic improvement with correction of hypocalcaemia are most consistent with our diagnosis.

A Case of SLE Presenting as Protein Losing Enteropathy

Christopher D. Fletcher, MD; University of Wisconsin Hospitals and Clinics, Madison, Wis

Case: A 71-year-old woman from Mexico of unknown medical history was admitted to the hospital with a nearly 4-month history of fever, watery diarrhea, and increasing abdominal girth. The patient denied alcohol and illicit drug abuse, and did not have any stigmata of liver disease on exam, but did have a left pleural effusion. CBC showed thrombocytopenia (70K/uL). Chemistry was remarkable only for profound hypoalbuminemia (1.3 g/dL). Tests of liver function were also within normal limits.

Prior to arrival at our facility, the patient had also undergone single photon emission computed tomography (SPECT) scan of the liver that showed increased uptake in the left hepatic lobe, and an exploratory laparoscopy that revealed a grossly normal liver, no varices or splenomegaly, and an absence of carcinomatosis despite a significant amount of ascites. A liver biopsy was ultimately found to be suggestive of immune versus toxic injury.

Our initial evaluation revealed osmotic diarrhea and low saggital ascites with negative infectious workup including viral disease, TB, *Tropheryma whipplei,* and bacterial/parasitic causes of diarrhea. Transthoracic echocardiogram (TTE) was within normal limits. Protein-losing enteropathy was entertained as other serum proteins were found to be low. Colonoscopy was unremarkable, but a duodenal biopsy from an EGD showed villous blunting with plasma cell infiltration, and a CT scan showed a focal area of duodenal involvement, both of which were thought to suggest celiac disease. The patient was placed on a gluten-free diet, with no relief, and tissue transglutaminase (tTG) later came back negative. In screening for other possible causes, serum protein electrophoresis (SPEP)/immunofixation electrophoresis (IFE) showed global hypoproteinemia only. ANA, dsDNA, and Smith antibodies were all drawn, and found to be markedly elevated. A trial of high-dose steroids (1 mg/kg of methylprednisolone) provided prompt improvement in diarrhea and increase in albumin, suggesting systemic lupus erythematosus (SLE) related protein losing enteropathy. The patient later stopped treatment and had return of diarrhea. The diarrhea again responded to steroids.

Discussion: In evaluation of this patient's case, she did meet 4 of 11 ARA consensus criteria for the diagnosis of SLE, including specific autoantibodies. Protein-losing enteropathy is a rare manifestation of SLE, and even more rare as an initial presentation. Nearly 50 cases are reported in the literature to date, with the largest group coming from a Chinese case series in 2007. In this series, 8 of 15 had enteropathy as initial presentation of SLE, with 11 of 15 having ascites as a manifestation of protein losing enteropathy (PLE). All patients ultimately met ARA criteria for the diagnosis of SLE, though 1 took as long as 30 years. Interestingly, all patients in the literature with SLE-related PLE had ribonucleoprotein

(RNP) antibodies, and our case was no exception. However, dsDNA antibodies are very rare among this demographic, which were also noted in our patient. The vast majority of these cases are steroid responsive, with the remainder responding to added immunosuppressants. Overall prognosis is good.

Acute Bilateral Swelling, Pain, and Stiffness in the Hands of an Elderly Woman: A Case Of RS3PE Syndrome

Leslie Harris, MD; Gundersen Lutheran Medical Foundation, La Crosse, Wis

Background: Remitting Seronegative Symmetrical Synovitis with Pitting Edema (RS3PE) syndrome is a rare inflammatory arthritis seen in older adults that occurs acutely and is resolved by a short course of low-dose oral steroids. The diagnostic criteria for RS3PE Syndrome include bilateral pitting edema of the hands, abrupt onset of polyarthritis, age >50 years, and seronegative RF. Not uncommonly, it represents a paraneoplastic process.

Case: An 82-year-old woman presented with sudden onset of bilateral swelling, pain, and stiffness in her hands. Prior to presentation, she tried over-the-counter naproxen 220 mg orally twice daily for 2 weeks but had minimal improvement of her complaints. A complete review of symptoms was otherwise negative. Besides the symmetrical synovitis and pitting edema in the hands, there were no other abnormal findings on physical exam. CRP and ESR were checked and were moderately elevated. RF and ANA were negative. She was treated with prednisone 5 mg orally twice daily for 4 weeks, and the bilateral hand swelling, pain, and stiffness resolved. She completed a prednisone taper over 2 more weeks. At a follow-up appointment 8 weeks after completion of the prednisone taper, she had no reoccurrence of her hand symptoms.

Due to the association of RS3PE Syndrome with cancer, she underwent an extensive malignancy workup, including mammogram and colonoscopy. All screenings were negative, thus no systemic cause for RS3EP Syndrome was found.

Was That Really Small?

Pravachan Hegde, MD, Michael J. Dolan, MD; Gundersen Lutheran Medical Foundation, La Crosse, Wis

Case: A 77-year-old white man presented with a 4-week history of unsteadiness. On examination, he had positive cerebellar signs. An MRI of the brain and cerebral spinal fluid (CSF) analysis were normal. Chest X-ray showed a scar at the left lung base, that was attributed to previous trauma. A CT scan of the chest and abdomen revealed a bladder mass, that was found to be a poorly differentiated small cell carcinoma. A paraneoplastic panel was positive for Anti-Hu antibody. These features suggested paraneoplastic cerebellar degeneration secondary to a small cell bladder cancer. Positron emission tomography (PET) scan was negative for metastatic disease. He was initiated on steroids and chemotherapy. Unfortunately, his symptoms neither improved nor progressed after 3 cycles of chemotherapy.

Discussion: This is a case of subacute cerebellar degeneration occurring with systemic cancer, present with diffuse cerebellar dysfunction. The etiology is believed to be an autoimmune response against onconeural antigens. Specifically anti-Yo, anti-Tr, and anti-Mglu1 are associated with pure cerebellar syndrome. The common associated malignancies are Hodgkin's lymphoma, breast cancer, and lung cancer. This is a rare presentation of bladder tumor. The striking histological finding is diffuse loss of purkinje fibers. CSF evaluation may show nonspecific elevation of protein, oligoclonal bands, and elevated IgG index. A CT and MRI are generally normal. ANA are useful for diagnostic purposes although a negative assay does not rule out the diagnosis. Treatment consists of plasmapheresis, IV immunoglobin, corticosteroids, or cyclophosphamide given alone or in combination. Unfortunately, less than 10% of patients respond to treatment.

An Elusive Diagnosis Exposed By Autoimmunity

Donna Miller, MD, Ramona Goyal, MD, Amalia Wegner; Medical College of Wisconsin, Milwaukee, Wis

Background: Henoch-Schönlein purpura (HSP) is an immune complex small-vessel vasculitis typically seen in young children. Identification of this uncommon autoimmune disease in adults warrants prudent consideration of its association with concurrent diagnoses of infection or malignancy.

Case: A 38-year-old man presented with a 6-month history of night sweats and migratory polyarthritis of the ankles, knees, and elbows. Initially diagnosed with rheumatoid arthritis (RA), his symptoms worsened on hydroxychloroquine, with development of a lower-extremity purpuritic rash, painful raised lesions on the hands, nausea, dark-colored urine, and fevers. Skin biopsy demonstrating leukocytoclastic vasculitis with IgA immunofluorescence was diagnostic for HSP. He was treated with steroids without improvement. Careful physical exam revealed a systolic murmur at the right upper sternal border. Blood cultures identified gram-positive cocci in chains. Echo characterized a 1.8 cm vegetation engulfing the patient's congenitally bicuspid aortic valve. Fifteen blood cultures grew *Abiotrophia* (nutritionally variant *Streptococcus* [NVS]) organisms nonviable for sensitivity testing. Treatment consisted of aortic valve replacement and 6 weeks of IV vancomycin, with subsequent resolution of bacteremia, skin lesions, and hematuria.

Discussion: This case illustrates the concept of autoimmunity induced by infection. HSP is generally a self-limited disease in children. Adult cases are uncommon and display a more severe course, with frequent joint symptoms, less GI involvement, and a high incidence of renal disease. Adult HSP often represents a secondary process. Therefore, identification of HSP in adults warrants prudent consideration of associated etiologies such as infections, malignancies, or connective tissue diseases. Rheumatic manifestations in endocarditis delay diagnosis. Compared with other *Streptococci,* infective endocarditis due to NVS has a higher rate of extracardiac complications and is more difficult to culture. To our knowledge, this is the first case report of *Abiotrophia* (NVS) endocarditis causing HSP.

Disseminated Blastomycosis: A Case Report

Ghera Princy, MD, Garcia-Montilla Romel, MD, Ludka Tiffany, MD; Marshfield Clinic, Marshfield, Wis

Background: Blastomycosis is a fungal infection caused by *Blastomyces dermatidis*, a thermally dimorphic fungus. The primary mode of entry is inhalation of spores into the respiratory system. The disseminated form can involve skin, bone, CNS, eyes, liver, etc.

Case: A previously healthy 44-year-old man presented with a chief complaint of a swollen, painful right ankle. He worked as a painter and was an avid outdoor fisherman and hunter throughout central and northern Wisconsin. He acknowledged remote IV drug use and occasional smoking. Initial foot X-rays were negative for any pathology, and the patient was treated with vicodin for pain relief. Subsequently, he had worsening right ankle pain, fever, occasional diaphoresis, cough, shortness of breath, 10-12 lb weight loss and generalized fatigue for 3-4 weeks. He was also found to be hypoxic and have violaceous skin lesions on his back. The chest X-ray revealed a diffuse reticular nodular pattern. Keeping in mind a differential diagnosis including *Pneumocystis jiroveci* (carinii) pneumonia and community acquired pneumonia, he was started on trimethoprimsulfamethoxazole, ceftriaxone, and azithromycin. The joint aspirate from the ankle revealed blastomyces, and the patient was started on IV amphotericin-B. Cultures from sputum, skin, and right ankle bone also revealed blastomyces. The patient underwent surgical debridement of the right ankle lesion and was treated with 2 weeks of IV amphotericin-B. The discharge plan was for oral itraconazole for 1 year.

Conclusion: Systemic blastomycosis in a previously healthy immunocompetent male is very infrequent. The primary presentation as ankle pain is also very infrequent. The literature search revealed frequent reports of disseminated spread in immunocompromised patients but only 2-3 reports of patients with an intact immune system.

Multiple Infectious Complications in Patient Treated for Ulcerative Colitis

Irene Rahman; University of Wisconsin School of Medicine and Public Health, Madison, Wis

Case: An 82-year-old man presented with a history of late-onset ulcerative colitis (UC) diagnosed at the age of 71. He was found to be intolerant to methotrexate and sulfasalazine, but had been in remission for several years. At presentation, he had 2 weeks of persistent watery diarrhea, which was bloody for the last few days, and a 25-lb weight loss. After appropriate resuscitation, the patient underwent a colonoscopy and biopsy, which was consistent with a UC flare. Thus, he was started on prednisone, budesonide, and azathioprine. Over the course of the next week, his diarrhea and weight had much improved, and consideration was made to start infliximab to avoid the need of strong-dose steroids. To rule out latent TB, which may be reactivated by tumor necrosis factor (TNF)-alpha receptor inhibitors, the patient received a purified protein derivative (PPD) skin test and chest X-ray. PPD was negative, but the chest X-ray displayed nodule-like opacities that were absent in an X-ray performed just 2 months prior. A follow-up CT confirmed the presence of multiple nodules, and a lung biopsy and bronchoalveolar lavage (BAL) performed the following week proved his lesions to contain *pneumocystis carinii* pneumonia (PCP) and nocardia.

During this time the patient developed a productive cough, intermittent fever and chills, and continued to be at a low body mass index (BMI). In addition, he developed multiple ulcerated lesions around his nose and circumoral regions, which on culture were consistent with herpes labialis. Four weeks after admission to the hospital, this patient was on atovaquone for PCP (due to a drug allergy to sulfa), minocycline and ciprofloxacin for nocardia, and valcyclovir for herpes simplex. In another week, he finally began to regain his original health via the numerous antibiotics, enhanced nutrition, and physical therapy.

However, this case clearly illustrates how devastating the immunosuppressive side effect of corticosteroids can be, especially in the elderly.

A Cold Case Investigation

Jonathan Thompson; Medical College of Wisconsin, Milwaukee, Wis

Case: A 61-year-old man with a 60-pack-per-year smoking history presented with a 2-day history of dyspnea on exertion, jaundice, and generalized weakness. The patient denied any recent fever, abdominal pain, vomiting, diarrhea, melena, or hematochezia. His admitting laboratory studies were remarkable for hemoglobin 6.1 g/dl, reticulocyte count 5.13%, LDH 429 IU/L, haptoglobin < 7mg/dL and indirect bilirubin 3.9 mg/dL. Direct Coombs test and cold agglutinins were both positive. Tests for cytomegalovirus, Epstein Barr virus, and mycoplasma pneumoniac antibodies were all negative. A few days prior to admission, work-up of a left hilar mass discovered on routine chest X-ray revealed a stage Ib (T2N0M0) squamous cell lung carcinoma. The patient's clinical presentation was consistent with autoimmune hemolytic anemia (AIHA), specifically cold agglutinin disease. Because the patient tested negative for the common infectious causes of cold agglutinin disease, and because his cancer had no bone marrow involvement, it was felt that the hemolytic anemia was likely secondary to a paraneoplastic syndrome.

Paraneoplastic syndromes are cancer-related disorders not directly attributable to mass effect or tissue invasion. A handful of case reports describe AIHA as a paraneoplastic syndrome related to various cancers, including squamous cell lung cancer. Unlike this case, most previous reports of cancer-related AIHA have occurred in patients with large tumor burdens and/or metastatic disease. Scant research exists in this area, but 1 review showed that erythrocyte auto-antibodies and carcinoma coexist 12-13 times more often than expected from their individual relative frequencies. Another review found that roughly 25% of patients with cold agglutinin disease also have malignancy with 5% having carcinoma. Numerous mechanisms have been proposed for

this interaction, most revolving around immune dysfuntion caused by the tumor/immune system interface.

Management of paraneoplastic cold agglutinin disease typically begins with keeping the patient warm, but definitive treatment often is dependent upon removal or cure of the underlying malignancy. In severe cases, plasmapheresis can be used as a temporary measure. Rituximab, a CD20 monoclonal antibody, has shown promise in treating cold agglutinin disease. A recent case series reported an increase in hemoglobin levels in over half the treated patients, but relapse was also common with this form of therapy.

Unilateral Somatic Symptoms And Hyperventilation

Natalia Yazigi, MD, Steven Yale, MD, Poonuru Sujani, MD; Marshfield Clinic and Marshfield Clinic Research Foundation, Marshfield, Wis

Case: A 67-year-old right-handed man was referred to our institution for evaluation of a 2-year history of recurrent spells, most dramatic over the past 2 weeks. Each episode was stereotypical in character though variable in duration, lasting <30 minutes. Symptoms included dizziness, perioral and tongue numbness, tingling dysesthesias involving fingertips bilaterally and traveling proximally up both arms and right face, and right arm weakness described as "being paralyzed." During an observed spell, the patient complained of anxiety with soft and poorly articulated speech and a normal breathing pattern. Examination showed decreased hand grasp, decreased resistance to muscle strength testing on the right upper extremity, weakness in raising the right arm, and decreased sensation to fine touch and pinprick during the spell with normal examination between spells. Voluntary hyperventilation reproduced the patient's symptoms. Echo and CT angiography of the head and chest, were normal. Arterial blood gas performed at the time of spell showed a pH of 7.6, pCO_2 of 11, HCO_3 24, and pO_2 of 83. As the spell was resolving, repeat blood gas revealed a pH of 7.48, pCO_2 of 27, and pO_2 of 83. The patient was diagnosed with hyperventilation with unilateral somatic symptoms and generalized anxiety. Treatment included behavioral therapy, forced breathing in a paper bag during the spells, and clonazepam. Follow-up 1 year later showed no new neurologic disease or symptoms.

Discussion: The term "hyperventilation syndrome" describes a constellation of somatic and psychological symptoms thought to be caused by hyperventilation. Recent evidence however, suggests that the term is a misnomer and that hyperventilation may, in fact, be a consequence rather than a primary trigger for symptomatic episodes. Furthermore, hyperventilation and hypocapnia may not always be identified on examination, or upon voluntary hyperventilation provocation testing. Unilateral symptoms typically lead to alternate diagnoses such as transient ischemic attacks, seizures, or migraines. It is important that physicians recognize and understand the symptoms of hyperventilation, as effective diagnosis and management generally leads to resolution.

The CHILD Project: Connecting Health Insurance with Lunch Data

Michelle Yang, Medical College of Wisconsin

During the summer of 2009, I had the opportunity to spend 8 weeks working under the guidance of John Meurer, MD, and more directly with Kari Mattson, a Milwaukee Public Schools project coordinator at Community Advocates. We worked to develop more efficient and effective ways to provide information and facilitate enrollment in BadgerCare Plus for qualified families. This work was done through the use of federally provided information on students' free and reduced price meal program qualifications, as families qualified for the Free and Reduced Price Lunch Program are most often qualified for Wisconsin Family Medicaid coverage. By learning the process of using this data for developing potential outreach methods, I gained both a better understanding of the public policies aimed at the low-income population as well as crucial knowledge of health insurance coverage accessibility for this population.

By building collaborations with schools for planning and implementation of outreach methods, as well as attending and learning to coordinate evaluation meetings between school personnel and community partners with Community Advocates and Covering Families and Kids (CFK), I was able to hone teamwork skills and gain a thorough understanding of the complex nature of working on a research project with the involvement of large school districts and a bureaucracy. Throughout the summer, I also had the chance to analyze data collected from the past 2 years and conduct literature reviews to gain a better understanding of the school-based outreach model.

This fellowship experience allowed me to grow not only as a student of medicine, but also as an individual who cares greatly about advocacy for unheard voices. The extent of dedication and passion I encountered working with advocates and experts in the field fueled my enthusiasm to learn more each day as I attended retreats and coordinated meetings. To see community health in action from behind-the-scenes made me realize the complexities and barriers that may be invisible even to a physician.

It was also challenging as I experienced frustrations brought about by the barriers of administration and time limitations due to the school-year dependent nature of this project.

I found myself repeatedly wishing that other medical students could have the same experiences to understand and keep in mind the subtle difficulties encountered by low-income populations as they search for access to care.

These experiences also made me ponder the greatly intertwined nature of funding in terms of not only medical care, but also advocacy for the community. During this time of economic downturn and public health changes, it was exciting to learn about the process of health policy reform and understand the logistical reasoning behind each step leading to a better plan of action for the general public, as well as experiencing the new implementation of Badgercare Core for Childless Adults. I now feel confident in my understanding of Wisconsin Medicaid policies, which was a major personal goal of this fellowship.

It is amazing to reflect on how much I have learned in just 8 weeks. I am more determined than ever to work toward meeting community health needs, especially for pediatric populations, and being involved with public health policy. I am indescribably thankful to the Wisconsin Medical Society Foundation for the opportunity.

The goal of the Wisconsin Medical Society Foundation's Summer Fellowship in Government and Community Service Program is to provide medical students the opportunity to increase their knowledge of how community organizations and/or government works with the medical profession to address health issues in Wisconsin. Each student receives a $3500 stipend.

These fellowships require the support of donors to make the experience possible and physician mentors who help students develop their proposals and provide guidance. In 2009, the Foundation was able to provide 6 fellowship opportunities, which will be highlighted in various issues of the *Wisconsin Medical* Journal throughout the year.

Wisconsin Medical Society Foundation

The mission of the Wisconsin Medical Society Foundation is to advance the health of the people of Wisconsin by supporting medical and health education. The individuals and organizations named below made contributions to the Wisconsin Medical Society Foundation from January 1, 2009, through December 31, 2009. We are deeply grateful for each donor's support of the Foundation.

We offer special thanks to our "Gold Donors" — those who have consistently contributed $100 or more to the Foundation during the past 3 or more years—as signified by an asterisk(*).

Legacy Gift
Dr Sridhar and Joyce Vasudevan

Patron Plus
James H. Barbour, MD
Clarence P. Chou, MD*
Dane County Medical Society*
Dr Donald and Jacquelyn Gore*
ProAssurance*
Whyte Hirschboeck Dudek SC*
Winnebago County Medical Society
WPS Health Insurance*

Patron
Dr James and Kathryn Allen*
Dr Mark and Marcia Andrew*
Badger Bay Management Company
Dr Timothy and Janice Bartholow
Carol Baylon*
Drs Bryan and Yolanda Becker
Dr Mark and Patricia Belknap*
Dr Steven and Susan Bergin*
Big Wild Communications
Community Memorial Hospital Medical Staff
Credit Union Executives Society
Dr Richard and Wendy Dart
Dean Health System
Drs Noel and Lakshmi Deep*
Divine Savior Healthcare
Epic*
Drs David Falk and Jo Anne Robbins*
Dr Timothy and Joan Flaherty
Gordon Flesch Company, Inc*
Group Health Cooperative of South Central Wisconsin*
Dr Erik and Marguerite Gundersen
Gundersen Lutheran Health System*
Dr Charles and Jean Holmburg*
Drs William and Mary Alice Houghton*
Pauline M. Jackson, MD*
Dr Norman and Nancy Jensen*
Johnson Bank*
Drs George Lange and Marlene Melzer Lange*
Dr Jack and Joyce Lockhart*
Madison Community Foundation
Markin Financial Group of Wells Fargo Advisors*
Marshfield Clinic*
McGladrey and Pullen LLP
Medical Society of Milwaukee County*
Monroe Clinic*
Nancy Allin Nelson
Sandra L. Osborn, MD*
Robert E. Phillips, MD*
Pierce-St. Croix County Medical Society*
Kenneth B. Simons, MD
Society Insurance*
St. Mary's Hospital*
Symphony Corporation
David Toivonen, MD
UW Health*
UW Health Dept. of Family Medicine*
Doran and Michelle Viste*
Walworth County Medical Society*
Waukesha County Medical Society*
Wisconsin Medical Alumni Association*
Wisconsin Medical Society Insurance & Financial Services, Inc.*
Drs Valerie and Jeffrey Zapolsky

Friend
American College of Obstetricians & Gynecologists - Wisconsin Section*
Peter D. Areson, MD
Dr John and Nancy AufderHeide*
Dr Jergen and Jean Barber
Brown County Medical Society*
Robert and Paula Cummings
Dr Joseph and Eleanor Di Raimondo*
Dr Philip and Lois Dougherty*
Dr Robert and Signe Durnin*
Dr Kevin and Anne Flaherty*
Fond du Lac County Medical Society*
Mark and Wendy Grapentine
Heil Financial Group
Fredric L. Hildebrand, Sr., MD*
Dr Ralph and Peggy Hudson*
Dr Robert and Nancy Jaeger*
Drs Robert and Gerda Klingbeil*
Thomas B. Kloosterboer, MD
Anthony S. Krausen, MD
Dr John and Jeanne Kroner*
Dr James and Elizabeth Kuplic
La Crosse County Medical Society*
Dr Bradley and Susan Manning*
Marathon County Medical Society*
James A. Meyer, MD*
Kermit L. Newcomer, MD*
Dr Eugene and Olive Nordby*
Dr John and Yvonne Petersen*
Portage County Medical Society*
Racine County Medical Society
John and Renee Reback*
Renaissance Charitable Foundation, Inc.
Dr John and Virginia Riesch*
Dr Dennis and Sharon Ryan*
Dr Gregory and Sandra Shove*
Tim and Pat Size*
Gilbert H. Stannard, Jr, MD*
Dr Susan and Peter Turney*
Verity Medical
Thomas F. Walker, MD*
Dr Stephen and Katherine Webster*
Wisconsin Radiological Society*
Wisconsin Society of Pathologists*
Wood County Medical Society

Founder
Arthur E. Angove, DO
Anonymous
Thomas J. Antlfinger, MD
G. Leonard Apfelbach, MD
Apollo's Voice, LLC
Dr William and Phyllis Bartlett*
Thomas P. Belson, MD
Charles P. Benedict, MD
Dr Hilary and Jon Bingol
Dr John and Margaret Ann Blackwood*
Dr Frederick and Patrice Boehm*
Dr Austin J. Boyle, III and Martha Boyle*
Roy A. Brandell, MD
Dr Michael Briselli and Jeannee Sacken
Drs Christopher Young and Sally Browne*
Dr Irwin and Dorothy Bruhn
Dr Lawrence and Carol Burkert
Kenneth and Mary Buroker
Dr Frank and Cynthia Byrne
Dr Bruce and Kathryn Campbell*
Dennis D. Christensen, MD
Steven H. Cohen, MD
Ronald J. Cooper, MD
Catherine T. Coyle, RN, PhD
Crawford County Medical Society
Dr Patrick and Jacqueline Cummings
Kevin J. Dahlman, MD
Ronald J. Darling, MD
Dr Frederick and Mary Davis*
John E. Dettmann, MD
Joseph M. Drinka, MD*
Dr Carl and Susan Eisenberg
Diane F. Elson, MD
Energy Performance Specialists, LLC
Robert and Margaret Foulks
Drs John and Mary Frantz*
Dr D. Joe and Mary Clare Freeman
Dr John J. Frey, III and Catherine Frey*
Ravindra and Andrea Ganesh
Dr Michael and Mary Ann Garrity
Susan D. Gedanke, MD
Drs Terry Geurkink and Alison Wilmeth*
David Galbis-Reig, MD
Dr Lawrence Golopol and Angelika Hughes-Golopol
Dr Robert and Diane Gomez
Dr Mary Govier and John Cashman
John H. Gray, MD
Alma M. Grewal, MD
Dr Peter and Louise Hansen
Dr Thomas and Ruth Hansen
Ralph A. Hawley*
Gregg A. Heatley, MD*
Grace M. Heitsch, MD
Jac and Ruth Heitz*
Timothy J. Helz, MD
Dr William and Linda Hisgen*
Drs David and Ann Hoffmann*
Dr Laurie and Aron Hogden
Harold J. Hoops, Jr., MD*
Dr Franz and Christine Igler
Charles V. Ihle, MD
Kevin A. Jessen, MD
Dr Albert and Dolores Kanner

Dr Lowell and B Keppel
Dr Thomas and Eileen Kidder*
Dr Kathleen and Paul Klespis-Wick*
Ivan M. Knezevic, MD*
Edward L. Knuteson, MD
Ronald C. Knuth, MD
Drs Mahendr and Arvind Kochar
Dr Thomas and Christine Koehler*
Arlyn A. Koeller, MD
Dr Marvin and Hope Kuehner
Kenneth and Deborah Kunkle
Charles B. Larkin, MD*
Dr Paul and Margaret Larson*
Paul J. Leehey, III, MD
Russell F. Lewis, MD*
Dr Roland and Martha Liebenow
Stephen M. Lindsey, MD*
Dr William and Marlene Listwan*
Dr Thomas and Susan Luetzow*
Ronald S. Luskin
Stevie Lynch
Dr Lloyd and Patricia Maasch*
Christopher J. Magiera, MD*
Dr Dennis and Gail Maki
Suzanne J. Martens, MD*
Dr Johan and Sally Mathison*
Dr John and Jane McAndrew*
Timothy G. McAvoy, MD*
Dr Michael and Mary McCormick
Dr Robert and Pamela McDonald
Dr John and Elsa McKenna*
John and Lorna McMahon
Jill R. Meilahn, DO
Merrill Lynch & Co. Foundation, Inc
John and Linda Meurer
Karen L. Meyer, MD*
Nicholas E. Mischler, MD*
Mohammed J. Mohiuddin, MD
David L. Morris, MD*
Dr Albert and Shannon Motzel*
Timothy Muldowney and Jacquelyn Hank
Dr Steven and Marie Nakata
Marvin W. Nelson, MD*
Nephrology Associates, Inc.
Kenneth G. Newby, MD*
Dr James and Colleen O'Connor
Dr Richard and Mary Lee Odders*
Dr Ronald and Wilma Olson*
Michael J. O'Neill, MD
Dr Joseph and Mary Ousley
Kambiz Pahlavan, MD
Dr R. Zorba and Penny Paster*
Dr John and Cathy Pederson
Todd R. Peebles, MD
Andrea T. Peterson, DO
Nicky Plementosh, MD
James and Peggy Possin
Sarah J. Pratt, MD*
Dr William and Frances Raduege*
Dr Stephen and Susan Ragatz
Charles J. Rainey, MD
Dr Claudia and James Reardon
Cornelia M. Riedl, MD*
Michael A. San Dretto, MD*
Thomas D. Sandager, MD*
Melissa Schall
Claude W. Schmidt, MD*
Carolyn Schuldt
Dr Christopher and Geralyn Schultz
Dr Walter and June Schwartz
Dr Daniel and Ellen Sherry*
Philip M. Shultz, MD*
Dr Ron and Linda Stark
Mary Starmann-Harrison
Dr Robert and Janet Starr*
John H. Steiner, MD
Gary C. Steven, MD
Dr John Stone and Meg Shannon-Stone
Kent and Linda Syth
Menandro V. Tavera, Jr, MD
Dr Bonnie and Timothy Tesch
Dr Michael and Kelly Thompson*
M. Kristin Thorsen, MD
Dr Bonnie and Willis Tompkins
Trempealeau-Jackson-Buffalo County Medical Society
Her-Lang Tu, MD
Allen O. Tuftee, MD
Drs Patrick and Deborah Turski
Dr Richard and Jane Ulmer*
Scott H. Warren, MD*
John D. Watson, MD
Dr Ronald and Judith Wenger
Dr Michael and Michelle Werner
Drs Paul Wertsch and Kay Heggestad*
Thomas H. Williams, MD
Dr Warren and Jacqueline Williamson*
Dan and Eileen Wilson
Dr Edward and Sharon Winga*
Wisconsin Rehabilitation Medicine Professionals, S.C.
William Wojta*
Vonnie Youngs*
Raymond C. Zastrow, MD

Benefactor

Thomas and Diane Adams
Dale E. Bauwens, MD
Dr John and Penelope Beasley
Scott A. Behrens, MD
Dr Louis and Sandra Bernhardt
Dr Richard and Doris Bibler
Drs Barbara Blodi and Justin Gottlieb
Dr John and Sandra Bolger
Dr J. Christopher and Arlene Braker
Matt and Melissa Breen
Dr Frederick and Barbara Bronson
Bruce A. Brown, MD
Dr Calvin Bruce and Catherine Caro-Bruce
Drs William Buchta and Lori Campbell
John L. Buhl, MD
Drs James and Charlotte Ann Burns
Drs Michael and Jill Cardwell
Dr Brian and Nancy Chapman
Dr Melissa Chudnow and John Yopps
Dr James and Peggy Concannon
Dr Byron and Pam Crouse
S. Marshall Cushman, Jr, MD
William A. Darling, MD
William B. Davies, MD
Dr Kirkland and Jennifer Davis
Amy Davis
Gerald J. Dorff, MD
Ivy Dowd
Dr Douglas and Linda Duffy
Dr Roy and Jane Dunlap
Dr Aaron and Monica Dunn
Heather Dyer
James R. Dyreby, Jr., MD
Dr Richard and Nancy Edwards
Dean A. Emanuel, MD
Dr David and Jensy Lee Engle
Carolyn J. Farrell, MD
Robert C. Feulner, MD
Dr Kristine Flowers and Dale Lenzner
Dr John and Eileen Foley
Mary Jo Freeman, MD
Dr Reynaldo and Digna Gabriel
Dr Walter and Donna Gager
Robert A. Gahl, MD
Mary Lou Geralts, MD
Dr James and Yvonne Gern
Gary L. Gerstner, MD
A. Nicholas Gianitsos, MD
Joan T. Gnadt, MD
Robert N. Golden, MD
Christopher A. Graf, MD
Charles and Joyce Grapentine
Green County Medical Society
Lauri T. Green, MD
Roger A. Gremminger, MD
Dr Theodore and Lauren Gronski
Thomas S. Haas, DO
Dr Gurdon and Lu Ann Hamilton
Dr Gerald and Joyce Harned
Lewis B. Harned, MD
Dr John and Barbara Harris
John W. Hartman, MD
Stephen D. Hathway, MD
Greg T. Heal, MD
Kate B. Heil
Dr Richard and Celeste Hein
Cyril M. Hetsko, MD, FACP
Andrea C. Hillerud, MD
Barbara A. Hummel, MD
Susan K. Hunter, MD
Dr Eliot and Francine Huxley
Kathy I. Hwang, MD
Michael C. Janowak, MD
Kyle R. Johnson, MD
Dr Michael and Pamela Kalinosky
Dr Sivakami and Kumar Kangayappan
Dr Jon Keevil and Jean Haugwout
Dr Michael and Rosemary Kehoe
James P. Ketterhagen, MD
Patti A. Kile, MD
Dr Frank and Mary Jo Kilpatrick
Gloria Knipschild
Dr Paul and Linda Koch
Dr Edward and Eileen Krall
Terry and Ruth Kringle
Dr Ervin and Marion Kuglitsch
Karin I. Kultgen, MD
Dr Arne and Miriam Lagus
Frederick J. Lamont, MD
Langlade Memorial Hospital
Dr Julie and James Larsen
Roger E. Laubenheimer, MD
Dr Kenneth and Maxine Leenhouts
Lincoln County Medical Society
Mark Linzer, MD
Dr Michael and Joan Lischak
Dr Gregory and Suzanne Lochen
Wolfram George Locher, MD
Paul W. Loewenstein, MD
Dr Thomas and Jean Londergan
Rodney W. Malinowski, MD
Dr Ronald and Kay Martins
Ken Matusek
Dr Donald and Patricia McDonald
Edith A. McFadden, MD
Jacqueline M. Medill
Dr William Merkow and Rosalind-Riva Merkow
Thomas C. Meyer, MD
Dr Donald and Mary Miech
Dr G. Daniel and Barbara Miller
Sheila L. Momont, MD
Dr Jeffrey and Carla Moore
George L. Morris, MD
Gilbert F. Mueller, Jr., MD
Dr Joan and Michael Mueller
Maureen A. Mullins, MD
Dr Frank and Helen Myers
Reynold M. Nesemann, MD
Jane L. Neumann, MD
Neurologic Associates of Waukesha, Ltd.
Dr Corina Norrbom and Jeff Carter
David C. Olson, MD
Dr Timothy and Trish O'Neil
Dr Edwin and Amy Overholt
Judith Pagano-Thoms, MD
Dr Rick and Tracy Papandrea
Dr John and Carole Paulson
Dr Thomas and Teresa Pellino
Dr Kathleen and David Phelan
Dr Jennifer and Michael Philbin
Dr Philip and Marna Pier
Dr Jeffrey and Susan Polzin
Robin T. Price, MD
Jacob P. Prunuske, MD, MSPH
Peter S. Rahko, MD
Eric and Nancy Rasmussen
Renee Reardon
Jennifer L. Reed
James Reuter
Joseph V. Richards, MD
Alphonse M. Richter, MD
Anne M. Riendl, MD
James and Sharon Riordan
Dr Richard and Laura Roberts
Owen Royce, Jr, MD
Dr James and Shirley Rupple
Dr Bonnie Samuelson and Jeffery Fritz
Susan M. Sarracino-Deihl, MD
Evan K. Saunders, MD
Dr Michael and Theresa Saunders

Your support makes this possible

Medical Education Programs

Scholarships and Awards—Provided $68,800 in scholarships and awards for students pursuing medicine and other health careers.

Student Loans—Assisted medical students with $295,000 in loans that are interest-free while in school.

White Coat Campaign—Welcomed all first-year students attending medical school in Wisconsin by providing their first white coat and a personal note of encouragement.

Operation: Education—Offered a forum for medical students to speak with physicians representing a variety of practices to get answers to practical questions about their chosen medical field.

Public Health Programs

Grants—Supported several health research and education initiatives in the state with grants totaling nearly $45,000.

Summer Fellowships—Provided $21,000 for 6 medical students to work on public health or health-related community service projects. Through the guidance of physician mentors, students explore public health issues in Wisconsin communities.

Fundraising Event

Our signature fundraising dinner and silent auction scheduled for April 15, 2010, will feature physician, former NASA astronaut and mountain climber Scott Parazynski, MD. Doctor Parazynski will share some behind-the-scenes stories of his experiences in space, including a risky spacewalk to repair the solar array of the International Space Station, and his unique expertise on human adaptation to extreme environments. With a large silent auction and a very intriguing program, we anticipate attendance of 450-500 people. Please consider joining us.

For table sponsorship details or tickets, contact Mary Oleson at 608.442.3756 or e-mail mary.oleson@wismed.org.

For more information on the Foundation, visit us at www.wisconsinmedicalsociety.org/foundation.

Wisconsin Medical Society Foundation

Dr Robert Schmidt and Patricia Weber-Schmidt
Dr George and Kathleen Schneider
Dr John and Rebekka Schneider
Charles D. Schoenwetter, MD
Alan I. Schwartzstein, MD
Dr Robert and Caryl Sewell
Dr Daniel and Jody Seybold
Charles L. Shabino, MD
Dr Paul and Ellen Simenstad
Greg Simmons
Dr R. Bruce Slater and Janice Hogle
Dr Michael and Mary Stevens
Dr Paul and Jill Stiegler
Kathleen S. Stokes, MD
Donald Strong, MD
David B. Tange, MD
George R. Tanner, MD
Dr Benton and Mary Taylor
Robert and Garnet Thalacker
Dr Trent and Amelia Thompson
Thor M. Thorgersen, MD
Joseph E. Trader, MD
Dr John and Eleanor Tucker
Dr Lee and Margaret Tyne
Carol J. Uebelacker, MD
Dr Gregory and Mariann Van Winkle
Dr Jeanne Vedder and Allan Edwards
Matt Wahoske
Jesi Wang
Dr Robert and Mary Warth
Sheldon A Wasserman, MD
Waupun Memorial Hospital
Dr David and Mary Weber
Dr Gene and Barbara Wegner
Linda J. Werner, MD
Tosha B. Wetterneck, MD
Susan Wiegmann
Dr Stephen and Judith Wilson
Wisconsin Association Medical Staff Services
Tuenis D. Zondag, MD

In Memory Of

Contributions have been made in loving memory of the following individuals:

Dick Beardsley
Leatrice Butts
Frank Cerny, MD
Judith Cooney
Gerald Derus, MD
Ruth Emory Allin
Linda Fabrey Farley, MD
Gordon Garnett, MD
Horace Hansen, MD
George Vosburgh Hering, MD
Cathy Holmgren, MD
Rollo Lange, MD
Steven Lawrence, MD
William J. Lee
Larry Livengood, MD
Juanita Malkowski
Gordon Marlow, MD
Kim Peek
John R. Petersen, MD
Cynthia Rauland
C.M. Schuldt, MD
Kenneth M. Viste, Jr, MD
Pauline Wixson
Richard Wixson, MD
James F. Zimmer, MD

In Honor Of

Tribute gifts have been made to honor the following medical professionals, patients, family members or friends:

John Boxrucker
Eugene J. Nordby, MD
Michael W. Schuldt, MD
Darold A. Treffert, MD

In Kind

Absolutely Art
Abuelo's
American Players Theatre
America's Best Flowers
Atlanta Bread Company
Baileys Harbor Yacht Club
Benvenuto's
Best Western–Lake Aire
Birch Creek Music Performance Center
Blackhawk Country Club
Blue Moon Bar and Grill
Blue Plate Catering
Body in Balance
Bootleggers Supper Club
Boulders Climbing Gym
Brett Favre Forward Foundation
Bridgeport Waterfront Resort
Brookfield Hills Golf Course
Budget Bicycle Center
Kathryn S. Budzak, MD
Buffo Floral
Stephen J. Busalacchi
Candinas Chocolatier
Dennis Carey, DDS
Charles Allis Art Museum
Cheeser's
ComedySportz
Coyle Carpet One
David DeCock, MD
Door County Maritime Museum
Dykman's Time Shop
Engelhart Greensmith
Epic Life Insurance
Flat Top Grill
Gielow Associates
Glass Nickel Pizza Co.
Harbor Athletic Club
Cindy Peterson Helstad
Mitch Henck
Hilton Garden Inn Green Bay
Hilton Garden Inn Madison West/Middleton
Home Concept
Hong Kong Cafe
Imperial Garden Chinese Restaurant
Inshalla Country Club
InterContinental Milwaukee
Island Cafe
Katy's American Indian Arts
Keep Me

Kennedy Manor Dining Room and Bar
Kneaded Relief Therapeutic Day Spa
Koss Stereophones
Lake Lawn Resort
Lakefront Brewery
Leff's Lucky Town
Lynn Casper Studio
Madison Area Technical College
Madison Originals
Madison Symphony Orchestra
David Maurer
Pat and Ronda Mc Carthy
Milwaukee Brewers Baseball Club
Milwaukee Bucks
Moet Hennessy USA
Nakoma Golf Club
Monica Nichter
Noble Metals
Off The Beaten Path
Orange Tree Imports
Pacific Cycle, Inc
Patricia Shoppe
Phyllis Porter
Prime Quarter Steak House
Princeton Club
Radisson Hotel Milwaukee West
Rock River Hills Golf Course
Angie Schwab
Schwoegler Park Towne Lanes
Sharkey Animal Portraits
Silver Birch Supper Club, LLC
Skin Care Source
Sunset Limousine Sevice, LLC
SVA Wealth Management, Inc.
The Bramble Patch
The Madison Polo Club
The Osthoff Resort
The Shoe Box
The Vinery
Timber Ridge Lodge & Waterpark
Top Promotions
Toppers Pizza in Wauwatosa
University of Wisconsin Men's Hockey
UW Press
Waukesha Symphony orchestra
John D. Wegenke, MD
Wild Birds Unlimited - Middleton
Wisconsin Medical Society
Zahava Designs
Zanders Interiors, Inc
Dia Zent

Support from Established Funds

We would also like to acknowledge the importance of the following funds currently held by the Foundation. These funds help support many of our current programs.

Student Loan Funds

Brown County Student Loan Fund
Marion Brown Student Loan Fund
Dane County Student Loan Fund
Danforth Memorial Student Loan Fund
General Student Loan Fund
Grant County Student Loan Fund
W.B. Hildebrand Memorial Student Loan Fund
Reginald H. Jackson, Jr, MD Student Loan Fund
Reginald H. Jackson, Sr, MD Student Loan Fund
Marathon County Auxiliary Student Loan Fund
Marinette County Student Loan Fund
Outagamie County Student Loan Fund
Popp Student Loan Fund
Racine County Auxiliary Student Loan Fund
Reznicheck Student Loan Fund
Ruth Stoerker, MD Loan Fund
Sheboygan County Auxiliary Student Loan Fund

Scholarship and Award Funds

Victor A. Baylon, MD Scholarship Endowment
General Scholarship Fund
Goodman-Goodell Scholarship Fund
Robert Jason Gore Scholarship Endowment
Drs John and William Houghton Award Fund
Amy Hunter-Wilson, MD Scholarship Endowment
Presidential Scholar Award Fund
John and Virginia Riesch Scholarship Endowment
Catherine M. Slota-Varma Scholarship Fund
Rukmini and Joyce Vasudevan Scholarship Fund
Kenneth M. Viste, Jr., MD Young Physician Leadership Award Fund
Waukesha County Scholarship Fund

Research and Education Funds

Henry A. and Irene S. Anderson Endowment
Marion Brown Orthopedic Research Project Fund
L. Wayne & Marion Brown Family Practice Fund
James and Clara Joss Research Trust
Charles W. Landis, MD Lecture Endowment
Medical and Health Education Fund
PIC Wisconsin Fund
Earl and Alice Thayer Fund

Family Medicine with OB

Amery, Wisconsin

Patient Centered, Care Focused

HealthPartners Medical Group is actively seeking exceptional BC/BE Family Medicine with OB physicians to join our group at Amery Regional Medical Center. Board Certified Family Medicine with OB physicians share 1:10 call. ER has 24/7 coverage. Amery Regional Medical Center relocated to a brand new facility in 2008. Current group includes family medicine, emergency medicine and general surgery. Amery, WI is within a one-hour drive of the Twin Cities, MN. We offer an excellent salary and benefit package, paid malpractice and a commitment to providing exceptional patient-centered care.

Amery Regional Medical Center is part of the HealthPartners Medical Group—our physicians enjoy the excellent compensation and benefits package, medical malpractice coverage and security offered by a large group, while practicing in a traditional community-based setting. For more information, please contact diane.m.collins@healthpartners.com or call (800) 472-4695 ext 3. Apply online at www.healthpartners.jobs Job ID# 7182. Site is not eligible for visa waivers. EOE.

HealthPartners®
Medical Group

www.healthpartners.com

Family Medicine

New Richmond, WI

We are actively recruiting exceptional Family Medicine physicians who are interested in living and practicing in a small rural community to join our primary care group at New Richmond Clinic, New Richmond, WI. The New Richmond Clinic is within an hour's drive of the Twin Cities, MN.

This full-time position has optional OB and ER coverage. Our current primary care group includes Family Medicine, OB/Gyn and General Surgery. Must be BC/BE and currently hold or be able to obtain Wisconsin Medical license. We partner with a multitude of specialists available on campus at Westfields Hospital.

We offer a competitive salary, an excellent benefit package, paid malpractice and commitment to providing exceptional patient-centered care.

The New Richmond Clinic and Westfields Hospital are part of the HealthPartners family of care. For more information, contact **diane.m.collins@healthpartners.com** or call Diane at (800) 472-4695, x3. EO Employer

www.nrclinic.com

Family Medicine – with or without OB

Osceola, Wisconsin

HealthPartners Medical Group is seeking exceptional Family Medicine with or without OB physicians to join our group at Osceola Medical Center. Located along the scenic St. Croix River, Osceola is a rural Wisconsin gem located just 45 minutes from the Twin Cities. We are currently recruiting BC/BE full-range Family Medicine with or without OB physicians to join our growing practice. Emergency Room coverage is provided. Our Osceola group moved to a brand new medical center in the fall of 2008.

Osceola Medical Center is part of the HealthPartners Medical Group—our physicians enjoy the excellent compensation and benefits package, medical malpractice coverage and security offered by a large group, while practicing in a traditional community-based setting. For more information, contact diane.m.collins@healthpartners.com, or call (800) 472-4695, ext 3. Apply online at www.healthpartners.jobs Job ID# 8975. Site is not eligible for visa waivers. EOE

HealthPartners®
Medical Group

www.healthpartners.com

Psychiatrist

Amery, Wisconsin

HealthPartners has an exciting opportunity for a practicing psychiatrist to join our group at the Amery Regional Medical Center (ARMC) in Amery, WI.

This key position will provide direct patient care as chief physician for our psychiatric treatment program, coordinate ARMC's psychiatric medical policies and procedures, and implement appropriate integration of clinical and medical services.

Top candidates will be board certified by the American Board of Psychiatry and Neurology or the Osteopathic Board of Neurology and Psychiatry. Geriatrics experience or board eligibility in geropsychiatry is preferred.

Forward CV and cover letter to lori.m.fake@healthpartners.com or apply online at www.healthpartners.jobs. For more details, call (800) 472-4695 x1 for more details. EOE

HealthPartners®
Medical Group

www.healthpartners.com

Classified Ads

DOOR COUNTY WISCONSIN—Outstanding opportunity for a highly qualified ABEM/AOBEM certified emergency physician to join a well established group practice at Door County Memorial Hospital. Outstanding compensation, benefits and retirement package with a distributed ownership structure. Opportunity to explore medical information systems, preventive and occupational health, as well as traditional clinical leadership roles. This community is located on Lake Michigan and provides outdoor activities, great neighborhoods, and schools. Please direct inquiries or CVs to Mary Schwei or Johanna Bartlett; e-mail: ihc-careerops@infinityhealthcare.com. Infinity HealthCare, Inc. 111 E. Wisconsin Ave, Ste 2100, Milwaukee, WI 53202; phone 888.442.3883, fax 414.290.6781

MEDSCRIBBLER—The Electronic Medical Record everyone has been waiting for! E-prescribing, practice management, and mobile multi-locations. Increase income and quality of care today! www.medscribbler.com or 866.350.6337

FAMILY MEDICINE—GORGEOUS CENTRAL WISCONSIN—Community owned and operated health care system in picturesque river city of 17,000. Practice in a modern Family Clinic attached to the hospital in the heart of this thriving community. Enjoy Wisconsin's excellent public education system and physician friendly environment. The 99-bed hospital boasts a Family Birthing Center with 7 spacious LDRPs with whirlpool and an operating suite. Call 1:5 supplemented by a hospitalist group. Excellent salary above area standards! Tracy Glynn 800.243.4353 or tglynn@strelcheck.com

THE WISCONSIN DISABILITY DETERMINATION BUREAU—(DDB) is looking for licensed physicians in all specialties to perform consultative exams in all areas of Wisconsin. These are one-time history and physical exams similar to new patient exams. The physician does not determine eligibility for benefits or provide treatment recommendations. There is no follow up with the disability applicant. For more information please visit our website, http://dhs.wisconsin.gov/ddb/CEopportunities.HTM. If you are interested, complete the form on our website and submit electronically to us. Or, call Heidi Schweikl at 608.266.2394. DDB representatives will contact you.

Index to Advertisers

COMING APRIL 15, 2010!

THE EPIC ADVENTURES OF A MAN WHO CHALLENGED SPACE MEDICINE MOUNTAINS and HIMSELF

2010: A medical SPACE ODYSSEY

starring SCOTT PARAZYNSKI, MD

2010 FUNDRAISING DINNER and SILENT AUCTION
produced by the WISCONSIN MEDICAL SOCIETY FOUNDATION
monona terrace convention center, madison, wis

Wisconsin Medical Society Foundation

www.wisconsinmedicalsociety.org/foundation

presenting sponsor WPS HEALTH INSURANCE

SAVE THE DATE! APRIL 15, 2010

For ticket or sponsorship information, contact Rebecca Thompson at 866.442.3800, or visit www.wisconsinmedicalsociety.org/foundation.

"Why is this the best fit for my practice?

They see things through my eyes."

ProAssurance understands your desire for more control, less uncertainty, and preservation of your hard-earned professional identity.

It's about fair treatment. You want reasonable rates with stable premiums, prompt service, easy access to valuable risk reduction information, and of course, unfettered defense of your good medicine.

The qualities you value most in a protection partner are easily within reach.

Just take a look.

PROASSURANCE®
Treated Fairly

Professional Liability Insurance & Risk Management Services

ProAssurance Wisconsin is rated **A- (Excellent)** by A.M. Best.
For individual company ratings, visit **www.ProAssurance.com** • 800.279.8331

WARD'S 50
SAFETY • CONSISTENCY • PERFORMANCE
2007 • 2008 • 2009