



advancing the art & science of medicine in the midwest

WMJ

volume 112 • no. 3 • june 2013

CATCH OF THE DAY

**Multipronged outreach needed
to educate anglers about risks**

Also inside: CME Quiz
Physicians honor veterans on DC flights



*With more than 30 years of
dedicated service, our focus is on the insurance
needs of Wisconsin's medical community.*



Wisconsin Medical Society
Insurance & Financial Services, Inc.

For more information on our products and services contact us at
866.442.3810 or visit www.wisconsinmedicalsociety.org/insurance.

WISCONSIN MEDICAL SOCIETY 14th ANNUAL SYMPOSIUM

HEALTH CARE IN REAL TIME: MAXIMIZING OPPORTUNITIES FOR SUCCESS

Opportunities abound in the ever-changing world of health care, and the Society's 2013 Symposium has everything you need to succeed. From sessions about practice management, coding, billing, and ICD-10, to quality and compliance – the Symposium offers information, tools and resources to improve patient care and maximize results.

SUNDAY, SEPTEMBER 22

Pre-Symposium: 12:30 to 4:30 p.m.

ICD-10: From Head to Toe; ICD-10 Implementation:
Lessons Learned in the Trenches

MONDAY, SEPTEMBER 23

Keynote: Increasing Your Professional Power to
New Levels of Excellence

Breakout Sessions: Choose three of the 12 offered

Bonus Education Sessions: What's Your Career
Blueprint? How Coding and HIM Careers
Are Evolving; Leveraging Data for Business
Intelligence: Where Do I Start?

Networking Party and Exhibit Hall Grand Opening:
Visit with exhibitors and peers; win great prizes!

TUESDAY, SEPTEMBER 24

General Session: A 360-Degree View
of Health Insurance Exchanges

Breakout Sessions: Choose three of the 12 offered

"The Society's annual Symposium gives me great insight into the intricacies of documentation and coding and how they affect reimbursement, *which has impact on our ability to care for our patients.* I highly encourage at least one person from your clinic to attend this information-filled event to make sure everyone is up to date on all of the changes in health care happening right now. "

—Andrea Hillerud, MD,
Marshfield Clinic, Eau Claire

<https://www.wisconsinmedicalsociety.org/resources/education/symposium/>



COVER THEME

Catch of the Day

Fishing is a popular pastime that spans age and gender. But years of freshwater pollution have made warnings about heavy metals and PCBs necessary for everyone. A study in this issue of *WMJ* explores awareness among older anglers of the hazards of eating too much of what they catch, and calls for a multipronged approach for educating the fish-consuming public.

Cover design by
Mary Kay Adams-Edgette.

The mission of *WMJ* is to provide a vehicle for professional communication and continuing education for Midwest physicians and other health professionals. *WMJ* is published by the Wisconsin Medical Society.

Volume 112, no. 3 • June 2013

WMJ

EDITORIAL

Letters to the Editor

Paying for the Uninsured; Clarification on Use of High-dose Influenza Vaccine in the Elderly	104
--	-----

As I See It

Nutritional Misfortune.....	105
<i>Kristin Roensch, BS</i>	

In This Issue

The World We Live in Can Be Hazardous to Our Health.....	109
<i>John J. Frey, III, MD, Medical Editor</i>	

ORIGINAL RESEARCH

Fish Consumption and Advisory Awareness Among Older Wisconsin Fishermen	111
<i>Pamela Imm, MS; Henry A. Anderson, MD; Candy Schrank, MS; Lynda Knobloch, PhD</i>	
A Single Urban Center Experience with Adult Pedestrians Struck by Motor Vehicles	117
<i>Lisa M. McElroy, MD; Jeremy J. Juern, MD; Annette Bertleson, RN; Qun Xiang; Aniko Szabo, PhD; John Weigelt, MD</i>	

HEALTH INNOVATIONS

A Pharmacist-guided Protocol for Improved Monitoring of Patients on Antidepressants	124
<i>Casey Gallimore, PharmD; Kenneth Kushner, PhD</i>	

CASE REPORT

Empyema Necessitans Caused by <i>Mycobacterium tuberculosis</i> in an Immunocompetent Patient.....	129
<i>David J. Magness, DO</i>	

advancing the art & science of medicine in the midwest

YOUR PROFESSION

Focus on Community Health

Physicians Honor Veterans as Medics

on Flights to DC Memorials106

Lisa Hildebrand

From the Office of General Counsel

Reshaping the Boundaries of Informed Consent in Wisconsin139

Krista J. Sterken, Esq.; Michael B. Van Sicklen, Esq.

Dean's Corner

Priority Initiatives in Health Care and Research

Harmed by Budget Cuts.....141

Joseph E. Kerschner, MD

MetaStar Matters

Curbing Unnecessary Use of Antipsychotic Medication.....143

Jody Rothe, RN, WCC; Jay A. Gold, MD, JD, MPH

CME Quiz

Quiz: A Single Urban Center Experience with

Adult Pedestrians Struck by Motor Vehicles123

Proceedings from the 2012 Annual Meeting of the American College

of Physicians, Wisconsin Chapter131

Classified Ads144

The *WMJ* (ISSN 1098-1861) is published by the Wisconsin Medical Society and is devoted to the interests of the medical profession and health care in the Midwest. The managing editor is responsible for overseeing the production, business operation and contents of the *WMJ*. 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. All articles published herein, including commentaries, letters to the editor and editorials represent the views of the authors, for which neither *WMJ* nor the Wisconsin Medical Society take responsibility, unless clearly stated. Advertising content is the responsibility advertiser and does not imply an endorsement or sponsorship by *WMJ* or the Wisconsin Medical Society and its affiliates unless specified. *WMJ* is indexed in Index Medicus, Hospital Literature Index, and Cambridge Scientific Abstracts.

Send manuscripts to *WMJ*, 330 E Lakeside St, Madison, WI 53715. Instructions to authors are available at www.wmjonline.org, call 866.442.3800, or e-mail wmj@wismed.org.

MEDICAL EDITOR

John J. Frey, III, MD, Madison, Wis.

EDITORIAL BOARD

John J. Frey, III, MD, Madison, Wis.

Philip F. Giampietro, MD, Madison, Wis.

Louis Kleager, MD, Scottsbluff, Neb.

Kathleen R. Maginot, MD, Madison, Wis.

Joseph J. Mazza, MD, Marshfield, Wis.

Richard H. Reynertson, MD, La Crosse, Wis.

Sarina B. Schrager, MD, Madison, Wis.

Kenneth B. Simons, MD, Milwaukee, Wis.

Geoffrey R. Swain, MD, Milwaukee, Wis.

Darold A. Treffert, MD, Fond du Lac, Wis.

Steven H. Yale, MD, Marshfield, Wis.

STAFF

Kendi Parvin

Managing Editor

Mary Kay Adams-Edgette

Layout and Design

Lisa Hildebrand

Editorial Assistant

Deana Hipke

Editorial Assistant

ADVERTISING

Kelly Slack, Slack Attack Advertising,
608.222.7630 or kelly@slackattack.com.

SUBSCRIPTION RATES

Members: included in membership dues.

Non-members: \$149. Current year single copies, \$25 each. Previous years' single copies, when available, \$12 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 *WMJ*, 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: *WMJ*,
PO Box 1109, Madison, WI 53701

ISSN 1098-1861

Established 1903

© 2013 Wisconsin Medical Society

Paying for the Uninsured

I am a lifetime member of the Wisconsin Medical Society and am a retired orthopaedic surgeon. I had a very active general orthopaedic practice in Sheboygan, Wisconsin, for 42 years.

When I started, we did not have emergency department physicians or hospitalists, so we essentially took care of everything from beginning to end. Of course, in those days we had patients who did not pay their bills, but I can honestly say I never was sure which was which and I never refused patients orthopedic care based on their ability to pay.

Times have changed, and it is time that we make some changes to help pay for those who are uninsured. There always are innovative ways of doing things, and I have 2 suggestions. The first is entirely my idea, and I have run this by senators and other public officials only to get the response, "that's interesting."

First, I would give physicians tax credit for providing uncompensated care. We have the mechanism for doing this. We have a code for every procedure we perform, and practices have elaborate fee collection services. We also have the IRS, so it would be no more difficult to take a tax deduction on unpaid care as easily as we deduct other professional expenses.

Second is something that, unfortunately, I heard only at the end of a discussion on the radio. Apparently it has been instituted in at least 1 state and I am sorry I cannot name the state. Essentially, what they did was use free care and broke it down into block units and used the money that was saved from that to pay the physicians' malpractice insurance. As I understand it, they would pay a portion or all of the premium. If this were a state-run program and enough physicians were involved, plaintiffs and their lawyers would be in the position of essentially suing the state, which is a much more formidable task than suing an individual.

Obviously, there are a lot of details that could be worked out, but that is why we have all those MBAs that have invaded the medical profession. It is about time we came up with some innovative ideas on how to deal with uncompensated care. The Affordable Care Act notwithstanding, these people are still going to be around and need to be helped. I hope readers will consider my suggestions into consideration and we can get some action at the level of the state medical society.

Donald R. Gore, MD, MS
Sheboygan, Wisconsin

Clarification on Use of High-dose Influenza Vaccine in the Elderly

I write in response to the commentary on my letter that was published in the April 2013 issue of the *WMJ*.^{1,2} One statement in Dr Temte's commentary might benefit from some amplification. He wrote that the FDA licensed the high-dose vaccine on the basis of "non-inferiority of the resulting antibody concentrations." I believe he was referring to the phase 3 trial outlined by Falsey, et al.³

The Falsey paper concluded in the abstract: "There was a statistically significant increase in the level of antibody response induced by HD [high-dose] influenza vaccine, compared with that induced by SD [standard dose] vaccine." This was based on results noted in the paper: "The HAI [hemagglutinin inhibition antibody] GMT [geometric mean titer] ratios were 1.7 (95% CI, 1.6–1.8) for [influenza strain] A/H1N1, 1.8 (95% CI, 1.7–2.0) for [influenza strain] A/H3N2, and 1.3 (95% CI, 1.2–1.4) for strain B." They went on to say: "HD vaccine met superiority criteria for the 2 A strains and showed non-inferiority for the B strain; it demonstrated overall superiority in accordance with predefined criteria." Prespecified criteria for

superiority of proportions of patients achieving seroconversion also were met for the A strains, and seroconversion was noninferior for the B strain.³ (Figure)

Dr Temte's statement, therefore, is correct in noting that the high-dose vaccine induced noninferior antibody responses for influenza B. However, this is not the whole story, since antibody concentrations were superior (not just non-inferior) for the A strains and superior overall. This is important, since superior antibody response was the basis for our routine use of the high-dose vaccine in the Nebraska-Western Iowa system.

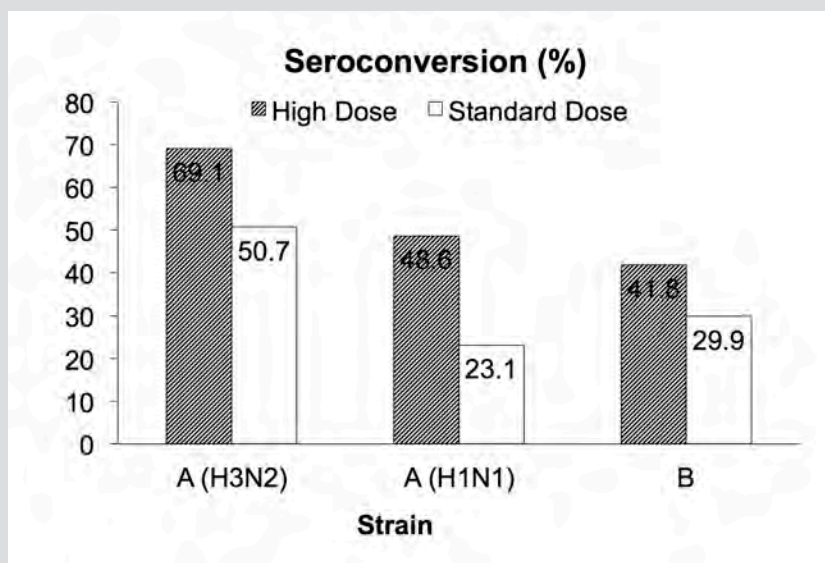
Marvin J. Bittner, MD

VA Nebraska-Western Iowa Health Care System
Omaha, Nebraska

References

1. Bittner MJ, Gorby GL, Parks CC. Absence of laboratory-confirmed failures of high-dose influenza vaccine in the elderly. *WMJ*. 2013;112(2):45.
2. Temte JL. Commentary: Solid evidence is lacking, but signs are hopeful. *WMJ*. 2013;112(2):45.
3. Falsey AR, Treanor JJ, Tornieporth N, Capellan J, Gorse GJ. Randomized, double-blind controlled phase 3 trial comparing the immunogenicity of high-dose and standard-dose influenza vaccine in adults 65 years of age and older. *J Infect Dis*. 2009;200(2):172-180.

Figure. Increased Antibody Response Induced by High-dose Influenza Vaccine.



Nutritional Misfortune

Kristin Roensch, BS

As my first year of medical school came to a close in May of 2012, I began work on a summer research project in collaboration with groups in Milwaukee studying childhood obesity. At first glance, the summer project seemed like it would be very clear-cut—the project mentors and I would develop a protocol to measure plate waste in a community center summer camp and extrapolate health and economic implications from those findings. But my idea that the summer project collaboration would go very smoothly quickly changed. As my research progressed, I became wrapped up in the literature review process in an attempt to educate myself in childhood nutrition, obesity, protocol development, and nutrition standards within schools. This last area is what stirred my passion about the implications of this project.

After meeting with the Executive Director of Agape, one of the Milwaukee area community centers, I learned about the resources the center receives to provide healthy, nutritious meals to their numerous summer camp participants. This fiscal year, the maximum lunch reimbursement rate is \$3.325 through the Wisconsin Department of Public Instruction (DPI) Summer Food Service Program.¹ The maximum rate corresponds to those students eligible for free lunch, which describes all of the Agape Community Center's summer camp participants. Because Agape works on a very small scale, most of the meals they serve cost more than what is reimbursed to the center (taking into

account the cost of food and labor), creating a fiscal deficit.

After processing this information, I began to wonder if it is possible to lower childhood obesity rates with such a low rate of meal reimbursement. How can chefs at schools and centers feasibly provide nutritious and plentiful meals with such little financial support? I also wonder whether pediatricians, family practice physicians, and nurses are aware of this dismal rate and what its implications are for the youth they care for. I believe it is imperative that this rate be increased to allow children who receive meals in community centers and schools to grow to be healthy.

In discussing with Agape staff the limitations involved in planning meals while adhering to the standards outlined by the DPI, I learned how this task is actually carried out. In a plate waste study last year at Agape, 56% of fruits and 50% of vegetables served were wasted.² It is apparent that community centers and schools need strategies that target youth to increase their fruit and vegetable intake. To do this, they need to be supported financially with the means to provide attractive, fresh, and healthy options. Instead of financially supporting sugar-laden or unappealing options such as applesauce and frozen fruits that are wasted anyway, the DPI should assist centers to provide fresh fruits as an alternative. In the end, the economics of the switch will benefit the DPI and provide nutritional benefits to the youth.

Getting youth in urban populations to consume enough fruits and vegetables is difficult enough, but the added stress of being severely limited financially makes the task even more daunting.³ Through increased financial support of community centers and schools that provide meals to youth, we can begin to change the face

of nutrition in public programs and encourage new, healthy eating habits in our youth.

As this project collaboration continues, I hope I can encourage change in those around me surrounding this topic of reimbursement rates and nutritional standards within our community and our schools. I will need to focus my efforts on future discussions with leaders of the Wisconsin DPI to begin to understand how change with regard to financial standards can come about. Also, keeping the medical community interested and inspired will require continual recruitment and education of fellow medical students to be a part of community-engaging projects.

The first year of medical school was difficult. The task of improving the nutrition in centers and schools may be even more of an uphill battle, but I am staying true to the cause and remain hopeful, passionate, and excited to see what the future holds with regard to childhood nutrition and healthy living.

Acknowledgements: This summer research project was supported by a grant from the Wisconsin Medical Society Foundation. The author is grateful to the staff at Agape for allowing the project to be conducted at their site, and thanks David Nelson, PhD, MS, and John Meurer, MD, MBA, for their mentorship and guidance.

REFERENCES

1. Wisconsin Department of Public Instruction. Reimbursement Rates for School Programs, 2011. http://dpi.wi.gov/fns/pdf/sfsp_rates_34.pdf. Accessed September 10, 2012.
2. Bastani D, et al. A Pilot Case Study of a Systematic, Low-Cost Method for Evaluation of Childhood Nutrition in Community Settings. Unpublished Manuscript. 2013.
3. Centers for Disease Control and Prevention. Fruit and Vegetable Consumption Among High School Students—United States, 2010. *MMWR Morb Mortal Wkly Rep*. 2011;60(46):1583-1586. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6046a3.htm>. Accessed September 10, 2012.

• • •

Ms. Roensch is a second-year medical student at the Medical College of Wisconsin in Milwaukee. She can be reached at kroensch@mcw.edu.

Physicians Honor Veterans as Medics on Flights to DC Memorials

Lisa Hildebrand

Like the military veterans they care for, Bill Nietert, MD, and Ryan Gossett, MD, are rather uncomfortable receiving recognition for their efforts. The family physicians with Aspirus Clinic in Mosinee received the Wisconsin Medical Society's 2013 Physician Citizen of the Year Award but reserve the accolades for the hundreds of veterans they've accompanied to Washington, DC, as part of the Never Forgotten Honor Flight.

"We are deeply honored, but frankly, we try to stay in the shadows because we don't want to pull any of the attention away from the veterans," said Dr Gossett "It's nice to be recognized, but it's really about them."

Doctor Gossett has accompanied more than 1100 veterans from northern Wisconsin on all 12 flights, and Dr Nietert has flown on all but one. Both of the family medicine physicians have served on the Board of Directors for the Never Forgotten Honor Flight (<http://www.neverforgottenhonorflight.org/>) since its inception in 2009. The organization is one of the 5 Honor Flight Network hubs in Wisconsin.

Earl Morse, a physician assistant and retired Air Force captain in Ohio, began the Honor Flight Network (www.honorflight.org) shortly after the World War II memorial was completed in Washington, DC. The first flights took place in May 2005 when 6 small planes flew 12 veterans to visit the memorial. By the end of 2012, the nonprofit organization transported more than 98,500 World War II veterans to Washington, DC, out of 121 hubs in 41 states.

In 2009, one of Dr Nietert's patients told him about a "nearly religious experience" accompanying his uncle on one of the first Honor Flights from Iowa. "He came back, and he basically said 'this is what I'm going to do with whatever life I have



Photo courtesy of Dave Junion

Never Forgotten Honor Flight

This Wausau-based organization was formed in November 2009 as an affiliate of the national Honor Flight Network. Its goal is to fly area veterans who served during World War II, the Korean War or the Vietnam War to Washington, DC, to visit the memorials erected in their honor. Visit www.neverforgottenhonorflight.org/ to learn more.

Upcoming flights:

Mission 13 – September 9, 2013
Mission 14 – October 21, 2013

left," Dr Nietert recalled Mike Thompson as saying. When Thompson told Dr Nietert that they would need medical people for their Honor Flight hub, he quickly agreed to help.

Doctor Nietert was medical director of the Aspirus Kronenwetter Clinic at that time, and he

said it was "serendipity" that he hired Dr Gossett, whose grandfather was a naval aviator in World War II. "He, like a lot of World War II veterans, didn't feel like he did anything special," Dr Gossett said about his grandfather, who passed away in 2001. "That's one of the struggles we find when trying to get veterans to sign up for the trip. They all feel like they were doing their job. I think he felt the same way. The nation called his name, and he signed up and did his job."

Patrick Bradley, whose father was one of the soldiers who raised the flag during the Battle of Iwo Jima during World War II, accompanied the veterans from the Never Forgotten Honor Flight earlier this year. "After spending the day with 100 veterans, he started to understand why his father didn't think he was anything special," Dr Gossett said. "There are all kinds of ways to be touched by this event, but I don't think anybody comes away as the same person that showed up at the airport in the morning."

Doctor Gossett said his work with the Honor



Photo courtesy of Dave Junion

Flight gives him a sense of completeness and purpose. The physicians and at least one other medical person accompany about 100 veterans and more than 50 guardians throughout the day-long trip, which begins when they arrive at the Mosinee airport before 5 AM. "The flight days are exceedingly long, and they're a lot of work," Dr Gossett said. "But I'm not sure that I've ever done anything that's more personally rewarding."

Often, there are close to 1000 people welcoming the veterans back to the Mosinee airport around 10 PM. "A lot of people are under the assumption that all these vets had this big, huge welcome home party," Dr Gossett said. "They didn't. Most of these guys were over for a while as occupying forces and slowly trickled home. If you talk to the veterans, the welcome home celebration (after the Honor Flight) is probably one of the most emotional events for them."

Doctor Nietert recalled one veteran who didn't want to leave the airport after the trip to Washington, DC, and welcome-home celebration.

"There's this one old codger who didn't want to get on the bus to go back to the hotel," he said. After a bit more encouragement, the veteran finally said to Dr Nietert: "Today, I'm a hero. If I get on the bus, I'm going to wake up a nobody. I want this day to last forever."

In addition to their flight day responsibilities and Board meetings, Drs Gossett and Nietert spend countless hours reviewing each veteran's medical form to identify any possible problems that may occur during the trip. "If we feel like we need to, we will call the veterans or their physicians to get a better sense of what their needs will be and figure out how to get that arranged," Dr Gossett explained.

Much of the care they provide on the flight day is routine – checking oxygen levels and giving insulin shots, and treating cuts and bruises. "We'll basically fly anyone whose oxygen levels can tolerate it," Dr Nietert said, adding that a local hospital donated a simulator to help determine if a veteran will be able to tolerate oxygen levels at 8,000 feet.



Photo courtesy of Dave Junion

Top photo: Ryan Gossett, MD, front left, and Bill Nietert, MD, second row with red cap, chat with other participants on a recent Never Forgotten Honor Flight to Washington, DC.

Bottom photo: The Iwo Jima Memorial at Arlington National Cemetery provides a fitting backdrop for a photo of Bill Nietert, MD, and dozens of veterans from north-central Wisconsin.

Opposite photo: Bill Nietert, MD, and Ryan Gossett, MD, arrive at the airport in Mosinee, Wisconsin, by 5 AM on flight day to make sure the veterans receive the care they need during their trip to Washington, DC.

"We've had 2 or 3 veterans who had to be seen in emergency room where we had to do rapid landings," Dr Nietert said. "We haven't had to divert, but we've had ambulances meet us at the airport a couple of times."

They also educate community members about the organization and recruit others to serve as guardians and members of the medical team. The day before the trip, they join the guardians and family members at a banquet honoring the veterans.

Both physicians consider the Never Forgotten Honor Flight a natural and logical extension of their work with local nursing homes. Thompson and Jim Campbell, co-founders of the local hub, believe the physicians go far beyond serving as the veterans' medics and say that's why they nominated them for the Physician Citizen of the Year Award on behalf of the organization's Board of Directors.

Drs Nietert and Gossett said they were humbled when they learned they would receive the honor, with Dr Nietert saying: "The only way we're content accepting any of the recognition is that it brings attention to the Honor Flight in general."



Photo courtesy of Dave Junion

Ryan Gossett, MD, of Aspirus Kronenwetter Clinic talks with some of the veterans on a recent Never Forgotten Honor Flight to Washington, DC, to visit the memorials built in their honor.



MARCH 17-19, 2014 KALAHARI RESORT, WISCONSIN DELLS

ICD-10 will affect all aspects of health care in 2014, and three highly respected organizations in Wisconsin have come together to make sure you're **READY**.

The ICD-10 Summit for practice managers, coding and billing specialists, and health information professionals will **SET** you on the path to a successful implementation.

You'll have the tools—and confidence—you need for a smooth transition when you **GO LIVE** on October 1, 2014.

ICD-10 SUMMIT: READY, SET, GO LIVE!

A collaborative effort of The Wisconsin Medical Society, Wisconsin Medical Group Management Association and Wisconsin Hospital Association

Details and registration coming Fall 2013!
www.wisconsinmedicalsociety.org/resources/education



The World We Live in Can Be Hazardous to Our Health

John J. Frey, III, MD, Medical Editor

Over the years, the *WMJ* has published a number of articles that describe the relationship of the environment where we live and possible risks to our health.¹ Anyone who has bought a house in recent years knows of the potential for radon exposure that exists in certain parts of the state.² A study of the environmental health measures of water, air, and the built environment (housing quality, transportation, safety, etc) showed dramatic variances in the state's counties;³ and the county health rankings, developed in Wisconsin but now a national program sponsored by Robert Wood Johnson Foundation, are used by public health and state and local governments to address the larger social determinants of health that affect their communities.⁴

Two articles in this issue highlight, again, the realities that where our patients live, work and play affects their health as much as anything we do in our offices. The public seems to be aware of the increasing frequency of falls in older patients and the serious consequences of those falls for the general health of individuals; effective interventions to decrease their likelihood are widely known.⁵ Less attention is paid to another environmental hazard, automobile-pedestrian accidents, which have ominous consequences, particularly for older people.

The article by McElroy and colleagues⁶ points out that the mortality rate for people over 65 is twice that of younger patients who are admitted to an urban regional level 1 adult trauma center. Older patients require more intensive and longer hospital stays and longer term rehabilitation and skilled nursing care after discharge. Most city streets are not built

for people whose vision is low and who cannot hustle away from oncoming vehicles, or, if they try to hustle, often fall. I remember my parents instructing me to stop at crosswalks, look both ways, and then keep looking as I crossed the street. The same advice, coupled with admonitions NOT to go for a walk in the dark, are ones I and my aging cohort should

Regardless, fishing is good for the soul and retains its remarkable popularity across age and gender. But we have managed to make something dangerous out of an activity that has fed our ancestors for millennia. Years of freshwater pollution have made warnings about heavy metals and polychlorinated biphenyls (PCBs) necessary for everyone, particularly

Two articles in this issue highlight, again, the realities that where our patients live, work and play affects their health as much as anything we do in our offices.

follow. What, exactly, older people are doing crossing streets between 6 PM and midnight, the peak time for automobile-pedestrian accidents, is not clear, but we should be talking with our patients and ourselves about a preference for taking walks in the daylight. Recently, I saw an older man walking across a busy street looking at his cell phone, not at the traffic. The only thing he lacked that younger people use is ear buds, which assure that they neither hear nor see warnings. "No texting while driving" should also be "no texting while walking," in my opinion, and I hope that McElroy and colleagues are doing the research to support my opinion.

The image of a guy sitting on a bucket on the ice in the middle of a lake has, for many people, come to characterize winter in the Upper Midwest. Even in May this year there were guys on buckets in Northern Minnesota and the Upper Peninsula of Michigan.

women of reproductive age and children. Imm and her colleagues⁷ surveyed older Wisconsin fishermen—perhaps the Wisconsin equivalent of Norwegian bachelor farmers and, probably in many cases, both—about their knowledge of the hazards of eating too much of what they caught. They report that, of those men who have seen Health Department advisories about the possible dangers of consuming too many lake fish, some will change their behavior and decrease the number of affected fish, change the types of fish they eat, or fish in safer locations. The attraction of a nice fish fry can sometimes override advice, so the need to keep information in front of anglers is important. That we occasionally do pay attention to warnings should reinforce the idea that public information and public health can work together effectively. And I haven't heard about folks pan frying their trophy muskie, so the top-of-the-food-chain fish are more likely to be returned or hung on a wall.

Depression is a risk factor for worse outcomes for almost any chronic illness, so managing it well is essential. However, as Gallimore and Kushner point out,⁸ the guidelines for followup of patients on antidepressants are often poorly met. Their study reports on a process that tripled the success rate of monitoring patients in a family medicine population. They used collaboration between pharmacy, clinical psychology, and a team nurse to manage a registry of patients with the diagnosis of depression on antidepressive medications. This team approach took place within and related to the primary care clinicians at their clinic. The careful chart review to identify patients who were selected for the study was necessary to make sure registries that identify patients solely from being on a particular class of medications correctly identify them for depression as well. While electronic health records can do a lot to integrate data, processes outlined in Gallimore and Kushner require experienced, clinically trained personnel who work together. Such

collaboration will positively affect patients and primary care systems. Their method also could be applied to a wide variety of health problems that require close monitoring as part of management. The key to their study is not simply the phone call; it is learning how to manage the entire process together.

Finally, a case study from Magness⁹ points out what most of us have learned in our careers, which is that skin lesions often are the manifestations of either more systematic illnesses or clues to deeper problems—in this case tuberculosis. The burgeoning area of online atlases of skin diseases that should make it easier to make diagnoses in practice likely don't include a once-in-a-lifetime diagnosis such as empyema necessitans.

REFERENCES

1. Robert SA, Booske BC, Rigby E, Rohan AM. Public views on determinants of health, interventions to improve health, and priorities for government. *WMJ*. 2008;107(3):124-130. PMID: 18575096.

2. Weiffenbach C, Anderson HA. Radon in Wisconsin. *WMJ*. 2000;99(8):39-42. PMID: 11149257.

3. Athens J, Bekkedal M, Malecki K, Anderson H, Remington PL. Measuring the environmental health of Wisconsin's counties. *WMJ*. 2008;107(4):169-175. PMID: 18702432.

4. University of Wisconsin Population Health Institute. County Health Rankings & Roadmaps website. <http://www.countyhealthrankings.org/>. Published 2013. Accessed May 13, 2013.

5. Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev*. 2012;12(9):CD007146. doi:10.1002/14651858.CD007146.pub3. Review. PMID: 22972103.

6. McElroy L, Juem JJ, Bertleson A, Xiang Q, Szabo A, Weigelt J. A single urban center experience with adult pedestrians struck by motor vehicles. *WMJ*. 2013;112(3):117-122.

7. Imm P, Anderson HA, Schrank C, Knobloch L. Fish consumption and advisory awareness among older Wisconsin fishermen. *WMJ*. 2013;112(3):111-116.

8. Gallimore C, Kushner K. A pharmacist-guided protocol for improved monitoring of patients on antidepressants. *WMJ*. 2013;112(3):124-128.

9. Magness DJ. Empyema necessitans caused by *Mycobacterium tuberculosis* in an immunocompetent patient. *WMJ*. 2013;112(3):129-130.

A landscape of opportunities

Physicians

Gundersen Lutheran is a physician led, integrated healthcare system employing over 450 physicians. Based in La Crosse, Wis., our mission is to distinguish ourselves through excellence in patient care, education, research and improved health in the communities we serve.

Currently seeking BC/BE physicians in these areas and more:

- Family Medicine
- Emergency Medicine
- Psychiatry
- Neurology
- Dermatology
- Internal Medicine

Gundersen Lutheran offers generous loan forgiveness, competitive salary, excellent pension, and more. Most importantly, you will find a rewarding practice and an excellent quality of life.

Cathy Mooney (608)775-3637
camooney@gundluth.org
gundluth.org/MedCareers

Gundersen
Lutheran®
HEALTH SYSTEM

EOE/AA/LEP

Fish Consumption and Advisory Awareness Among Older Wisconsin Fishermen

Pamela Imm, MS; Henry A. Anderson, MD; Candy Schrank, MS; Lynda Knobeloch, PhD

ABSTRACT

Objectives: The provision of fish consumption advice issued by the Wisconsin Department of Health Services (DHS) and Department of Natural Resources (DNR) has evolved over the past 40 years. In 2010, DHS received a US Environmental Protection Agency Great Lakes Restoration Initiative (GLRI) grant to evaluate existing advisory approaches, identify gaps, and adapt current communication approaches.

Methods: Previous research conducted by DHS found that older, male anglers eat more sport fish and have higher body burdens of persistent contaminants found in fish than other groups. As part of the GLRI, Wisconsin DHS and DNR aimed to engage this subpopulation and improve communication by using an Internet-based survey to collect information about fishing habits, consumption, and advisory awareness. At the end of the survey, participants were provided with answers to advisory questions and links to relevant online information. From fall 2011 through spring 2012, 827 men aged 50 and older completed this survey.

Results: Nearly all fishermen were aware of the existence of consumption advisories. Although awareness was high, penetration of traditional outreach materials was low with fewer than 35% having seen any of the pamphlets featured in the survey. Knowledge of the advisories was significantly higher among residents of counties along Lakes Michigan and Superior and among more frequent sport fish consumers. Men who were aware of these advisories were significantly more likely to have modified their consumption behavior.

Conclusion: Wisconsin's experience suggests general awareness among older male anglers. Participation in the online survey and responses to sources of advisory information supports the need to expand the current outreach program to reach and inform the fish-consuming public.

INTRODUCTION

The current goal of fish consumption advisories is to encourage people to eat fish that are high in nutrients and low in contaminants. Wisconsin began testing fish for contaminants in 1970 and the Wisconsin Department of Health Services (DHS) and Department of Natural Resources (DNR) first issued fish con-

sumption advice in 1976 due to levels of polychlorinated biphenyls (PCBs) found in fish. The state began issuing mercury-based advisories in 1985 after DNR monitoring found higher levels of mercury in predator species of fish from northern lakes that were remote from any direct discharger or emitter of mercury. Based on mercury concentrations found in fish from certain waters and differences in vulnerability among populations, recommendations were provided for 2 demographic groups: (1) women of child-bearing age and children; and (2) men and older women.

In 2001, Wisconsin adopted a statewide advisory for mercury after the National Research Council and US Environmental Protection Agency (US EPA) determined there was a need to better protect fetuses and young children. Wisconsin's advice, for all fish consumers, is designed to prevent ingestion of mercury above levels that increase risk of adverse health effects based on health protection values determined

appropriate by DHS. In addition, another goal of the statewide advice was to provide a simple message that frequent fish eaters could easily remember. The statewide advice differs by age and gender of the consumer and is supplemented with more stringent advice for particular waters where some species of fish have been found to have higher concentrations of contaminants. In 2012, there were 129 locations where levels of PCBs, mercury or other contaminants found in the fish required more restrictive advisories.

Prior to 1993, each state in the Great Lakes region had a different protocol for developing advisories and it was recognized that a common message from all states bordering the Great Lakes was needed to enhance public acceptance of the advice. Wisconsin participated as a member of the Great Lakes Sport Fish Consumption Advisory Task Force, which published a Uniform Advisory Protocol for PCBs in 1993.¹ A 2007 adden-

Author Affiliations: Wisconsin Division of Public Health, Bureau of Environmental and Occupational Health, Madison, Wis (Imm, Anderson, Knobeloch); Wisconsin Department of Natural Resources, Fisheries Management, Madison, Wis (Schrank).

Corresponding Author: Pamela Imm, 1 W Wilson St, Rm 150, Madison, WI 53703; phone 608.267.3565; fax 608.267.4853; e-mail pamel.imm@wi.gov.

Table 1. Sample Demographics.

Background Demographic	Number (%)
Age (in Years)	
50-60	455 (55)
61-70	282 (34)
71-80	83 (10)
80+	7 (1)
Ethnicity/Race	
Identification as non-Hispanic (n=803)	795 (99)
Identification as White only (n=802)	787 (98)
Years living and fishing in Wisconsin	
Lived less than 10 years in the state (n=806)	17 (2)
Fished WI waters for <10 years (not including Great Lakes) (n=825)	30 (4)
Never fished in any of the Great Lakes	143 (17)
Residence	
Lives in a county bordering Lakes Superior or Michigan (n=826)	195 (24)
Lives in another county (not bordering a Great Lake) (n=826)	631 (76)
Education	
High school or less	192 (23)
Some college or associate degree	308 (37)
College degree or greater	307 (37)
Not answered	20 (3)
Employment	
Working (full or part-time, or self-employed)	405 (49)
Retired (including semi-retired)	349 (42)
Other or not answered	73 (9)
Household income (n = 779)	
<\$15,000	27 (3)
\$15,000 to \$24,999	42 (5)
\$25,000 to \$34,999	67 (8)
\$35,000 to \$49,999	132 (16)
\$50,000 to \$74,999	221 (27)
>75,000	290 (35)
Not answered	48 (6)
Marital Status	
Married (or marriage-like relationship)	696 (84)
Other or not answered	131 (16)

Note: Missing values excluded from some analysis; n is noted in these instances.

dum to the protocol addressed methyl mercury.² The protocols provide guidelines for the development of consumption advisories and outreach programs. Wisconsin's outreach program has used a combination of printed brochures, web pages and press releases, as well as warning signs posted near some contaminated waterways and posters sent to health care clinics.

In addition to advice for the general population, due to concerns regarding the developmental effects of PCBs and mercury, Wisconsin's outreach efforts have targeted women of child-bearing age and children as an especially vulnerable group. Recent research has linked methyl mercury exposure to higher rates of heart disease in men^{3,4} and Wisconsin has begun to target messages for older adults as well. DHS initiated a statewide mercury exposure study that identified older, male anglers as a high risk group that ate more fish and had higher hair mercury levels than others.⁵ This finding was consistent with earlier studies of Great

Lakes sport fish consumers that found higher levels of PCBs and dichlorodiphenyldichloroethylene (DDE) in the blood of men compared to women.^{6,7}

In an effort to evaluate the overall reach and impact of Wisconsin's advisory program on a subpopulation that has not been targeted previously by the state's outreach efforts, an online survey was deployed to collect dietary, health, and awareness information from male anglers aged 50 and older. This was created as part of a multipronged strategy (including biomonitoring of human samples to test for nutrients and contaminants commonly found in fish) to strengthen the scientific basis for fish consumption advisories and help achieve a better understanding of the risks and benefits of sport fish consumption. Another goal is to develop and employ modern risk communication strategies to effectively elicit fish consumption behavior changes that will result in reduced human body burdens of persistent, bioaccumulative contaminants found in the Great Lakes fishery. Wisconsin's strategy for improved advisory communication is part of the US EPA Great Lakes Restoration Initiative (GLRI). This article presents findings from 827 fishermen who completed this survey between October 2011 and May 2012.

METHODS

An online survey developed by the Wisconsin Department of Health Services' Great Lakes Research Program was deployed in October 2011. Men who fished in Wisconsin waters, lived in Wisconsin at least part of the year, and were 50 years old or older were eligible to participate in this survey. Recruitment included a series of press releases, Department tweets on Twitter, and notices in state agency and other fishing and lake organization publications targeted at fishermen. As of May 2012, 827 men completed the survey, providing information on their fishing practices, the species of fish they catch and eat, their awareness of local and statewide consumption advisories, and their consumption of sport fish (fish caught by the respondent or someone they knew) and commercially purchased fish. Respondents also were asked standard demographic questions and a few questions about their health.

At the conclusion of the survey, respondents were provided with the correct responses to a series of questions about consumption advisories related to mercury and PCB contamination. They also were provided with links to the DNR website for fish consumption advisory information and the DHS website link for 2 advisory pamphlets.

All statistical analyses were conducted using SAS 9.2 software (SAS Institute Inc, Cary, North Carolina). Where missing values have been excluded from analysis, this has been noted in the tables and text.

Human Subjects

This study was reviewed by the University of Wisconsin Health

RESULTS

Sample Demographics

Fifty-five percent of survey respondents were between the ages of 50 and 60 years (mean 60) (Table 1). Compared to the Wisconsin general population of men aged 50 and above, study participants were more likely to report their race as white only (98% vs 95%) and to have attended or graduated from a 4-year college (74% vs 52%). Approximately half were working either full- or part-time or were self-employed, and 42% were retired (vs 31% retired for this same demographic for the state as a whole). The majority of respondents were married or in a marriage-like relationship (84%). The majority (62%) reported annual household incomes above \$50,000 compared to 56% for this demographic subgroup for the entire state. Conversely, only 3% of the sample reported an income below \$15,000 compared with 7% for the state (statewide demographics based on 2010 American Community Survey Public Use Microdata Sample file). Twenty-four percent of respondents reported living in a county bordering either Lake Michigan or Lake Superior.

Fishing and Fish Consumption

Fishing is a popular activity in Wisconsin, with more than a million resident licenses sold each year.⁸ For the 2011 license year, slightly more than 300,000 license holders were men aged 50 or older. Ninety-four percent (94%; $n=804$) of our study sample held a current (2011 or 2012) Wisconsin fishing license and the average number of years fishing in Wisconsin waters (not including the Great Lakes) was 45. Eighty-three percent (83%) of respondents had fished the Great Lakes at some time in their life. Among these men, the average number of years fishing in 1 or more of the Great Lakes was 19.

The average number of fish and shellfish meals consumed was 93 meals per year (just under twice a week) (range: 0-624, median: 74). Sportfish comprised almost half of this total (range: 0-416, median: 28) (Table 2). The average number of sport fish meals differed significantly based on work status and status as a consumer of Great Lakes sport fish versus non-Great Lakes sport fish consumers. Men who ate fish caught from a Great Lake reported significantly more sport fish meals than anglers who did not eat Great Lakes sportfish (55 vs 27, $P<0.05$). Retired men ate sport fish more often than men who were employed (51 vs 38, $P<0.05$).

Table 2. Average Number of Fish Meals Consumed Per Year.

	Sportfish	Purchased Fish	Purchased Shellfish	All Fish and Shellfish
Total sample ($N=812-824$)	43	34	17	93
By Residence in a Great Lake County or Other Area				
Great Lake County residence ($n=194-195$):	48	36	17	101
Non-Great Lake County residence ($n=617-628$):	41	33	16	91
By Work Status				
Working ($n=396-403$):	38 ^a	33	16	87 ^a
Retired ($n=343-348$):	51	36	18	105
By Great Lakes Sport Fish Consumption Status				
Consume Great Lakes sport fish ($n=457-463$):	55 ^{a,b}	36	18 ^a	110 ^a
Do NOT consume Great Lakes sport fish ($n=355-360$):	27	31	14	72

^a Significant difference based on t test of means; $P<0.05$

^b 35% of the sport fish meals consumed by Great Lakes sport fish consumers were from 1 of the Great Lakes

Note: A range is given for the total N and the n by residence, work status, and Great Lakes sport fish consumption due to missing data for some types of fish and/or some of the predictor variables.

Advisory Awareness

Respondents were asked if they had seen advisory pamphlets published by DHS and DNR. The front covers of 3 pamphlets were displayed in the survey. The "Family Guide to Eating Fish from Wisconsin" and "Guide to Eating Fish for Older Adults" review safe fish eating practices for local sport fish and commercially purchased fish, specifically listing species of fish and recommended frequency of consumption. The "Older Adults" guide also discusses beneficial nutrients in fish and safe preparation practices to reduce PCB exposure. "Choose Wisely," the pamphlet, provides species- and location-specific advice based on the DNR's monitoring program.

Though most (73%; $n=819$) of the men in our study ate sport fish more than once a month and 26% ($n=819$) ate sport fish more than once a week, 67% did not recall seeing any of the 3 featured pamphlets (data not shown). The "Choose Wisely" guide was the most commonly seen pamphlet (25%) and the "Older Adults" guide was the least commonly seen (10%). Only 4% of anglers in our study had seen all 3 pamphlets (data not shown).

Respondents also were asked to indicate all of their sources of locally-caught sport fish advisory information. The most common response was the fishing regulation guide (published by the DNR) provided with their license (73%). This guide presents a 1-page, general statewide advisory with reference to the DNR website for additional detail. The DNR website and publications (referring to any materials published by the DNR) were noted by over half of respondents (65%); these materials present general and site-specific advisories. The other common response included warning signs posted along the lakes and rivers these anglers fish (60%). Due to elevated PCB levels, DNR posts signs along the Sheboygan River, Cedar Creek and upper Manitowoc River; county health departments post signs along parts of the Milwaukee River; and DHS posts the Lower Fox River/Green

Table 3. Advisory Knowledge by Residence and Fish Consumption.

Total Sample (N = 827)	Nothing %	Some %	A Lot %
Polychlorinated Biphenyls (PCBs)	33	52	15
Mercury	7	65	28
PCBs			
By Residence^a			
Live in a Great Lake county (n=195)	26	56	18
Do not live in a Great Lake county (n=631)	35	51	14
By Great Lakes Sport Fish Consumption Status^a			
Consume Great Lakes sport fish (n=464)	28	54	18
Do NOT consume Great Lakes sport fish (n=361)	40	50	10
By Consumption of Sport Fish^a			
None (n=47)	45	45	10
Up to once a month (1-12/year) (n=178)	37	52	11
More than once a month up to twice a month (13-24/year) (n=135)	35	51	14
More than twice a month up to once a week (25-52/year) (n=248)	31	53	16
More than once a week (53+/year) (n=211)	28	53	19
Mercury			
By Residence			
Live in a Great Lake county (n=195)	8	70	22
Do not live in a Great Lake county (n=631)	7	64	29
By Great Lakes Sport Fish Consumption Status^a			
Consume Great Lakes sport fish (n=464)	6	63	31
Do NOT consume Great Lakes sport fish (n=361)	8	69	23
By Consumption of Sport Fish^a			
None (n=47)	13	66	21
Up to once a month (1-12/year) (n=178)	6	72	22
More than once a month up to twice a month (13-24/year) (n=135)	8	62	30
More than twice a month up to once a week (25-52/year) (n=248)	8	66	26
More than once a week (53+/year) (n=211)	5	60	35

^a Statistically significant differences, $P < 0.05$; based on M-H chi-square test.

Bay. Not all waters are posted. Only 4% of respondents reported getting advisory information from a health care professional (data not shown).

Nearly all of the men who completed the survey knew something about advisories for mercury while 67% had heard of advisories for PCB-contaminated fish (Table 3). Respondents were asked to indicate how much they knew about each advisory based on a 5-point scale ranging from “nothing” to “a great deal.” In order to boost cell sizes for analysis, the 5 levels of awareness were combined into 3 categories: nothing, some, and a lot. Men who had eaten sport fish caught from the Great Lakes in the previous 12 months knew significantly more than others. For PCB awareness, 18% of the men who ate Great Lakes sport fish knew “a lot” compared to 10% of those who did not eat Great Lakes sport fish. These differences were significant for mercury awareness as well. Amount of sport fish consumed also was associated with advisory awareness. Men who ate fewer sport fish meals per year knew less about the advisories compared to those who ate more (Table 3); these differences were more pronounced at the extremes of the knowledge scale (knew

nothing or knew a lot). These differences were significant for both the mercury and PCB advisories ($P < 0.05$). This finding is encouraging as those who eat more are also more likely to be at greater risk due to greater exposure.

Residents of counties that border Lakes Michigan or Superior knew more about the PCB advisories than others (based on an M-H chi-square test, $P < 0.05$) (Table 3). Seventy-four percent (74%) of the men who resided in a Great Lake county had heard about PCB advisories compared to 65% of anglers in other counties. This may be due to the fact that about half of Wisconsin’s PCB-contaminated sites, especially those undergoing remediation, are located in the Great Lakes basins.

Behavioral Changes

The survey included questions related to behavioral changes. These questions asked whether the respondent ate fewer fish meals, ate different fish types (species), or avoided fish from certain locations because of concerns with contamination. More than half of the men reported at least 1 change; 24% had made more than 1 change. The most commonly reported change was the source (water-body) of

their fish meal (55%) while only 15% reduced their fish intake (Table 4).

For each behavior, there were significant differences in the percentage of men who reported changes based on familiarity with a DHS or DNR pamphlet or their self-reported level of knowledge of the mercury and PCB advisories. These 3 items are all highly correlated (Spearman correlation $P < 0.05$). Men who had not seen any of the pamphlets were less likely to have changed their behaviors than men who had seen at least 1 pamphlet (46% vs 33% made no change at all due to concern with chemical contamination). Greater knowledge of PCB and mercury advisories was significantly associated with changes in behavior as well (Table 4).

Men who had not attended college were the least likely to change any behavior (54% made no change), and those living in a county along the Lake Michigan or Lake Superior boundary were more likely than others to have changed the amount of sport fish meals they ate (22% vs 12%) and the source of these meals (66% vs 52%). There were no significant differences for any of the behavioral changes based on number of sport fish meals consumed per year.

DISCUSSION

Most survey respondents were aware of advice concerning mercury (93%) and PCBs (67%). Men who ate sport fish more than once a week were more likely to be very knowledgeable of these advisories. The fact that men who ate more sport fish knew more about the consumption advisories is encouraging since these men are at greater risk of exposure. This study population also appears to be more knowledgeable of advisory messages than other groups DHS has studied in the past. In particular, a study conducted in 1998-1999 of women of child-bearing age⁹ found that only 26% of Wisconsin women were aware of the state's advisory for mercury in sport fish. The higher level of awareness among male anglers may be the result of self-selection by men who have an interest in this issue compared to the women in the 1998-1999 study who were part of a random digit-dial telephone survey.

Based on responses to this survey, our advisory program does not appear to discourage men from eating the fish they catch. Most of the men who took part in this survey were aware that local sport fish can be a source of exposure to persistent contaminants and were willing to change some of their consumption behaviors while continuing to eat an average of 1 sport fish meal per week. The more common behavioral changes included modifying the species they ate and/or the water-body source of their meals. The Wisconsin advisory messages encourage these types of actions and these results provide evidence of successful communication. National Health and Nutrition Examination Survey (NHANES) data has revealed similar results for other sub-populations.¹⁰ Data from 1999 to 2004 revealed that elevated blood mercury among women of child-bearing age declined without significant changes in amount of fish consumed. This was suggestive of changes to fish types consumed rather than reduction in amount eaten. Knuth et al¹¹ also discussed the challenge of advisories to address the trade-offs between risks and benefits related to fish consumption. For our study population, it does appear that participants are not losing any health benefits by eliminating fish from their diet.

Wisconsin's advisory outreach program has been moving away from almost exclusive reliance on traditional printed materials, such as brochures, to include the use of electronic messaging,

Table 4. Behavior Change Due to Contamination Concern.

	Ate Fewer Fish Meals % (n)	Ate Different Types % (n)	Ate From Different Locations % (n)	No Change % (n)
Total sample (N = 827)	15 (121)	24 (202)	55 (457)	42 (344)
By Residence				
Great Lakes counties (n=195)	22 (43) ^a	28 (54)	66 (129) ^a	31 (61) ^a
Non-Great Lakes counties (n=631)	12 (78)	23 (148)	52 (328)	45 (282)
By Sport-fish Consumption				
Up to once a month (1-12/year) (n=178)	15 (26)	25 (44)	56 (100)	41 (73)
More than once a month up to twice a month (13-24/year) (n=135)	19 (26)	25 (34)	52 (70)	46 (62)
More than twice a month up to once a week (25-52/year) (n=248)	14 (35)	25 (61)	58 (144)	39 (96)
More than once a week (53+/year) (n=211)	12 (25)	24 (51)	56 (119)	40 (85)
By Education				
High school or less (n=192)	12 (23)	19 (36) ^a	43 (82) ^a	54 (103) ^a
Some college or college degree (n=615)	15 (93)	26 (162)	59 (365)	38 (231)
By Advisory Awareness^b				
Have not seen any of the 3 advisory pamphlets (n=550)	12 (68) ^a	21 (113) ^a	52 (288) ^a	46 (252) ^a
Seen at least 1 of the advisory pamphlets (n=277)	19 (53)	32 (89)	61 (169)	33 (92)
By Level of Knowledge of Mercury Advisories				
Nothing (n=60)	3 (2) ^a	7 (4) ^a	40 (24) ^a	58 (35) ^a
Some (n=538)	13 (72)	23 (122)	55 (295)	43 (229)
A lot (n=228)	21 (47)	33 (76)	61 (138)	35 (80)
By Level of Knowledge of PCB Advisories				
Nothing (n=275)	8 (22) ^a	14 (38) ^a	44 (121) ^a	55 (150) ^a
Some (n=429)	16 (68)	26 (111)	59 (251)	38 (164)
A lot (n=123)	25 (31)	43 (53)	69 (85)	24 (30)

^a Significant difference at $P < 0.05$ level using chi-square test; changes are not mutually exclusive.

^b Having seen 1 of the DHS advisory pamphlets and/or the DNR pamphlet.

Note: Having seen advisory materials and level of knowledge of mercury and polychlorinated biphenyls (PCBs) advisories are all highly correlated ($P < 0.05$).

such as interactive websites, Twitter and e-mail messaging. In order to reach older fishermen, DHS and DNR will need to continue with its multipronged outreach program. This may need to include targeted distribution of printed materials (especially to those unable or unlikely to use or have access to a computer or the Internet), redesigned web pages that display advisory information in a more prominent manner, seasonal news releases, and updated signage near contaminated waterways. The majority of study respondents (67%) indicated that they had not seen any of the DHS/DNR fish advisory brochures. These materials have been distributed in print form for decades but also can be downloaded from the DHS and DNR websites. Targeted distribution and the redesign of web pages may boost the visibility of these brochures or the messages provided within. In addition, as the fishing regulation guide was widely acknowledged by respondents as 1 of their sources of information (73%), expanding the information provided in this guide may prove to be the most effective method to reach the largest audience. Finally, as only 4% of respondents identified health care professionals as a source of

advisory information, DHS may need to encourage physicians and other health care professionals to discuss the health benefits of eating fish that are low in mercury and other contaminants with their patients.

The strength of this study relates to the large sample of older Wisconsin fishermen; a population not previously targeted for study or advisory outreach. These study volunteers were able to use the Internet to access and complete the survey with relative ease based on the average number of minutes they spent on the site. Efforts to provide information on websites are a more cost-effective way to disseminate advisory information compared to distribution of printed materials. However, outreach efforts must first focus on getting anglers to access the relevant sites (this component appears to be lacking as few had seen the advisory pamphlets that are available in print and also on DHS/DNR websites). New outreach tools being explored by DHS and DNR include e-mail subscription services, messages posted using social media, and an online query page where one can view advisories for a specific water-body of interest. Though new tools are in development, lack of access to the technology and computer illiteracy will require that the DHS and DNR continue to provide outreach in print form as well.

The study weaknesses relate largely to the method used to gather data. The use of an online survey introduces bias as respondents must be computer literate and have access to the Internet. Furthermore, our outreach promoting the survey focused on press releases in local newspapers, flyers at fishing expositions, articles in the DNR magazine, direct contact with fishing organizations, and messages by DNR and DHS using Twitter and other online notices. While we have used a variety of outlets to promote the survey, none of them is free of bias. Compared to Wisconsin's population, men who participated in this survey were more educated, had higher incomes and more leisure time (greater percentage retired), and were more racially homogeneous. These demographics likely reflect the population reached by our advisory program efforts, which have limited success reaching lower income and minority anglers. This finding is not unique to Wisconsin, as Tan et al¹² also reported on studies that have found fish consumption advisories are often less than effective in reaching non-white ethnic groups and people with lower incomes or less education. In the future, more will need to be done to ensure that all Wisconsin anglers know how to select local sport fish that are safe to eat.

CONCLUSION

The results of Wisconsin's study, while supporting the general success of the state's fish advisory program based on the high level of awareness among this subpopulation and willingness to modify behavior to improve health outcomes, also has provided useful information on future directions for outreach. Continued

improvements in communication methods using social media and interactive web programs may prove to be effective outreach methods for young and old alike. The key to Wisconsin's future endeavors may be targeting ways in which to steer anglers and fish consumers towards these websites, online programs, and the like. In addition to the state's expansion of its electronic communications, DHS and DNR may choose to expand the information provided in the fishing regulation guide and may create outreach programs geared towards educating health care professionals.

Acknowledgement: The authors would like to thank the University of Wisconsin-Madison Survey Center for their work with setting up and managing the online survey.

Funding/Support: The Research described in this article has been funded by the US Environmental Protection Agency Great Lakes National Program Office under Assistance no. GL-00E00452-0. It has not been subjected to the Agency's required peer and policy review and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred.

Financial Disclosures: None declared.

REFERENCES

1. Anderson, HA, Amrhein JF, Shubat P, Hesse J. Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory. Great Lakes Sport Fish Advisory Task Force; September 1993.
2. Anderson HA, McCann PJ, Great Lakes Sport Fish Consortium. A Protocol for Mercury based Fish Consumption Advice. An addendum to the 1993 "Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory." Great Lakes Sport Fish Advisory Task Force; May 2007.
3. Salonen JT, Seppanen K, Nyyssonen K, et al. Intake of Mercury from fish, lipid peroxidation, and the risk of myocardial infarction and coronary, cardiovascular, and any death in Eastern Finnish men. *Circulation*. 1995; 91(3):645-655.
4. He K, Rimm EB, Merchant A, et al. Fish consumption and risk of stroke in men. *JAMA*. 2002; 288(24):3130-3136.
5. Knobeloch L, Steenport D, Schrank C, Anderson H. Methylmercury exposure in Wisconsin: a case study series. *Environ Res*. 2006; 101(1):113-122.
6. Knobeloch L, Turyk M, Imm P, Schrank C, Anderson H. Temporal changes in PCB and DDE levels among a cohort of frequent and infrequent consumers of Great Lake sport-fish. *Environ Res*. 2009; 109(1):66-72.
7. Turyk ME, Bhavsar SP, Bowerman W, et al. Risks and benefits of consumption of Great Lakes fish. *Environ Health Perspect*. 2011;120(1):11-18. doi:10.1289/ehp.1003396.
8. Wisconsin Department of Natural Resources. Fish, Wildlife and Habitat Management Plan. June 2007. <http://dnr.wi.gov/topic/fishing/documents/publications/fwhplan.pdf>. Accessed April 22, 2013.
9. Knobeloch L, Anderson HA, Imm P, Peters D, Smith A. Fish consumption, advisory awareness, and hair mercury levels among women of childbearing age. *Environ Res*. 2005;97(2):220-227.
10. Mahaffey KR, Clickner RP, Jeffries RA. Adult women's blood mercury concentrations vary regionally in the United States: association with patterns of fish consumption (NHANES 1999–2004). *Environ Health Perspect*. 2009;117(1):47–53.
11. Knuth BA, Connelly NA, Sheeshka J, Patterson J. Weighing health benefit and health risk information when consuming sport-caught fish. *Risk Anal*. 2003;23 (6):1185-1197.
12. Tan ML, Ujihara A, Kent L, Hendrickson I. Communicating fish consumption advisories in California: what works, what doesn't. *Risk Anal*. 2011; 31(7):1095-1106.

A Single Urban Center Experience with Adult Pedestrians Struck by Motor Vehicles

Lisa M. McElroy, MD; Jeremy J. Juern, MD; Annette Bertleson, RN; Qun Xiang; Aniko Szabo, PhD; John Weigelt, MD

ABSTRACT

Background: Pedestrian-vehicle crashes are a significant problem in public health.

Understanding contributing factors within a specific community helps recognize and target key intervention points.

Methods: Trauma registry analysis included all of the patients treated at a Level I trauma center following pedestrian-motor vehicle collisions from January 1, 2000 to December 31, 2010. Variables examined included patient demographics, timing of collision, abbreviated injury scale score, injury severity score (ISS), hospital and intensive care unit (ICU) length of stay (LOS), and emergency department and hospital disposition.

Results: A total of 945 pedestrians were reviewed within the study period. Average age was 46.4 ± 19.4 years. One hundred seventy-seven (18.7%) patients were elderly and of the elderly group, 69 (39%) were 80 years of age or greater. The median ISS score was 12, average hospital LOS was 10.8 days and average ICU length of stay was 6.0 ± 7.5 days. More elderly patients required admission to the ICU than the nonelderly (61.6% vs 40.2%; $P < 0.001$), and more elderly patients required admission to a skilled nursing facility than nonelderly (42.1% vs. 9%; $P < 0.001$). The mortality rate for elderly patients was more than double that of nonelderly patients (20.9% vs 9.1%; $P < 0.001$). Pedestrian-motor vehicle collisions occurred disproportionately between the hours of 6 PM and midnight ($P < 0.0001$).

Conclusion: Elderly patients struck by a motor vehicle have a mortality rate twice that of the nonelderly and a higher rate of discharge to a skilled nursing facility, despite having a similar injury severity score on admission. This highlights the need for aggressive prevention efforts targeted at the elderly population.

• • •

Author Affiliations: Medical College of Wisconsin and Affiliated Hospitals, Division of Trauma and Critical Care (McElroy, Juern, Bertleson, Weigelt); Medical College of Wisconsin and Affiliated Hospitals, Division of Biostatistics (Xiang, Szabo).

Corresponding Author: Lisa McElroy, MD, 420 E Superior, 10th fl, Chicago IL 60611-3152; phone 312.503.5578; fax 312.503.2777; e-mail lisa.mcelroy@northwestern.edu.

INTRODUCTION

Pedestrian-vehicle crashes are a significant problem in public health. Although the overall risk to pedestrians has not significantly changed over the past decade, the risk of fatality after being struck by a motor vehicle has increased by more than one-third over the past 5 years. Deaths from pedestrian-vehicle crashes rank 3rd behind motorcycle riders and vehicle occupants, and constitute 11% of total crash fatalities nationally.¹

Locoregional analysis is important to augment national analysis of pedestrian-vehicle crashes. Understanding contributing factors within a specific community helps determine the appropriate effectiveness measures, recognize key intervention points, and target interventions. Local analysis also reveals unique situations not seen at the national level that are subsequently addressed with community-level interventions.

The number of pedestrian fatalities varies significantly from state to state.

In 2009, California, Florida, Texas, and New York accounted for 41% of the nation's pedestrian fatalities, while the 25 states with the fewest pedestrian fatalities accounted for only 12%. In Wisconsin, pedestrian fatalities make up approximately 8% of all traffic-related deaths.² Although Wisconsin has a low incidence of pedestrian crashes relative to national rates, improvement of pedestrian safety remains an active state policy goal.

Previous studies examining patterns in pedestrian-vehicle crashes have been largely single-center series examining smaller sample populations and have focused primarily on injury types,³⁻⁸ geographic foci,⁹⁻¹⁸ and environmental factors.¹⁹⁻²³ Over 10 years ago, Peng and Bongard conducted the largest study to date examining pedestrian motor vehicle collisions in Los Angeles County. They found that hospital length of stay, injury severity

CME

CME available. See page 123 for more information.

Table 1. Demographics of Patients Seen at Froedtert Memorial Lutheran Hospital Following Pedestrian-Vehicle Crash.

Characteristic	n	%
Average age (\pm SD) (y)	46.4 (19.4)	—
Gender		
Male	579	61.3
Female	366	38.7
Age Group		
18-24	167	17.7
25-34	140	14.8
35-44	172	18.2
45-54	170	18.0
55-64	119	12.6
65-79	108	11.4
≥ 80	69	7.3
Age Subgroups		
Nonelderly (18-65 years old)	768	81.3
Elderly (≥ 65 years old)	177	18.7

score, revised trauma score, Glasgow coma scale and mortality all increased with age.²⁴ Demetriades and colleagues added to this foundation in 2004 with their subsequent analysis of the LA County database, showing a higher incidence of severe trauma and higher mortality in patients older than 65.²⁵

The purpose of our study was to examine pedestrian-vehicle crashes in Southeast Wisconsin attempting to characterize the populations, injury pattern, and timing of pedestrian-vehicle trauma. We also compared our findings to prior studies to see if the injury patterns in our region were different or similar.

METHODS

Froedtert Memorial Lutheran Hospital (FMLH) is an American College of Surgeons designated Level I adult trauma center providing care to trauma victims in the Milwaukee metropolitan area. It also is a referral trauma center for the state, receiving patients from the southeast region of Wisconsin, northern Illinois, and the Upper Peninsula of Michigan. We reviewed the FMLH trauma registry for pedestrian-vehicle crashes from January 1, 2000 to December 31, 2010. All entrants in the trauma registry are patients who have been admitted to the hospital because of their injury; ie, patients seen in the emergency department (ED) and discharged home will not appear in the trauma registry. Variables examined included patient age and gender; day, month, and time of the crash; abbreviated injury scale (AIS) score, injury severity score (ISS) score on admission, hospital and intensive care unit (ICU) length of stay (LOS), and ED and hospital disposition. The AIS is a whole number assigned by a trauma registrar to each injury and ranges from 1 (superficial) to 6 (non survivable). ISS divides the body into 6 regions: head or neck, face, abdominal, chest, extremities, and external. ISS is computed by taking the top 3 largest AIS scores from each of the 3 most severely injured

regions of the body and summing their squares. A patient with any AIS score of 6 is automatically given an ISS of 75. Otherwise, the ISS score will range from 1 to 75. Although ISS has limitations, it correlates with mortality and is the most common anatomic trauma scoring system. Approval was obtained by the Medical College of Wisconsin and Froedtert Hospital Institutional Review Board prior to any data collection. The association of age group with covariate was analyzed using the *t* test (hospital and ICU LOS), the chi-square test (death and discharge disposition), and Wilcoxon rank-sum test (ISS). Odds ratios (OR) with 95% confidence intervals were calculated. Logistic regression analysis was used to analyze the effect of age on ICU admission, mortality, and disposition. Elderly was defined as ≥ 65 years old, nonelderly was defined as < 65 years old. Multiple regression analysis was used to analyze the effect of age on hospital LOS and ICU LOS. A *P*-value < 0.05 was considered statistically significant.

For purposes of analyzing the time of day that incidents occurred, a day was divided into daytime (8 AM-6 PM), evening (6 PM-midnight), and night (midnight-8 AM). These time periods were chosen because that is what was used in previous research and will allow comparison.³ The chi-square goodness-of-fit test was used to determine if crashes were equally distributed across these time categories. Specifically, we tested whether the proportion of crashes during daytime, evening, and night was in a 10:6:8 ratio corresponding to the length of these periods.

RESULTS

Over the study period, 945 pedestrians were seen at FMLH after being struck by a motor vehicle. Table 1 shows the patient demographics and age distribution. The average age was 46.4 ± 19.4 years, and males made up the majority (61.3%). One hundred seventy-seven (18.7%) patients were elderly (age ≥ 65); 87 (49.2%) elderly patients were male and 69 (39%) were 80 years of age or greater.

Table 2 shows the injury severity of patients treated after pedestrian-vehicle crashes. The overall median ISS score was 12, with no significant difference between elderly and nonelderly. Average hospital LOS was $10.8 (\pm 16.7)$ days and average ICU LOS was 6.0 ± 7.5 days, with no significant difference between elderly and nonelderly. However, more elderly patients required admission to the ICU than the nonelderly (61.6% vs 40.2%; $P < 0.001$). At the time of discharge, more elderly patients required admission to a skilled nursing facility than the nonelderly (42.1% vs 9%; $P < 0.001$). The overall mortality rate was 11.3%. These patients had an average ISS of $25.0 (\pm 18.0)$. Elderly patients had a significantly greater mortality rate than nonelderly patients (20.9% vs 9.1%; $P < 0.001$).

The most common injury was to the extremities in both elderly and nonelderly patients (Table 3). There was little difference between groups for the next most common injury category:

external (skin and soft tissue) and head/neck.

Logistic regression analysis was used to examine if age predicted hospital mortality and disposition. Controlling for ISS score and gender, we found that elderly patients were 3 times more likely to die in the hospital (OR 2.91; 95% CI = 1.72-4.90; $P < 0.0001$) and 7 times more likely to be transferred to a skilled nursing facility after hospital discharge (OR 7.40; 95% CI = 4.78-11.44; $P < 0.0001$) than non-elderly patients (Table 4). Controlling for age and gender, for 10 units increase in ISS, we observed a 250% increase in the odds of death in hospital ($P < 0.0001$) and 50% increase in the odds of being transferred to SNF ($P = 0.0001$) (Table 4).

Figure 1 shows the distribution of pedestrian-vehicle crashes by time of day. Incidents were not distributed evenly ($P < 0.0001$) throughout the day, with more incidents in the evening (36.7% from 6 PM to midnight) and fewer during the night (39.5% from midnight to 8 AM) (Table 5). Incidents were spread throughout the week (Figure 2) and the year (Figure 3).

Disposition out of the ED was divided between floor (39%), ICU (38%), and operating room (21%), with a 2% mortality rate in the ED (Figure 4). Fifty-one percent of patients were discharged home from the hospital, 16% went to a rehabilitation hospital, 13% went to a skilled nursing facility, 11% died, and 6% went home with visiting nurse assistance (Figure 5).

Multiple regression analysis was applied to see among those who were discharged alive if age, ISS, and gender affect length of stay in hospital and in ICU. The result shows that for 10 units increase in ISS, the hospital LOS increased 6 days (P value < 0.0001) and the ICU LOS increased about 3 days (P value < 0.0001) (Table 4).

DISCUSSION

Pedestrian injuries represent an important aspect of travel and road safety. Analyzing

Table 2. Injury Severity of Patients Treated at Froedtert Memorial Lutheran Hospital After Pedestrian-Vehicle Crashes.

Measure	Total	Nonelderly (< 65 years old)	Elderly (≥ 65 years old)	P-value
Median ISS (q25-q75 ^a)	12 (6-21)	11 (6-20)	13 (6-24)	0.136 ^b
Hospital length of stay (LOS)	10.8 \pm 16.7	10.7 \pm 17.3	11.8 \pm 13.1	0.470 ^c
Intensive care unit (ICU)				
Percent ICU admission	44.2%	40.2%	61.6%	$< .001^d$
ICU LOS	6.0 \pm 7.5	6.0 \pm 8.0	6.0 \pm 5.9	0.949 ^c
Discharge to skilled nursing facility	14.6%	9.0%	42.1%	$< .001^d$
Mortality	11.3%	9.1%	20.9%	$< .001^d$

Abbreviations: ISS, injury severity score.

^a 25th percentile - 75th percentile

^b Wilcoxon rank-sum test

^c *t* test

^d Chi-square test

Table 3. Injury Distribution in Pedestrian-Vehicle Crashes.

Location	Nonelderly (< 65 years old)		Elderly (≥ 65 years old)		Total	
	n	%	n	%	n	%
Head and neck	501	17.3	164	18.1	665	17.5
Abdomen	324	11.2	98	10.8	422	11.1
Chest	446	15.4	156	17.3	602	15.9
Extremity	921	31.8	254	28.1	1175	31.0
Face	204	7.05	44	4.87	248	6.53
External	496	17.2	188	20.8	684	18.0
Total	2892	100	354	100	3796	100

Table 4. Predictors of Injury Severity in Pedestrian-Vehicle Crashes.

	Parameter estimates (95% CI)	P-value
Hospital Length of Stay (LOS) (≥ 65 vs < 65)	$\Delta = 1.15$ days (-1.75, 4.05)	0.446 ^a
Intensive care unit (ICU) LOS (≥ 65 vs < 65)	$\Delta = 1.13$ days (-0.63, 2.90)	0.209 ^a
ICU admission (≥ 65 vs < 65)	$\Delta = 3.70$ days (2.29-5.98)	$< .0001^a$
Discharge to skilled nursing facility (SNF) (≥ 65 vs < 65)	OR = 7.40 (4.78-11.44)	$< .0001^b$
Mortality (≥ 65 vs < 65)	OR = 2.91 (1.72-4.90)	$< .0001^b$
Hospital Mortality		
Injury severity score (ISS) (10 units increase)	OR = 3.48 (2.80-4.32)	$< .0001^b$
Sex (m vs f)	OR = 0.84 (0.52-1.37)	0.49 ^b
Discharge to SNF		
ISS (10 units increase)	OR = 1.53 (1.24-1.89)	$< .0001^b$
Sex (m vs f)	OR = 0.71 (0.47-1.09)	0.11 ^b
ICU Admission		
ISS (10 units increase)	OR = 8.54 (6.31-11.55)	$< .0001$
Sex (m vs f)	OR = 1.29 (0.88-1.87)	0.19
Hospital LOS		
ISS (10 units increase)	$\Delta = 5.97$ (4.77, 7.18)	$< .0001^a$
Sex (m vs f)	$\Delta = -0.13$ (-2.37, 2.10)	0.907 ^a
ICU LOS		
ISS (10 units increase)	$\Delta = 3.16$ (2.37, 3.94)	$< .0001^a$
Sex (m vs f)	$\Delta = -1.38$ (-2.94, 0.18)	0.084 ^a

Abbreviations: OR is odds ratio.

Δ is mean difference

^a multiple regression

^b logistic regression

Figure 1. Time of Pedestrian-Vehicle Crashes.

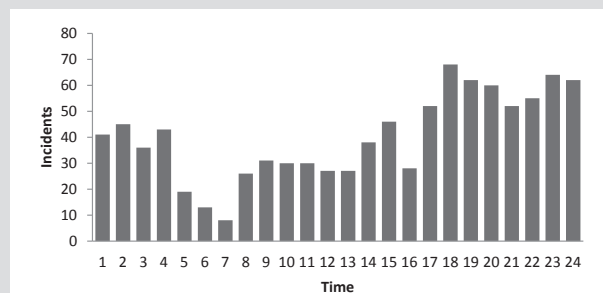


Table 5. Incidents of Pedestrian-Vehicle Crashes by Time of Day.

Time	Frequency	Percent (%)	Expected Ratio (%)
Daytime (8 AM to 6 PM)	373	39.5	10/24 (41.7%)
Evening (6 PM to midnight)	347	36.7	6/24 (25%)
Night (midnight to 8 AM)	225	23.8	8/24 (33.3%) ^a

^a $P < 0.0001$; ie, more than expected incidents in the evening and fewer than expected during the night.

Figure 2. Day of Pedestrian-Vehicle Crashes

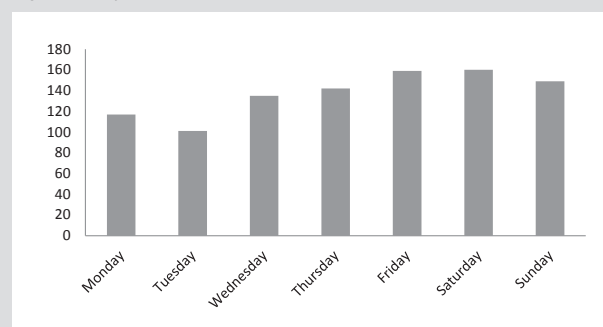
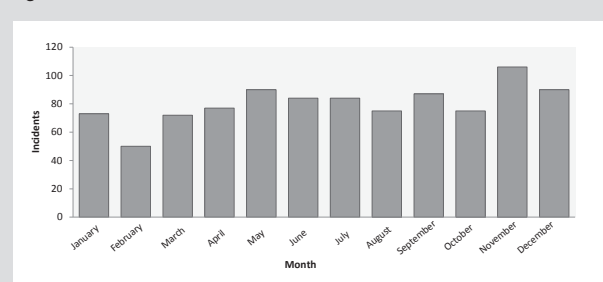


Figure 3. Month of Pedestrian-Vehicle Crashes.



patterns in pedestrian-vehicle crashes allows for development of interventions aimed at protecting pedestrians and reducing their risk on roadways; this is one of the main goals of transportation safety. However, the problem is multifactorial. No single cause of pedestrian-vehicle crashes has been identified, and no definitive countermeasure will definitively solve the problem. States with

significant numbers of fatalities as a result of pedestrian-vehicle crashes have used environmental, educational, and enforcement measures to improve pedestrian safety.²⁶⁻²⁸ Proximity to bars^{9,10} and crosswalk markings in absence of a traffic signal have both been associated with increased pedestrian injury.²⁹ Interventions that have proven to be the most effective include single-lane roundabouts, sidewalks, exclusive pedestrian signal phasing, pedestrian refuge islands, and increased intensity roadway lighting.²⁷ How these interventions will lower the rate or alter the severity of injury, especially among elderly patients, is not clear. What is clear is that a better understanding of the reasons pedestrians are struck is sorely needed.

Pedestrian motor vehicle crashes contribute significantly to the Milwaukee area trauma system. In 2001, the Wisconsin Department of Transportation released the Wisconsin Pedestrian Policy Plan 2020. One of the 3 primary goals outlined in the plan was to reduce the number of pedestrian crashes and fatalities.³⁰ Strategies for achieving this include education, improved enforcement of existing laws, and planning that accommodates pedestrians better. One example is making changes to the areas along busy state trunk highways as they come into small and medium-sized towns. The plan proposes the use of wider median islands, longer pedestrian signals at traffic lights, and pedestrian overpasses. Our study characterizes the populations affected by pedestrian-vehicle crashes, as well as the timing with which they occur, and the outcomes of hospitalization.

The median ISS of 12 and observed overall mortality rate of 20.9% reflects the substantial force imparted on pedestrians when struck by vehicles. This is consistent with prior major studies, where overall ISS for patients ranged from 8.9 to 20 and overall mortality rates ranged from 8 to 22%.^{3,25,31} The ICU and hospital LOS, as well as hospital disposition, reinforce what we already know about severity of the pedestrian trauma. We found no difference between the elderly and nonelderly patients in regards to ISS, hospital LOS and ICU LOS. This may be due to an increased rate of deaths in elderly patients before even getting to the hospital. Despite the nonsignificant difference in ISS, elderly patients suffered higher rates of ICU admission, mortality, and discharge to a skilled nursing facility. Disposition out of the hospital in particular shows the toll that is taken on pedestrians who are struck by motorized vehicles, with only 51% of patients able to return home. This is consistent with results seen in prior studies and highlights the increased burden of illness and mortality suffered by elderly patients after sustaining pedestrian trauma.^{12,24,30,32-35}

Our injury distribution was similar to previous reports in that injury to the extremities was number 1 for both nonelderly and elderly.^{3,4,24,31} Our study does not include pediatric patients, where head and neck injuries are more common.²⁴ Our study confirms previous findings that pedestrian-vehicle crashes occur

Figure 4. Emergency Department Disposition Following Pedestrian-Vehicle Crashes.

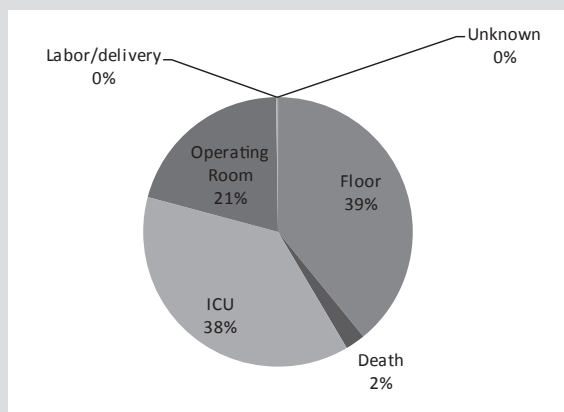
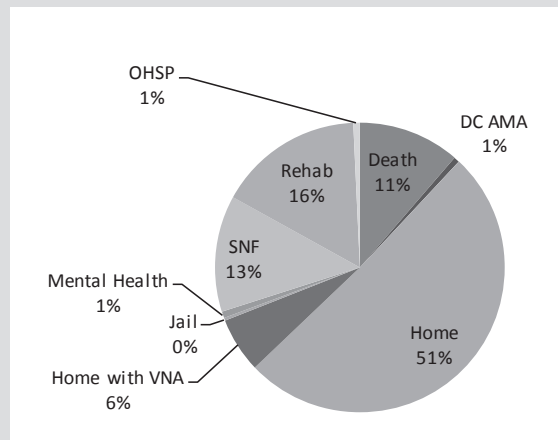


Figure 5. Hospital Disposition Following Pedestrian-Vehicle Crashes.



disproportionately between 6 PM and midnight.^{3,31} The June 2008 National Highway Traffic Safety Administration report showed that more than one-third of pedestrian crash deaths occurred on Fridays and Saturdays, and our data confirm that weekend days are high risk for pedestrian-vehicle incidents.^{1,19}

Implications of our research are two-fold. First, pedestrian-vehicle crashes remain a significant source of morbidity and mortality in Wisconsin, particularly for elderly patients. Future interventions that aim to reduce the incidence and severity of pedestrian-vehicle crashes should be targeted toward this population. Further research is needed to explore the environmental factors contributing to the disproportional occurrence of pedestrian injury in the evening hours. Second, the data shows that for a given ISS score, the elderly patient has a higher mortality rate than the nonelderly patient. This highlights the need for a nontrauma hospital to transfer a patient to a trauma center even for injuries that do not seem life-threatening. A practical example is an elderly patient struck by a motor vehicle resulting in 4 rib fractures. Optimum care for this patient may require thoracic epidural placement and aggressive pulmonary toilet with the help of respiratory therapists. A nontrauma hospital may not be able to provide these interventions, and the patients like this who remain at a nontrauma center may suffer higher mortality rates than those who are transferred to a trauma center. It is important to anticipate poor outcomes and transfer patients early instead of transferring when the patient is doing poorly and may be in an irreversible downward spiral.

Limitations of our study include a relatively small patient number and an inability to capture all pedestrian-vehicle crashes because we used data from our own trauma database and not from government (ie, police, department of motor vehicles) or insurance sources. Our analysis also included only pedestrians struck by motor vehicles that were admitted to FMLH. It does not include those who died at the scene, died at other hospitals

prior to transport, were treated at other hospitals, or did not report for medical treatment. However, with FMLH being the only Level I trauma center in southeastern Wisconsin there is an assumption that a patient with any type of a serious injury would be transported to FMLH either immediately or after initial care at another hospital.

CONCLUSION

Pedestrian-vehicle collisions have a high rate of morbidity and mortality and occur disproportionately between the hours of 6 PM and midnight. Elderly patients have a mortality rate that is twice that of the nonelderly and have a higher rate of discharge to a SNF, despite having the same ISS. This highlights the need for aggressive prevention efforts to mitigate the number of factors that contribute to the problem of pedestrian vehicle crashes.

Funding/Support: Funded in part by Clinical and Translational Science Award 1UL1RR031973 from the National Institutes of Health (Szabo, Xiang).

Financial Disclosures: None declared.

Planners/Reviewers: The planners and reviewers for this journal CME activity have no relevant financial relationships to disclose.

REFERENCES

1. National Highway Traffic Safety Administration. National Pedestrian Crash Report. Washington, DC: National Highway Traffic Safety Administration. <http://www-nrd.nhtsa.dot.gov/Pubs/810968.pdf>. DOT HS 810 968. Published June 2008. Accessed April 29, 2013.
2. National Highway Traffic Safety Administration. Traffic Safety Facts 2008. A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System. Washington, DC: National Highway Traffic Safety Administration. <http://www-nrd.nhtsa.dot.gov/Pubs/811170.pdf>. DOT HS 811 170. Published 2009. Accessed April 29, 2013.
3. Brainard BJ, Slauterbeck J, Benjamin JB, Hagaman RM, Higlie S. Injury profiles in pedestrian motor vehicle trauma. *Ann Emerg Med*. 1989;18(8):881-883.
4. Derlet RW, Silva J Jr, Holcroft J. Pedestrian accidents: adult and pediatric injuries. *J Emerg Med*. 1989;7(1):5-8.

5. Ifesanya AO, Afuwape D, Okoje VN, et al. Unintentional injury outcomes secondary to pedestrian traffic crashes: a descriptive analysis from a major medical center. *Prehosp Disaster Med.* 2009;24(5):443-446.
6. Hannon M, Hadjizacharia P, Chan L, Plurad D, Demetriades D. Prognostic significance of lower extremity long bone fractures after automobile versus pedestrian injuries. *J Trauma.* 2009;67(6):1384-1388.
7. MacLeod KE, Griswold JB, Arnold LS, Ragland DR. Factors associated with hit-and-run pedestrian fatalities and driver identification. *Accid Anal Prev.* 2012;45:366-372. doi: 10.1016/j.aap.2011.08.001.
8. Helmer T, Ebner A, Samaha RR, Scullion P, Kates R. Injury risk to specific body regions of pedestrians in frontal vehicle crashes modeled by empirical, in-depth accident data. *Stapp Car Crash J.* 2010;54:93-117.
9. Schurman N, Cinnamon J, Crooks VA, Hameed SM. Pedestrian injury and the built environment: an environmental scan of hotspots. *BMC Public Health.* 2009;9:233. doi: 10.1186/1471-2458-9-233.
10. LaScala EA. Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis. *Accid Anal Prev.* 2000;32(5):651-658.
11. Lee C, Abdel-Aty M. Comprehensive analysis of vehicle-pedestrian crashes at intersections in Florida. *Accid Anal Prev.* 2005;37(4):775-786.
12. Nicaj L, Wilt S, Henning K. Motor vehicle crash pedestrian deaths in New York City: the plight of the older pedestrian. *Inj Prev.* 2006;12(6):414-416.
13. Dai D, Taquechel E, Steward J, Strasser S. The impact of built environment on pedestrian crashes and the identification of crash clusters on an urban university campus. *West J Emerg Med.* 2010;11(3):294-301.
14. Chakravarthy B, Anderson CL, Ludlow J, Lotfipour S, Vaca FE. The relationship of pedestrian injuries to socioeconomic characteristics in a large Southern California County. *Traffic Inj Prev.* 2010;11(5):508-513.
15. Cottrill CD, Thakuriah PV. Evaluating pedestrian crashes in areas with high low-income or minority populations. *Accid Anal Prev.* 2010;42(6):1718-1728. doi: 10.1016/j.aap.2010.04.012.
16. Pulusurtha SS, Sambhara VR. Pedestrian crash estimation models for signalized intersections. *Accid Anal Prev.* 2011;43(1):439-446. doi: 10.1016/j.aap.2010.09.014.
17. Gårder PE. The impact of speed and other variables on pedestrian safety in Maine. *Accid Anal Prev.* 2004;36(4):533-542.
18. Campos-Outcalt D, Bay C, Dellapena A, Cota MK. Motor vehicle crash fatalities by race/ethnicity in Arizona, 1990-96. *Inj Prev.* 2003;9(3):251-256.
19. Griswold J, Fishbain B, Washington S, Ragland DR. Visual assessment of pedestrian crashes. *Accid Anal Prev.* 2011;43(1):301-306.
20. Sullivan JM, Flannagan MJ. Differences in geometry of pedestrian crashes in day-light and darkness. *J Safety Res.* 2011;42(1):33-37. doi: 10.1016/j.jsr.2010.11.005.
21. Lichenstein R, Smith DC, Ambrose JL, Moody LA. Headphone use and pedestrian injury and death in the United States: 2004-2011. *Inj Prev.* 2012;18(5):287-90.
22. Statter M, Schuble T, Harris-Rosado M, Liu D, Quinlan K. Targeting pediatric pedestrian injury prevention efforts: teasing the information through spatial analysis. *J Trauma.* 2011;71(5 Suppl 2):S511-516.
23. Roudsari B, Kaufman R, Koepsell T. Turning at intersections and pedestrian injuries. *Traffic Inj Prev.* 2006;7(3):283-289.
24. Peng RY, Bongard FS. Pedestrian versus motor vehicle accidents: an analysis of 5,000 patients. *J Am Coll Surg.* 1999;189(4):343-348.
25. Demetriades D, Murray J, Martin M, et al. Pedestrians injured by automobiles: relationship of age to injury type and severity. *J Am Coll Surg.* 2004;199(3):382-387.
26. Kwan I, Mapstone J. Interventions for increasing pedestrian and cyclist visibility for the prevention of death and injuries. *Cochrane Database Syst Rev.* 2006;(4):CD003438.
27. Retting RA, Ferguson SA, McCartt AT. A review of evidence-based traffic engineering measures designed to reduce pedestrian-motor vehicle crashes. *Am J Public Health.* 2003;93(9):1456-1463.
28. Duperrex O, Roberts I, Bunn F. Safety education of pedestrians for injury prevention. *Cochrane Database Syst Rev.* 2002;(2):CD001531.
29. Koepsell T, McCloskey L, Wolf M, et al. Crosswalk markings and the risk of pedestrian-motor vehicle collisions in older pedestrians. *JAMA.* 2002;288(17):2136-2143.
30. Wisconsin Department of Transportation. Wisconsin Pedestrian Policy Plan 2020. <http://www.dot.wisconsin.gov/projects/state/docs/ped2020-plan.pdf>. Published March 2002. Accessed April 29, 2013.
31. Vestrup JA. A Profile of Urban Adult Pedestrian Trauma. *J Trauma.* 1989;29(6):741-745.
32. Sklar DP, Demarest GB, McFeeley P. Increased pedestrian mortality among the elderly. *Am J Emerg Med.* 1989;7(4):387-390.
33. Loo BP, Tsui KL. Pedestrian injuries in an ageing society: insights from hospital trauma registry. *J Trauma.* 2009;66(4):1196-1201.
34. Kim JK, Ulfarsson GF, Shankar VN, Kim S. Age and pedestrian injury severity in motor-vehicle crashes: a heteroskedastic logit analysis. *Accid Anal Prev.* 2008;40(5):1695-1702. doi: 10.1016/j.aap.2008.06.005.
35. Henary BY, Ivarsson J, Crandall JR. The influence of age on the morbidity and mortality of pedestrian victims. *Traffic Inj Prev.* 2006;7(2):182-190.

Quiz: A Single Urban Center Experience with Adult Pedestrians Struck by Motor Vehicles

EDUCATIONAL OBJECTIVES

Upon completion of this activity, participants will be able to:

1. Understand the magnitude of pedestrian-vehicle accidents in the United States and Wisconsin.
2. Identify some of the factors in pedestrian-vehicle accidents that relate to outcome.
3. Understand the factors involved in the differences in outcome of pedestrian-vehicle accidents among the elderly versus non-elderly victims.

PUBLICATION DATE: June 3, 2013

EXPIRATION DATE: June 3, 2014

QUESTIONS

1. The risk of fatality after being struck by a motor vehicle has decreased by more than one-third over the past 5 years.
☐ True
☐ False
2. In this study, approximately 60% of individuals who were involved in pedestrian-vehicle accidents were male; however, among the elderly patients, the victims were equally as likely to be female as male.
☐ True
☐ False
3. Nationally, deaths from pedestrian-vehicle crashes constitute 11% of total traffic-related fatalities. In Wisconsin, pedestrian fatalities make up approximately 8% of all traffic fatalities.
☐ True
☐ False
4. The current study is highly selective in that it only includes adults 18 years of age and older, only those patients who were admitted to a single Level 1 adult trauma center in metropolitan Milwaukee, and excludes those individuals who died at the scene or at another hospital or were only seen in the emer-

...

You may earn CME credit by reading the designated article in this issue and successfully completing the quiz (75% correct). Return completed quiz to *WMJ* CME, 330 E Lakeside St, Madison, WI 53715 or fax to 608.442.3802. You must include your name, address, telephone number, and e-mail address.

The Wisconsin Medical Society (Society) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The Wisconsin Medical Society designates this journal-based CME activity for a maximum of 1.0 *AMA PRA Category 1 Credit*[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

gency department and not admitted to the hospital.

- ☐ True
☐ False
5. In this study, elderly patients (≥ 65 years of age) and nonelderly patients (< 65 years of age) had similar injury severity scores, distribution of injuries, hospital length of stay, and intensive care unit (ICU) length of stay. However, significantly more elderly patients required admission to the ICU and admission to a skilled nursing facility than the nonelderly, and elderly patients had a mortality rate more than twice that of non-elderly patients.
☐ True
☐ False
 6. By logistic regression analysis and controlling for injury severity score and gender, elderly patients were twice as likely to die in the hospital and 3 times more likely to be transferred to a skilled nursing facility after hospital discharge than nonelderly patients.
☐ True
☐ False
 7. Pedestrian-vehicle crashes occur disproportionately at night, between midnight and 8 AM.
☐ True
☐ False
 8. Multiple regression analysis indicated that for every 10 unit increase in injury severity score, the hospital length of stay increased by 6 days and the ICU length of stay increased by 3 days.
☐ True
☐ False
 9. The major site of injury in both the elderly and nonelderly patients in this study was to the head and neck.
☐ True
☐ False
 10. In this study, only one-half of the patients were discharged home without assistance.
☐ True
☐ False
 11. Physicians caring for trauma patients in a non-trauma hospital should consider transfer to a trauma center even for injuries that do not seem life-threatening.
☐ True
☐ False

A Pharmacist-guided Protocol for Improved Monitoring of Patients on Antidepressants

Casey Gallimore, PharmD; Kenneth Kushner, PhD

ABSTRACT

Background: Local guidelines recommend that patients treated for depression receive 3 follow-ups within 12 weeks of antidepressant initiation; however, this is often not achieved in practice.

Methods: A monitoring protocol was implemented as a quality improvement project at Wingra Access Medical Center in which patients treated for anxiety or depression received a follow-up phone call 1 to 2 weeks after starting an antidepressant.

Results: A retrospective chart review demonstrated the percentage of patients achieving 3 follow-ups within 12 weeks significantly increased from 7% to 24% following implementation.

Conclusion: Results suggest the protocol is a feasible method to improve antidepressant follow-up in primary care. Confounding factors including cohort dissimilarities and introduction of a behavioral health service should be considered.

BACKGROUND

Major depressive disorder (MDD) and anxiety disorders are common and disabling conditions. The lifetime prevalence of anxiety and depression in adults in the United States is 31.2% and 16.9% respectively.¹ Worldwide, unipolar depression is the leading cause of disease-related disability in both men and women. In the United States, the annual cost of depression is estimated at \$83.1 billion, with a large portion related to reduced productivity and absenteeism.^{2,3}

Pharmacotherapy is commonly used to treat depression and anxiety. Between 2005 to 2008, antidepressants were the third most commonly prescribed class of medications in the United States and the most common among patients aged 18 to 44 years of age.⁴ Local guidelines recommend a minimum of 3 follow-ups within the first 12 weeks of antidepressant initiation, and at

least 1 face-to-face visit with the prescribing clinician.⁵ However, large studies have reported poor adherence to guidelines for recommended treatment of major depressive disorder in primary care.^{6,7} A cohort study of 148 primary care patients with a depressive disorder reported that 16.2% received appropriate antidepressant follow-up defined as at least 1 consultation with the patient's provider within 6 weeks of starting antidepressant medication, and continuation of medication for at least 5 months or cessation of medication after 2-6 weeks if no response.⁶ The Midlife

Development in the United States (MIDUS) survey defined appropriate care for patients with major depression as at least 4 visits with the same prescribing provider and reported 16.9% received guideline-concordant mental health care.⁷

Approximately 33% to 50% of adult patients with depression are managed in primary care, and approximately 70% to 80% of antidepressants are prescribed by primary care clinicians.⁸⁻¹⁰ A local chart review performed in 2008 at Wingra Access Family Medical Center, a teaching clinic of the University of Wisconsin Department of Family Medicine, found follow-up rates consistent with the previously published studies. Seventy-eight percent of patients with new episode depression were started on an antidepressant agent, but only 3% of those patients received the recommended 3 follow-up visits, and 40% had no follow-up.

Study investigators hypothesized that a telephone monitoring protocol would be a feasible method to increase compliance with first follow-up and to facilitate the scheduling of a second in-clinic visit for patients newly starting on an antidepressant medication in a primary care setting. More intensive telephone case management by nurse care managers has been reported to improve treatment adherence and depression outcomes in primary care, but the follow-up effects of a simplified monitoring protocol that could be easily adopted by a wide range of primary care clinics were unknown.^{11,12}

• • •

Author Affiliations: Clinical Assistant Professor, University of Wisconsin-Madison School of Pharmacy, Madison, Wis (Gallimore); Professor, University of Wisconsin-Madison Department of Family Medicine, Madison, Wis (Kushner).

Corresponding Author: Casey Gallimore, PharmD, UW-Madison School of Pharmacy, 777 Highland Ave, Madison, WI 53705-2222; phone 608.890.1916; fax 608.265.5421; e-mail cgallimore@pharmacy.wisc.edu.

METHODS

This was a retrospective comparison to evaluate the telephone follow-up monitoring protocol at Wingra Access. The clinic goal was for each patient newly started on an antidepressant to have 3 follow-ups within 12 weeks of starting the medication. The project received exemption status through the University of Wisconsin-Madison Health Sciences IRB to perform a chart review to compare data for 2 cohorts of patients: those receiving an antidepressant prescription prior to implementation of the protocol (pre-cohort), and those receiving an antidepressant prescription following protocol implementation (post-cohort).

Wingra Access is a primary care clinic and training site of the University of Wisconsin Department of Family Medicine. Although Wingra is not an NCQA-certified Patient Centered Medical Home (PCMH), patient care is provided in line with this model; primary care clinicians, behavioral health consultants, pharmacists, social workers, and nurses jointly provide coordinated medical and psychiatric care. The patient population is ethnically and socioeconomically diverse with 46% white, 20% Hispanic, and 20% African American, and the majority English or Spanish speakers.

Protocol

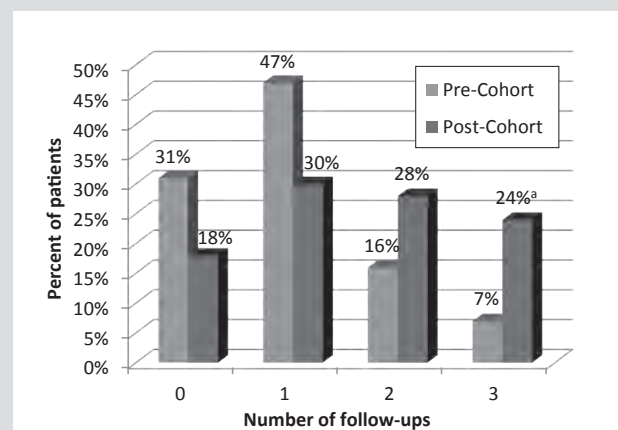
The telephone follow-up monitoring protocol was implemented on April 19, 2009. The protocol dictated calling all patients within 1 to 2 weeks of newly starting on an antidepressant for depression and/or anxiety. The Department of Family Medicine Clinical Data Warehouse (a central server that houses, manages, and reports data entered into the electronic medical record) used eligibility criteria to generate a weekly report of potentially eligible patients. These criteria included (1) electronic antidepressant prescription from a prescriber at Wingra Access within the previous week (2) no previous antidepressant prescription within the past 24 months and (3) aged 18 years or older. The patient list was sent from the Data Warehouse to team members at the beginning of each week. The clinic pharmacist or pharmacy student performed a review of each patient's electronic medical record (EMR) to verify eligibility criteria and screen for the following exclusion criteria: (1) patient received the antidepressant to treat a condition other than depression and/or anxiety (2) patient received an antidepressant prescription from a prescriber outside of Wingra Access in the past 24 months or (3) patient unable to speak either English or Spanish. A final list of eligible patients was sent to the designated clinic nurse who conducted follow-up calls within 2 weeks of antidepressant prescription. A follow-up interview template was developed and used to standardize calls and to ensure antidepressant efficacy, safety, and adherence. Whether or not a future follow-up visit had already been scheduled was also determined, and scheduling of this visit was facilitated if needed. If a patient could not be reached, a message was left asking the patient to call the clinic. If voice mail or an answering machine

Table 1. Average Characteristics of Patients in Pre- and Post-Cohorts.

	Pre-Cohort (n=45)	Post-Cohort (n=50)
Average Age (years)	38	39
Gender (%)		
Female	76	72
Male	24	28
Number of Medical Conditions	2.5	3.2
Number of Prescription Psychotropic Medications	1.3	1.4
Psychiatric Diagnoses (%)		
Depression ^a	94	76
Anxiety disorder	33	48
Insomnia	11	16
Attention Deficit Hyperactivity Disorder	7	4
Alcohol and other drug abuse (AODA)	7	18
Bipolar disorder	7	4
Psychotic disorder	4	2

^aP-value = 0.02 for pre- to post-comparison of depression diagnosis. All other comparisons were non-significant.

Figure 1. Percentage of Patients Completing 0-3 Follow-ups Within 12 Weeks of Antidepressant Prescription.



^a P-value <0.05 for pre- to post-comparison

was not available, the nurse would attempt to contact the patient up to 3 times. Completed and attempted telephone encounters were documented in the EMR using the standardized template and routed to the patient's prescriber.

Evaluation

Following a 6-month protocol trial period, the pre- and post-cohorts were formulated. The Clinical Data Warehouse used the eligibility criteria from the clinic protocol to identify potentially eligible charts for both cohorts. Charts identified for the pre-cohort were those meeting eligibility criteria within 1 year prior to the date of protocol implementation, and charts identified for the post-cohort were those meeting eligibility criteria 6 months after the start date of the protocol. Each chart on the pre-cohort

Figure 2. Method of First Follow-up for Patients in the Pre- and Post-Cohorts.

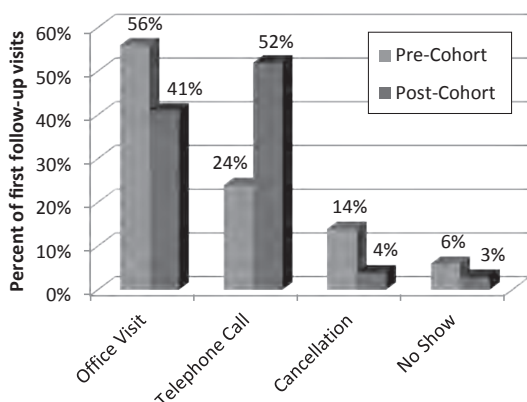


Table 2. Type of Health Care Professional Conducting the First Follow-up Visit.

	Pre-Cohort	Post-Cohort
Primary Care Provider	55%	43%
Physician Team Member	39%	5%
Behavioral Health Consultant	3%	28%
Nurse	3%	9%
Pharmacist	0%	11%
Social Worker	0%	4%

list was assigned a random number, and charts were sorted into an ascending list based upon assigned number. The study team hand-screened each chart in sequential order to confirm eligibility criteria as stated in the protocol, and omitted charts meeting exclusion criteria. Exclusion criteria included those stated in the protocol, in addition to patients who had not been on the prescribed antidepressant for a minimum of 12 weeks. This process was continued until 50 eligible charts were identified. The same randomization process was conducted with the post-cohort. A sample size calculation was not performed, but a target of 50 charts in each cohort was deemed a feasible sample size for purposes of evaluating the pilot protocol.

The primary outcome measure of the chart reviews was the percentage of patients who achieved 3 follow-ups within 12 weeks of antidepressant prescription. Additional outcomes included the total number of scheduled visits that were completed; the percentage of patients completing 0, 1, or 2 follow-up visits within 12 weeks following antidepressant prescription; the type of provider responsible for follow-up (primary care clinician, behavioral health consultant, pharmacist, nurse or social worker); and the mode of follow-up (telephone call or office visit).

Data for the pre- and post-cohorts were compared using 2 sample *t* test and chi-square test. To assess protocol feasibility

the pharmacist and nurse responsible for performing telephone follow-ups recorded time commitment and call outcome for a period of 2 weeks.

RESULTS

A total of 45 charts in the pre-cohort and 50 charts in the post-cohort were included in the final analysis. Data was not available for 5 of the charts in the pre-cohort due to incomplete documentation, so these charts were excluded from the analysis. Chart demographics and clinical characteristics are compared in Table 1. There were no statistically significant differences in age, gender divide, and number of medical conditions and psychotropic medications between cohorts. In the pre-cohort, more patients had a diagnosis of depression and fewer had a diagnosis of anxiety compared to the post-cohort, although the difference was only significant for depression.

The average number of follow-ups completed was significantly greater in post-cohort, compared to the pre-cohort (1.6 vs 1.0, $P=0.003$). The percentage of patients who completed 0, 1, 2 or 3 follow-ups within 12 weeks following antidepressant prescription is summarized in Figure 1. A greater percentage of patients completed 2 or 3 follow-ups in the post protocol cohort, but the difference was only statistically significant for 3 follow-ups ($P=0.024$).

The method by which the first follow-up occurred is described in Figure 2. The percent of first follow-ups occurring via telephone call was increased, and the percent of patient cancellations and no show visits were decreased in the post-cohort. A primary care clinician or physician team member was responsible for conducting the first follow-up in the majority of the patients in the pre-cohort (94%). This number decreased to 48% in the post cohort, and instead 52% of follow-up occurred with behavioral health, nursing, pharmacy, or social work (Table 2). For the second and third follow-ups the primary care clinician or physician team member was responsible for more than 70% of visits before and after implementation of the protocol.

The clinical pharmacist devoted approximately 20 to 30 minutes per week performing chart reviews to verify patient eligibility. Over a single 2-week period, the clinic nurse attempted to contact 13 unique patients for follow-up. Out of this group, calls were completed for 7 patients. Overall the nurse made 27 total calls, and on average it took 3 attempts per patient to complete telephone follow-up (range 1-4 calls). The average length of a call was 4.3 minutes, and this could be further broken down into 11 minutes for a completed call and 1.8 minutes for an incomplete call.

DISCUSSION

Results suggest a multidisciplinary telephone follow-up protocol is a feasible method for improving antidepressant follow-up

in a high risk primary care setting. These findings are consistent with previously published results of improved treatment adherence with nurse-conducted telephone care management programs.^{11,12} However, those programs provided more intensive, and presumably more costly, care management than that described in this communication. Thus, the present results illustrate a way in which clinics without the resources to adopt an intensive care management program can implement simplified option for improving follow-up rates.

Several aspects consistent with the PCMH model likely contributed to the success of the protocol. First, it used a team-based approach to optimize patient care through collaboration of pharmacists, nurses, behavioral health consultants, and primary care clinicians. Further, the involvement of the Data Warehouse provided an efficient method of creating a registry of patients for the monitoring service, and follows the PCMH emphasis of health information technology to improve patient care.¹³ Clinic time devoted by the clinical pharmacist and clinic nurse was manageable and was able to be performed in conjunction with other expected clinical responsibilities.

Despite encouraging results, limitations to the protocol were identified and represent areas for further advancement. While the percentage of patients achieving 3 follow-ups more than tripled (7% to 24%), still less than one-third of patients achieved the guideline-recommended follow-ups. Based on the current design of contacting patients 1 to 2 weeks after an antidepressant is prescribed, it is speculated that the protocol is most effective in ensuring a first follow-up visit and facilitating a second in-clinic visit. This is supported by 52% of first follow-ups occurring via telephone. To target improvement in additional follow-ups, the protocol should be extended to include phone calls at 1 to 2 months and at 3 months. This would require a system for alerting team members when calls are due. This would be feasible using reminder tools in the EMR, but could significantly increase the workload necessary to run the protocol due to the expanded call volume.

Limitations in the study design may have introduced confounding factors. First, 2 separate cohorts of patients were selected using the eligibility and exclusion criteria in the protocol. While this method was used to identify a sample reflective of those who would have qualified for follow-up calls in the protocol, it is difficult to ensure the 2 groups were comparable. The cohorts were similar in age, gender distribution, number of medical conditions, and number of psychotropic medications. While the majority in both cohorts had a diagnosis of depression, this percentage was smaller in the post-cohort, indicating more were receiving antidepressants for anxiety alone compared to the pre-cohort. It is possible that differences in outcome measures were partially due to measured and unmeasured dissimilarities between cohorts.

Second, the two cohorts initiated antidepressant treatment at separate points in time. Between the times when the post- and pre-cohorts received treatment, a behavioral health service was incorporated into patient care. In this model, behavioral health consultants are available to facilitate patient psychiatric care in clinic Monday through Friday. Previously a single psychologist was available in clinic several half-days per week. The intensification of behavioral health care presents a confounding factor which may have independently resulted in a positive impact on depression follow-up rates in the post-cohort.

Finally, interpretation of study results is limited by the lack of measurement of depression and anxiety outcomes. Due to the retrospective chart review design, data measuring depression and anxiety severity and antidepressant treatment response were not available for comparison between cohorts. It is unknown whether improved follow-up rates translate into improved treatment outcomes for patients. This should be the focus of future studies evaluating depression telephone monitoring programs in primary care.

CONCLUSION

A multidisciplinary telephone follow-up protocol is a feasible method for improving antidepressant follow-up in a high risk primary care setting. However, compliance rates with guideline-recommended monitoring remain low, and the impact on depression treatment outcomes is unknown. Extension of the monitoring protocol to include follow-up calls at multiple time points throughout the first 3 months of antidepressant treatment and the assessment of depression treatment outcomes should be considered for further study.

Acknowledgement: The authors would like to thank David Rabago, MD, and John J. Frey, MD, for their input and guidance in the writing of this manuscript.

Funding/Support: None declared.

Financial Disclosures: None declared.

REFERENCES

1. Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Replication. *Arch Gen Psychiatry*. 2005;62(6):617-627.
2. World Health Organization. The global burden of disease: 2004 update. http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html. Accessed April 23, 2013.
3. Greenberg PE, Kessler RC, Birnbaum HG, et al. The economic burden of depression in the United States: how did it change between 1990 and 2000? *J Clin Psychiatry*. 2003;64(12):1465-1475.
4. National Comorbidity Study (NCS) and National Comorbidity Survey Replication (NCS-R). Updated July 19, 2007. <http://www.hcp.med.harvard.edu/ncs/>. Accessed April 23, 2013.

5. Unity Health Insurance, Clinical Quality Improvement Committee. Diagnosing and Treating Depression in Adults in Primary Care Guideline. November 2010.
6. Smolders M, Laurant M, Verhaak P, et al. Adherence to evidence-based guidelines for depression and anxiety disorders is associated with recording of the diagnosis. *Gen Hosp Psychiatry*. 2009;31(5):460-469.
7. Wang PS, Berglund P, Kessler RC. Recent care of common mental disorders in the United States: prevalence and conformance with evidence-based recommendations. *J Gen Intern Med*. 2000;15(5):284-292.
8. Kessler RC, Berglund P, Demler O, et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA*. 2003;289(23):3095-3105.
9. Pincus HA, Tanielian TL, Marcus SC, et al. Prescribing trends in psychotropic medications: primary care, psychiatry, and other medical specialties. *JAMA*. 1998;279(7):526-531.
10. Mojtabai R, Olfson M. National patterns in antidepressant treatment by psychiatrists and general medical providers: results from the national comorbidity survey replication. *J Clin Psychiatry*. 2008;69(7):1064-1074.
11. Simon GE, VonKorff M, Rutter C, Wagner E. Randomised trial of monitoring, feedback, and management of care by telephone to improve treatment of depression in primary care. *BMJ*. 2000;320(7234):550-554.
12. Hunkeler EM, Meresman JF, Hargreaves WA, et al. Efficacy of nurse telehealth care and peer support in augmenting treatment of depression in primary care. *Arch Fam Med*. 2000;9(8):700-708.
13. National Committee for Quality Assurance. Patient-Centered Medical Home (PCMH). PCMH 2011 Overview. January 31, 2011. http://www.ncqa.org/Portals/0/Programs/Recognition/PCMH_2011_Overview_5.2.pdf. Accessed April 23, 2013.

Empyema Necessitans Caused by *Mycobacterium tuberculosis* in an Immunocompetent Patient

David J. Magness, DO

ABSTRACT

A 22-year-old man, a recent immigrant from Mexico, was admitted to a Wisconsin hospital because of a swelling of the chest wall and right axilla. Originally, it was thought to be a skin infection with *Staphylococcus aureus*. When the treatment was unsuccessful, the patient returned to the hospital and the abscesses were found to have been caused by *Mycobacterium tuberculosis*. Furthermore, there were pleural collections and it was thought that he had a manifestation called empyema necessitans, an extension of purulent pleural liquid through adjacent tissues to form an abscess on the thoracic wall.

INTRODUCTION

With the influx of immigration to the United States, there has been an increase in patients presenting with illnesses that are less common in the general population. Tuberculosis is one of these infections and must be on the differential diagnosis in order to expedite diagnosis and management. Reporting to the local health department is necessary for optimal treatment and protection of the public health of the local community. From 1993 to 2009, immigration from Mexico has produced the largest number of cases of tuberculosis in the United States.¹ Between 2000 to 2006, 45.4% of all immigrants to Wisconsin came from Mexico.²

CASE

A 22-year-old man presented to his primary care physician's office with a chief complaint of mild swelling, pain, redness, and warmth in his right axilla which he had noticed for the past few weeks. The symptoms had been worsening over that time, but he had never noticed anything similar to this in the past. He was diagnosed with hidradenitis suppurativa, and discharged home with instructions to use warm compresses along with analgesics as needed.

Two months later, the patient presented at a local urban emergency department (ED) with an increase in swelling, warmth,

pain, and redness. He was afebrile, had a normal white blood cell count, and had no signs or symptoms of infection anywhere else. He was diagnosed with an abscess, and underwent incision. A swab for culture and sensitivity was sent to the lab, and he was sent home on 2 empiric antibiotics, trimethoprim-sulfamethoxazole and cefalexin. The wound grew out *Staphylococcus aureus*, sensitive to the prescribed antibiotics.

Three months later, he presented to the same ED with a reaccumulation of the axillary abscess. But in addition, he complained of new swelling, warmth, redness, and pain to his right upper and lower chest wall. Each of the new areas of swelling were measured at about 10 cm in diameter. These were also given incision and drainage, with culture and sensitivity sent to the lab. Complete metabolic panel, complete blood count, protime, and international normalized ratio (INR) were all within normal limits. A computerized tomography (CT) scan of the abdomen and pelvis showed multiple circumscribed hypoattenuating lesions with peripheral enhancement in the right anterior chest wall, right paraspinal muscles, retroperitoneum, and right pleura likely representing abscesses (Figure 1). Upon further investigation by a second radiologist, it was determined that the chest wall lesion was directly anterior to the pleural abscesses. A connection between them was not seen directly, but could not be ruled out. He was admitted to the medical/surgical floor and placed on intravenous vancomycin. Considering immunosuppression, we obtained an HIV test which was negative. We then asked for infectious disease consultation who recommended that we send the aspirated fluid for acid-fast bacilli, which turned out positive. An interferon-gamma release assay test was also obtained, and came back positive, confirming infection with *Mycobacterium tuberculosis*. Eventually, aspiration of one of the pleural abscesses, along with gastric aspirates, also grew *M tuberculosis*.

The patient denied any medications, allergies, medical, surgical, or family history. He did admit to occasional alcohol use along with intermittent smoking of cigarettes. He denied any drug use including intravenous drugs. The patient had recently immigrated from a small village in northern Mexico and did not

• • •

Author Affiliation: Brevard Health Alliance, Titusville, Fla; formerly Aurora St Luke's Medical Center, family medicine residency, Milwaukee, Wis.

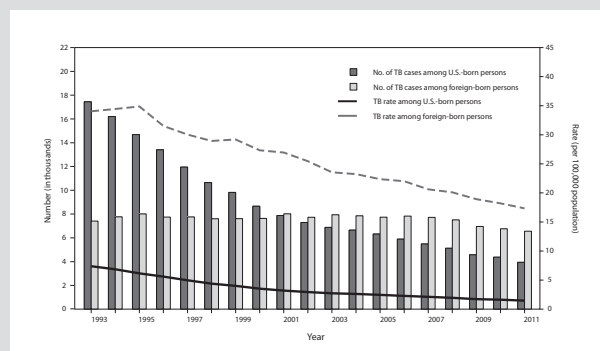
Corresponding Author: David J. Magness, DO; 500 N Washington Ave, Titusville, FL 32976; phone 608.332.1501; fax 321.268.3357; e-mail magness@nova.edu.

Figure 1. Computerized Tomography Scan of the Abdomen and Pelvis.



Image courtesy of Aurora Health Care, Centricity EMR

Figure 2. Number and Rate of Tuberculosis (TB) Cases Among U.S.-born and Foreign-born Persons, by Year Reported — United States, 1993–2011.*



Source: National Tuberculosis Surveillance System

* Data are updated as of February 22, 2012. Data for 2011 are provisional

know of any tuberculosis in the village or in any of his immediate family members.

When the diagnosis of tuberculosis was confirmed, he was started on rifampin 300mg by mouth daily, isoniazid 300mg by mouth daily, pyrazinamide 1500mg by mouth daily, and ethambutol 1200mg by mouth daily, along with pyridoxine 50mg by mouth daily. His skin lesions improved over his hospital stay and he was discharged to home. With the help of the county health department, his treatment was continued for 6 months. At that time, a repeat CT scan of his chest showed improvement of the pleural tuberculous abscesses.

DISCUSSION

Across the United States, the rate of tuberculosis in 2010 was 3.6 cases per 100,000 population.³ According to the Wisconsin Department of Health Services, between 2003 and 2010, there were 1.28 cases of tuberculosis per 100,000 population, or an aver-

age of 71.8 cases per year statewide.⁴ In 2009, 9% of the cases had both pulmonary and extrapulmonary symptoms.⁵ Sixty percent of the cases occurred in Southeastern Wisconsin, 58% in males, 65% in ages 25–64, 70% in minorities, 78% in HIV-negative patients, and 58% in foreign born patients. Our patient fit into all of these groups. Even though the rate of tuberculosis across the United States has been falling for both American and foreign-born residents, the proportion of those cases in foreign-born individuals is on the rise (Figure 2).⁶

Empyema is a pleural effusion containing pus occurring as a complication of a respiratory disease. It can be caused by various types of infections, including an entity called tuberculous pleuritis. Empyema necessitans is defined by the extension of an empyema through the parietal pleura, into surrounding tissue, finally burrowing to the chest wall and setting up a connection between the pleural infection, and the subcutaneous tissue.⁷ CT is the imaging modality of choice to visualize empyemas, but the connection between the empyema and the skin is rarely seen.⁸ Treatment for tuberculous empyema necessitans is usually all of the same medications as for any form of primary tuberculosis, but might also include drainage.

SUMMARY

Tuberculosis is a rare cause for skin abscesses, but one of the major etiologic agents in empyema necessitans. Even though the prevalence of tuberculosis in Wisconsin is just under half that of the rest of the United States, clinicians should still be ever mindful of the various manifestations of this disease. Prompt identification of cases will mean faster treatment, and fewer public health exposures.

Funding/Support: None declared.

Financial Disclosures: None declared.

REFERENCES

1. CDC. *Reported Tuberculosis in the United States, 2009* Atlanta, GA: US Department of Health and Human Services, CDC; October 2010. <http://www.cdc.gov/tb/statistics/reports/2009/pdf/report2009.pdf>. Accessed April 18, 2013.
2. Parol R. *Mexican Immigration in the Midwest, Meaning and Implications*. Chicago, IL: The Chicago Council on Global Affairs; 2009.
3. Sahn SA, Iseman MD. Tuberculous empyema. *Semin Respir Infect Dis*. 1999;14(1):82–87.
4. Wisconsin Department of Health Services. Wisconsin Tuberculosis Cases by Public Health Region and by County, 2003–2010. <http://www.dhs.wisconsin.gov/tb/statistics/DocsStatistics/TBCaseByCounty2010.pdf>. Accessed April 18, 2013.
5. Wisconsin Department of Health Services. Active Tuberculosis Disease. Wisconsin, 1997–2009. <http://www.dhs.wisconsin.gov/tb/statistics/DocsStatistics/WI-TBdata-2009.pdf>. Accessed April 18, 2013.
6. Centers for Disease Control and Prevention. Trends in tuberculosis — United States, 2011. *MMWR Morb Mortal Wkly Rep*. 2012;61(11):181–185. <http://www.cdc.gov/mmwr/pdf/wk/mm6111.pdf>. Accessed April 18, 2013.
7. Kono SA, Nauser TD. Contemporary empyema necessitatis. *Am J Med*. 2007;120(4):303–305. DOI: 10.1016/j.amjmed.2006.09.019
8. Glicklich M, Mendelson DS, Gendal ES, Teirstein AS. Tuberculous empyema necessitans. Computed tomography findings. *Clin Imaging*. 1990;14(1):23–25.

Proceedings from the 2012 Annual Meeting of the American College of Physicians, Wisconsin Chapter

The Wisconsin Chapter of the American College of Physicians held its annual meeting in Wisconsin Dells, September 9-11, 2012. Internal medicine residents from each of Wisconsin's 5 residency programs presented their research and/or unusual clinical experiences via posters and vignettes. Posters were included in the previous issue of *WMJ*: Volume 112(2).

CASE-BASED VIGNETTES

Elevated Troponin and Non-Exertional Heatstroke: A Case Report

Maria Batool, MD, Anushree Agarwal, MD, Krishna Nagendran, MD; Aurora Health Care Internal Medicine Residency Program, Aurora Sinai Medical Center, Milwaukee, Wis

Introduction: Heatstroke is an uncommon cause of elevation of cardiac troponin I. Increasingly, it is being recognized that cardiac troponin I levels may have a prognostic significance in patients admitted to the intensive care unit (ICU) with heatstroke.

Case: A 51-year-old woman was transported to the emergency department (ED) after family noted that she had altered mental status along with difficulty breathing. At the scene, her temperature was 108.1°F (rectal). She was intubated and transferred to the ICU. Ambient temperature forecasted for that day was 99°F. The patient was living in an old house with no central air conditioning and limited number of fans. Diagnostic workup showed troponin I: 0.16, peaking to 12.38 the next day, creatine kinase-MB: < 1, myoglobin: 232, creatine kinase: 96, and serum creatinine: 2 mg/dl. Initial electrocardiogram (ECG) showed sinus tachycardia with non-specific T wave abnormality in the anterior leads. Subsequent ECG showed normal sinus rhythm. Patient was seen by cardiology service. A 2D echocardiogram performed showed no regional wall motion abnormalities and an ejection fraction (EF) of 53%. Given the concern about the ris-

ing troponin I levels, a cardiac catheterization was performed, which revealed normal coronary arteries.

Discussion: Troponin I is considered a highly sensitive and specific biomarker for myocardial injury. Data on Troponin I elevation in heatstroke are scarce. Most of the research on this relationship has been done in the context of the August 2003 heat wave in Paris, France. In 2 major studies that reported increased Troponin I in heatstroke (Pease et al and Hausfater et al), no data on coronary angiography was available to comment on the precise mechanism involved in release of Troponin I. This case is unique because we were able to demonstrate normal coronaries by cardiac catheterization.

When Your Ear Continues to Hurt: Thrombocytopenia in a Patient with Relapsing Polychondritis

Lane Benes, Christine Sharkey, MD; University of Wisconsin, Madison, Wis

Introduction: Relapsing Polychondritis (RP) is a rare immune-mediated disorder associated with inflammation of cartilaginous structures, most commonly affecting cartilage of the ear, nose, joints and respiratory tract. Non-cartilaginous structures may be affected including the eye, heart, kidney, and nervous system. RP is associated with other autoimmune disorders as well as myelodysplastic syndrome (MDS). The diagnosis of RP is based primarily on clinical findings and the gold standard of affected cartilage biopsy is infrequently performed.

Case: A 49-year-old previously healthy man presented to his primary care physician with sinusitis and was found to have mild thrombocytopenia with platelets of 79,000/ μ L. His sinusitis improved over 2 weeks on antibiotics, however he developed pain, swelling, and erythema of the nasal bridge and was found to have an erythrocyte sedimentation rate (ESR) of 17. One week later, the patient developed swelling, erythema and 10/10 pain of the left auricle that spared the earlobe. He also had erythema and tenderness in the lateral right ankle joint. He denied a history of trauma or any other inciting factors. He was started on antibiotics for presumed cellulitis of the ankle and prednisone for his ear, both of which improved. At that time his platelet count was 50,000. He experienced 3 additional similar episodes of left auricle symptoms, each time occurring when his prednisone dose was tapered. Evaluation by a rheumatologist led to the diagnosis of RP. A referral to a hematologist was made for a platelet level of 35,000 without other hematologic abnormalities. Following bone marrow biopsy, he was diagnosed with MDS. He is currently undergoing bone marrow transplant, which, if successful, will cure both his RP and MDS.

Discussion: RP should be suspected in patients presenting with auricular pain, erythema, warmth, and swelling that spares the earlobe. While less likely than other rheumatologic disorders, it can also be the cause of arthritis. If RP is diagnosed, evaluation of additional rheumatologic disorders and MDS should be considered given the high incidence of concurrence. For this patient, obtaining a complete blood count revealing thrombocytopenia was the main finding that led to the discovery of MDS and should be routinely performed in all patients diagnosed with RP.

Myelopathy Due to Spinal Cord Compression Secondary to Extramedullary Hematopoiesis in Beta Thalassemia Major

Muhammad W. Choudhry, Sreelatha Chalasani, Arlene Gayle; Marshfield Clinic, Marshfield, Wis

Case: A 19-year-old woman presented to our hospital for evaluation of a 1-month history of progressive descending bilateral lower extremity paresthesia and weakness associated with difficulty walking, frequent stumbling, and falls. Her medical history was significant for transfusion-dependent beta-thalassemia major and hemoglobin E trait. Physical examination was significant for orofacial abnormalities including prominent cheek bones and protrusive premaxilla. Neurological findings included hypoesthesia to touch and pin prick sensations from mid-trunk to the lower extremities and decreased strength in the right and left lower extremity. Magnetic Resonance Imaging (MRI) of the spine showed numerous well-defined, enhancing epidural masses extending from T3-T9 with severe spinal canal compromise and cord compression. Given the patient's history of thalassemia major, a diagnosis of extramedullary hematopoiesis (EMH) was made. Treatment included dexamethasone and radiotherapy over 2 weeks. At 1-month follow-up, symptoms completely resolved. Follow-up MRI at 3 months showed marked resolution in EMH masses.

Discussion: EMH is defined as formation of blood cells outside the bone marrow as a physiological response to chronic anemia in hematologic disorders, such as leukemia, myelofibrosis, and hereditary hemoglobinopathies. EMH is almost always asymptomatic, but in rare cases, compression of adjacent structures due to organ or bone marrow enlargement leads to clinical symptoms. The liver, spleen, and lymph nodes are common sites for EMH. There are very few reports of EMH involving the vertebra resulting in myelopathy, and therefore, no evidence-based treatment guidelines. Primary treatment options include surgical excision, radiotherapy, and hypertransfusion. Most reported cases describe surgical intervention and successful treatment with a combination of radiotherapy, corticosteroids, and blood

transfusions. Recognizing this rare complication early in patients with beta thalassemia is important to improve the chances of complete clinical recovery.

Spontaneous Coronary Artery Dissection Associated With Elevated Lp(a)

Jason R. Darrah, MD, Raju G. Ailiani, MD, FACC; Gundersen Lutheran Medical Foundation, La Crosse, Wis

Introduction: Spontaneous coronary artery dissection (SCAD) is a relatively rare cause of acute coronary syndrome (ACS) that frequently occurs in younger adults. SCAD is more common in women with approximately one third of cases affecting women during the peripartum period. The clinical manifestations vary, with STEMI and sudden cardiac death being the most common presentations. Several associations have been identified as risk factors for SCAD including atherosclerosis and connective tissue disorders. However, the majority of cases are idiopathic in patients with no known atherosclerotic risk factors. Described here is a unique case of SCAD in a young, postpartum woman with a unique underlying lipid abnormality.

Case: A 34-year-old woman, 2 months postpartum, presented with retrosternal chest tightness. Associated symptoms included nausea, diaphoresis, and dizziness. The patient was slightly hypertensive and an ECG demonstrated new right bundle branch block (RBBB) with ST elevations in I, II, and aVL. Initial troponin I and CK-MB were within normal limits. Angiography revealed dissection of the 1st diagonal artery with 100% occlusion. Balloon percutaneous coronary intervention (PCI) was performed with reestablishment of flow.

Two days later, patient began to complain of "heartburn." Troponin T value increased and she was taken back for repeat angiography. The diagonal branch showed a capped dissection. However, there was now 80% narrowing just distal to the dissection, which was felt to be atherosclerotic in nature. A drug-eluting stent was placed successfully. Without known coronary artery disease (CAD) risk factors, a workup of lipid abnormalities was undertaken, which revealed a normal lipoprotein analysis but lipoprotein (a) was significantly

elevated at 107 mg/dL (normal <30).

Discussion: With the widespread use of coronary angiography, SCAD is becoming recognized more frequently as a cause of ACS in young, otherwise healthy individuals. Dissection results from separation of the layers of the arterial wall creating a false lumen. Hemorrhage into this lumen with subsequent thrombosis occludes the true lumen. The pathogenesis of SCAD remains poorly understood. Histologically, cystic medial necrosis and peri-adventitial inflammation with eosinophilic infiltrates have been observed. Only 1 case report exists linking SCAD and elevated lipoprotein(a) Lp(a). Angiography is the diagnostic test of choice. Treatment options include conservative management, PCI with stent placement, and coronary artery bypass graft (CABG), depending on the vessels involved.

A Great Clinical Paradox: Heparin-Induced Thrombocytopenia, An Overdiagnosed, Yet Underrecognized Entity

Narendranath Epperla, MD, Sowjanya Bapani, MD, Steven Yale, MD; Department of Internal Medicine, Marshfield Clinic, Marshfield, Wis

Introduction: We present a case of rapid onset Heparin-Induced Thrombocytopenia (HIT) with venous thromboembolism potentially preventable if this clinical entity was recognized earlier.

Case: A 61-year-old man with a history of schizoaffective disorder was admitted for severe aspiration pneumonia treated with Zosyn 3.375g IV q6 hours and vancomycin 1g q12 hours. During the 7 days of his hospitalization, he received 5000 IU s/q heparin 3 times a day for deep vein thrombosis (DVT) prophylaxis. At the time of hospital transfer to an inpatient psychiatric unit, his platelet count was 672,000/ μ L (normal 175,000-450,000/ μ L). On hospital day 11 he experienced an inferior wall myocardial infarction and underwent coronary catheterization, which showed complete occlusion of the right coronary artery treated with angioplasty and bare metal stent, (acetylsalicylic acid (ASA), clopidogrel, eptifibatide, and prophylactic heparin. His post-catheterization platelet count was 322,000. On day 17, he

experienced right lower extremity pain and swelling with duplex ultrasonography showing thrombus extending through the deep venous system with a normal platelet count of 158,000/ μ L. He was started on intravenous heparin. Two days later he experienced a massive central pulmonary emboli treated with 100mg alteplase, which caused his platelet count to drop to 46,000/ μ L. The presence of thrombocytopenia and venous thrombosis raised concern for HIT, confirmed by platelet factor 4 [(PF4) OD of 2.72] and serotonin assay. Heparin was discontinued and argatroban started.

Discussion: HIT is an immune-mediated adverse drug reaction caused by heparin-dependent, platelet activating IgG antibodies that recognize complexes PF4 bound to heparin. Once HIT is suspected all heparin products must be discontinued and an alternative non-heparin anticoagulant started (eg, lepirudin or argatroban). This case illustrates that careful clinical acumen and high suspicion for HIT could have obviated the complications when the patient had >50% platelet count drop in the presence of venous thrombosis.

An Atypical Chemotherapy Complication: BCG Sepsis

Amy N. Evjen, Danyon Wagner, MD; Department of Internal Medicine, Gundersen Lutheran, La Crosse, Wis

Case: A 74-year-old man was brought to the ED by ambulance for syncope with profound weakness and confusion. Initial assessment included hypotension with systolic blood pressures in 60s. This improved with fluid, but he remained clinically unstable with blood pressures in the 90s systolic, tachycardia, and fever to 39.4°C. He was actively having rigors and was oriented only to person and place. He was unable to follow commands or answer questions appropriately. He had no focal neurologic deficits. Computed tomography (CT) head was negative for hemorrhage. Lab studies included mild leukocytosis, thrombocytopenia, and creatinine elevation consistent with acute kidney injury. Chest x-ray was without infiltrate. Urinalysis showed >100 white blood cell (WBC), >100 bacteria, albumin, and bilirubin. He was

started on levofloxacin and aggressive fluid resuscitation for a picture consistent with urosepsis. Further studies demonstrated labs consistent with acute liver failure as well as disseminated intravascular coagulation (DIC).

Family provided a history of no recent illness or complaint and a normal state of health. The day prior, the patient went for bacillus Calmette-Guérin (BCG) installation number 3 of 3 for treatment of recurrent bladder cancer. A pretreatment urinalysis was normal. Notes from that treatment stated the standard catheter used for treatment could not be inserted so an alternate was used. He was given one-tenth dose (8.1mg) dose of BCG along with 50 million units of interferon.

This clinical history prompted suspicion for BCG sepsis. Appropriate treatment with levofloxacin, rifampin, and corticosteroids was initiated. Isoniazid (INH) replaced rifampin as clinical diagnosis was supported with no growth on standard blood and urine cultures. No mycobacterium cultures were obtained. Further evaluation of liver function favored a diagnosis of granulomatous hepatitis related to BCG with component of acute ischemic hepatitis. Abnormal international normalized ratio (INR), partial thromboplastin time (PTT), and fibrinogen were attributed to liver dysfunction rather than DIC given the course of improvement. Acute kidney injury required dialysis for several weeks. Patient completed 4 weeks of targeted therapy, which was discontinued given his clinical improvement and side effects of nausea and anorexia. Slow recovery back to baseline was achieved.

Discussion: Although BCG installation is generally a well-tolerated chemotherapy for bladder carcinoma, it is associated with complications ranging from common localized symptoms to the rare systemic shock. The mechanism of the systemic effect is debated but may be from a true infection, cytokine mediated hypersensitivity reaction, or combination of both.

Not a Fungi to Be With

Jeffrey Gehl, MD; Medical College of Wisconsin, Milwaukee, Wis

Introduction: *Coccidioides* is a dimorphic fungus endemic to the southwestern United

States. It primarily causes an acute or sub-acute pneumonia, but in some individuals, it can cause serious extrapulmonary disease such as meningitis. With growing numbers of immunosuppressed individuals in our population, it is important to recognize *Coccidioides* as a potential cause of systemic infections in high-risk patients with a potential exposure history.

Case: A 41-year-old man with a history of HIV/AIDS presented after having a witnessed seizure at home. He reported a history of cryptococcal meningitis associated with seizures that required placement of a ventriculoperitoneal (VP) shunt. A recent cerebrospinal fluid (CSF) culture 1 month prior grew an unspecified mold and was treated with voriconazole. CT imaging of the head revealed stable appearing meningeal calcifications but no acute findings. CSF showed an elevated white blood cell count, an elevated protein level, but no organisms or hyphal elements. He was treated empirically with antibiotics and amphotericin B. Eventually the unspecified mold from the previous CSF culture was identified as *Coccidioides immitis*. Further history revealed that he attended school in Phoenix, Arizona, where he was first diagnosed with meningitis, presumably secondary to *Coccidioides* and not *Cryptococcus*. In addition, a voriconazole level was subtherapeutic suggesting a drug interaction with ritonavir or patient noncompliance. Voriconazole was switched to fluconazole to be continued indefinitely, and the patient was discharged.

Discussion: *Coccidioides* is a pathogen that most commonly causes a self-limited pneumonia occurring 1 to 3 weeks after exposure. Disseminated disease occurs in less than 5% of symptomatic patients and is more likely in immunocompromised individuals. Meningitis occurs in nearly half of disseminated cases and causes significant morbidity and mortality from hydrocephalus, frequently requiring shunt placement. Treatment for Coccidioidal meningitis consists of fluconazole or itraconazole, although voriconazole has been reported to be effective as well. Lifelong therapy is suggested regardless of immune status as there is a high risk of relapse with discontinuation. *Coccidioides* is well known in the southwestern United

States but may not always be considered outside of this region. This case illustrates how a thorough history and wide differential is important, especially in immunocompromised patients where atypical infections are more likely so as to avoid delay in diagnosis and potentially impact patient outcomes.

Not Your Typical Sinus Infection

Liana Gonzalez, MD, Catherine Holznacht, MD, Apoorv Broor, MD; Medical College of Wisconsin, Milwaukee, Wis

Case: A 26-year-old man presented with an 8-day history of worsening headache, neck pain, and sudden-onset shortness of breath. Outpatient evaluation 5 days prior revealed severe sinusitis; however antibiotics were not initiated. On physical exam the patient was febrile, hypoxic, tachycardic, and hypertensive. Notable exam findings were mild right periorbital edema, trismus, anterior cervical lymphadenopathy, and an exquisitely tender anterior neck. Laboratory evaluation revealed leukocytosis, coagulation values suggestive of disseminated intravascular coagulopathy, and an arterial blood gas consistent with hypoxemic respiratory failure. Chest CT showed multilobar pneumonia and was negative for a pulmonary embolism. No abscess or occult infection was seen on noncontrast neck CT. Shortly after admission to the ICU he was intubated for impending respiratory failure and treated with broad-spectrum antibiotics for severe sepsis and multilobar pneumonia. Admission blood cultures subsequently grew *Streptococcus intermedius*. The patient developed worsening right-sided periorbital edema, chemosis, ptosis, and cranial nerve palsy prompting repeat imaging that revealed thrombophlebitis of bilateral internal jugular veins, evidence of pulmonary septic emboli, and cavernous sinus thrombophlebitis. In addition to continued antibiotic treatment, the patient was started on anticoagulation as well as corticosteroid therapy with fairly rapid improvement in his ocular manifestations.

Discussion: Septic thrombophlebitis involving the cavernous sinus and internal jugular vein are rare complications of sinusitis as well as primary infections of the oropharyngeal space. Infection of the sinuses or oropharyngeal space can involve vascular structures via

hematogenous, lymphatic, or direct extension. Once thrombophlebitis develops, the potential exists for hematogenously spread septic emboli causing multisystem organ failure. To date, few case reports identify *S. intermedius* as a causative agent in septic thrombophlebitis of the internal jugular vein. While the mortality rate is about 5% for septic thrombophlebitis involving the internal jugular vein, the mortality rate for cavernous sinus thrombophlebitis is as high as 30%. Thus, prompt recognition and early antibiotic treatment are important for reducing the morbidity and mortality associated with this disease. Anticoagulation is generally an accepted practice for those with cavernous sinus involvement. Surgical intervention is reserved for cases with persistent septic embolization despite medical therapy or evidence of a collection requiring drainage.

Escapade With Exjade®: Deferasirox-Induced Fanconi's Syndrome

Noreen Murphy, MD, Mohsein Elamah, MD, Viveka Boddipalli, MD, Jose Torrealba, MD, Micah R. Chan, MD, MPH; University of Wisconsin School of Medicine and Public Health, Madison, Wis

Case: Three years into remission, a 21-year-old male survivor of Ewing sarcoma had a ferritin level of 1502 and MRI T2 hypointensities consistent with iron deposition in the liver and spleen. Hemochromatosis gene mutation tests were negative. Iron overload was thought to be secondary to the over 35 blood transfusions he received during the course of treatment for Ewing sarcoma.

The patient was started on deferasirox in April 2011, at which time his serum creatinine was 1.0. The patient's renal function declined with a creatinine of 1.25 in August 2011 and 1.5 in January 2012. While receiving chelation therapy, his urinalyses were significant for 1-3+ proteinuria and 2-3+ glucosuria. In March 2012, the patient was admitted to the hospital with abdominal pain, creatinine of 2.5, bicarbonate of 16, potassium of 2.7, proteinuria, and glucosuria. Serum protein electrophoresis (SPEP) showed elevated alpha 1 and decreased alpha 2, beta, and gamma levels. The patient's urine sediment was bland. His kidney biopsy revealed severe tubular

injury without interstitial inflammation. Deferasirox was stopped. The patient was treated with bicarbonate drip, and potassium and phosphate repletion. Eleven days after admission, the patient's creatinine was 1.5 and bicarbonate was 24, but he continued to have hypokalemia, hypophosphatemia, proteinuria, and glucosuria.

Discussion: On review of the literature, there are approximately 1 dozen case reports documenting acute kidney injury in the setting of deferasirox use. Injuries described include Fanconi's syndrome, acute interstitial nephritis, and mild nonprogressive increases in creatinine. This is the first biopsy-documented case of deferasirox-associated Fanconi's syndrome and tubular injury. Our patient had a history of Ewing sarcoma and an abnormal serum protein electrophoresis (SPEP) test eliciting the possibility of light chain deposition disease as an alternative explanation for Fanconi's syndrome so therefore, biopsy was indicated to rule this out as well as tubulointerstitial nephritis. His biopsy did not demonstrate light chain deposition or interstitial inflammation, leaving deferasirox as the most likely explanation for Fanconi's syndrome and tubular injury. In addition, the start of chelation therapy correlated precisely with the onset of our patient's rising serum creatinine and the presence of significant glucosuria and proteinuria on urinalysis.

What's that Pustule?! Bringing Mass Spectrometry to the Bedside

Brooke Rogers, Emily Fisher, MD, D. Takahashi, DO, FACP; Medical College of Wisconsin, Milwaukee, Wis

Introduction: Disseminated nocardiosis is a rare but serious disease in immune-compromised patients. However, prognosis is good if treated with the appropriate antibiotics. Because there are many different species of *Nocardia* with different treatment recommendations, the challenge of treatment lies in rapid identification of the species involved.

Case: A 66-year-old immune-compromised woman with systemic lupus erythematosus, anti-phospholipid antibody syndrome, and adrenal insufficiency was admitted to the hospital due to a 2-week history of painful skin lesions and associated swelling on her

extremities. Four months prior to admission, her immunosuppressive therapy was switched from azathioprine to mycophenolate mofetil due to an episode of acute pancreatitis induced by the azathioprine. Mycophenolate mofetil was discontinued when a rash appeared a month prior to admission, and her prednisone was increased.

On physical exam, she was afebrile with stable vitals. Examination of skin revealed multiple tender hemorrhagic pustules of various sizes concentrated on the left leg, right upper arm, and right hip. The rest of the physical exam was unremarkable. Chest CT revealed a 2.1 cm nodule in the right lower lung along with multiple smaller bilateral pulmonary nodules. Head CT was benign. Cultures from the cutaneous lesions showed branching Gram-positive rods, consistent with *Nocardia*. Results of mass spectrometry testing performed in our lab were consistent with *Nocardia brasiliensis*. Because of this, she was started on trimethoprim-sulfamethoxazole and meropenem. Verification culture later confirmed *Nocardia brasiliensis*.

Discussion: There are 33 different pathogenic species of *Nocardia* reported. Each species of *Nocardia* has a different antibiotic sensitivity profile. Although it is not difficult to identify *Nocardia* genus, speciation takes weeks and therefore may delay treatment. Mass spectrometry is used in Europe to aid in clinical diagnosis of isolates, but is not yet approved for clinical use in the United States. However, by utilizing mass spectrometry for this patient, we were able to empirically and accurately treat for disseminated *Nocardia brasiliensis* while the official cultures remained unavailable for weeks.

An Unusual Case of Dysphagia: The Importance of Physical Exam

Lyndsey Runaas, MD, Ann Sheehy, MD, MS;
University of Wisconsin Department of Internal Medicine, Madison, Wis

Introduction: Dysphagia is often first categorized as either oropharyngeal or esophageal, depending on whether the patient reports difficulty with initiating swallow or with food getting “stuck.” This distinction helps clinicians sort through a large differential diagnosis. However, as important as history

is, physical exam should not be ignored and occasionally can be the key to the diagnosis.

Case: A 75-year-old man with a history of gastroesophageal reflux disease and stage 4 prostate cancer recently treated with sipuleucel-T presented with 6 weeks of progressive dysphagia without odynophagia. He denied dysarthria but did have hoarseness. He had lost 15 pounds. Exam was notable for deviation of his tongue to the left but was otherwise unrevealing. Esophagogastroduodenoscopy (EGD) revealed a complete, but non-obstructing Scatzki’s ring in the lower esophagus with no evidence of external obstruction or esophagitis. A video swallow study showed severely decreased oral pharyngeal motility. Head and neck imaging subsequently revealed an enhancing extraosseous tumor involving the medial aspect of the left occipital condyle and extending both intra- and extracranially up the clivus and encasing the left hypoglossal canal and into the left jugular foramen, explaining the findings of medialization of the left vocal fold, atrophy of the left tongue muscles, and thus his severe oropharyngeal dysphagia and tongue deviation.

Discussion: Despite a compelling history for esophageal dysphagia with risk factors for mechanical obstruction, this patient proved to have severe oropharyngeal dysphagia. Even with a relatively negative review of systems for neurological symptoms on history, his tongue deviation on exam could not be ignored and ultimately led to the correct diagnosis.

An Unusual Case of Recurrent Pneumonia

Molla Teshome, MD, Habtamu Belete, MD;
Aurora Health Care Internal Medicine Residency Program, Aurora Sinai Medical Center, Milwaukee, Wis

Introduction: Bronchopulmonary sequestration (BPS) is a rare disorder of the lower respiratory tract comprising 0.15% to 6.4% of all congenital pulmonary malformations. It consists of a nonfunctioning mass of lung tissue that lacks normal communication with the tracheobronchial tree and receives its arterial blood supply from the systemic circulation. It is usually diagnosed later in childhood or adolescence after presenting with recurrent pneumonia.

Case: A 30-year-old man with history of recurrent pneumonia presented to the ED with fever, chest pain, and shortness of breath for 3 days. He had associated non-bloody productive cough. On physical examination, he was in moderate respiratory distress. Vitals showed respiratory rate 24/min, pulse rate 116/min and temperature 38.3°C. There was dullness on the right posterior lower lung field with inspiratory crackles. The rest of the examination was unremarkable.

Diagnostic workup showed WBC count of 12,300 with left shift, but the rest of hemogram was normal. Chest CT revealed consolidation of the right lower lobe with distortion of the structures and multiple air pockets. There was no extension of the tracheobronchial tree into this area. A 3-D CT reconstruction demonstrated an aberrant vessel extending from the upper abdominal aorta in to the intrapulmonary sequestration in the anterior basilar segment of the right lower lobe. There was a cystic mass with abscess cavity and thickened pleura probably from recurrent infection. The venous drainage was in to the pulmonary vein. The patient was managed with antibiotics and open thoracotomy with right lower lobectomy and abscess drainage. Patient had smooth postoperative course and was discharged improved. No recurrence of pneumonia was reported 2 years after intervention.

Conclusion: This patient presented with an intrapulmonary BPS complicated by recurrent pneumonia. BPS is classified as intrapulmonary and extrapulmonary depending on the visceral pleural investment of the abnormal tissue. Communication with bronchi or lung parenchyma may be present allowing infection to occur. Resolution of infection is usually slow and incomplete due to inadequate bronchial drainage. Surgical resection is the treatment of choice for patients who present with infection or symptoms resulting from compression of normal lung tissue. Intrapulmonary lesions often require lobectomy because the margins of the sequestration may not be clearly defined. In patients who present with recurrent pneumonia at younger age, the possibility of congenital malformations like BPS should be considered and diagnostic workup pursued.

RESEARCH-BASED VIGNETTES

The Relationship Between Experience and Outcomes: Another Look at the July Effect

Jennifer Carnahan, Alexis M. Visotcky, Kathryn E. Fletcher; Medical College of Wisconsin, Milwaukee, Wis

Introduction: The “July effect” is an oft-cited, occasionally proven, and pervasively feared phenomenon that refers to the supposed ill-effect of the July influx of inexperienced house staff on patient outcomes. Various studies have found evidence for and against the July effect on patient outcomes. This study explored the association between house staff experience and patient outcomes.

Methods: This project was part of a larger study of discontinuity in hospitalized general medicine patients. The data came from retrospective chart review. Patient charts from 3 sites were randomly chosen and evenly distributed over a 1-year period between March 2009 and March 2010. The sites included a VA Medical Center, an academic tertiary care medical center, and a community teaching hospital. To be included in the study, patients were assigned either to a house staff or a hospitalist team. Patients were excluded if their hospital stay was <48 hours. Trained nurse abstractors did the chart review, which included demographics, comorbidity data, adverse events, readmission within 30 days, and ED visit within 30 days of discharge. We used multivariate analyses to compare the readmission rates and adverse events in patients by quarter of the year. We used the patients admitted to hospitalist teams as “controls” in order to evaluate for evidence of different outcomes in the first quarter of the academic year (“July-September” phenomenon).

Results: The sample had 1180 patients. Mean age was 61 years (SD 18); 41% of the sample was female with 51% white, 43% African-American, and 6% other. Mean Charlson score was 2.3 (SD 2.1). Mean length of stay was 5.2 (SD 4.1) days. The overall readmission rate was 22%. There was no difference in readmission rate between quarters for either the house staff or the hospitalist patients. In a multivariate analysis of adverse events by academic year quarter and hospitalist versus house staff team there was no significant difference in adverse events.

Conclusions: Prior evidence is variable for the existence of a July effect. Our study failed to identify a July effect when house staff patient outcomes were compared with hospitalists practicing at the same time at the same institutions over 4 quarters of the academic year.

Multi-Anatomic Versus Nasal-Only Surveillance Cultures for Detection of MRSA Colonization Status Among Skilled Nursing Facility Residents

Elizabeth Duke, Christopher Crnich; University of Wisconsin, Department of Internal Medicine, Madison, Wis

Abstract: Skilled nursing facilities (SNFs) represent ideal environments for the emergence and spread of methicillin-resistant *Staphylococcus aureus* (MRSA). Longitudinal data from culture swabs from residents in 6 SNFs in South Central Wisconsin were analyzed to determine whether multi-anatomical screening offered an advantage over nares-only screening in detecting MRSA colonization.

Subjects participating in this study underwent multi-anatomical active surveillance cultures of their nares, skin of the axilla and groin, skin of their peri-rectal area or a stool specimen, urine in the presence of an indwelling catheter, insertion site of any other invasive devices, and any open wounds to determine if they were colonized with MRSA. All surveillance cultures are placed in enrichment broth prior to plating on selective media. A total of 449 residents from 6 Wisconsin SNFs were screened; 149 (33%) were found to be MRSA(+) at one or more body sites on at least 1 visit. Employing a nares-only screening approach would have identified only 101 (68%) of colonized SNF residents compared to screening all body sites. Combining a nasal with a peri-rectal/stool culture identified 131 (88%) of colonized residents. Combining a nasal with a combined axillary/groin culture detected 127 (85%) of colonized residents, whereas combining peri-rectal/stool with axillary/groin detected only 93 (62%). Combining all 3 culture sites detected 142 (95%) of colonized subjects. Of the 7 subjects that were screen-negative at these three sites, 5 had a wound that was positive for MRSA (and 2 of these also had devices) and 2 had a device that was positive for MRSA. Thus, a nasal screening approach fails to identify a

significant proportion of SNF residents who are colonized with MRSA.

A multi-anatomical approach to screening, with cultures of nares, peri-rectal skin/stool versus axilla groin, and open wounds or devices (if present), appears to be the most sensitive method for detecting asymptomatic MRSA colonization. Future work will be aimed at determining which combination of anatomical screens and/or clinical characteristics best predicts persistence of MRSA carriage, which is known to be a predictor of invasive infection.

Post Bariatric Surgery Hypoglycemia – A Descriptive Analysis

Rajasree Nambron, MD, Michelle Mathiason, Kara Kallies, Shanu Kothari, MD, Daniel Short, MD, PhD; Gundersen Lutheran Medical Center, La Crosse, Wis

Introduction: Non-insulinoma pancreatogenous hypoglycemia syndrome (NIPHS), first described in 1999 by J Service is characterized by neuroglycopenic symptoms due to excess insulin production that is not from an insulinoma. A subgroup of NIPHS relating to post-bariatric hypoglycemia also has been described. The incidence of this syndrome is unknown, as is the percent of patients who develop post bariatric hypoglycemia after bariatric surgery.

Objective: The purpose of this study is to create a retrospective descriptive analysis of all patients who have developed hypoglycemia after gastric bypass surgery at our institution over a 10-year period, from September 2001 to September 2011.

Methods: This is a retrospective chart review of patients who had bariatric surgery and hypoglycemia. Patients who had other reasons to be hypoglycemic for example alcohol dependence, adrenal insufficiency, type 1 diabetes, and type 2 diabetes on anti-hyperglycemic medications (either oral medications or insulin) were excluded.

Results: Of the 1092 total patients defined as having had bariatric surgery during the study period, 407 patients (37%) had a diagnosis of hypoglycemia or of symptoms that might be related to hypoglycemia (spells, light-headedness, dizziness, diaphoresis, loss of consciousness, weakness, disorientation, confusion or seizures). Additionally, 69 patients had a documented sugar of less than 60 mg/dl. Of those, 67 described symptoms of hypoglycemia. Out

of the 69 patients with a documented low sugar, 29 patients (42%) required counseling on dietary modification, including the ingestion of frequent small meals with high protein content and avoidance of large carbohydrate loads.

Conclusion: The incidence of confirmed post-bariatric hypoglycaemia syndrome was very low (0.46%). Only 3 patients (0.27% of all bariatric cases) required pharmacologic treatment, and all successfully responded to and were satisfied with their treatments. None of them required pancreatectomy or revision of their bariatric surgery. Not all 69 patients could be thoroughly evaluated for post bariatric surgery hypoglycaemia, so the incidence of post-bariatric hypoglycemia may be greater than the 0.46% we are reporting.

Carbon Dioxide Insufflation for ERCP-A Systematic Review

Naga Swetha Samji, MD, Sarah D. Komanapalli, MD, Praveen K. Roy, MD; Department of Internal Medicine, Marshfield Clinic, Marshfield, Wis

Introduction: Carbon dioxide (CO₂) has been

proposed as an alternative to air insufflation during endoscopic retrograde cholangio pancreatography (ERCP). Absorption of CO₂ is rapid compared to air and thus may lead to less post-procedure discomfort and abdominal distension. Several randomized controlled trials (RCTs) have evaluated the role of CO₂ in ERCP. We conducted a systematic review of the published studies to evaluate the efficacy and safety of CO₂ in ERCP.

Methods: MEDLINE, Cochrane Central Register of Controlled Trials and Database of Systematic Reviews, PubMed, and recent abstracts from major conference proceedings were searched (through June 2012). RCTs comparing the role of CO₂ and air insufflation in ERCP were included. Standard forms were used to extract data by 2 independent reviewers. Data regarding abdominal pain, distension, dose of sedation, and end tidal CO₂ are collected.

Results: Seven studies were included (n=780). Mean age ranged from 54 to 68 years. Mean procedure duration ranged from 31 to 45

minutes. Three studies used propofol and 3 studies used fentanyl or midazolam or pethidine. Abdominal pain scores improved 1 hour post-ERCP in CO₂ group. Abdominal pain at 24 hours post-ERCP was similar between 2 groups. Abdominal distension at 1 hour following the procedure was less in CO₂ group. Abdominal pain and distention were measured by different scales among the studies and thus statistical pooling of the scores was not done. No significant difference in procedure time was seen among the studies. Doses of sedation used were similar between the 2 groups. No significant retention of CO₂ was noted. No significant ERCP related complications were noted in CO₂ group compared to air insufflation group.

Conclusion: Carbon dioxide insufflation decreases immediate post-procedure ERCP pain and abdominal distension at one hour post-procedure. No major complications were noted with use of CO₂.



My name is Tyler,
and in nine years I'll be an alcoholic.

I'll start drinking in middle school,
just at parties. But my parents won't
start talking to me about it until
high school. And by then, I'll already be
in some trouble. The thing is, my parents
won't even see it coming.

START TALKING BEFORE THEY START DRINKING
Kids who drink before age 15 are 5 times more likely to have alcohol problems when they're adults.
To learn more, go to www.stopalcoholabuse.gov or call 1.800.729.6686

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
www.samhsa.gov

Ad Council

Representing Physicians in Licensing and Regulatory Matters



Hal Harlowe
Attorney

Included on lists
for Best Lawyers®
in America and
Wisconsin Super
Lawyers®. Rated
AV (top rating)
by Martindale-
Hubbell.

Former Dane County D.A. Hal Harlowe heads Murphy Desmond's Professional Licensing team. He represents physicians and other medical professionals in:

- Defending against investigations and disciplinary complaints
- Obtaining licensure

As former Chair of the Governor's Task Force on Licensed Professionals, Harlowe's knowledge of the process can help defend your professional license and protect your reputation and career.

Contact Hal Harlowe at 608.257.7181 or hharlowe@murphydesmond.com



Madison & Janesville • www.murphydesmond.com



Body language
can tell you all
sorts of things.
Like someone is
having a **stroke**.

F

FACE DROOPING

A

ARM WEAKNESS

S

SPEECH DIFFICULTY

T

TIME TO CALL 911



American
Heart
Association

American
Stroke
Association

Together to End Stroke™

Know the sudden signs.
Spot a stroke F.A.S.T.

Ad
Council



strokeassociation.org

Reshaping the Boundaries of Informed Consent in Wisconsin

Krista J. Sterken, Esq.; Michael B. Van Sicklen, Esq.

Wisconsin law imposes 2 distinct legal duties on physicians—to provide non-negligent medical care, and to secure a patient’s informed consent to that care. The modern informed consent obligation has evolved far beyond the traditional requirement that a physician merely obtain permission before performing a procedure on a patient. A recent Wisconsin Supreme Court case raises the question of whether this evolution has gone too far, leading to legislative efforts to overturn the court’s holding.

In *Jandre v. Wis. Injured Patients and Families Compensation Fund*,¹ the Wisconsin Supreme Court affirmed a \$2,011,185 jury verdict against a physician for failing to inform her patient about the existence of a diagnostic test for a condition already ruled out by an alternative diagnostic test. The precedential weight of the Court’s 3-1-3 split decision is uncertain because no 4 justices agreed to the same rationale for the decision. Justice Patience Roggensack’s dissent discusses why the majority’s holding lacks binding weight because the concurring justice, Justice David Prosser, employed a different rationale than the other 3 justices in the majority.

As of this writing, the Wisconsin legislature is considering an amendment to Wisconsin’s informed consent statute to clarify the types of

information that a physician is legally obligated to disclose. The quickly evolving and uncertain state of informed consent law highlights the need for physicians to be aware of informed consent requirements and take proactive steps to manage their potential liability exposure.

This article provides an overview of the informed consent obligation, the *Jandre* decision, and the recently introduced legislation that proposes revisions to Wisconsin’s informed consent statute, as well as a discussion of steps physicians can take to minimize the risk of an informed consent lawsuit.

The Informed Consent Obligation

A physician’s obligation to obtain informed consent is governed by state law. In Wisconsin, physicians must disclose “the availability of all alternate, viable medical modes of treatment” as well as the benefits and risks of these treatments, subject to a number of exceptions.² Although the language of the informed consent statute only requires information about treatment options, Wisconsin courts have interpreted the term “treatment” to encompass diagnostic testing. In determining whether a particular disclosure is required, Wisconsin courts consider what a “reasonable patient” would want to know under the circumstances.

The *Jandre* Decision

The *Jandre* case involved a physician’s failure to inform her patient about the availability of a carotid ultrasound to test for a transient ischemic attack (TIA) because she had ruled out a TIA after listening to the patient’s carotid arteries in an effort to detect the “whooshing

sound” characteristic of a blocked artery. The physician conducted a series of additional tests to rule out a hemorrhagic stroke and a brain tumor, and then diagnosed the patient with Bell’s palsy. Eleven days later, the patient suffered a stroke that left him physically and cognitively disabled.

The patient sued the physician, arguing that the physician had (1) committed malpractice by misdiagnosing his condition; and (2) breached her informed consent obligation by not informing him about the option of a carotid ultrasound to diagnose a TIA. The jury found that the physician’s diagnosis of Bell’s palsy, although erroneous, was not negligent. Notwithstanding its conclusion that the physician had reasonably arrived at a diagnosis of Bell’s palsy, the jury held that the physician should have told her patient about the option of a carotid ultrasound, and awarded the patient \$2,011,185 for the physician’s informed consent breach.

The physician appealed to the Wisconsin Supreme Court, arguing that the informed consent obligation only requires disclosures related to the condition(s) the physician believes the patient has. The physician argued that, in most instances of patient care, such disclosures would actually impair decision-making by increasing the amount of largely irrelevant information before the patient. The physician also argued that requiring disclosures about excluded diagnoses would encourage the practice of defensive medicine and would dramatically increase the amount of time required to obtain informed consent.

In a sharply divided decision, the Court rejected the physician’s arguments, hold-

• • •
Krista Sterken is an associate with Foley & Lardner LLP. She can be reached at 608.258.4227; ksterken@foley.com. Michael Van Sicklen is a partner with Foley & Lardner LLP. He can be reached at 608.258.4206; mwansicklen@foley.com.

ing that a physician must provide information about tests and treatments for conditions that are consistent with the patient's symptoms even if the physician has ruled out those conditions. Several justices wrote separate opinions expressing concern about the extreme burden this decision would impose on Wisconsin physicians. Justice Prosser called for a reevaluation of Wisconsin's informed consent statute to address the expansion of the duty of informed consent that has occurred over the past 30 years, and to resolve concerns about the profound consequences of that expansion on the practice of medicine, such as the practice of defensive medicine.

The Legislature's Response to the *Jandre* Decision

Members of the Wisconsin Legislature introduced 2013 Assembly Bill 139³ and 2013 Senate Bill 137⁴ (companion bills), which include proposed changes to clarify the scope of legally mandated disclosures.

First, the bills propose that "information about alternate medical modes of treatment for conditions that the physician does not believe the patient has at the time the physician informs the patient" be exempted from the informed consent obligation. Second, the bills propose that the scope of legally mandated disclosures include only "information that a *reasonable physician* in the same or a similar medical specialty would know and disclose under the circumstances," rather than information that a reasonable patient would want to have. Both the Legislature and the Senate will likely vote on the proposed changes before they break for the summer at the end of June.

Recommendations for Physicians

The *Jandre* case illustrates the broad scope of disclosures potentially required in any patient encounter. According to the lead opinion in *Jandre*, physicians must disclose any information that a reasonable patient would want to know about any condition consistent with his

or her symptoms, even if the physician does not believe the patient has that condition.

Until the Legislature clarifies the scope of the informed consent duty, physicians should consider consulting with clinic counsel regarding the scope of information to disclose and keeping diligent records of their informed consent discussions with patients, including notes on the scope of information provided.

REFERENCES

1. *Jandre v. Wis. Injured Patients and Families Compensation Fund*, 813 N.W.2d 627 (Wis. 2012). <http://www.wicourts.gov/sc/opinion/DisplayDocument.pdf?content=pdf&seqNo=81164>. Accessed May 3, 2013.
2. Wis. Stat. 448.30. Information on alternate modes of treatment. <http://docs.legis.wi.gov/statutes/statutes/448/11/30>. Accessed May 7, 2013.
3. Assembly Bill 139. 2013-2014 Wisconsin Legislature. <https://docs.legis.wisconsin.gov/2013/proposals/ab139>. Accessed May 7, 2013.
4. Senate Bill 137. 2013-2014 Wisconsin Legislature. <https://docs.legis.wisconsin.gov/2013/proposals/sb137>. Accessed May 7, 2013.



ALEXANDRIA CLINIC
A Service of Douglas County Hospital

For more information, contact:
Alexandria Clinic
Attn: Tim Hunt, Administrator
610-30th Ave W,
Alexandria, MN 56308
Phone: (320) 763-2540
email: thunt@alexclinic.com
www.alexclinic.com

Employment Opportunities:

► Dermatology ► Emergency Room Physicians ► ENT
► Family Practice ► Oncology ► Neurology ► Rheumatology

The Alexandria Clinic, P.A. is a multi-specialty group practice. We are located two hours west of the Twin Cities on I-94 in the heart of Lakes Country. Alexandria offers year-round recreation for the whole family and is home to a service area approaching 100,000 people and over 1,000 growing businesses. *We're easy to get to and hard to leave!*

Trusted Care. For Generations.



Priority Initiatives in Health Care and Research Harmed by Budget Cuts

Joseph E. Kerschner, MD

The ability of academic medical centers across the country to advance health research and train future physicians is being compromised by the federal budget cuts triggered by sequestration and a lack of adequate support for the National Institutes of Health (NIH). The budget reductions that took effect March 1 disproportionately affect medical schools, teaching hospitals, and the patients we serve.

One of the many items affected by sequestration is the Medicare budget. Although all health care professionals who treat Medicare patients will be affected negatively by a 2% reduction in Medicare reimbursement, the cuts inordinately impact academic medical centers and the unique secondary, tertiary, and quaternary services they provide. Nationwide, academic medical centers will lose a resultant \$10.7 billion.

In addition to clinical impact, there will be an educational consequence of the Medicare cuts that primarily affects academic medical centers. Our country and our state are challenged by an inadequate supply of physicians. In Wisconsin, the Wisconsin Hospital Association estimates that we will need 100 new doctors per year for the next 20 years, particularly in primary care, and in rural and

underserved regions of our state.¹ The new cuts imperil the Medicare program's longstanding support for graduate medical education. Annually, the federal government contributes about \$9.5 billion Medicare dollars and \$2 billion Medicaid dollars to the training of physicians.² The Association of American Medical Colleges (AAMC) posits that reducing federal support for teaching hospitals could mean up

medical schools and other research institutions will find it increasingly difficult to make important discoveries that improve human health. The lack of resources inevitably will prevent quality investigators from continuing their work and maintaining their labs. Such wholesale cuts in research support likely will have a long-term impact on health care discovery. It will affect medical progress across all disciplines

It is likely that every Wisconsinite will feel
a negative impact from discoveries not being made
as a result of the budget cuts.

to 10,000 fewer physicians trained every year when the United States already faces a shortage of approximately 92,000 doctors over the next 10 years.³

Sequestration may further jeopardize the supply, diversity, and distribution of the health care workforce by significant reductions in the Health Resources and Services Administration's Title VII health professions programs, which are subject to an 8.2% cut,⁴ and the National Health Service Corps, for which a 5.3% cut in funding is anticipated.⁵ Weakening these programs puts our most vulnerable populations at risk.

With federal funding for biomedical research also eroding under sequestration,

of research, investigating the full spectrum of diseases and conditions. It is likely that every Wisconsinite will feel a negative impact from discoveries not being made as a result of the budget cuts.

This research funding also substantially supports the training of medical researchers. As funds are reduced, the talent pool for the next generation of scientific investigators will be diminished. At MCW, we anticipate grant reductions of \$5 million to \$9 million per year from existing grants and reduced awards in the future, impacting health discoveries made in the state of Wisconsin.

The overall consequences of sequestration are not entirely known, nor fully determined.

• • •

Dr Kerschner is dean of the medical school and executive vice president of the Medical College of Wisconsin.

The latest budget proposals fail to alleviate health professions cuts, and although the White House's recently proposed 1.5% increase in NIH research dollars is welcome, it will still mean that NIH funding will have failed to keep pace with inflation for the last 11 years, as the AAMC notes.³

Inadequate funding results in the awarding of fewer grants to promising projects. According to NIH reports, the overall success rate, defined as the percentage of reviewed NIH grant applications that receive funding, for 2012 was 17.6%, down from 32.1% in 2001.⁶ In addition to impeding growth in established research programs, this environment is exceedingly adverse for young investigators working to establish their labs and careers, further deteriorating our ability to sustain a climate for discovery in the future.

MCW is committed to actions that slow the

growth of health care spending by developing new models of care, disseminating best practices, and ensuring that future physicians are educated in these new practices. Sequestration, by its effect on the training of the next generation of physicians and scientists, as well as its negative impact on research and knowledge creation, disproportionately affects academic medical centers. The approach of across-the-board budget cuts, unfortunately, is not a thoughtful one that allows us to place priorities on the important missions of education, discovery, and improving health care for people everywhere.

REFERENCES

1. Turkal N, Brenton S, WHA Physician Workforce Workgroup. *100 New Physicians a Year: An Imperative for Wisconsin*. Madison, Wis: Wisconsin Hospital Association; November 2011.

2. Health Policy 101. Graduate Medical Education (GME) Funding. Association of American Medical Colleges Web site. https://www.aamc.org/members/osr/communications/legislative_affairs/326594/gmefunding.html. Accessed May 7, 2013.

3. President's budget will jeopardize access to care [press release]. Washington, DC: Association of American Medical Colleges; April 10, 2012. <https://www.aamc.org/newsroom/newsreleases/333008/041013.html>. Accessed May 7, 2013.

4. Office of Management and Budget. Report Pursuant to the Sequestration Transparency Act of 2012 (PL 112–155). http://www.whitehouse.gov/sites/default/files/omb/assets/legislative_reports/stareport.pdf. Published September 14, 2012. Accessed May 7, 2013.

5. How Sequestration Will Hurt America's Health [talking points]. Washington, DC: Association of American Medical Colleges; February 2013. <https://www.aamc.org/download/328102/data/sequestrationtalkingpoints.pdf>. Accessed May 7, 2013.

6. Research Project Success Rates by NIH Institute for 2012. US Department of Health & Human Services. National Institutes of Health Web site. http://report.nih.gov/success_rates/Success_ByIC.cfm. Accessed May 7, 2013.



If this is your idea of traffic, we should talk.



231.346.6812
jobs@hnmdocs.com
michiganhospitalists.com/careers



Curbing Unnecessary Use of Antipsychotic Medication

Jody Rothe, RN, WCC; Jay A. Gold, MD, JD, MPH

All too often, residents of long-term care facilities are prescribed antipsychotic medications despite not having a proper diagnosis that supports their use. While these medications have been approved for conditions such as schizophrenia and bipolar disorder, they increasingly are administered to older patients with behavioral difficulties or cognitive impairments, especially dementia.

Off-label use of antipsychotics in nursing facility residents is associated with adverse events such as heart failure, strokes, and falls, as well as corresponding increases in hospitalizations. The Food and Drug Administration released a black box warning in 2005 that notified prescribers that elderly patients with dementia-related psychosis who are treated with antipsychotic drugs are at an increased risk of death compared to those given a placebo.

Because of the powerful sedative effects of antipsychotics such as aripiprazole or olanzapine, such medications sometimes are employed as a chemical restraint for nursing home residents with undesirable behaviors. It can be easy to make incorrect assumptions about residents' needs.

...

Doctor Gold is senior vice president and chief medical officer for MetaStar, Inc. Ms. Rothe is a MetaStar quality consultant and project lead on health care-acquired conditions in nursing homes. Jess King, MetaStar senior communications specialist, also contributed to this column. This material was prepared by MetaStar, the Medicare Quality Improvement Organization for Wisconsin, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the US Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. 10SOW-WI-CRSP-13-02.

Pain and comfort may be under-addressed. It takes time and resources to assemble an interdisciplinary team to look at residents' social history, and to conduct targeted behavior interventions and monitoring.

In addition to the dangerous side effects associated with antipsychotic medications for the elderly, overprescribing can be expensive for consumers and for payers. A report from the Centers for Medicare & Medicaid Services (CMS) found that almost 40% of nursing home patients with signs of dementia received antipsychotic drugs at some point in 2010, whether or not there had been a diagnosis of psychosis. Ending the misuse of these medications among nursing home residents would help save millions of health care dollars that could be better used in other ways to benefit patients.

Last year, CMS launched a national initiative to improve dementia care and to ensure appropriate use of antipsychotic medications. This topic also is a current focus among Quality Improvement Organizations, such as MetaStar, that are working with health care professionals to reduce the incidence of health care-acquired conditions. Almost half of the nursing homes in the state have signed up to join MetaStar's Wisconsin Quality Coalition. MetaStar offers education and assistance to long-term care staff, familiarizing them with such resources as the Advancing Excellence in America's Nursing Homes campaign and the Wisconsin Clinical Resource Center. In addition, MetaStar is collecting baseline data on antipsychotic use in nursing homes and sharing reports with participants monthly.

In addition, under its contract with CMS, MetaStar is collaborating with teams around the state in the national Pharmacy Services

Patient Safety Collaborative (PSPC), sponsored by the federal Health Resources and Services Administration. One of the topics on which nursing teams are working is the use of potentially inappropriate antipsychotic medications. Resources from the PSPC are made available to participating facilities, whose interventions and data collection MetaStar supports to improve care in this area.

Where behavioral problems exist, caregivers should first work to treat them and their root causes on an individual basis. Is the resident too warm, too cold, overstimulated, under stimulated? Does he or she have meaningful activities to fill the days? Is there conflict with a neighbor that could be resolved by simply moving the resident to another location? Does the resident have the same staff members working with him or her every day (known as consistent or permanent assignment)? Modification of the environment and daily routines remains the best way to meet the person's needs.

Physicians working with patients with dementia should ensure that care teams have fully explored nonpharmacological interventions before resorting to medications, and should be sure the medications are appropriate to patients' conditions. They should routinely monitor the progress of any patients prescribed antipsychotics, and reassess the need for them on a regular basis. They should use the lowest effective dose for the shortest possible duration, based on findings in the specific individual. If appropriate, they should call the attention of nursing home partners to the programs MetaStar offers to educate staff on alternative solutions.

Southwestern suburban Milwaukee medical building for lease. Please call Steve at 414.238.5562.



**Seeking Phlebologist,
Interventional Radiologist,
General/Vascular Surgeon**

Total office based care for vein disorders. Serving NE WI and upper MI. Prefer experience in duplex ultrasound, endovascular. Will train Phlebology. **Vein Care with Excellence and Distinction!**

Terry Guelnder, MD, FACS, RPhS
Member: AVF, ACP, Vein Experts
940 Maritime Drive
Manitowoc, WI 54220

920.686.7900 • www.wivein.com

MEDICAL CLINIC SPACE

**Historic Cedarburg Location
Washington Avenue**

Private Entrance
Common Reception Area
Nine Exam Rooms

Lab Area

Office Consultation Room

Medical Records Storage

Nurse's Station

Competitive Rates

Easy Access

Aurora Medical Center—Grafton

Columbia St. Mary's Hospital—Ozaukee

***Up To Six
Months
Free Rent!***

CEDARBURG SQUARE OFFICE COMPLEX

Contact Ed at 262.377.4170

www.cedarburg-square.com



**WE EXIST
TO MAKE SURE
IT DOESN'T**

Multiple sclerosis interrupts the flow of information between the brain and the body and stops people from moving. With the help of people like you, the National MS Society addresses the challenges of each person whose life is affected by MS and helps them stay connected to the great big moving world.

JOIN THE MOVEMENT
jointhemovement.org



**National
Multiple Sclerosis
Society**


Index to Advertisers

Alexandria Clinic.....	140
Cedarburg Square Office Complex	144
Gundersen Lutheran Health System.....	110
Hospitalists of Northern Michigan	142
Medical Property Associates	144
Murphy Desmond SC	137
ProAssurance Group.....	BC
Wisconsin Medical Society Education Department	101, 108
Wisconsin Medical Society Insurance and Financial Services	IFC
Wisconsin Vein Center	144

advancing the art & science of medicine in the midwest



Advertise in WMJ—Call Kelly Slack, Slack Attack Communications, 5113 Monona Dr, PO Box 6096, Madison, WI 53716; phone 608.222.7630; fax 608.222.0262; e-mail kelly@slackattack.com.



6:00am GET BATH READY FOR DAD *6:30am* PACK LUNCH FOR THE KIDS *10:00am* GIVE DAD HIS MEDICINE *1:00pm* FOLD EVERYONE'S LAUNDRY *2:00pm* SORT DAD'S BILLS *3:30pm* PICK UP THE KIDS *4:20pm* TAKE DAD OUT FOR FRESH AIR *5:30pm* REMEMBER THE DAYS WHEN DAD TOOK CARE OF ME *6:00pm* MAKE DINNER *8:00pm* HELP DAD TO BED *11:00pm* FINALLY GO TO SLEEP

— *Repeat* —

Only those who care for others know what it's really like to care for others. That's why AARP created a community with experts and other caregivers to help us better care for ourselves and for the ones we love.

aarp.org/caregiving or call 1-877-333-5885

“As physicians, we have so many unknowns coming our way...

One thing I am certain about is my malpractice protection.”

Medicine is feeling the effects of regulatory and legislative changes, increasing risk, and profitability demands—all contributing to an atmosphere of uncertainty and lack of control.

What we do control as physicians:
our choice of a liability partner.

I selected ProAssurance because they stand behind my good medicine and understand my business decisions. In spite of the maelstrom of change, I am protected, respected, and heard.

**I believe in fair treatment—
and I get it.**

Proudly Endorsed by



Wisconsin **Medical** Society
Insurance & Financial Services, Inc.



PROASSURANCE
Treated Fairly



Professional Liability Insurance & Risk Management Services

ProAssurance Group is rated **A (Excellent)** by A.M. Best.
ProAssurance.com • 800.279.8331

