

West Virginia

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Vol. 108, No. 3

West Virginia State Medical Association

The Voice of Medicine
in West Virginia

Special CME Issue

The Art, Science and Ethics of Prevention



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Dr. Lindsey earned his medical degree from the University of Cincinnati College of Medicine, and he completed a residency in orthopaedic surgery at West Virginia University School of Medicine. He also completed a fellowship in musculoskeletal oncology at the University of Pittsburgh Medical Center.



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Dr. Santrock is a graduate of the West Virginia University School of Medicine, where he completed a residency in orthopaedic surgery. He also completed a fellowship in foot and ankle surgery at the Orthopedic Foot and Ankle Center at Ohio State University.

He is board certified by the American Board of Orthopaedic Surgery and is a member of the American Orthopaedic Foot and Ankle Society, American Diabetes Association, and the Wound Healing Society.

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Volume 108, No. 3

West Virginia
JOURNAL
West Virginia State Medical Association

Special CME Issue



About the cover: *The books and medical instruments pictured in the masthead were donated to the West Virginia State Medical Association in 1987 in memory of Dr. Conrad Fisher Sayre by his daughter Nancy Tully. Dr. Conrad Sayre was born in Letart, WV, July 23, 1888. The ATV photo is courtesy of Todd Stinnett. Cover design and masthead photo by Angie Lanham, Managing Editor.*

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- » Immunizations for Adults and Children (Goebel, et al)
- » Screening Children for Hyperlipidemia by Primary Care Physicians in West Virginia (John, et al)
- » Interdisciplinary Treatment of Adolescent Eating Disorders in West Virginia (Luzier, et al)
- » Possible Prevention and Treatment of Prostate Cancer by Exercise (Zaslau, et al)
- » Using Health Information Technology to Advance Preventive Care in West Virginia (Schade, et al)
- » Extraskelatal Effects of Vitamin D: Potential Impact on WV Disease Morbidity and Mortality (Shuler, et al)
- » A Review of Depression Prevention in Primary Care (Clark, et al)
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WVSMA Healthcare Summit – August 24-26, 2012

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A Continuing Education Program

Title:	The Art, Science and Ethics of Prevention	
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Format:	Enduring Material - Journal/Internet delivery of related articles. This special issue is available in print and in pdf format on the WVSMA website: wvsma.com. Participants are required to complete a post-test instrument for credit completion. Approximate course completion time is 8 hours.	
Featured Faculty:	Faculty information listed with each article.	Course Materials: Related articles, process evaluation, content post-test.

About the Program and Objectives

The May/June 2012 special issue of the *West Virginia Medical Journal* provides fourteen specific topics of particular interest and importance to West Virginians and their physicians. The theme of this issue, "The Art, Science and Ethics of Prevention," is thoroughly explored by the authors through commentary, scientific research and statistical study. Topics include guidelines for immunizations, interdisciplinary treatment teams to help adolescents overcome eating disorders, the management and prevention of migraines and headaches, updates and controversies in screening programs for women, older West Virginians and children. Depression prevention and primary care management is explored. Excellent data and "calls to action" are published in two papers on helmet usage and injury prevention for bicycles and ATVs. Technological advances in health information technology and its role in advancing preventive care, as well as breakthrough research in cancer prevention through exercise and the impact of Vitamin D on disease morbidity and mortality also is presented. At the conclusion of The Art, Science and Ethics of Prevention issue, physicians will have an increased awareness and knowledge of the following:

This program does not meet the educational requirements for end-of-life or pain management credits.

- understand the injury patterns, resource utilization and discharge dispositions of older West Virginians who were injured in a fall, and discuss ways to prevent injuries.
- describe recent changes in adult and pediatric vaccines, apply knowledge about vaccines to clinical practice, have an awareness of recent outbreaks of certain vaccine preventable diseases in West Virginia, be able to improve office mechanics to improve vaccine uptake.
- understand the practices of screening children for hyperlipidemia by primary care providers in West Virginia.
- describe assessment and treatment interventions for youth at risk of eating disorders using a multidisciplinary team format and understand the importance of community outreach/prevention efforts.
- understand preventive measures of prostate cancer and ways to improve the quality of life of patients with the disease, including the use of exercise therapy.
- appreciate the historical advances that have been made in the use of HIT to enhance the effectiveness and efficiency of health care delivery, especially preventive care; understand and achieve "Meaningful Use" and access organizations and resources that are available to assist physicians select and implement HIT in the clinical setting.
- explore the association of vitamin D deficiency on major contributors to West Virginia disease morbidity and mortality.
- understand the needs of depression care in order to meet the challenges of today's primary care practice.
- learn of up-to-date recommendations from several national organizations about breast, cervical and ovarian cancer screening, and cardiovascular disease prevention in women, including evidence review to assist providers in deciding the best approach to prevention, taking into consideration individual patient risk factors and preferences.
- evaluate the injury pattern of children less than 15 years old involved in bicycle accidents and compare the differences between those wearing a helmet and not wearing a helmet to demonstrate the effectiveness of helmet use in this age group in order to further promote their use.
- learn to counsel older adult patients on which preventive services are recommended by the U.S. Preventive Services Task Force and which are covered by Medicare, and individualize their care based on age, gender, individual risk factors and preferences.
- recognize the significant burden of migraine and headache disorders, especially on women, and have knowledge of both the pharmacological and non-pharmacological approach to the prevention of episodic migraine.
- discuss the ethical dilemma of screening mammograms for Alzheimer's patients and formulate a plan to follow the breast cancer screening needs and benefits of the patient with dementia, including treatment issues of early stage breast cancer in patients with dementia.
- describe and compare the demographic variables, injury patterns, hospital course, and resource utilization of non-helmeted and helmeted riders involved in ATV accidents
- understand the impact of helmet use on injuries and emergency department and hospitalization as well as implications for helmet legislation throughout the state of West Virginia.

Disclosure

It is the policy of the CAMC Health Education and Research Institute that any faculty (author) who presents a paper for an enduring material designated for AMA Physician's Recognition Award (PRA) Category I or II credit, AANA credit or ACPE credit must disclose any financial interest or other relationship (i.e. grants, research support, consultant, honoraria) that faculty member has with the manufacturer(s) of any commercial product(s) that may be discussed in the educational presentation.

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This enduring material has been planned and implemented in accordance with the essentials and standards of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the CAMC Health Education and Research Institute and the West Virginia State Medical Association. The CAMC Health Education and Research Institute is accredited by the ACCME to provide continuing medical education for physicians.

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President's Message



Ethics and Rationing of Healthcare

While driving to work recently, the announcement came over the radio that former Vice President Cheney had undergone a heart transplant. The reporter went on to say that he was 71 years old and usually the cutoff for heart transplantation is approximately age 65. A bioethicist on National Public Radio did mention that this brings up the question, "Should people of Mr. Cheney's age, who have had multiple heart surgeries, which complicate later surgeries, be on the transplant list?"

This raises the age old question of "Is age just a number?" We as physicians have all seen people in their 40's and 50's who are much sicker due to poor lifestyle choices, diabetes, coronary artery disease, hypertension, etc., than patients in their 70's and 80's. Should the healthy 70 year old or 80 year old be denied a heart transplant? The other side of the coin is the 90 year old brought from a nursing home with vomiting. The next thing you know, an EKG is ordered which is found to be abnormal that leads to a heart catheterization and the patient put on the schedule for coronary artery bypass surgery. Believe me, my fellow medical colleagues, this is being done. Does this represent fear of reprisal from the patient's family or greed on the part of the doctor?

Hospitals and medical institutions are faced with these scenarios every day. Ethics committees, if available, have to examine all of these challenges, and may end up making the ultimate decision. In other parts of the world, medical care is markedly affected by ones ability to pay. You literally 'buy' a new heart, lungs, or kidney. Here in the United States, often a very ill patient wants quality of life, but the family insists on quantity of life. In this scenario, often the wishes of the family supersede those of the patient because he or she did not want to upset their loved ones. The patient who told his or her family their wishes but had no signed directive ends up on a ventilator, then a tracheostomy, and weeks of suffering before dying.

I would imagine that if we as a nation began placing a dollar amount on medical care and procedures that was easy for people to understand, there would be an immediate reduction in cost, and an immediate rise in screams to the government. Is this the world we want? We need to bring diverse groups together including physicians, bioethicists, clergy and ordinary citizens for an open dialogue. I would hate to see the day when medical decisions are made based on economics alone, but

I am afraid that it may be coming. It may be disguised, but surely it is coming. Do we want the government and private health insurance companies making these decisions? Have we really had the kind of fair and open discussions that are needed in this country on these issues? I fear that many ordinary citizens are grappling with these issues and even discussing them among family and friends. The ethics community needs to do more to foster these discussions so that everyone participates in the decision-making process and formulating health policy. This would truly be democracy in action.

So what is ethics? Is it the science of morality? Is it the study of good or bad behavior or values? One needs to go back through history to define these values. Ethics is not a new subject. The discussion of ethics is found in the literature of Mesopotamia, the cradle of civilization. The Sumerians and the Egyptians and the Greeks, including Socrates and Aristotle, all wrote of ethics. If we still have not "got it right", do not despair, we are all still making history together.

MaryAnn Nicholas Cater, DO
WVSMA President

Barbara Good Named to National Board



Barbara Good, Physician Practice Advocate for the West Virginia State Medical Association, located in Charleston, WV, has been selected to serve on the

Practice Management Institute (PMI) 2012-2013 National Advisory Board.

Advisory board members provide directional support and resources to PMI in the areas of policy, planning, evaluation, development, and public relations. Ms. Good will serve on the board for a period of two years.

"Ms. Good will be an integral part of PMI's overall planning process, advising and participating in the evaluation and development of programs that support PMI's 15,000 certified professionals

across the country," said Douglas O'Dell, president and CEO of Practice Management Institute. "We are extremely excited to tap into her talents."

Chosen from among hundreds of potential candidates, Ms. Good is recognized by PMI for her exceptional commitment to education and advanced learning scenarios in support of the physician and medical office staff member.

PMI is a leading educational and credentialing organization for medical office professionals. Its four certifications and 40 training programs focus on coding, reimbursement, compliance and productivity issues.

"I look forward to being a part of the PMI National Advisory Board as we seek new ways to provide the best in educational opportunities for physician practices," Good said.

Good said she has been delighted with the West Virginia State Medical Association's affiliation with PMI. "Our partnership has enabled us to bring CMOM (Certified Medical Office Manager) and CMC (Certified Medical Coder) certification programs, as well as other valuable and necessary educational programs, to West Virginia physician practices."

During the past year, the WVSMA has offered a number of classes, including the CMOM Certification, CMC Certification, Mastering E/M Coding and 2012 Coding and Medicare Update.

Always reaching higher, Good said, "Our next goal is to be the first State Medical Association to offer the CMCO (Certified Medical Compliance Officer) certification in a classroom setting."

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Losing the Art of Medicine

Stanley M. Pamfilis, MD, FACC

Parkersburg Cardiology Associates

It has been said for centuries that the practice of Medicine is an art and I hold to this idea. While Medicine may not be as aesthetically pleasing as a painting or sculpture I offer this consideration; the act of patient evaluation requires a complex creative process. Each physician comes to this process with his innate gifts and abilities. These talents allow him to start the journey down the path of learning the Medical art. The student of Medicine is encouraged to mature the development of these talents by his teachers, mentors, colleagues, and patients. During this process he hones his talents through long hours and years of training and hardship to build a thorough intellectual understanding of the material. As the word "practice" would suggest, he devotes a lifetime building the experience to refine this understanding.

The time he spends with his patient is among the most sacred human interactions.

When approached with openness and skill, it can be the most honest and cathartic moment a patient will experience.

With this groundwork complete, he then researches the specifics of this patient encounter by gathering old records, looking up test results and often supplementing this with additional library time to narrow down or sometimes expand the possibilities.

This complex process is necessary to develop the unique encounter that occurs with each patient contact. As such it requires a complex descriptive document to paint the one and only picture of this patient at this moment as revealed to this artist. We humbly call this the "History and Physical". This portrait will live forever to describe that unique patient contact. It gives anyone who reads it insight into the very complex work already done and leads to the appropriate next steps in furthering the evaluation

and treatment of this individual. It allows the writer to step right back into the process even though it has been a long time between visits and furthermore acts as a vital communication among physicians.

In order to create this unique document, the language has to be truthful, flowing, and descriptive with word choices and nuance that define both the patient and the artist.

This beautiful, healing, complex process is now essentially destroyed by the cold canned language of electronic medical records. No longer can we expect a patient's presentation to be clearly outlined or the artistry of the practitioner to be manifest. This paint by numbers product of EMR will make everything ring the same. And possibly the worse tragedy of all is that artists in training, will see this as the norm and will never learn what pigments and brushes and canvases have been stolen from them.

Objective

The purpose of this paper is to express my personal sadness about the permanent and detrimental changes to medicine that are being forced upon us and that we as a group have no will to take control of our own profession.

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A Tale of Two Patients—Leadership in the Art, Science and Ethics of Prevention

James D. Felsen, MD, MPH

A friend was lamenting the premature deaths of two high school classmate, patients of the same family physician. Both were 47 years old. He asked, do you believe their deaths could have been prevented if their doctor, and others, had done more, or done things differently? I answered, perhaps, it depends.

One was an insured, female, single, corporate lawyer who, until eight months before her demise, was in excellent health. She exercised regularly, ate a healthy diet, did not smoke and drank an occasional glass of wine. Although she had several sexual partners in her twenties (and aborted two pregnancies), she had been in a monogamous, heterosexual relationship for the past twenty years. She visited the family physician on average less than twice a year; her visits mainly were for periodic insurance physicals, minor sports injuries, rashes or limited acute respiratory infections. She was diagnosed with advanced, invasive

cervical cancer when she saw the physician for unusual vaginal bleeding and pelvic discomfort.

The other was an insured, married, airplane mechanic who was medically retired at age 39 years. He was an obese, hypertensive, diabetic, with chronic renal failure and a BK amputation, who, after high school sports ended, rarely exercised, smoked a pack of cigarettes a day, ate an unhealthy diet and had frequent alcohol binges. His employer, in addition to providing generous, high quality primary and specialty care, embraced a progressive “wellness” programs. He was unsuccessfully enrolled in several programs over 20 years to assist to modify his obesity, inactivity and poor health practices. In the last decade, he visited his primary care physician and various specialists over 20 times per year, with frequent hospitalizations. For the past three years he had been on dialysis. Despite frequent assessments, counseling and referrals,

his HA1C never was below 9, and other system indicators, e.g., blood pressure, weight, visual acuity continued to deteriorate until his death from multiple system failure.

The advances in the *science* of primary and secondary prevention over the last fifty years clearly support the conclusion that both these individuals *could have* enjoyed several more decades of productive life. Successful application of scientific knowledge gleaned from medical immunology, nutrition, endocrinology, bacteriology, pharmacology, genetics, pathology, biochemistry, physiology and environmental health, e.g., physical, chemical, biological, psychological stressors, has added significant longevity and quality to the lives of most Americans through primary and secondary preventive interventions.

There are thousands of scenarios like those above where an individual scientifically *could have* – but *did not* – benefit from the *science*. And, there

Objectives

- ❖ *Understand that with the rapid progress in the “science” of prevention over the last 50 years, the basic duty of the physician to patients and the community remains, although this scientific advancement presents new “art” of practice and “ethical” challenges*
- ❖ *Appreciate the nature, scope and magnitude of these new challenges and the physician leadership necessary to successfully confront them.*
- ❖ *Understand that the success and failure of patients to embrace and adopt the scientific advancements in prevention is probably more influenced by gaps in addressing “art” and “ethics” issues, than physicians’ knowledge of the “science.”*
- ❖ *Appreciate the massive array of opinions and factors offered – and lack of definitive knowledge and consensus concerning the influence of these factors – when defining and quantifying the reasons behind the gap between “what is” and “what could be” regarding potential gains in health status and longevity with more successful adoption of the science of prevention.*
- ❖ *Understand the types of leadership that physicians must provide to improve the current situation.*

are thousands of reasons advanced for this gap, e.g., poverty, lack of insurance or health care access, inadequate federal funding, sub-standard neighborhood nutritional and exercise facilities, culture of excess, health illiteracy, physician knowledge gaps, poor organization and integration of health service delivery, physician reimbursement policies, waste of resources on ineffective activities, stress of social injustice and loss of personal responsibility, to name a few.

Who (e.g., patient/ family, community/ public at large, or physician/health system) and what is responsible for the gap, is obtuse and often contradictory, usually based more on ideology than any sound applied system's research. Recently the California Medical Association joined the State's legislature in advocating for relaxing control measures that discourage obtaining and smoking marijuana,

although both were in the vanguard to successfully apply such measures to reducing cigarette smoking.

Physicians are not in a position to directly address many of these factors but their basic duty to their patients and community to do so remains. However, in addition to staying abreast of new science, the role of the physician regarding the *art* and *ethics* of preventive practice has changed and expanded:

- ❖ The role of many, if not most, primary care physicians has shifted from a reactive posture of treating the acutely and chronically ill who request their assistance to assist proactively in maintaining the optimal health and function of a sub-population (patients) who have selected (a) physician(s) or practice(s) as their source(s) of care. They may or may not make regular contact with the physicians and practices.

- ❖ This expanded "proactive" role of the physicians presents new ethical challenges as to scope and nature of the responsibilities of physicians. One aspect regards the extent of the duty to contact, track, educate and offer preventive screening and educational, diagnostic, intervention and follow-up services to those who might or might not seek care. It also involves embracing a "public health" or population approach that quite likely requires new or expanded information management and other evaluation, communication and monitoring techniques.
- ❖ Another ethical issue involves the role and responsibility of each patient to embrace behavioral change and preventive interventions recommended by one's physician and the balance between physicians respecting



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individual patient autonomy and discharging patients who fail to accept, adopt and follow the physician's recommendations.

- ❖ And a third ethical issue involves the role of the physician as a "steward" of society's scarce resources by assisting to reduce and eliminate unnecessary, wasteful and minimally effective preventive services in order to conserve societal resources – while still maintaining the primary duty to best care for each unique patient.

Promising preventive screening tests, e.g., PP13 for preeclampsia, and interventions, e.g., Malaria vaccine, roll off the assembly line weekly. It is difficult to track which patients in one's practice might be prime candidates for new services (or tried and true ones) in order to assure appropriate and timely communication, contact and discussion with them. Without expanded health information technology (HIT) and/or assistance from other health staff, it is difficult for most physicians (with the possible exception of those in small concierge practices) to know who has been offered and received a recommended preventive service in a timely manner.

Furthermore, without a formal "enrollment" procedure, at times it is not even clear to a physician or patient to which "practice(s)" the patient belongs as regards any "prospective" obligation and/or whether the patient wants to be proactively tracked, monitored and contacted. Nevertheless, HIT and organizational adjustments might well have portended a better outcome in the first case above.

However, the degree to which such factors as sub-standard automation, poor organizational integration, and misaligned reimbursement incentives contribute to the failure to

receive essential services is largely conjecture. Nevertheless, there are multiple new bureaucratic initiatives such as "medical homes" and "pay for quality" to change these factors. Medicare has proposed reimbursing physician \$20 per patient per month to correct such alleged care deficiencies they contend results in poor health status and higher costs.

Although not opposed, many doubt these initiatives will result in significant improvements in health status. They contend the failure to obtain essential services and modify unhealthy health status behavior is primarily a manifestation of an "excess" culture. It results in risky overindulgence and an unwillingness to expend energy and disposable income on health, as opposed to recreational and unhealthy behavior, e.g., cigarettes, fast food, alcohol, drugs, tanning booths, inactivity. Daniel Akst writes about this in his book "We Have Met the Enemy: Self-Control in an Age of Excess" and notes it affects all types of behavior such as eating, drinking, irresponsible credit purchases, smoking, and sexual promiscuity.

Many tests and interventions – or the frequency of their application – are subjects of disagreement, not consensus. Mammography in younger, low risk women, PSA screening, HPV screening and pap smears are a few examples of recent debates.

In many instances, some believe side effects and the morbidity associated with chasing false positives support more limited use of many services and also would conserve scarce health resources. This extends to the appropriate use of screening tests that yield interesting information but add little to future care management. Medicare recently expanded coverage for clinical depression screening and CDC recommended increased screening,

although, according to CDC, two-thirds of those with diagnosed severe depression are not receiving treatment. In a recent *New York Times* article Dr. Danielle Ofri reinforced the value of "clinical inertia" as discussed by Drs. Dario Giugliano and Katherine Esposito in JAMA.

The issue is further complicated by the facts that even with adequate contact and counseling many patients refuse recommended interventions or fail to make suggested behavioral changes. The second case above is an obvious example. Refusal of immunizations and circumcision, continued use of tanning booths and harmful substances, inactivity, poor diet, failure to take medications as prescribed are a few others. Did the women's physician in the first case take a thorough sexual history and was she offered a timely Pap smear or HPV test but never got around to getting it?

These factors present a formidable challenge even in a milieu of strong scientific consensus and maximum professional autonomy. The challenge becomes even more difficult within the current environment where there are major debates over the scientific validity and cost-effectiveness of various behavioral practices and preventive interventions.

Moreover, there is a concerted move by advocacy groups, politicians, bureaucrats and payers to entice or coerce physicians to provide certain services to all patients who meet certain criteria and parameters, regardless of whether the individual physician believes they are appropriate and cost-effective. How many wasteful tests and referrals did the man in the second case above receive despite his physician knowing they were for naught? Recently, pediatricians have engaged in a debate regarding whether they should refuse to see children whom the parents refuse

to adequately immunize. Why retain “difficult” patients in one’s practice and get “penalized” by quality evaluators and payers?

In a September 26, 2011 *Archives of Internal Medicine* study of physicians, 28%, thought their patients were getting too much care, 52% ,the right amount of care, and only 6% too little care. Some attributed “too much care” partially to the need to meet policy imposed “quality” monitoring reimbursement measures.

Meanwhile a recent *Consumer Reports* survey suggest from 40%-50% of patients are putting off essential care, or not following physician advice, because of financial hardship. Yet an August 2011 *Health Services Research* study suggest 21% of patients report behaving similarly for non-economic reasons and only 19% for financial reasons. We do not have a clue as to the real numbers and reasons regarding receipt of essential preventive care.

Finally, physicians have always had an ethical obligation to promote public health. Implicit in this obligation is the duty to help conserve scarce resources to do the greatest good for the population. Millions of dollars are being spent on public initiatives to improve health status and control cost with little evidence of effectiveness. If physicians do not weigh in, spending for ineffective and wasteful programs is not likely to abate.

Categorical governmental educational, regulatory and taxing policies and programs have been successful in reducing tobacco use over the last several decades, but have appeared to have reached a plateau, as have those directed at alcohol and drug abuse. Yet often we continue to pour more money into the same approaches and extend them to other issues such as healthy eating and obesity.

Catherine Magnu-Ward in a October 16, 2011 *Washington Post*

article exposed and dispelled five myths (food deserts, lack of information, advertising, too expensive, too many fast food venues) that allegedly contributed significantly to unhealthy eating and that have been the targets of considerable government funded programs.

Recent articles on rising teenage births in West Virginia and infant mortality in certain U.S. populations suggest they are the result of decreased government funding. There is no evidence provided that is the reason and no one outlines for what the government funds should be used. One assumes it is for the same programs that have had meager results over the past few decades. A reader suggested a new approach that would provide teenage girls \$1,000 a year if they remained nulliparous. That might be worth trying.

Of the many recent policy proposals to improve health status and reduce expenditures, those related to providing all women with free birth control (and other preventive services) and enhanced breast feeding assistance (especially in hospitals) are concerning. The premise is that such actions will result in improved health and massive cost savings by preventing unplanned/unwanted (especially high risk) pregnancies and fat kids.

Not only will taxpayers have to assume the cost of care for “financially able” women, but where is the cost-effectiveness and comparative-effectiveness research that establishes such outlays will significantly prevent the costs of unwanted pregnancies and fat kids? Most public and private insurance plans already pay most of the cost of birth control and community groups to educate and assist with obtaining contraception and breast feeding have existed for decades.

Advances in the *science* of prevention have yielded several

medical practice *art* and *ethical* challenges that physicians and the public must face. A few are mentioned. Successfully confronting these challenges will require enhanced physician leadership. That leadership must take three forms:

- ❖ Development and support of new health information technology, patient communication, and practice management approaches to facilitate the conversion of “willing” primary care practices to “proactive” operations that assume responsibility for a defined patient population, who seek and accept such an approach.
- ❖ Initiation and maintenance in every community of a local mechanism to assure every citizen can be offered an opportunity to be assisted in monitoring, maintaining and improving his or her health status if they desire. (This can be accomplished in many different ways depending on local resources and conditions.)
- ❖ Initiation – and participation in – local, regional and national consensus forums, debates and advocacy to promote optimal “stewardship” of health resources by promoting the development and adoption of “guidelines” for the most cost-effective, efficient and proven preventive interventions and activities, while also respecting the need for professional physician and personal patient autonomy.

Falls and Dilemmas in Injury Prevention in Older West Virginians

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Abstract

Falls are the number one cause of injury-related morbidity and mortality in West Virginia senior citizens. Poor outcomes following falls are exacerbated by numerous comorbidities which are prevalent in the elderly population in West Virginia. This study describes the injury patterns, resource utilization and dispositions of WV seniors injured in a fall. *Methods:* This is a descriptive retrospective cohort study utilizing the West Virginia State Trauma System registry; which collects trauma data from 33 acute care facilities in West Virginia. *Results:* Data from 5498 cases were reviewed for patients enrolled in the Registry in 2010. Fall victims aged 65 and older were included. Most falls occurred in the home (75.2%) or in a residential institution (11.3%). Femur fractures (36.3%) and intracranial hemorrhages (8.2%) were the most common injury diagnoses. Disposition back home declined from 58.6% in the 60-65 age group to 20.9% returning home following falls in the age 90-94 group. Conversely, disposition to a skilled nursing facility rose from 20.1% in the age 60-65 group to 49.1% in the age 90-94 group. The case

fatality rate for all the seniors enrolled in the trauma system was 3.3%. *Discussion:* Fall was the mechanism of injury for 83.3% of traumatic injuries in persons over the age of 65 enrolled in the WV trauma system. Older West Virginians suffer from numerous comorbidities that increase the risk of fall as well as the severity of injuries from a fall. *Conclusion:* In West Virginia, there is a correlation between increasing age and less desirable outcomes and dispositions from trauma centers for senior citizens after a fall. West Virginia patients, families and care providers must frequently face complicated treatment dilemmas, especially as the related risk of falling and the co-morbid conditions are commonly seen in older West Virginians. Multi-modal fall prevention programs can reduce the risk of falls in senior citizens.

Introduction

Falls are the number one cause of nonfatal injury in adults over 65.¹ It is estimated that 1 in 3 community-dwelling adults over 65 years of age will fall each year.² The biggest risk factors for falls appear to be a history of prior falls and disturbances in gait and balance.² Fractures have been found to be the most common injury after a fall in the elderly, with femoral neck fractures being the most prevalent.³ Older adults have a higher injury severity score and different pattern of injury from falls than younger patients and have a higher rate of mortality.⁴ Furthermore, the rate of death from falls in the elderly is rising.⁵ Of those

who survive, there is a higher rate of placement in skilled-nursing facilities than among those without falls.⁶ Falls among the elderly account for significant economic cost.⁷ The estimated direct medical cost of falls in 2010 was \$28 billion dollars.⁸ Even without injuries, older adults who have fallen often develop a fear of future falls and therefore may become less active.⁹ The high rate of falls in the elderly, which frequently leads to debilitating injuries such as hip fractures and intracranial hemorrhages (ICH), raises a significant public health dilemma. Questions arise such as suitability to return to home versus placement in a nursing home or assisted living. The availability of long-term care facilities is a significant issue, especially in some of the more rural counties. In addition, placing elderly patients who may be at risk for falls on anticoagulating agents for comorbid conditions also represents a treatment dilemma. This study sought to characterize injuries occurring as the result of falls in elderly adults in the state of WV during 2010 using data from the WV State Trauma Registry. Specifically, we examined age, gender, location of fall, mortality, emergency department and hospital disposition, as well as patterns of injury in these patients.

Objectives

Falls are the leading cause of injury in older West Virginians. The goal of this article was to investigate the injury patterns, resource utilization and discharge dispositions of older West Virginians who were injured in a fall. We discuss some of the dilemmas older West Virginians, their families and health care providers face in trying to prevent these injuries.

Methods

Design and Setting

The current research is a descriptive, retrospective cohort study of data extracted from the West Virginia Trauma Center System statewide registry for the year 2010. Thirty-three acute care hospitals in West Virginia continually submit medical records information for all trauma patients seen and treated at the centers for inclusion in the registry. This study was approved by the West Virginia University Institutional Review Board (Protocol Number H-23492).

Selection of Cases

Cases were included in the analyses if "Fall" was present in the Blunt Cause of Injury field and if age was greater than 65 years in the abstraction forms. Age, gender, location of fall, disposition

from the emergency department, disposition from the trauma center and injury frequencies and percentages were analyzed.

Data Analysis

Descriptive statistics, such as means and standard deviations and frequencies and percentages, were calculated for each study variable. Data were analyzed using SPSS version 19 (SPSS Inc., 2011, Chicago, IL).

Results

In 2010, there were 6604 patients aged 65 or older who were enrolled in the West Virginia State Trauma Registry. Of these, 5498 (83.3%) of these patients were injured in a fall. Their ages ranged from 65 to 105 with a mean age of 80.5 years ($SD = 8.2$). Approximately 72% (3974) of the cases were female and almost 28% (1524) were

male. Table 1 displays the gender differences and age distribution by five year intervals. The gender disparity continues to widen with increasing age. Most (86.5%) of the falls occurred at the primary residence (home or residential institution) of the senior (Table 1).

Less than 1% (35) of the seniors evaluated with a trauma team activation in the emergency department went home from the emergency department (Table 2). The majority (78.4%) were admitted to a floor bed, 8.5% of the patients were admitted to the ICU, 3.7% were admitted to step-down and 2.9% went directly to the operating room from the emergency department. The disposition following admission to the trauma center was as follows: 37.3% went home, 36.9% went to a skilled nursing facility, 13.1% went to a rehabilitation facility, 4.1% went to a residential institution

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For more information, contact Jeff Lilly at **304-255-3557**.

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Table 1. Demographics and Location of Injury

Age and Gender Distributions			
Age Range	Number (%)	Female (n, %)	Male (n, %)
65-69	662 (12.0)	423 (63.9)	239 (36.1)
70-74	810 (14.7)	540 (66.7)	270 (33.3)
75-79	921 (16.8)	668 (72.5)	253 (27.5)
80-84	1266 (23.0)	937 (74.0)	329 (26.0)
85-89	1044(19.0)	760 (72.8)	284 (27.2)
90-94	631 (11.5)	511 (81.0)	120 (19.0)
95-99	144 (2.6)	115 (81.6)	26 (18.4)
Total All Ages	5498	3974 (72.3)	1524 (27.7)

Location of Injury Distributions		
Location	Number	(%)
Home	4133	(75.2)
Residential Institution	621	(11.3)
Public Building	238	(4.3)
Street	79	(1.4)
Other*	427	(7.8)

*Includes locations of "farm", "industry", "mine", recreation", "unknown" and "unspecified"

and 3.3% died. Disposition from the emergency department broken down by five-year age groups and for all ages can be seen in Table 2.

When disposition from the trauma center was analyzed by 5-year age intervals, significant

trends were noted with increasing age (Figure 1). A steady decline in the number of persons able to return to their home is noted as is a steady increase in the number of persons going to skilled nursing facilities. These trends are seen up

to age 95, where a variance is noted in the patients aged 95 and older.

Frequencies and percentages of various injuries sustained during falls can be seen in Table 3. The five most common injuries sustained were femur fractures (36.3%), intracranial hemorrhages (8.2%), head and neck soft tissues injuries (6.9%), and forearm (6.3%), lower leg (6.1%), and upper arm (6.0%) fractures/dislocations.

Discussion

In 2010, for persons over the age of 65 enrolled in the WV State Trauma Registry, the number one cause of injury was a fall (83.3%). The most common place for these falls to occur was in the primary residence of the individual, with 75.2% of falls occurring at home and 11.3% in a residential institution. Ambulatory residents of long term care facilities are at increased risk of falling compared to community dwelling seniors, although patients in these long term care facilities probably have a higher level of functional decline than those living at home.¹⁰ Many older West Virginians

Table 2. Disposition from the Emergency Department by Age

Disposition (n %)	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100+	All Ages
Home‡	11 (1.7)	8 (1.0)	5 (0.5)	6 (0.5)	3 (0.3)	2 (0.3)	--	--	35 (0.6)
Admit to Floor*	470 (71.0)	606 (74.7)	700 (76.0)	1016 (80.2)	849 (81.3)	529 (83.8)	123 (87.2)	18 (82.3)	4312 (78.4)
Admit ICU	63 (9.5)	74 (9.1)	90 (9.8)	100 (7.9)	93 (8.9)	45 (7.1)	3 (2.1)	2 (8.7)	470 (8.5)
Admit Step-down	25 (3.8)	25 (3.1)	35 (3.8)	45 (3.6)	36 (3.4)	29 (4.6)	5 (3.5)	2 (8.7)	202 (3.7)
Other†	41 (6.3)	48 (5.9)	38 (4.1)	41 (3.3)	14 (1.3)	6 (0.9)	1 (0.7)	--	189 (3.4)
To Operating Room	32 (4.8)	27 (3.3)	2 (0.2)	30 (2.4)	27 (2.6)	7 (1.1)	--	--	157 (2.9)
Transfer	20 (3.0)	21 (2.6)	18 (2.0)	28 (2.2)	21 (2.0)	13 (2.1)	9 (6.4)	--	130 (2.4)
Morgue	--	1 (0.1)	1 (0.1)	--	1 (0.1)	--	--	--	3 (0.1)
Total	662	810	921	1266	1044	631	141	23	5458

* Includes dispositions of "floor", "observation" and "telemetry"

† Includes dispositions of "unknown", "AMA", "n/a", "other in-hospital location", "outpatient clinic" and "other"

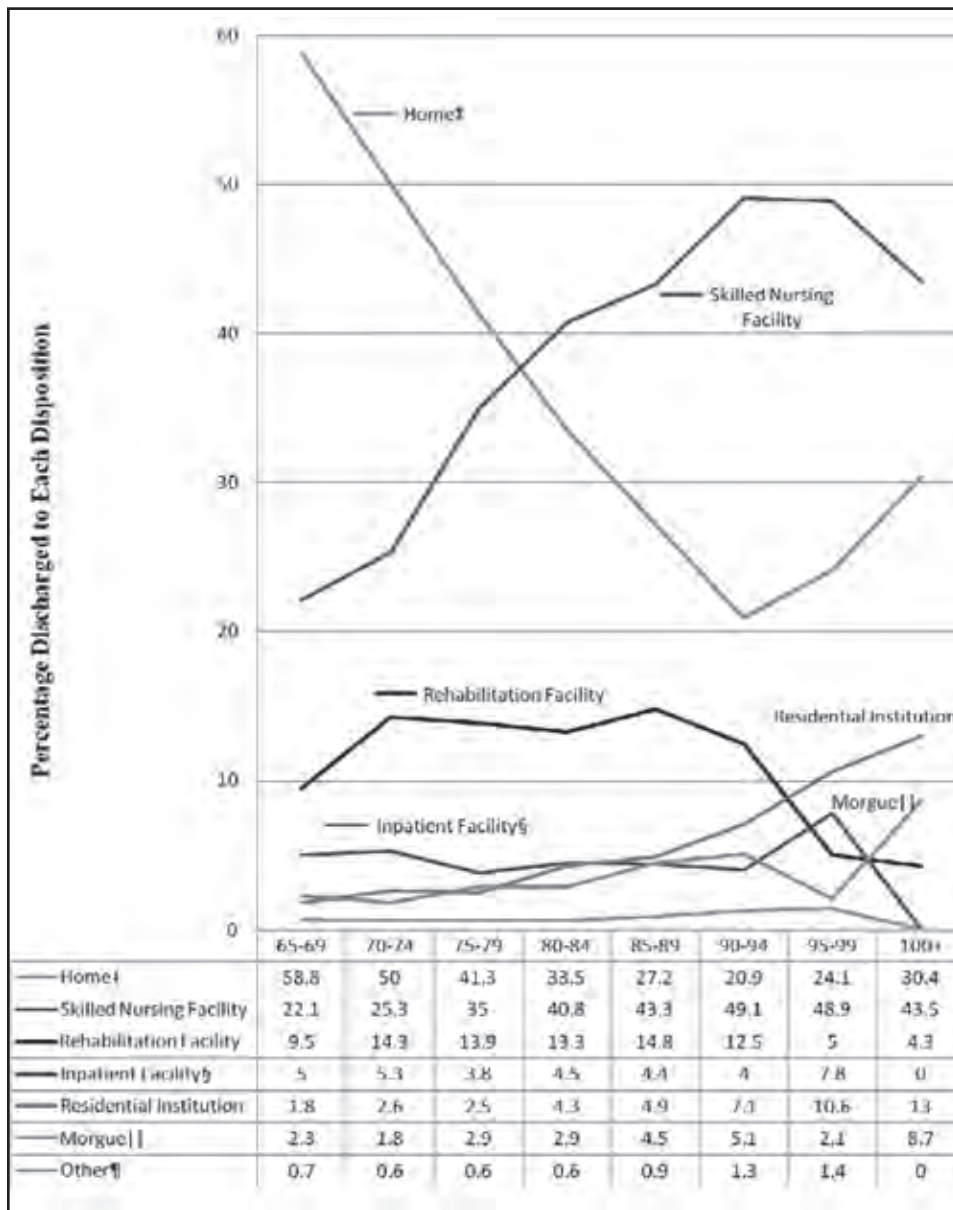
‡ Includes dispositions of "home, no assistance" and home, health care", "home, rehab outpatient" and "jail/prison"

§ Includes dispositions of "acute care hospital", "ICF" and "psych facility"

|| Includes dispositions of "morgue/funeral home" and "medical examiner"

¶ Includes dispositions of "unable to complete treatment/AMA" and "other"

Figure 1.
Hospital Discharge Disposition by Five Year Age Ranges



may not have access to assisted living housing options in the more rural communities near to where they have family and community support. This may prevent at-risk older individuals from transitioning to safer housing options when their fall risk increases. Retrofitting older homes to mitigate fall risks can be very expensive and financially out of reach for seniors on fixed incomes.

In our study, the most common injuries were femur fractures, intracranial hemorrhages, and

head and neck soft tissue injuries. Hip fractures in the elderly carry significant associated morbidity and mortality. Twenty percent of patients with a hip fracture will be dead within two years of that injury.¹¹ Limitations of subsequent ambulation and mobility are often the reason these individuals cannot return to their home after the fall. This limitation in mobility further leads to an increased risk of infection and thrombo-embolism that is

central to the increased mortality that follows a hip fracture.

ICHs likewise have significant associated morbidity and mortality. West Virginia has the highest prevalence of heart disease in the nation. With this heavy burden of heart disease, many older West Virginians are on some form of antiplatelet or anticoagulant therapy. Antithrombotic therapy increases the risk of ICH with even minor trauma, and complicates treatment of such patients with ICH. As the risk of fall is a significant concern in older patients, the decision to initiate and maintain a patient with cardiovascular disease on antithrombotic therapy clearly must involve a complicated risk-benefit analysis. For patients with known atherosclerotic disease and atrial fibrillation, antithrombotic therapy has strong evidence to support its use. The 2011 American Heart Association/ American College of Cardiology Foundation Guidelines for secondary prevention of atherosclerosis recommend aspirin therapy (75-162 mg/day) for all patients with coronary artery disease (CAD) unless contra-indicated (Class I, Level of Evidence A).¹² If a patient with CAD is allergic to aspirin, clopidogrel (75 mg/day) is recommended (Class I, Level of Evidence B). Patients who have had an ischemic stroke or TIA and atherosclerosis should be treated with aspirin alone, clopidogrel alone or aspirin and extended-release dipyridamole (Class I, Level of Evidence B). Antiplatelet therapy is preferred to anticoagulant therapy for prevention of secondary atherosclerotic disease unless there is significant reason to initiate anticoagulant therapy (i.e., atrial fibrillation, prosthetic heart valve, venous thromboembolic disease, left ventricular thrombus). In these patients, the addition of warfarin to low dose aspirin is

Table 3. Injury Distributions

Diagnosis	Number with injury	Percent with injury
Femur Fracture	1996	(36.3)
Intracranial Hemorrhage *	448	(8.2)
Head and Neck STI †	379	(6.9)
Forearm Fracture	347	(6.3)
Lower Leg Fracture	333	(6.1)
Upper Arm Fracture	332	(6.0)
Pelvis Fracture	247	(4.5)
Concussion ‡	224	(4.1)
Lower Leg STI	202	(3.7)
Rib Fracture	179	(3.3)
Lumbar Spine Fracture	120	(2.2)
Upper Leg STI	93	(1.7)
C Spine Fracture	88	(1.6)
T Spine Fracture	86	(1.6)
Upper Arm STI	67	(1.2)
Trunk STI	62	(1.1)
Facial Fracture	51	(0.9)
Forearm STI	45	(0.8)
Skull Fracture	43	(0.8)
Hand Fracture	35	(0.6)
Hand STI	25	(0.5)
Intra-abdominal Injury §	22	(0.4)
Intra-thoracic Injury	21	(0.4)
Foot Fracture	19	(0.4)
Foot STI	5	(0.1)

* Includes: subdural hemorrhage, subarachnoid hemorrhage, intra-parenchymal hemorrhage, epidural hematoma and cerebral contusion

† Soft tissue injury (STI) includes: lacerations, contusions, abrasions, hematomas and tissue avulsions to the body area. STI excludes fracture to the body area.

‡ Includes: loss of consciousness and concussion

§ Includes: liver laceration, bowel injury, aortic injury

|| Includes: pneumothorax, hemothorax, myocardial contusion

recommended (Class I, Level of Evidence A). Warfarin therapy, in combination with aspirin or clopidogrel, has an increased risk of bleeding (Level of Evidence A).¹² Evidence to support antithrombotic therapy to prevent atherosclerotic events in patients without documented disease is less clear.

Once a patient develops an unsteady gait or has a history of falls, any antithrombotic therapy should be re-evaluated for clear benefit

that outweighs the substantial risks for ICH related to falls. Patients on warfarin therapy have more intracranial hemorrhages after trauma, even relatively minor trauma and have nearly twice the chance of dying subsequent to these injuries and overall and may develop worse functional outcomes.¹³⁻¹⁵ These facts suggest there is likely a subset of patients in which the risk of fall with hemorrhage outweighs the benefit of anticoagulant therapy.

Modalities of Prevention

Identification of older individuals at risk for falling is the first step in preventing injury from falls. All older adults should be screened every year for risk of falling. Table 4 summarizes screening questions to identify persons at risk for falling as well as interventions that may help prevent falls.¹⁶

Multimodal fall prevention interventions have been shown to be most effective in reducing falls in the elderly.¹⁶ Polypharmacy and the use of psychotropic medications in the elderly are well documented as a risk factor for falls. Reducing the total number of medications and/or eliminating/reducing certain psychotropic medications have been found to reduce falls. The Beers list and the STOPP criteria are two attempts at outlining inappropriate medications for the elderly.^{17,18} Individualized exercise programs focusing on improving balance, strength, flexibility, endurance and coordination are effective in reducing falls.

Management of bradycardic and tachycardic heart rhythms, postural hypotension and podiatric concerns are all effective parts of a multifactorial approach to fall reduction. Vitamin D supplementation, even in those who are not deficient in this vitamin, has shown to be beneficial. The identification of home fall hazards with subsequent modification of the home environment has mixed support when used in isolation but has strong support when used as part of a multifactorial approach. Based on the available body of evidence, it is unclear whether correction of visual impairment reduces falls.¹⁶

Limitations

One limitation of our data set is that we do not have long-term follow-up for the patients. Thus,

Table 4. Fall Risk Screening and Prevention Interventions Summary¹⁶

<u>Screening Questions</u>
<ul style="list-style-type: none"> • Have you fallen more than twice in the last year? • Are you here for treatment of an acute fall? • Do you have problems with walking or balance? <p>Any “Yes” answer requires further evaluation and intervention.</p>
<u>Fall Prevention Interventions</u>
<ul style="list-style-type: none"> • Medication Review and Reduction • Individualized Exercise Program • Correct Visual Impairments • Management of Orthostatic Hypotension • Cardiac Rate and Rhythm Control • Supplement Vitamin D • Foot and Footwear Optimization • Eliminate Environmental Hazards • Patient and Caregiver Education

Note: Modified from Reference 16.

it is difficult to draw conclusions as to whether or not sending these patients to a rehabilitation setting has a beneficial effect on long-term outcome, especially on their ability to return to their home. Another limitation is that this data were collected from hospitals participating in the WV State Trauma Registry, which are only 33 of the 52 acute care hospitals in the state. Higher acuity patients that are initially seen at the nonparticipating hospitals were likely transferred to higher level of care facilities, which primarily do participate in the trauma registry, thus capturing these patients in the data. However, the minimally injured patients that were seen and discharged home from non-participating hospitals are not captured, so the current study may have underrepresented the number of minimally injured patients.

Conclusion

Falls can be prevented in older individuals.¹⁰ Patients who present to

the health care system for treatment of a fall or with a complaint of gait or balance disturbance should be screened for fall risk. Mitigation of fall risk factors in the patient and environment and education about the risk of falling can likely reduce the risk of subsequent injury. Correction of vision deficits, minimization of medications, management of cardiac rhythm disturbances and orthostatic hypotension and implementation of an exercise program can reduce the risk of falls in older adults.

Evaluating the home environment for fall hazards and initiating a hazard mitigation program should be part of an integrated fall prevention intervention for older individuals. Transiting to a safer, assisted living situation should be considered if fall hazards cannot be adequately remedied at home. The decision to leave one’s home for a safer living situation is a deeply personal and emotional decision. Many older individuals would prefer to be “less safe” and in “their

own home” than move away from friends and family and the home they have known for decades.

Exercise programs can decrease the risk of falling in older individuals. Exercise can improve balance, flexibility, strength and cardiovascular endurance. Exercise programs have been shown to work best when implemented with other fall prevention interventions. Older West Virginians on antiplatelet or anticoagulant medications who are at significant risk for falls present challenging treatment decisions for patients, families and care providers. The evidence for the use of antithrombotics in the treatment of various atherosclerotic diseases is compelling, but the consequences of these same medications in the face of trauma due to falls can be devastating.

Acknowledgement

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CME POST-TEST

1. Select the best answer to the following question: What percent of older West Virginians, injured in a fall and admitted to a participating WV Trauma Center Hospital had intra-cranial hemorrhages?
 - a. 5.1%
 - b. 8.2%
 - c. 14.6%
 - d. 22.1%
2. The most common place for a West Virginia senior citizen to fall is?
 - a. A residential institution
 - b. A street or public walkway
 - c. Their home
 - d. A public building
3. Select the best answer regarding trauma center disposition for all ages of senior West Virginians:
 - a. 37.4% were discharged home and 36.9% were discharged to skilled nursing facilities
 - b. 22.1% were discharged home and 44.9% were discharged to skilled nursing facilities
 - c. 55.2% were discharged home and 22.1% were discharged to skilled nursing facilities
 - d. 18.8% were discharged home and 54.9% were discharged to skilled nursing facilities

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Immunizations for Adults and Children

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Introduction

Vaccines represent the most important medical advance of the twentieth century. The time has passed when large numbers of children and adults suffered serious, life threatening illness from viruses including poliovirus, measles virus, influenza viruses, hepatitis B virus and varicella zoster virus or faced lifelong disability or death from bacterial infections including *Hemophilus influenzae*, meningococcus and pneumococcus, all infections that can be prevented now by effective vaccines.

In this review, we discuss various aspects of vaccines for children and adults, including a description and recommendation of new vaccines, the importance of and improvements in established vaccines, and overcoming obstacles such as ethical dilemmas and office dynamics to improve uptake. We include two summary tables, Table 1 and Table 2, which highlight vaccine immunization schedules for children and adults, respectively.¹

Herpes zoster vaccine (Zostavax)

Key points: Zostavax is now approved for patients aged 50-59 years. This age range has a better

response with a 70% reduction in risk of getting shingles. It is not necessary to check varicella titers before giving the vaccine.

Approximately 1 in 3 people in the United States become ill with herpes zoster or shingles and 10-18% develop post-herpetic neuralgia, a devastating chronic pain syndrome. Zostavax became available in 2006.² It reduces the risk by one-half of shingles and by two-thirds the risk of post-herpetic neuralgia in immunized patients over age 60. Zostavax is not helpful in treating shingles or post-herpetic neuralgia. It can be administered to patients who previously had shingles as they experience a 3% recurrence rate. Persons with compromised immune systems and persons allergic to neomycin and gelatin should not take this vaccine.

Hepatitis A vaccine

Key points: Everyone over age 1 can get this vaccine.

Hepatitis A virus (HAV) causes foodborne illness that usually lasts 2 months; however, 10-15% last up to 6 months. In rare cases, acute liver failure and death ensue. From 1998 to 2008, 227 cases of HAV were reported in West Virginia.³ In 2007, outbreaks of HAV occurred in Pendleton and Wirt Counties and, in 2010, an outbreak occurred among 11 people in Cabell County, WV, and nearby Boyd County, KY.

Although HAV is not required for children in schools or daycare centers, it is a good idea to vaccinate everyone over age 1 year. It is especially recommended for persons over age 18 that provide a home or day care for an international adopted child, men who have sex with men, illicit drug users, people with chronic liver disease from other causes, travelers to countries with high prevalence of HAV and researchers working with HAV.⁴

Hepatitis B vaccine

Key points: Anyone not in a monogamous sexual relationship should get this vaccine. Those born after 1991 have probably had it as part of routine childhood vaccination.

What's New: The ACIP now recommends Hepatitis B vaccine for diabetics especially those aged 19-59 with their increased risk being due to contaminated glucose monitoring equipment.

Hepatitis B virus (HBV) causes an acute illness with anorexia, diarrhea and vomiting and a chronic illness that can lead to cirrhosis, liver cancer, and death. Since 1991, newborns in the United States routinely receive their first dose of hepatitis B vaccine within 12 hours of birth, a program that decreased by over 95% the incidence of acute HBV illness among children.⁴ Because HBV is transmitted by blood and body fluids, anyone who is sexually active is at risk and

Objectives

1. Be able to describe recent changes in adult and pediatric vaccines.
2. Be able to apply knowledge about vaccines to clinical practice.
3. Be aware of recent outbreaks of certain vaccine preventable diseases in West Virginia.
4. Be able to improve office mechanics to improve vaccine uptake.

persons at highest risk include sex partners and household contacts of those infected with HBV, men who have sex with men, intravenous drug abusers, healthcare workers, dialysis patients and travelers to countries with a high prevalence of HBV. Patients with HIV infection, chronic liver disease and diabetes should be vaccinated. A recombinant vaccine, hepatitis B vaccine involves insertion of the HBsAg gene using plasmids into yeast or mammalian cells; anyone with a life-threatening allergy to Baker's yeast should not receive the vaccine.

Tetanus & Diphtheria Toxoids & Acellular Pertussis Vaccine (DTP/TT/Td/Dtap/Tdap)

What's new: All healthcare personnel should receive a single dose of Tdap regardless of the time since last Td dose. Tdap should be administered during the second or third trimester to pregnant women or immediately postpartum.

— Adults who have close contact with an infant less than 1 year old should have a Tdap.

— All adolescents and adults can have one Tdap in place of their usual tetanus booster.

Although only 3 cases of tetanus have been reported in WV from 1999-2008 and no cases of diphtheria, there have been 288 cases of pertussis or whooping cough (Figure 1).³ Adults either vaccinated against pertussis or having the disease in childhood show waning immunity, become susceptible to the disease and can transmit the disease to infants under 1 year who have not yet developed full immunity. During 2001-2003, 28,998 cases of pertussis were reported in the United States.⁵ In the older DPT vaccine, the pertussis component was derived from killed bacteria and it caused many serious adverse reactions in children. Recently, an acellular pertussis component was incorporated into

the vaccine (DTaP for children less than 7 years old and Tdap for people over 11 years old) that elicits few adverse reactions. Td should be administered to adults every 10 years provided they previously received one Tdap as an adult. TT is given to adults who are allergic to the diphtheria portion of the vaccine.

Pneumococcal Vaccine PPV23 for Adults and PCV13 for Children

Key Points: The maximum number of doses of Pneumovax (PPV23) an adult should receive is two.

What's New: Asthma and smoking are now considered in the chronic medical condition category and adults with either of these risk factors get two doses, one before age 65 and one after age 65 years of age.

PCV13, a conjugated vaccine, is the new standard of care vaccine for children.

PCV13 is now FDA approved for people over age 50 but ACIP has not yet made recommendations.

Streptococcus pneumoniae causes serious disease among children and adults, with younger children and older adults most at risk.⁶ In WV from 1999 to 2008, 1,932 cases of invasive pneumococcal disease (IPD) were reported (Figure 1).³ The current vaccine, comprised of 23 polysaccharides or PPV23, was licensed in 1983.⁷ Adults of average risk should receive only one dose of PPV23 after the age of 65 years. Adults with chronic medical conditions including heart disease, chronic lung disease, diabetes mellitus, alcoholism, cerebrospinal fluid leaks and cochlear implants should receive one dose before age 65 and one after age 65, provided at least 5 years have elapsed between the two doses. Immunocompromised adults should receive two doses five years apart; both doses can be given before the age of 65 years. Immunocompromised children who

receive PPV23 before age 10 can receive a second dose three years later and those who receive their first dose after 10 years of age can receive a second dose five years later. Elderly patients should receive only one dose of PPV23 after 65 years of age, as the modest antibody responses to second doses do not warrant them.

Protein-conjugated pneumococcal polysaccharide vaccine (PCV7) for infants and children was introduced in 2000 as one of the regularly scheduled immunizations for infants starting at age 2 months for the prevention of otitis media and invasive pneumococcal disease (IPD). The vaccine comprised of seven polysaccharides, each conjugated to minute amounts of diphtheria protein, induced higher antibody responses. It led to a significant decline in all IPD cases, especially in childhood IPD, due to the seven serotypes in PCV7, and a significant decline of IPD in adults due to the same serotypes, probably through decreased spread of these serotypes from grandchild to grandparent.⁸ As five of the seven serotypes in PCV7 (6B,9V,14,19F,23) can develop penicillin resistance, the number of cases of penicillin resistant IPD also decreased. In 2010, PCV13 supplanted PCV7 as the routinely used pneumococcal vaccine for infants and children. PCV13 contains 13 pneumococcal serotypes and offers wider protection against IPD.⁷

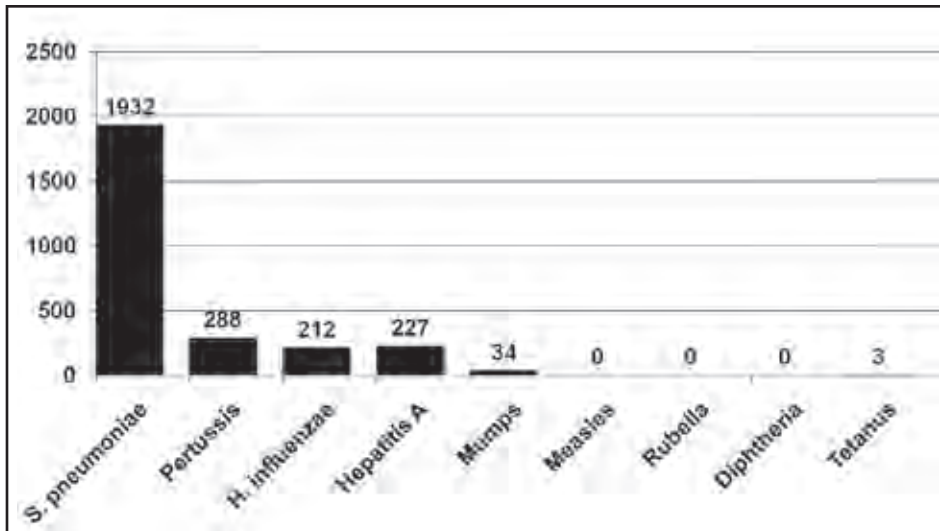
Influenza Vaccine

What's New: Since 2010, all people over age 6 months should receive the influenza vaccine. New preparations include the high dose influenza vaccine for those over age 65, intradermal vaccine, and a quadrivalent live attenuated vaccine. The H1N1 strain is included in the 2011 vaccine.

The two seasonal influenza vaccines are a trivalent inactivated vaccine and a live attenuated influenza virus vaccine (LAIV) that

Figure 1.

Cumulative cases of selected vaccine preventable diseases in West Virginia, 1999-2008.



typically contain two type A strains and one type B strain; the included vaccine strains change annually.⁹ The inactivated virus vaccine comes in three CDC approved formulations: an intramuscular injection approved for ages 6 months and older, a high-dose injection approved for ages 65 years and older and an intradermal injection approved for ages 18-64 years. The high-dose vaccine contains four-fold as much antigen as the traditional flu shot and produces a stronger immune response in older persons. The intradermal injection employs a needle that is 90% smaller than the needle used for the intramuscular injection and contains 40% less antigen. LAIV, a nasal spray, is approved for healthy individuals 2-49 years of age. Immunocompromised persons should not receive LAIV. The first quadrivalent seasonal influenza vaccine was approved in February 2012. It contains two Type A and two Type B strains. The quadrivalent vaccine is an LAIV which is also administered intranasally and is approved for the same patient population as the trivalent LAIV.

In 2010, the Advisory Committee on Immunization Practices recommended for the first time that all persons aged 6 months and older

should receive influenza vaccine, unless contraindicated.⁹ Infants and children aged 6 months to 8 years who are receiving flu vaccine for the first time or who did not or may not have received a flu vaccine last year require two doses this season, at least 28 days apart. Infants and children aged 6 months to 8 years who received only one dose of flu vaccine during the 2010-11 season would normally be recommended to receive two doses this season; however, since the formulation of the vaccine is the same for the 2011-12 season as for the 2010-11 season, a child in the 6 months to 8 years age group who received at least one dose last year, only requires one dose this year.

People who should not receive influenza vaccine include those with a severe egg allergy, a severe reaction to influenza vaccine, a history of Guillain-Barre syndrome associated with administration of influenza vaccine and infants younger than 6 months of age. People with a moderate to severe illness with fever should delay immunization until they have recovered.

Poliovirus vaccine

Key point: There is only one poliovirus vaccine given at this time and it is the inactivated vaccine (IPV).

The immunization of infants, children and adults with poliovirus vaccine started in the late 1950's, initially with the Salk inactivated poliovirus vaccine (IPV) and then the Sabin oral poliovirus vaccine (OPV), virtually eliminating poliomyelitis in the United States during the ensuing decades. However, after a few cases of paralytic polio occurred among adults who had received OPV, the CDC discontinued routine use of OPV in 2000 and now all infants, children and adults receive IPV.⁴

Measles, Mumps, and Rubella Vaccine (MMR)

Key Points: MMR is a live vaccine and should not be given to severely immunocompromised people.

MMR vaccine is a trivalent vaccine containing three live attenuated viruses for protection against measles, mumps and rubella infections. During the ten years from 1999-2008 in WV, no cases of measles or rubella were detected and only 34 cases of mumps were reported (Figure 1). In 2011, sixteen outbreaks of measles were reported in the United States, the largest occurred in Minneapolis and among the 21 patients who contracted measles, 16 patients were unvaccinated.¹⁰

Varicella vaccine

What's new: Since 2006, two doses are recommended, one at 12-15 months and another at 4-6 years. It is now recommended for HIV positive children and adults with certain CD4 counts, namely lymphocyte percentages of 15-24% in children and CD4 counts greater than 200cells/microliter in adolescents and adults.

Routine varicella vaccine usage has decreased hospitalizations and deaths from this disease. Deaths occur mainly among immunocompromised patients. After identifying a shift in the peak incidence in age of varicella cases among those who

received the vaccine once as an infant, the CDC recommendation changed to include a second dose of vaccine at age 4-6 years.⁴

Human Papillomavirus vaccine (HPV2 and HPV4)

What's new: HPV4 (quadrivalent) is now recommended for boys aged 9-26 years to prevent genital warts.

Human papillomavirus vaccine (HPV, either bivalent or quadrivalent) is recommended for all girls starting at 11-12 years of age (range 9-26 years).¹¹ The quadrivalent HPV vaccine prevents infection with four serotypes included in the vaccine, two of which cause most cervical cancers and genital warts.

HPV4 is suggested for males 9-26 years of age to prevent genital warts and possibly head and neck cancer. It reduces the risk of anal intraepithelial neoplasia in men who

have sex with men. The recombinant vaccine is made in Baker's yeast, so anyone with a severe yeast allergy should avoid the vaccine. Syncope has been reported after vaccination so each vaccinee should be observed for 15 minutes.

Meningococcal Vaccine (MCV4-conjugate quadrivalent and MPSV4-polysaccharide quadrivalent)

What's new: Since 2010, the MCV4 vaccine is given as a two dose series, the first at age 11-12 years and a booster at age 16 years. Persons with asplenia and complement deficiency should receive a booster every 5 years. MPSV4 is for people over age 56 years.

The meningococcal vaccine, which contains four of the most common meningococcal antigens, protects against about 80% of meningococcal disease. College students in their first and second years, especially those

who live in campus dormitories, are at high risk of contracting the disease and many colleges now require proof of vaccination before attendance. The new requirements suggest a dose of vaccine within 5 years of starting college so those who received their first dose at age 11-12 should receive a booster after age 16 years.¹²

Hemophilus influenzae type B vaccine (Hib)

What's new: Widespread use of Hib conjugate vaccine nearly completely eradicated invasive disease and eliminated nasopharyngeal carriage.

Hib causes invasive disease and meningitis, with serious complications including mental retardation. Hib vaccine is available alone or in combination with other vaccines and need only be administered at 2, 4, and 6 months of age.⁴ A booster dose is administered at 12-15 months.

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Table 1. Recommendations for Routine Immunization of Children 0-8 Years of Age

Vaccine	Code	Number of Doses	First Dose at Age	Additional Doses at Ages	Notes
VIRUS VACCINES					
Hepatitis B	HepB	3	Birth	1-2m, 6-18m	Give HBIG within 12h of birth if Mother HbsAg positive
Hepatitis A	HepA	2	12-23 m	12-23m	Two doses at least 6m apart
Influenza, seasonal	Flu	2	6m-8y	At least 4w after first dose	First year receiving vaccine
		1	Over 8y	Annually	Administer one dose each Fall
Measles, mumps, rubella	MMR	2	12-15m	4-6y	Can give second dose before 4y if at least 4 weeks between two doses
Poliovirus, inactivated	IPV	4	2 m	4m, 6-18m, 4-6y	Final dose on or after 4y of age
Rotavirus	RV	3	2 m	4m, 6m	No dose at 6m if Rotarix given at 2 and 4m
Varicella	Var	2	12-15m	4-6y	Age 12m-12y need at least 3m between doses
BACTERIAL VACCINES					
Diphtheria, tetanus, pertussis	DTap	5	2m	4m, 6m, 12-18m, 4-6y	Need at least 6m between 2 nd and 3 rd doses
Haemophilus influenza type b	Hib	4	2m	4m, 6m, 12-15m	No dose at 6m if PedVaxHIB or Comvax given at 2 and 4m
Meningococcal	MCV4	1	2-6y	2-6y	High risk only
Pneumococcal	PCV13	4	2m	4m, 6m, 12-15m	Complete PCV7 series with PCV13

Rotavirus

What's new: There are now two approved vaccines, RV5 and RV1, both live oral vaccines and about 74-87% effective at preventing the disease. Intussusception is not increased in recipients.

Before vaccine, four of five children experienced rotavirus infection by age 5 and this illness accounted for 30-50% of hospitalizations among this age group.⁴ RV5, a live oral vaccine, shows 98% effectiveness in

preventing severe disease. RV1 appears to have similar rates of efficacy. RV1 has latex in the applicator and should not be administered to persons with latex allergy. RV5 is latex-free.

Ethical issues about vaccines

Parents who deny vaccines for their children, except for specific medical conditions confirmed by a physician, fail to act in the best interests of their children, religious beliefs notwithstanding. Physicians have an ethical responsibility to address their reasons for refusal and

explain the risk and benefit. School districts in every state require routine immunizations of children before they start kindergarten, an important ethical prevention program.

Some parents who refuse vaccines for their children, especially MMR, may worry that the vaccines cause autism. Unfortunately, that relationship was fostered by one group of researchers from the UK who published falsified data for personal gain.¹³ Subsequently, several studies provided evidence that refuted autism as an adverse event of immunization with MMR vaccine.¹⁴

Table 2. Recommendations for Routine Immunization of Adults

Vaccine	Code	Number of Doses	Age Range for Immunization	Notes
VIRUS VACCINES				
Hepatitis B	HepB	3	All adults at high risk 19 years and older, especially health care persons	Administer 2 nd dose 1 month later; 3 rd dose at least 2 months after 2 nd
Hepatitis A	HepA	2	All adults at high risk 19 years and older including travelers to countries with high endemicity	Two doses at least 6m apart
Influenza, seasonal	Flu	1	All adults 19 years and older	Annual immunization
Measles, mumps, rubella	MMR	1 or 2	19-49 years if unvaccinated	Persons who lack immunity
		1	50 years and older if unvaccinated	Persons who lack immunity
Human papillomavirus	HPV	3	Women 13-26 years, Men 9-26 years HPV4	Administer 2 nd dose 1-2 months later and 3 rd dose 6 months after 2 nd dose
Zoster	HZ	1	50 years and older	Administer to persons who have or have not had shingles
Varicella	VZV	2	19 years and older if unvaccinated or otherwise lack immunity	Persons who lack immunity
BACTERIAL VACCINES				
Diphtheria, tetanus, pertussis	Td, Tdap	1	19 to 64 years	1-time dose of Tdap, Td vaccine every 10 y
		1	65 years and older	1-time dose of Tdap Td vaccine every 10 y
Meningococcal	MCV4	1 or 2	55 years and younger	1 or 2 doses for pre-college students and booster every 5 years for high risk adults
	MPSV4	1	56 years and older	Single dose
Pneumococcal	PPV23	1 or 2	1 dose before age 65 years for high risk adults; 1 dose for all adults over 65 years	Second dose should be at least 5 years after first dose and after age 65 years

Recently, the US Court of Federal Claims ruled that the “theory of vaccine-related causation [of autism] is scientifically unsupported,” that thimerosal-containing vaccines do not cause autism.

How can we increase vaccine uptake?

Physicians should initiate office procedures that are proven to increase immunization rates. First, employ standing orders for influenza and pneumococcal vaccines for adults. We reported a retrospective study of standing orders for elderly patients that showed higher rates of immunizations than when individual orders were relied on at each visit.¹⁵ Second, communicate using reminders for un-immunized at-risk patients. Third, since Medicare data for the US and West Virginia show that only about two-thirds of elderly adults have been immunized with PPV23 we should take advantage of opportunities to promote this vaccine such as in the annual Medicare wellness visit and when patients present for their influenza vaccine. Even though PPV23 can be administered any time of the year, data collected in our practice showed that influenza vaccine season provided the trigger to remind physicians to offer PPV23.¹⁶ Finally, physicians should be advocates for vaccines and provide education

about their need as uncertainty about the need for H1N1 vaccine among elderly in 2009 prevented many of them from getting the vaccine.¹⁷

The admonition that “an ounce of prevention is worth a pound of cure” applies to vaccines more than any other medical advance. During the past six decades established and new vaccines pushed many viral and bacterial diseases into the background by preventing a myriad of serious illnesses and saving untold numbers of lives. The systematic, appropriate and conscientious use of vaccines among children and adults in West Virginia will promote their health and reduce serious disease among them.

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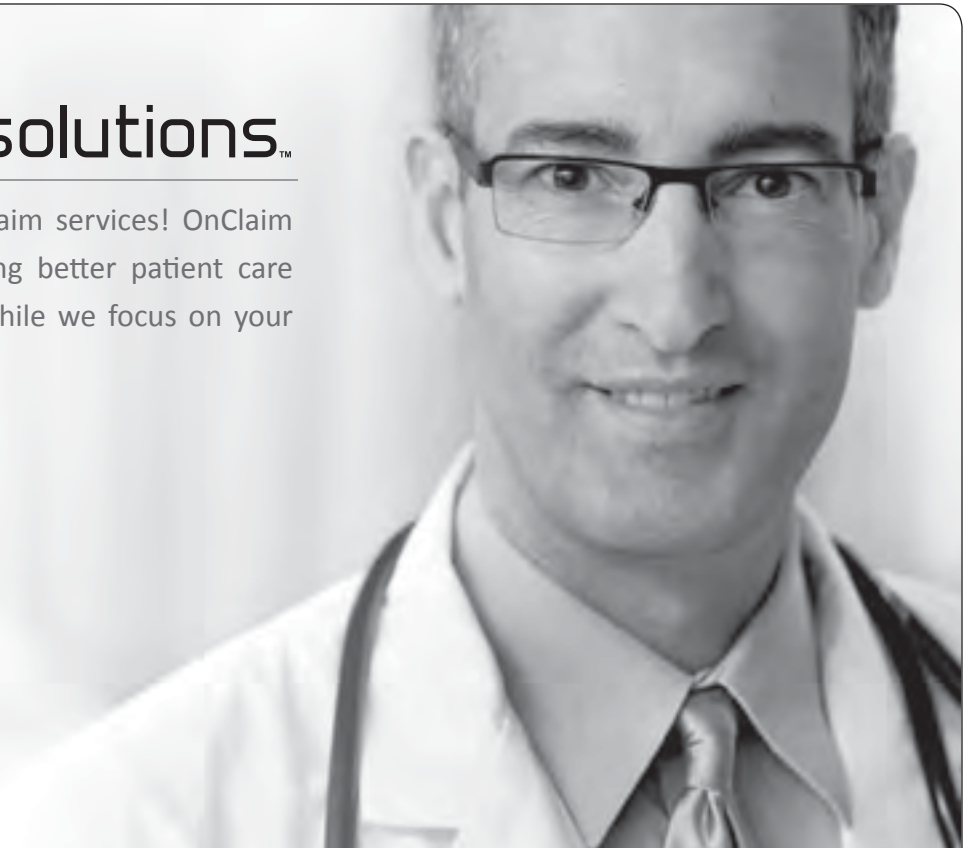
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CME POST-TEST

4. A 65 year old man with a history of hypertension only should receive the pneumococcal vaccine
 - a. every 5 years
 - b. 2 doses, 5 years apart
 - c. once
 - d. as PCV7 which is indicated for adults
5. Which is true about influenza vaccine?
 - a. It comes in a new high dose formulation for people over age 65 years
 - b. Live attenuated vaccine is given by injection
 - c. Live attenuated vaccine is for people over age 50
6. A 70 year old female has a new grandchild and asks about Tdap vaccine. Which is true?
 - a. She doesn't need it if she had whooping cough as a child
 - b. She needs to wait until 10 years after her last tetanus shot
 - c. She should not get it because it is not indicated over age 65
 - d. She should get it as soon as possible
7. People with fever and moderate illness should still get the vaccine that visit



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Screening Children for Hyperlipidemia by Primary Care Physicians in West Virginia

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Abstract

Background: Hyperlipidemia is a well known risk factor for coronary artery disease. Several studies have shown that the initial stages of atherosclerosis, one of the major manifestations of hyperlipidemia, may be present as early as age two. Despite this known risk, screening children for hyperlipidemia is sporadic at best. In 2008, the American Academy of Pediatrics (AAP) published a policy update with regards to recommendations for screening children for hyperlipidemia. The crux of the recommendation is to obtain a fasting lipid panel on children between the ages of two and ten with a known family history of hyperlipidemia, known traditional risk factors for cardiovascular disease (including a family history of premature CAD), and/or an unknown family history. This study was undertaken to assess the current practices of family practitioners and pediatricians in West Virginia with regards to screening for hyperlipidemia in children after the policy update.

Design and Methods: A thirteen item survey consisting of demographic questions and questions focusing on screening children for hyperlipidemia was constructed, pilot tested, and then distributed to practicing family practitioners and pediatricians all throughout West Virginia. A total of 178 family practitioners and 104 pediatricians returned a completed survey. The data was analyzed with regard to screening practices in general, as well as differences in screening related to practitioner type.

Results: Of the total sample of practitioners (n=282), 42% routinely offered screening for hyperlipidemia to

children between the ages of two and ten with any known traditional risk factors for cardiovascular disease. Pediatricians were statistically more likely to routinely offer screening according to the AAP guidelines than family practitioners. Additionally, 28% of the sample offered screening to children between the ages of two and ten with only a positive family history of hyperlipidemia. 40% of the sample was familiar with the new AAP policy update.

Conclusion: A minority of sampled practitioners offered screening for hyperlipidemia to children in concordance with the 2008 policy statement published by the AAP. This result may stem from lack of knowledge regarding the AAP guideline or the persistence of conflicting viewpoints regarding screening children for hyperlipidemia in general.

Introduction

Coronary artery disease continues to be the leading cause of mortality among adults in the United States.¹ The major underlying cause of CAD is atherosclerosis. There are several risk factors associated with the development of atherosclerosis, one of which is the presence of dyslipidemia. Elevated levels of low-density lipoprotein and triglycerides with or without concomitant depressed levels of high density lipoprotein have been repeatedly shown to be associated with the development of atherosclerosis in multiple adult based studies.¹

While coronary artery disease is a disease of adulthood, the initial stages of atherosclerosis begin in

childhood. The Bogalusa Heart Study analyzed the extent of atherosclerosis among deceased children during autopsy, and illustrated a strong association between the extent of atherosclerosis and LDL, HDL, and serum triglyceride concentrations in this age group.² As a result of this study, the National Cholesterol Education Program published a series of recommendations regarding screening children for hyperlipidemia in 1992 that was adopted by the American Academy of Pediatrics.³ They recommended selective screening for children who met the following criteria: a family history of coronary artery disease or myocardial infarction in a first degree relative less than 55 years of age, a family history of a parent with elevated total cholesterol (>240 mg/dl), or an unknown family history.³ The PDAY study, published in 2000, confirmed the association between dyslipidemia in youth and early onset atherosclerosis unearthed in the Bogalusa Heart Study.⁴

Despite this evidence, controversy exists for screening children for hyperlipidemia. In 2007, the United States Preventive Services Task Force gave lipid screening in children an "I" recommendation stating that "evidence is insufficient to recommend for or against routine screening for lipid disorders in infants, children, adolescents, or

Objectives

In 2008, the American Academy of Pediatrics released new guidelines with regards to screening children for hyperlipidemia. The authors undertook this study to assess the practices of screening children for hyperlipidemia by primary care providers in West Virginia with respect to these guidelines.

young adults (up to age 20).⁵ The USPSTF cites a lack of evidence regarding whether or not the identification and treatment of hyperlipidemia during youth, would necessarily improve cardiovascular outcomes in adulthood. Furthermore, they also cite the lack of evidence regarding the adverse effects of long term use of lipid-lowering medications during childhood.⁶

In 2008, the American Academy of Pediatrics published a policy update regarding lipid screening in children.⁷ In this policy statement update, the AAP stated that screening, in the form of a comprehensive fasting lipid profile, should be done at least one time between the ages of two and ten in the following individuals: those with a positive family history of dyslipidemia, those with a positive

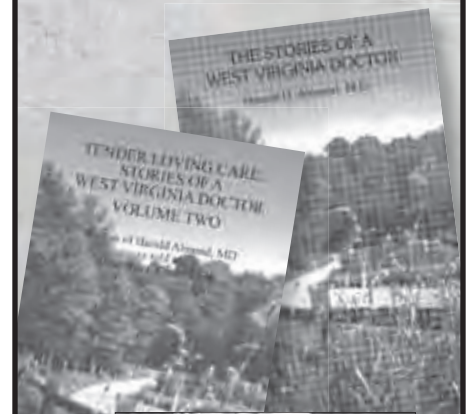
family history of premature CAD (≤ 55 years of age in men and ≤ 65 years of age in women), those with an unknown family history, or those with traditional cardiovascular risk factors already present (obesity, cigarette smoking, diabetes, hypertension).⁷ The guidelines also endorse the use of pharmacologic interventions, namely statins, at specific LDL thresholds given the presence of absence of CAD risk factors. Statins have been shown to be safe and well tolerated by children (de Jongh, Ose et al. 2002). As there is virtually little documentation regarding the screening practices among primary care providers, the authors undertook this survey based study to assess this. Additionally, we wished to assess whether or not primary care providers were

Table 1. Demographic Variables

Demographic variable	Number	Percent
Practitioner type		
Family Practice	178	63%
Pediatrician	104	37%
Average number of well child checks per day		
< 5 children	186	66%
5-10 children	53	19%
11-15 children	21	8%
16-20 children	12	4%
>20 children	9	3%
Years experience in practice		
< 5 years	47	17%
6-10 years	44	16%
11-15 years	35	12%
16-20 years	45	16%
>20 years	110	39%
Practice setting		
Community	195	69%
Private Hospital	13	5%
Academic	66	23%
Other	8	3%

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HISTORIC OLD-TIME WEST VIRGINIA



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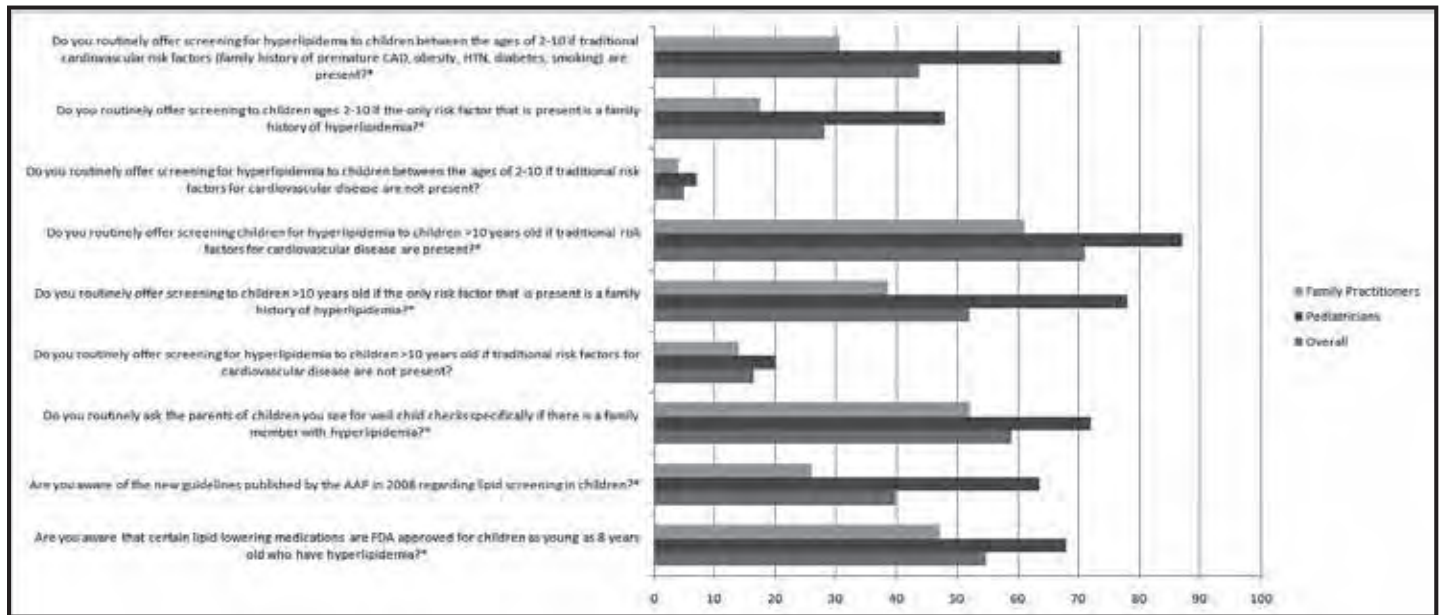
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Figure 1.
Proportion of “yes” responses to each question stratified by practitioner type.



familiar with the policy update as well as determine if they were aware of the use of lipid lowering medications in children.

Methods

This study was approved by the West Virginia University Institutional Review Board. A ten item questionnaire was created and initially pilot tested at West Virginia University. Thirteen individuals returned the initial questionnaire and after further analysis, three of the questions were slightly changed and an additional three questions were added. The final questionnaire can be seen in Appendix A.

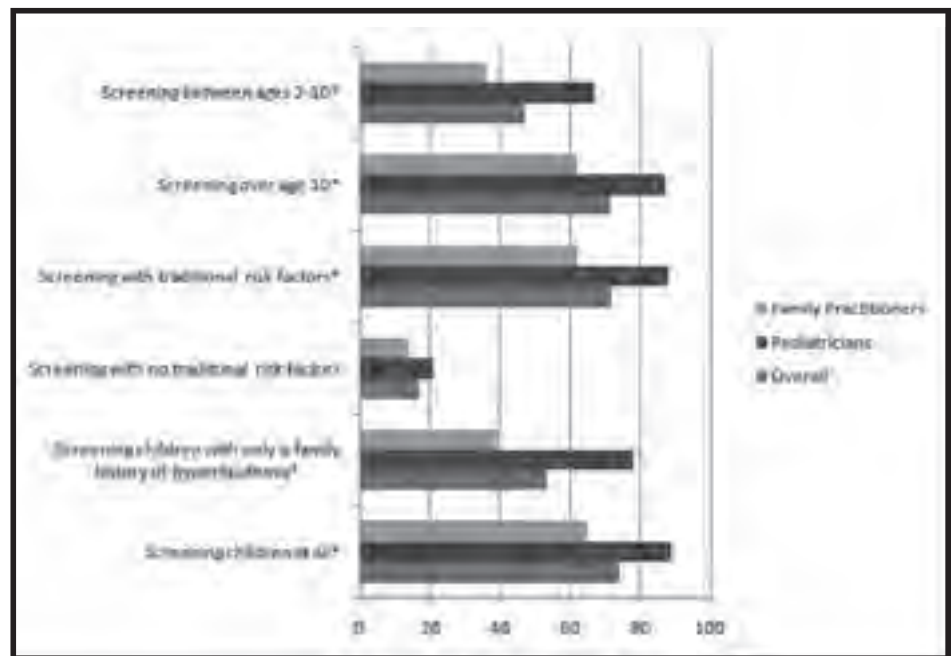
With the use of public databases, 215 general pediatricians and 453 family practitioners who currently practice within the state of West Virginia were identified. This survey was sent via hard copy to all of these practitioners as well as electronically to those who had email addresses readily available. Those who received a copy electronically as well as via traditional mail were asked to only send one completed survey back. Family practitioners

who completed a questionnaire but noted they did not see any children were excluded from the analysis. Furthermore, practitioners who were retired were also excluded. After excluding these individuals, a total of 187 pediatricians and 381 family practitioners were eligible. 104

pediatricians returned a completed survey for a response rate of 56% among pediatricians. 178 family practitioners returned a completed survey for a response rate of 47%.

SPSS version 11.0 was used for statistical analysis. General proportions were calculated for

Figure 2.
Proportion of practitioners who routinely offer screening for certain populations stratified by practitioner type.



each response. Additionally, chi-square analysis was used to look for statistically significant differences in screening practices between pediatricians and family practitioners. A p-value less than 0.05 was considered statistically significant.

Results

Table 1 depicts each of the demographic variables assessed in the questionnaire and their relative proportions. The majority of practitioners who returned a completed survey noted they saw <5 well child checks per day (66%). This is likely reflective of the fact that the majority of the practitioners in the sample are family practitioners (63%) with children as a minority of their patient population. The majority of practitioners had > 20 years of experience (39%) and practiced in a community setting (69%).

Figure 1 depicts the proportion of “yes” answers to each of the questions on the questionnaire stratified by type of practitioner. Pediatricians had a higher proportion of “yes” responses for all questions. A statistically significant difference was apparent for all questions except questions 7 and 10. The majority of pediatricians in the sample routinely offered screening to children ages 2-10 with traditional cardiovascular risk factors present (67%) as well as to children > 10 years old with traditional risk factors present (87%) and a family history of hyperlipidemia without other risk factors (78%). The majority of pediatricians in the sample were also familiar with the AAP policy update on lipid screening (64%) as well as use of lipid lowering medications in children (68%). Most pediatricians noted they routinely ask specifically if there is a history of

hyperlipidemia (78%). On the other hand, only children >10 years of age with traditional cardiovascular risk factors were routinely offered screening by the majority of family practitioners in the sample (61%). A minority of family practitioners were familiar with the AAP policy update on lipid screening (26%) as well as use of lipid lowering medications in children (47%). However, most family practitioners did ask specifically about a family history of hyperlipidemia (52%). Between both groups of practitioners, the least amount of screening was offered to children ages 2-10 without any traditional risk factors (5%) and the most amount of screening was offered to children aged > 10 years with traditional cardiovascular risk factors present (84%).

Figure 2 illustrates the overall screening practices of family practitioners and pediatricians with

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respect to specific patient populations contained within the survey. Pediatricians were statistically more likely than family practitioners to routinely offer screening for all categories except those children with no traditional cardiovascular risk factors. Very few practitioners routinely offered screening to children belonging to this category. Interestingly, 33% of pediatricians and 67% of family practitioners did not routinely offer screening to children between the ages of 2 and 10, which is part of the 2008 AAP policy update. Furthermore, 11% of pediatricians and 35% of family practitioners in the sample do not routinely offer screening for hyperlipidemia to children at all.

Discussion

The results of this survey-based study illustrate that screening children for hyperlipidemia appears to be a sporadic practice in West Virginia. With less than half of the sampled practitioners in the state screening children according to the guidelines within the new AAP policy update, it appears that this update has not yet been able to diminish the controversy surrounding this topic. Furthermore, nearly 25% of practitioners in the study did not screen children at all. Family practitioners in general, were less likely to screen according to the guidelines than pediatricians were. This may be due in large part to two separate factors: family practitioners' unfamiliarity with the new guideline and the fact that the American Academy of Family Practice has no official stance on screening children for hyperlipidemia.

It still remains unclear whether or not the portion of the AAP guideline related to age at first screening is absolutely essential. While most practitioners did not offer screening to children between the ages of

two and ten, the majority did offer screening to children over the age of 10. Does waiting until after the age of 10 to screen for and potentially identify hyperlipidemia contribute any potential morbidity to children? Interestingly, when looking at the guidelines for screening adults, all major agencies note that screening should take place at some point in time but they all differ on when the initial screening should take place.^{8,9}

This study is one of the first known studies to look at the practice of screening children for hyperlipidemia among primary care providers not only in West Virginia, but in the United States. A fairly reasonable sample size was able to be generated and a comprehensive picture of screening practices and knowledge among primary care providers was able to be painted.

However, there are a few limitations within this study. As with most survey-based studies, results are drastically influenced and limited by the survey response rate. Just over half of eligible pediatricians responded in our study. Furthermore, less than half of eligible family practitioners responded, but this is likely artificially low as many family practitioners who do not see children likely did not respond. Although the geographic spread of respondents was quite high within West Virginia, generalizing results to all practitioners in the state must be handled with caution given the modest response rate. Family practitioners did outnumber pediatricians within the study almost 2:1. While this in fact may represent the true proportion of these particular specialties in West Virginia, it also may have slightly skewed the results as family practitioners were less likely to screen children than pediatricians. Also, as with any survey-based study, practitioners

may have not answered with veracity as potential feelings of inadequate patient care may have surfaced while perusing the questions.

What does remain clear is that further studies regarding the outcomes of children who are diagnosed with hyperlipidemia are needed to help streamline guidelines for screening. Until then, controversy regarding this topic and concomitant sporadic screening practices will continue to exist.

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Appendix A

This is a questionnaire designed to look at pediatricians'/family practitioners screening practices for hyperlipidemia in children in West Virginia. Please place an "X" in front of your answer or circle the answer where applicable. Thank you very much for your time!

Questions 1-3 are basic demographic questions.

1. What county is your practice located in? _____ (Write in answer)
2. How long have you been in practice?
 <5 years 5-10 years 11-15 years 16-20 years >20 years
3. How many well child checks do you see in one normal clinic day?
 <5 children 5-10 children 11-15 children 16-20 children >20 children
4. Which term best describes your outpatient practice setting?
 Community Private Hospital Academic Other

For the following questions, the term "routinely" means over 50% of the time and "screening" means obtaining a fasting lipid profile.

5. Do you routinely offer screening for hyperlipidemia to children between the ages of 2-10 if traditional cardiovascular risk factors (family history of premature CAD, obesity, HTN, diabetes, smoking) are present?
 Yes No
6. Do you routinely offer screening to children ages 2-10 if the only risk factor that is present is a family history of hyperlipidemia?
 Yes No
7. Do you routinely offer screening for hyperlipidemia to children between the ages of 2-10 if traditional risk factors for cardiovascular disease are not present?
 Yes No
8. Do you routinely offer screening children for hyperlipidemia to children >10 years old if traditional risk factors for cardiovascular disease are present?
 Yes No
9. Do you routinely offer screening to children >10 years old if the only risk factor that is present is a family history of hyperlipidemia?
 Yes No
10. Do you routinely offer screening for hyperlipidemia to children >10 years old if traditional risk factors for cardiovascular disease are not present?
 Yes No
11. Do you routinely ask the parents of children you see for well child checks specifically if there is a family member with hyperlipidemia?
 Yes No
12. Are you aware of the new guidelines published by the AAP in 2008 regarding lipid screening in children?
 Yes No
13. Are you aware that certain lipid lowering medications are FDA approved for children as young as 8 years old who have hyperlipidemia?
 Yes No

CME POST-TEST

7. When should children be screened for hyperlipidemia if certain criteria are met according to the AAP?
 - a. At birth
 - b. Between the ages of 2 and 10
 - c. Between the ages of 5 and 15
 - d. Between ages 15 and 18
 - c. Fibrates
 - d. Niacin
 - e. All of the above
8. Which class(es) of lipid lowering agents is/are FDA approved for children with hyperlipidemia?
 - a. Statins
 - b. Bile-acid binding resins
9. Children with the following should be screened for hyperlipidemia according to the AAP?
 - a. Family history of premature CAD
 - b. Family history of hyperlipidemia
 - c. Obesity
 - d. Diabetes
 - e. All of the above

Interdisciplinary Treatment of Adolescent Eating Disorders in West Virginia

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Introduction

West Virginia consistently ranks among the top three states in the nation for prevalence of obesity for both children and adults. Obesity is a risk factor for eating disorders, with high premorbid rates of obesity for both Anorexia Nervosa (AN, 7-20%) and Bulimia Nervosa (BN, 18-40%).¹ While obesity is on the disordered eating spectrum and receives a good deal of attention, there are other eating disorders that do not. Like obesity, clinical eating disorders are a significant public health problem, yet they have largely been overlooked by the healthcare community.

The Diagnostic and Statistical Manual of Mental Disorders² diagnostic criteria for AN and BN are listed in Table 1. Individuals with AN maintain their low weight by either restricting food or compensating by exercising, vomiting, or other types

of purging. The average age of first onset of AN is 17, with 68% of cases beginning between ages 14-20.³ Ninety percent of AN cases are in females. BN is characterized by binge eating and self induced vomiting or other purging or compensatory behaviors. The average age of onset of bulimia nervosa is 21; however, 68% start between ages 15- 27.³ Eating Disorder Not Otherwise Specified has two main sub-groups: patients who do not meet full criteria for AN, and those with Binge Eating Disorder.³ Treatments for eating disorders include individual and family cognitive behavioral psychotherapy, nutritional counseling, and careful medical monitoring. Inpatient hospitalization either in a medical or psychiatric hospital may be necessary for patients who are severely malnourished.

Eating disorders may have serious consequences if left untreated. AN has the highest premature mortality rate of any psychiatric disorder (20-30%), yet only one-third of people with AN and 6% of those with BN receive mental health care.⁴ The Youth Risk Behavior Survey (YRBS) identifies youth at risk for the development of clinical eating disorders, and Table 2 reflects that many West Virginians suffer from disordered eating and pathological weight control behavior.⁵ While obesity is obvious to a physician, eating disorders are underreported

or disguised and are easily missed in a clinical exam. Once diagnosed, despite the high prevalence of disordered eating, there are limited treatment resources available in West Virginia, so physicians have few options for an in-state referral.

The Model Eating Disorders Treatment Team

Treatment of eating disorders should preferably include physicians, nutritionists, and psychologists/ social workers with specialty training in eating disorders. This multidisciplinary team should meet regularly to review cases and facilitate coordination of care for patients who are struggling. This allows for close monitoring of the patient's medical, nutritional, and psychological status and tailoring of treatment plans. The roles of team members are described below.

The Team Physician

The physician on an eating disorder team assists in establishing the diagnosis by ruling out medical conditions that can resemble eating disorders. The physician also evaluates medical complications, provides medical input on caloric and exercise prescriptions, prescribes appropriate medications and sets clear criteria for medical hospitalization. When a patient presents with weight loss and distorted body image an eating

Objectives

It is well documented that adolescents in West Virginia have a disproportionately high rate of obesity, but the rate of other dangerous eating disorders among our teens has been understated and overlooked. The present paper describes assessment and treatment interventions for youth at risk of eating disorders using a multidisciplinary team format, providing practical information for clinicians of all disciplines. The latter part of the paper will highlight the WVU-DECC program, reviewing the obstacles to building specialized treatment programs in our State and the importance of community outreach / prevention efforts.

Table 1. Diagnostic Criteria for Anorexia Nervosa and Bulimia Nervosa^a

Anorexia Nervosa	
A.	Refusal to maintain body weight in at or above a minimally normal range for age and height; weight of less than 85% of expected body weight (i.e., BMI < 17.5)
B.	Severe fear of gaining weight, although underweight
C.	Disturbance in body image (i.e., denies how serious the low weight is, body shape and weight highly influences evaluations of self)
D.	Absence of at least 3 consecutive menstrual cycles; if periods occur only following hormone treatment, she is considered to have amenorrhea (i.e., birth control pills)
Bulimia Nervosa	
A.	Episodes of binge eating, as characterized by
1.	Eating an amount of food that is definitely larger than most others would eat in a discrete period of time and in similar contexts (ex: entire pizza, multiple fast-food meals, entire carton of ice cream, entire pan of brownies)
2.	Sense of lack of control while eating during this episode (ex: belief that one cannot stop eating, cannot control what one is eating)
B.	Compensatory behaviors to prevent weight gain, including vomiting, laxative abuse, diuretics, enemas, diet pills, fasting, and excessive exercise
C.	Binge eating and compensatory behaviors occur at least twice per week for three months
D.	Weight and body shape are primary influences on one's self-evaluation
E.	Disturbance may not occur during episode of Anorexia Nervosa
^a Data from DSM-IV-TR ¹	

Table 2. Prevalence of Disordered Eating Behaviors and Attitudes from the YRBS (n=1100-1900)^a

WV High School Students	
Trying to lose weight	48.4%
Males	35.4%
Females	62.3%
Gone without eating for 24 hours to lose weight	13.7%
Taken diet pills, powders, or liquids without a doctor's advice to lose weight	7.0%
Vomited or took laxatives to lose weight	6.8%
WV Middle School Students (grades 6-8)	
Trying to lose weight	47%
Males	31.8%
Females	57.6%
Gone without eating for 24 hours to lose weight	20.8%
Taken diet pills, powders, or liquids without a doctor's advice to lose weight	6.3%
Vomited or took laxatives to lose weight	6.8%
^a Data from U.S. Department of Health and Human Services Centers for Disease Control and Prevention ¹	
^b Items were specified "within the last 30 days".	

disorder cannot be assumed. Up to half of teenage girls at any given time are trying to lose weight (Refer to Table 2); therefore the chance of someone having the onset of a medical condition coincidentally during the onset of dieting is high. Medical conditions commonly mimicking AN include inflammatory bowel disease (IBD)⁶ and Celiac disease (CD).⁷ For instance, both IBD and CD can present with weight loss as the prominent symptom. Non-specific symptoms such as fatigue, bloating, abdominal pain,

and altered bowel habits can be misattributed to malnutrition or diet pill and laxative use. Other medical conditions which can present with weight loss and mimic AN include diabetes mellitus, hyperthyroidism, Addison's disease, tuberculosis, human immunodeficiency virus infection and tumor.⁸ Evaluation for these conditions may be necessary depending on index of suspicion and associated symptoms. Usually, a complete blood count, erythrocyte sedimentation rate, C-reactive protein, chemistry panel including

albumin, and celiac serology are enough to suggest another diagnosis; if all of these are normal, the diagnosis is likely eating disorder.

The physician should provide a complete medical history and physical exam on the initial visit. Weight should be standardized and performed post void and in a gown. Urine may be collected for specific gravity; dilute urine suggests water-loading in order to artificially inflate weight. Regular monitoring of electrolytes, particularly in those who purge or misuse laxatives or diuretics, is essential. Physical markers associated with malnutrition are found in Table 3.

New patients are initially seen weekly while a treatment pattern is established. Patient's with AN and BN should be weighed at each appointment, and patients should not be weighing themselves at home between visits. Most patients should be informed of their weight. However, some patients are so anxious and fearful about any weight gain, it may be necessary to initially refrain from disclosing this information. Criteria for hospitalization have been established by the Society for Adolescent Health and Medicine⁸ and are shown in Table 4. With consistent and steady weight gain, visits change to every two weeks and then monthly. Semiannual medical visits for those in recovery are advised to evaluate for signs of and risk for relapse.

No specific medication promotes weight gain in AN. High dose fluoxetine (60 mg/day) as well as other serotonin reuptake inhibitors (SSRIs) have been demonstrated to decrease bulimic binge/purge cycles for persons with AN binge/purge subtype⁹ and with BN, though risk of relapse is high after cessation of the medication. Although antidepressant medications have not worked to promote weight gain, they are often prescribed for co-morbidities such as depression, anxiety or obsessiveness, and patients report improved mood.¹⁰ Short acting benzodiazepines

Table 3. Physical Examination and Laboratory Indicators of Malnourishment

<p>Physical Examination</p> <ul style="list-style-type: none"> • Lanugo hair (fine, downy hair on the back, trunk, arms and face) • Acrocyanosis (bluish discoloration of the hands and feet) • Scaphoid abdomen • Muscular atrophy • Breast atrophy in females • Bradycardia • Orthostatic tachycardia (increase in pulse of more than 20 beats per minute from lying down to standing) • Parotid enlargement in those who binge • Calluses on the backs of the knuckles (in those who self-induce vomiting; Russell's sign) • Sacral erosions (in those who perform excessive sit-ups) <p>Laboratory</p> <ul style="list-style-type: none"> • Hypogonadotropic Hypogonadism <ul style="list-style-type: none"> ○ Lowered follicle stimulating hormone ○ Lowered lutenizing hormone ○ Lowered estradiol • Thyroid stimulating hormone and T4 are usually normal, but T3 is low <p>Other Indicators</p> <ul style="list-style-type: none"> • Electrocardiogram on initial visit to evaluate degree of bradycardia and acquired prolonged QT interval • Bone densitometry may be ordered after 1 year of amenorrhea

Table 4. Criteria for Hospital Admission for Youth with Eating Disorders

<p>Anorexia Nervosa</p> <ul style="list-style-type: none"> - <75% ideal body weight or ongoing weight loss despite intensive management - Refusal to eat - Body fat < 10% - Heart rate < 50 beats per min daytime; <45 beats per min nighttime - Systolic pressure < 90 mm Hg - Orthostatic changes in pulse (<20 beats per min) or blood pressure (<10 mm Hg) - Temperature <96°F - Arrhythmia <p>Bulimia Nervosa</p> <ul style="list-style-type: none"> - Syncope - Serum potassium concentration < 3.2 mmol/L - Serum chloride concentration < 88 mmol/L - Esophageal tears - Cardiac arrhythmias including prolonged QTc - Hypothermia - Suicide risk - Intractable vomiting - Hematemesis - Failure to respond to outpatient treatment <p><small>^aData from Rosen, American Academy of Pediatrics Committee on Adolescence⁸</small></p>
--

can be prescribed at mealtime to suppress anxiety and food phobias. Medications associated with weight gain and appetite increase typically have no effect in AN. Lack of appetite is not why persons with AN eat so little. In fact, feeling victorious over hunger, a sense of exceptional willpower and self control are key psychological features of AN. Acid reducing medications are commonly prescribed to reduce esophagitis

due to purging, and multivitamin and calcium supplementation are recommended. Oral contraceptives have not been shown to support bone density in the presence of malnutrition, and therefore are not recommended to treat amenorrhea in eating disorders. Also, since oral contraceptives result in menses occurring at much lower weight, they interfere with evaluation of normal menstrual function, one of the key

indicators of physical and nutritional rehabilitation. This indicates that the AN patient has gained sufficient weight to return to the hormonal pattern of an adult female.

The Team Nutritionist

The nutritionist assists the treatment team and the patient and family to develop calorie and meal goals.¹¹ Specific tasks include providing education on food and nutrition issues, targeting and addressing specific disordered eating behaviors, continued monitoring of physical symptoms, and designing / implementing a nutritional treatment plan. Usually the nutritionist will require patients to keep detailed food logs. This team member should also collaborate closely with the physician by providing medical status updates and with the psychologist / social worker when the clinician identifies triggers, such as negative emotions, to binge eating or food restriction.

Calorie prescription in patients with AN should start low (somewhat more than their current daily calorie intake) and be increased approximately 200-500 calories per week. Patients are usually hypometabolic when they present for treatment, but the metabolic rate picks up quickly. For this reason and others, it is often necessary to eventually prescribe 3500-5000 calories/day to establish consistent weight gain of 1-2 lbs/week. If the initial prescription for calories is too high there is risk of noncompliance on the patient's part due to her/his fear of eating and weight gain. Although rare, there is also risk for re-feeding syndrome, which may result in potentially fatal hypophosphatemia, along with neurologic, pulmonary, cardiac, neuromuscular, and hematologic complications. In our Center we avoid rigid "goal weights" derived from standard weight charts. Rather, we look for physical and emotional signs that the patient has gained enough weight to have reached her/his individual set point weight range.

Table 5. Psychotherapy Treatments for Eating Disorders

Anorexia Nervosa	
•	Family Based Therapy ¹⁴
○	Evidence base: effective in producing full remission at the end of treatment as well as six- and 12-month follow-up ¹⁵
○	Therapist works with the family members to assist them in re-feeding their child to restore the patient's weight
○	Therapist conducts family sessions: parents are coached to use supportive but firm techniques during each meal; siblings are coached to provide emotional support and warmth
○	After weight regain is achieved, the therapist changes focus to assisting the adolescent to gradually assume more control over her eating decisions and to return to more normative adolescent developmental tasks (e.g., dating, learning to drive)
○	The last phase of treatment is focused on establishing a health adolescent relationship with parents
Bulimia Nervosa, ED-NOS	
•	Cognitive Behavioral Therapy ¹⁷
○	Evidence base: Effective for treating Bulimia Nervosa, Eating Disorder, NOS, Anxiety, Depression, OCD, and other comorbid disorders
○	CBT model of eating disorders targets extreme concerns about shape and weight, combined with rigid diet guidelines and rules leading to bingeing and purging
○	Assist patients in "mapping" out their eating disorder by clearly delineating antecedents and consequences to bingeing and purging episodes
○	Collaborative stance with patients to determine treatment targets and set up behavioral experiments to complete on a weekly basis
○	Patients keep detailed records of binge and purge episodes, antecedents, emotions, and contexts; therapists then assist them to problem-solve alternative coping strategies
○	Close measurement of progress on goals
•	Interpersonal Therapy ¹⁸
○	Evidence base: Effective for treating depression, marital problems, eating disorders
○	Target 1: Engages the patient in treatment, identifies interpersonal problems and develops a treatment contract. Assess the interpersonal context in which the BN developed and maintained, examine of the patient's current interpersonal functioning, and the interpersonal circumstance of individual bulimic episodes. The therapist and patient decide which acknowledged problems will be the focus of the rest of the treatment.
○	Targets 2 and 3: Therapist pressures the patient to change, and the eating disorder is seldom addressed directly, but rather if referred to by the patient the therapist immediately shifts focus to its interpersonal context.

We seek to help the patient discover the weight that will naturally occur when they are eating normally (i.e., not obsessing about foods or manipulating foods for weight control), having regular menses, and no longer have physical signs and symptoms of malnutrition.

The Team Psychologist/ Social Worker

The mental health professional is the primary team member responsible for diagnosing an eating disorder, as well as any comorbid psychological problems. Team psychologists and social workers provide psychotherapy for the patient and her/his family. Eating disorder specific psychotherapy is the core treatment in AN and

BN, and is focused on the initial psychological factors that led to the development of the eating disorder, as well as the factors that currently maintain it.¹² First, a strong therapeutic relationship with the patient is essential.¹³ This may be difficult to achieve since patients are often ambivalent or intensely resistant to change. The therapist uses various techniques to build rapport with the patient, including validation, empathy, and motivational interviewing, working collaboratively in an age-appropriate manner with the patient to develop treatment goals and methods to achieve them. For AN the clinician utilizes a detailed treatment contract, specifying for example daily calorie goals and weekly weight

goals along with contingencies for meeting and not meeting those goals. The psychologist or social worker has primary responsibility for negotiating the terms of the contract with the patient. Research evidence supports a number of treatment modalities for psychotherapy of eating disorders, and three such treatments are described in Table 5.

The team psychologist / social worker stays in close contact with the other clinicians to ensure that patients are receiving consistent messages regarding recommendations and expectations, to prevent the patient from "splitting" the treatment team, and to monitor progress toward goals. While the team physician and nutritionist play key roles in developing the individualized treatment goals for the patient, the therapist is the primary team member charged with helping the patient make the necessary emotional, cognitive, and behavioral changes to achieve the treatment goals.¹² Patients can make progress on physical goals but still hold eating disordered attitudes and beliefs. For instance, a patient with AN may gain enough weight to no longer meet criteria in the DSM-IV but still have long-standing body image disturbances. Negative body image at the end of treatment substantially increases the risk of relapse. The mental health clinician is responsible for assessing and addressing the various factors that increase the risk of relapse.

The WVU Disordered Eating Center of Charleston (WVU-DECC)

Given the significant prevalence of disordered eating behaviors and attitudes in state and the scarcity of treatment resources, we developed and then launched the WVU-DECC in 2010. This is a multi-disciplinary outpatient program designed to treat patients with disordered eating across the spectrum, and includes WVU physicians specializing in adolescent medicine, internal

medicine and psychiatry, WVU psychologists and social workers and a licensed dietitian. The functions of DECC team members follow the model guidelines referenced for team members above. All team members have received extensive training in assessment and intervention with disordered eating patients, and utilize a journal club format to remain current in their knowledge and skills. The missions of the team are two-fold: to treat patients with eating disorders, and to educate the public and prevent the onset of eating disorders in those not yet afflicted.

Treatment referrals are made through the Medical Director, who then makes referrals for the nutritionist and the mental health professionals. The team meets face to face twice monthly to discuss cases, and includes an off-site psychologist who is an eating disorder expert and who is the Director of the WVU Eating Disorders Clinic in Morgantown. He participates

in each team meeting via video conferencing. Between meetings team members regularly collaborate to provide the most effective, evidence-based care for patients, and collectively address complex clinical issues. Currently patients are treated in outpatient settings, although they may be hospitalized on medical floors at CAMC to treat physical complications of their eating disorders. The WVU-DECC team is exploring opportunities with local psychiatric hospitals to create residential or inpatient eating disorder units, with concomitant staff training.

Awareness and prevention are major commitments for the WVU-DECC. Eating disorders remain hidden and are often associated with misinformation and strong emotions not only in adolescents but their families, friends, teachers and counselors. There is an imperative to increase public awareness and provide high fidelity information

to counter the myths and shame associated with these perilous medical and psychiatric conditions. Thus far the WVU-DECC team has become involved in regional community education through consultation by the senior author on scripting an eating disorder themed play with adolescent actors that will be attended by the majority of eighth through twelfth grade students in the local school systems. Team members also present workshops on disordered eating for local educators and clinicians to raise awareness of the frequency and urgency of this problem, to highlight signs and symptoms and assist them in making assessments and necessary referrals. As part of the mission of WVU-DECC, the team will expand these prevention and advocacy efforts.

Overcoming Obstacles

A considerable limitation to expansion of this program and others is the lack of qualified and specially-



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trained clinicians available to treat eating disorders in other parts of the state. In West Virginia there are no comprehensive programs to train mental health professionals, physicians, or nutritionists to work expressly with eating disordered populations. The West Virginia University School of Medicine in both Charleston and Morgantown has employed abbreviated training for residents in psychiatry and pediatrics and psychology interns. However, there are no comprehensive training opportunities in the state such as fellowships and post-doctoral training. Funding remains an issue when treating eating disorders for both patients and clinicians because insurance companies may limit the time allocated for inpatient, residential or intensive outpatient treatment. Although there are currently no residential or inpatient eating disorder programs in the state, West Virginia Medicaid does not pay for this level of care at out-of-state facilities. Co-payments and insurance company denials of inpatient, residential, or intensive outpatient treatment of sufficient length create a considerable financial burden for many families. Currently, specialized treatment for eating disorders is available in the state only at the WVU School of Medicine's Charleston and Morgantown

campuses. Thus, many West Virginians must travel long distances to receive specialized treatment services for their eating disorders.

These obstacles must be confronted and overcome. Disordered eating goes well beyond the very serious problem of obesity in our adolescents and calls for state of the art assessment and treatment. The WVU-DECC program begins what will hopefully be a rigorous and coordinated effort to address a public health concern in West Virginia that has been under appreciated and overlooked.

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CME POST-TEST

- Which statement is FALSE regarding laboratory values indicative of malnourishment?
 - Lowered estradiol (hypogonadotropic hypogonadism)
 - Lowered follicle stimulating hormone
 - Lowered thyroid stimulating hormone and T4
 - Lowered lutenizing hormone
- During treatment and weight regain, avoid setting rigid "goal weights" derived from standard weight charts for patients who are underweight.
 - True
 - False
- Techniques psychologists and social workers may use to build a strong therapeutic alliance with the patient and his/her family should NOT include
 - Validation
 - Comparing patient's size to that of celebrities and models
 - Motivational interviewing
 - Empathy

Possible Prevention and Treatment of Prostate Cancer by Exercise

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Abstract

Exercise and physical activity have been linked to the prevention of certain types of cancer such as colon and breast. As prostate cancer is the most common malignancy diagnosed in the male population, there is obvious interest in determining a possible effect of exercise on disease prevention and improvement of disease-related outcomes. Thus far, data has been conflicting and there has been no clear determination of prostate cancer prevention through exercise. However, as prostate cancer treatment carries many side effects which may be bothersome and health-threatening, researchers have examined the effects of exercise training on reducing treatment-related complications and improving outcomes and quality of life (QOL). In this review, we discuss the impact of exercise on reducing side effects of prostate cancer treatment and improving cancer-specific and overall survival outcomes, as well as improving QOL in prostate cancer patients.

Introduction

Over the past several years, numerous studies have been published discussing the benefits of physical activity to cancer incidence and recurrence. A strong association has been shown for cancers such as colon and breast, but the data seems to be conflicting for many other types. Although equivocal, some data has indicated that physical activity may provide a protective effect against the development of advanced prostate cancer and may be used in conjunction with common treatments for the disease. This review will focus on each of these two hypotheses with attention given to possible mechanisms of action.

Prostate cancer is the most frequently diagnosed cancer in men and will account for 29% of the newly diagnosed cases this year. It is the second most common cause of cancer death in men.¹ While age is the primary risk factor, other important disease associations include family history, race, and obesity. Accepted treatments for prostate cancer include surgery, radiotherapy, androgen deprivation therapy (ADT), and chemotherapy. Survival rates for the various treatments have improved over the last three decades, indicating that men are living longer post-diagnosis.² West

Virginia has observed this steady decline in the relative mortality due to prostate cancer over the last 30 years (Figure 1). Unfortunately, many of these treatments are associated with numerous side effects that may significantly affect patients' health-related quality of life (HRQOL).³ HRQOL is defined as a patient's ability to function normally and have an overall sense of satisfaction with life.⁴ This has been reported to be reduced in certain areas such as urinary control, bowel control and sexual function following prostate cancer progression and/or treatment. Fatigue, another common symptom reported in patients undergoing prostate cancer treatment, interferes with activities of daily living and further reduces QOL.^{6,7} Chronic fatigue, a consequence of long-term treatment, may reduce physical activity to such a degree as to predispose individuals to other chronic diseases such as obesity, diabetes, and heart disease.⁸

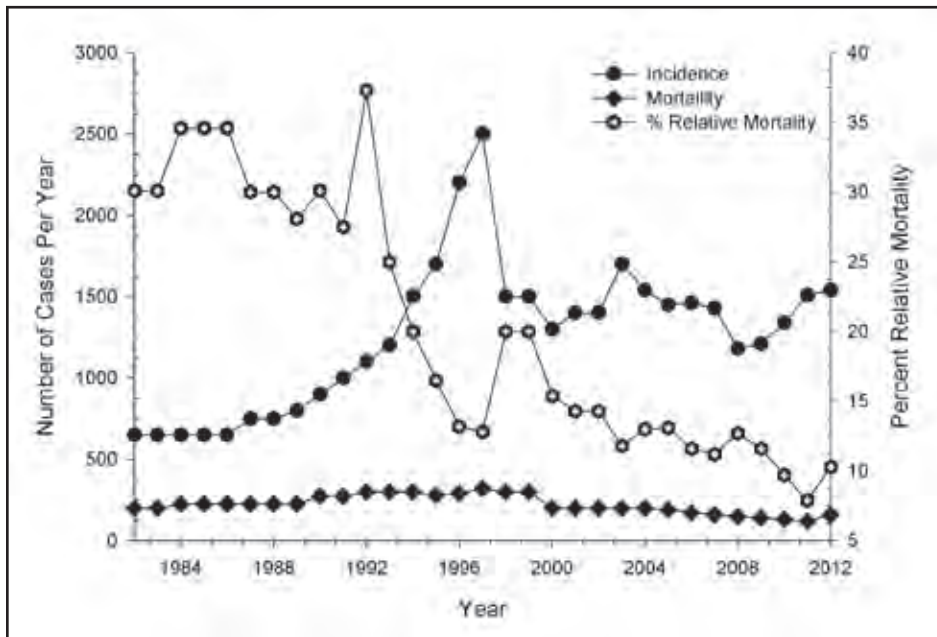
ADT is a widely-used treatment for prostate cancer. An estimated 50% of men with prostate cancer will use this alone or as an adjuvant treatment, especially for disease with early PSA relapse.⁹ Although ADT has been shown to be an effective treatment for prostate cancer, it is associated with adverse effects. Hypogonadism from

Objectives

A goal of this paper is to provide health care providers with reasons to address preventive measures of prostate cancer and to improve the quality of life in their patients with the disease. We will discuss ways to prevent cardiovascular and metabolic disease, especially for those patients on androgen suppressive therapy. We will suggest that because prostate cancer is so common, it is imperative that effective therapies be developed which could modify risk factors and also lessen the side effects associated with standard treatment. We believe that exercise (physical activity) may be one such therapy.

Figure 1.

The 30 year History of Prostate Cancer in West Virginia. The figure shows a significant reduction in percent relative mortality since 1996.



ADT may induce a significant loss of skeletal muscle with an increase in fat mass, a decrease in bone mineral density with an increased risk of fracture,¹⁰ reduced upper and lower body muscle strength, and impaired physical and functional musculoskeletal performance.¹¹ Patients receiving ADT have been reported to have 24% less muscular strength, 7% less aerobic fitness, and 20-27% less functional performance ability in repeated chair rise and walking tests compared with age-matched controls.¹² Most men who develop prostate cancer and require treatment are over the age of 65. This has led to the concern that may cause an early onset of sarcopenia, frailty, and osteoporosis.¹³ Men undergoing ADT are also at an increased risk of developing insulin resistance, hyperlipidemia, obesity and cardiovascular disease.^{8,14-15} The above effects contribute to a loss of independence, further reducing quality of life.

Clearly, a primary focus for health care providers should be

addressing preventive measures of prostate cancer and improving the quality of life of their patients with the disease. Since this disease is so common, it is imperative that effective interventions be developed which could modify risk factors and also lessen the side effects associated with standard treatment. Exercise/physical activity has been proposed to be one such intervention.

A literature review search for publications was conducted through the PubMed database using the search criteria "Exercise and Prostate Cancer." Search results were reviewed for relevance by the contributing authors to this manuscript.

Effect of Exercise on Preventing Prostate Cancer

Evaluation of the epidemiological evidence regarding the association between exercise and prostate cancer development has been difficult as studies show inconsistent findings. There have been a few studies indicating that regular exercise

reduces the risk of developing prostate cancer, although the magnitude of this reduction is reportedly low. Many cancers, including prostate cancer, have been associated with being overweight and obese, and there is growing evidence linking excessive body fat to cancer risk.¹⁶ Life-long vigorous physical activity has clearly been shown to reduce adiposity and the chances of developing obesity. Whether or not the potential inverse relationship between vigorous life-long exercise and prostate cancer risk occurs as a result of a long-term low body fat percentage has yet to be fully determined.

Currently there is no definitive opinion on the degree of impact that the amount of exercise and physical activity have on prostate cancer incidence or progression. A landmark paper by Giovannucci¹⁷ tried to answer that very question. The relationship of physical activity to prostate cancer incidence, mortality, and Gleason histologic grade was assessed. The authors evaluated the number of cases of incident, advanced (seminal vesicle invasion, metastatic, or fatal), fatal, and high grade prostate cancer in 47,620 US male health professionals taking part in the Health Professionals Follow-up Study. After 14 years of follow-up, they documented 2892 new cases of prostate cancer, including 482 advanced cases (280 of which were fatal). In regards to the overall cases of prostate cancer, no association was observed in regards to the level of activity. Men aged 65 years or older exhibited the lowest risk in the highest category of vigorous activity for advanced and fatal prostate cancers. Patients with high levels of physical activity who were diagnosed with prostate cancer were less likely to be diagnosed with poorly-differentiated cancers (Gleason grade 7 or greater). The authors state that their findings suggest that regular

vigorous activity could slow the progression of prostate cancer and might be recommended to reduce mortality from prostate cancer.

A more recent report¹⁸ reviewed the results from 40 epidemiological studies evaluating the effects of physical activity/exercise on the prevention of prostate cancer. Fourteen of the studies showed no relationship between exercise and the development of prostate cancer, while four showed an increased risk. The remaining 22 studies showed that exercise reduced the risk of prostate cancer in study participants. Richman et al studied the effect of vigorous activity on disease progression.¹⁹ In 1,455 patients diagnosed with prostate cancer, men who walked briskly for 3 hours or more per week had a 57% lower progression rate than those who walked at a lower intensity ($p = 0.03$). They also report that walking pace significantly decreased progression regardless of duration ($p = 0.01$). The authors concluded that brisk walking after the diagnosis of localized prostate cancer may delay or inhibit the risk of prostate cancer progression. Similar results were observed in a 9-year prospective study conducted by the American Cancer Society Cancer Prevention Study II Nutrition Cohort. Of the 72,174 men in the cohort (all cancer-free at enrollment), 5,503 developed prostate cancer during the course of the study.²⁰ Results indicated that there was a reduced risk of aggressive prostate cancer development in those men most physically active.

The Impact of Exercise on Patients Undergoing Androgen Deprivation Therapy for Prostate Cancer

Androgen deprivation therapy (ADT), a common treatment for men with prostate cancer, reduces testosterone production and causes side effects that negatively impact quality of life and reduce physical

functionality.²¹ Fat gain and bone/muscle loss are common physical changes noticed during ADT. Studies have shown that exercise may improve treatment-related toxicities of ADT in patients with prostate cancer.²² Galvao et al examined the combination of resistance and aerobic exercise for 12 weeks in 57 men with prostate cancer that were undergoing ADT. The study results indicated that with exercise, lean mass and muscle strength increased, physical function and balance improved when compared to patients that were randomized to usual care.²³ Keogh et al also evaluated the impact of exercise on prostate cancer through a systematic review of 12 training studies. This study also suggested that an exercise program may improve muscle mass, strength, and functional performance. Muscle and aerobic endurance also improved as did the overall quality of life.¹² In addition to the reported literature above, Galvao et al investigated the effect of exercise on acute and chronic exposure to ADT in 50 men for non-bone metastatic prostate cancer. The investigators concluded that during acute exposure of ADT of less than 6 months, an increase in total body fat and triglycerides were observed; however, the benefits of exercise of improved muscle strength, muscle function and cardiorespiratory function were similar regardless of the duration of ADT exposure.²⁴

Effects of Exercise in Patients Receiving Radiotherapy for Prostate Cancer

Fatigue is one of the most common side effects associated with radiation therapy for the treatment of prostate cancer. Other common short-term side effects include nausea, diarrhea, urinary frequency due to bladder inflammation, painful urination, and skin soreness at the site of treatment. Many patients who receive radiation therapy will also develop erectile

dysfunction. Erectile dysfunction usually occurs 6 to 12 months after treatment and is due to blockage of the penile arteries and decreased circulation of blood to the penis.

The effects of exercise training on acute radiation toxicity were evaluated in 66 patients undergoing external beam radiotherapy for cancer of the prostate.²⁵ Participants were randomized to a control group or to an exercise group which was asked to walk for thirty minutes, three times a week. After four weeks of external beam radiotherapy, the investigators observed a trend towards lower rectal toxicity in the exercise group and a significant decrease in overall toxicity scores during therapy ($p = 0.004$). Exercise has also been reported to reduce the fatigue associated with external beam radiotherapy for localized prostate cancer.²⁶ After 4 weeks of radiotherapy, patients in the control group experienced significant

Table 1. Possible Mechanisms for Exercise to Benefit Prostate Cancer Patients

- | |
|--|
| <ul style="list-style-type: none"> • Improve immune function • Reduce obesity • Regulate body weight • Improve cardiovascular function • Reduce inflammation • Reduction of fatigue • Possible reduction of side effects from prostate cancer therapies |
|--|

increases in reported fatigue scores ($p = 0.013$), while patients in the exercise groups exhibited no such increase. The Prostate Cancer Radiotherapy and Exercise Versus Normal Treatment Study examined the effects of 24 weeks of resistance training or aerobic training compared to standard care.²⁷ After 24 weeks of training, both resistance ($p = 0.01$)

Table 2. Potential Mechanisms of Action of Exercise-induced Modification of Prostate Cancer

- Change in energy balance
- Change in hormonal milieu
- Stimulation of antioxidant function
- Stimulation of insulin-like growth factor

and aerobic training ($p = 0.004$) reduced the amount of fatigue experienced by the participants compared to standard care alone. Additionally, resistance training resulted in long-term improvements over standard care in quality of life ($p = 0.015$), fitness ($p = 0.041$), both upper and lower body strength ($p < 0.001$) and in the prevention of increased body fat ($p = 0.049$). Dahn et al evaluated the effects of physical activity on 111 patients who had

undergone radiotherapy for prostate cancer.²⁸ Men who had undergone external beam radiotherapy (XRT) exhibited significantly higher sexual function scores as the amount of physical activity increased ($p < 0.001$). For those patients who underwent brachytherapy and brachytherapy with XRT, no such increase was observed.

Exercise Training for Cancer Patients

Cancer patients undergoing standard therapy often experience immunosuppression, increased susceptibility to infection and slow reconstitution of immune function after treatment, while enhancing the risk of cancer recurrence. A program of exercise training may help to attenuate these complications. Table 1 describes some of the possible mechanisms for exercise to benefit prostate cancer patients. Exercise goals for patients with

cancer are certainly dependent on individual circumstances. The primary objective for patients who are in remission or have been cured is to return functional capacity to pre-disease states. For those still undergoing therapy, an improvement in cardiorespiratory endurance and muscle strength should be the primary goals. Prostate cancer and its associated treatment can significantly reduce the physical and psychological strength of the patient. Table 2 displays potential mechanisms of action of exercise-induced modification of prostate cancer.

Aerobic exercise has also been related to increase self-efficacy and active coping, which are conceptually similar to the adoption of a fighting spirit, an attitudinal stance positively related to cancer survival. There is now scientific evidence that an exercise program of low to moderate intensity can

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substantially reduce cancer-related fatigue and improve quality of life in cancer patients. Exercise may improve functional capacity (VO_{2max}) and mood states in patients while possibly countering some of the negative effects of treatment (i.e. nausea and weakness).²⁹

Exercise can present a unique challenge to patients still undergoing therapy. Loss of muscle mass and strength combined with a general state of fatigue make daily exercise even more challenging. Despite these factors, many cancer patients can greatly benefit from exercise training because much of the improvement occurs at the skeletal muscle level. Unfortunately, there is very little research on the optimal type(s) or amount of exercise for which cancer patients should engage. However, a similar exercise prescription used with patients who have other chronic disease (i.e. heart disease) may be appropriate if used with caution. According to the American College of Sports Medicine, aerobic exercise training should be done 3-4 days per week, 20-40 minutes per session at 40-85% VO_{2max} or HR reserve. The mode of exercise should use large muscle activities (i.e., walking, cycling). Strength training could be performed 2-3 days per week, at 40-50% maximal voluntary contractions, using 1-3 sets with 10-15 repetitions per set. Resistance should be gradually increased over time and reflect more of a circuit-type training. Upper and lower body range-of-motion activities could be used 2-3 days per week to increase flexibility.

Conclusions

It is important for health care providers to address preventive measures of prostate cancer and work to improve the quality of life in patients with the disease. It is unclear if exercise training has any effect on the prevention of prostate cancer,

but it may limit the development of advanced disease. Exercise has also been shown to ameliorate the side effects inflicted from hormonal and/or radiation treatment. Considering that side effects include fatigue, immunosuppression, osteoporosis and an increased risk of cardiovascular disease and diabetes, any measure taken to reduce or delay these effects should be considered a top priority in patient care. Exercise programs, when performed under the guidance of the patient's medical team, represent an excellent way to improve health and reduce side effects. We believe that a program of exercise training may help to attenuate complications of prostate cancer, ultimately improving quality of life, and possibly disease progression and survival as well.

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CME POST-TEST

13. Giovannucci's study regarding the degree to which vigorous exercise may impact the progression of prostate cancer suggests which of the following beneficial effects?
 - a. Reduction of prostate size
 - b. Reduction of serum PSA
 - c. Slow progression of prostate cancer
 - d. Improve survival in obese patients with prostate cancer
14. Which of the following potential effects of exercise would be expected in a patient with prostate cancer who is treated with external beam radiation?
 - a. Decrease in rectal toxicity
 - b. Increase in fatigue
 - c. Increase in infection susceptibility
 - d. Increase in overall toxicity profile
15. A patient with prostate cancer undertakes an exercise plan that includes brisk walking for 3 or more hours per week. This activity will likely have which of the following effects on prostate cancer?
 - a. Increase in serum PSA
 - b. Increase in prostate size
 - c. Decrease in prostate cancer progression rate
 - d. Downgrading of Gleason score

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Using Health Information Technology to Advance Preventive Care in West Virginia

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Introduction

Studies of preventive health services use in the United States have consistently shown relatively poor performance in reaching everyone with life-saving and often inexpensive services such as immunizations, screening, and counseling. In 2003, a Rand study showed slightly more than half of adults received recommended preventive services.¹ This dismal rate only increased to about two-thirds by 2010.² In some health systems, such as the Veterans Health Administration, and in some foreign countries, such as the United Kingdom, population rates of use of appropriate preventive care are much higher, approaching universality.³ ⁴ In selected settings, research has demonstrated a positive correlation between clinicians' use of electronic

health records (EHRs) and patients' receipt of preventive services.^{5,6}

Health services researchers have long believed that computerized medical records could improve medical care and generate data useful for scientific study. Beginning in the 1960s, a few pioneers extended the use of computers in hospitals from administrative and financial activities to clinical decision support and patient management.⁷⁻⁹ Over the next 30 years, the Veterans Health Administration¹⁰ and the Regenstrief Institute¹¹ pioneered the development and implementation of robust electronic health records in the United States, and included EHR features to facilitate preventive services.

The effective use of EHRs to increase the attainment of preventive services only came when physician leaders began to use these systems to document population health status and care system shortfalls. This fueled rapid changes throughout the entire system of care.¹² For many practitioners, the organizational and conceptual inertia impeding

the transition from the traditional practice of "reactively" caring for each patient who "shows up", to the practice of "prospectively" caring for a defined population of patients contributed historically to a slower than expected uptake of electronic health records (EHRs). In 2008, when President Bush established the Office of the National Coordinator to advance HIT in medical practice, only 17% of physicians used HIT.¹³

The American Recovery and Reinvestment Act of 2009 (ARRA/HITECH Acts) contained funding and support for HIT adoption.¹⁴ Steadily-increasing health care costs¹⁵ and a rising rate and number of uninsured people (from 30 million in 1987 to 50 million in 2010)¹⁶ provided impetus for the passage of the Patient Protection and Affordable Care Act,¹⁷ which included incentives for physicians and hospitals to use EHRs – and ultimately penalties if they do not. Preventive health services were key considerations in these complex laws.

Since 2005, the West Virginia Medical Institute (WVMI), a

Objectives

To enable the reader to:

1. *Appreciate the historical advances that have been made in the use of HIT to enhance the effectiveness and efficiency of health care delivery, especially preventive care.*
2. *Understand the three phases of "Meaningful Use" and the importance and consequences of physicians achieving meaningful use standards by 2015.*
3. *Describe at least 3 meaningful use measures that relate to preventive health care.*
4. *Identify and access organizations and resources that are available to assist physicians select, implement, or advance the use of the HIT in the clinical setting.*
5. *Appreciate the information technology, organizational, conceptual, resource and related barriers and challenges that influence the optimal adoption and use of HIT to improve the quality of preventive care.*

Medicare Quality Improvement Organization (QIO), and its affiliates have assisted physicians in three states to improve chronic disease management and preventive care through HIT adoption. WVMI was commissioned by West Virginia to develop a "Roadmap for HIT Adoption." This document guided new e-health legislation and the subsequent establishment of the West Virginia Health Information Network (WVHIN), which now serves as the state's official Health Information Exchange (HIE).

In 2010, WVMI became a contractor to the West Virginia Regional Health Information Technology Extension Center (WVRHITEC), an ARRA-funded program intended to accelerate HIT adoption by assisting more than 1,000 West Virginia primary care physicians to achieve the defined Meaningful Use standards in order to more effectively manage individual patients, track health status of populations, report health quality measures, and communicate clinical information securely with other health care providers. This article summarizes our experience assisting West Virginia private medical practices with office EHR implementation over the last 18 months, focusing on efforts to improve preventive health services.

Government Incentives for EHR adoption

Implementation of EHRs in physicians' offices is only the beginning of a continuum of processes leading to the EHR's full utilization as an essential tool of medical practice—just as invaluable as the blood pressure cuff or stethoscope. "Meaningful Use" as defined by the ARRA, is the use of certified EHR technology in a meaningful manner, and specifically includes electronic prescribing,

exchange of health information to promote care coordination, managing at-risk populations, and reporting on health care quality measures. Meaningful Use is the standard by which the Centers for Medicare & Medicaid Services (CMS) EHR Incentive Program provides incentive payments to eligible professionals for using the technology. It is the beginning step in assisting practitioners to integrate this technology into the everyday practice of medicine.

Practitioners can participate in the EHR Incentive Program either through Medicare or Medicaid. For demonstrating the capacity to meet Meaningful Use thresholds for each of 25 criteria, including the capacity to report data on 6 clinical quality measures, eligible professionals can receive up to \$44,000 or \$63,000 in incentive payments, depending on the program they choose and their level of participation through 2016. After 2015, practitioners who aren't meaningfully using certified EHR technology face reductions in Medicare payments.

Preventive Care: A Cornerstone of Meaningful Use

Meaningful use is tightly linked with preventive services, as illustrated in Table 1. To receive payment for meaningful use of an EHR under the Medicare or Medicaid incentive program, a physician's system must achieve 15 "core objectives," one third of which relate to or support prevention. Fully half of the "menu objectives" concern prevention. Since a physician must meet five of them, s/he could satisfy all these requirements by focusing on prevention alone. One of the core objectives requires reporting clinical quality measures. All of the core quality measures relate to preventive services, and a physician

must report them or alternative measures (also all prevention). Because over half of the remaining measures touch on prevention, a physician, who must report three, could easily choose to report preventive measures exclusively. These prevention-intensive measures will help protect patients from unnecessary illnesses while lifting the country's performance rates for these critical services.

The heavy emphasis on prevention has clear implications for fundamental change in the way practices approach patient care. Many practices can attest to defining new roles for staff, new work processes, and new ways to engage patients to be active participants in their care as a result of Meaningful Use. In future stages of Meaningful Use, one may reasonably anticipate progression towards higher thresholds for reporting, greater emphasis on the use of clinical decision support to assure achievement of standards, and demonstrated improvements in health outcomes for at risk populations at the practice level.

Increased HIT adoption in West Virginia and Nationally

HIT use in private medical practices has accelerated rapidly since the enactment of the ARRA. According to the most recent National Ambulatory Medical Care Survey (NAMCS), EHR system use among office-based physicians in the US has increased from 18% in 2001 to 57% (preliminary 2011 estimates).¹⁸ Nearly 34% of physicians reported having a "basic" system that met a subset of the Meaningful Use criteria, a 36% increase from 2010. In West Virginia, 53.9% of physicians said that they had installed an EHR system of some type, and 29% have a system in place that meets the basic criteria for Meaningful Use (Figure 1). The infusion of funding

Table 1. Meaningful Use Objectives and Clinical Quality Measures Related to Prevention

Meaningful use element	Description	Relationship to prevention
Core Objectives¹ (Physician's EHR use must meet 15, 5 of which relate to prevention)	Maintain an up-to-date problem list of current and active diagnoses	Targeting patients for disease-specific secondary prevention services (such as eye exams for diabetics) requires an accurate, complete, and searchable list.
	Record all of the following demographics: (A) Preferred language. (B) Gender. (C) Race. (D) Ethnicity. (E) Date of birth.	Identifying population subgroups in need of preventive services requires the ability to select based on age, race, and gender to identify individuals who would benefit.
	Record and chart changes in the following vital signs: (A) Height. (B) Weight. (C) Blood pressure. (D) Calculate and display body mass index (BMI). (E) Plot and display growth charts for children 2–20 years, including BMI.	Monitoring success of efforts to prevent complications of illness such as obesity or hypertension requires longitudinal collection of data and periodic analysis to find individuals who need more intensive services to meet therapeutic objectives.
	Record smoking status for patients 13 years old or older.	Allows physicians to intervene to prevent consequences of smoking and to monitor success in those efforts.
	Report ambulatory clinical quality measures to CMS or, in the case of Medicaid EPs, the States.	More than half of the quality measures relate to prevention. Reporting allows policy makers to gauge success of national efforts and provide assistance/incentives as appropriate.
Menu Objectives (Physician EHRs must meet at least 5 of 10)	Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach.	Coupled with individual problem lists, allows targeting patients for disease-specific secondary prevention services.
	Send patient reminders per patient preference for preventive/follow-up care.	One tool for increasing use of appropriate preventive services.
	Use certified EHR technology to identify patient-specific education resources and provide those resources to the patient if appropriate.	Such resources may include information, advice, and support for preventive care.
	Capability to submit electronic data to immunization registries or immunization information systems and actual submission according to applicable law and practice.	Immunization registries allow physician-health department partnership to identify and immunize children who might otherwise get sick.
	Capability to submit electronic syndromic surveillance data to public health agencies and actual submission according to applicable law and practice.	Enhances the public health agency's capability to detect and respond to epidemics, potentially preventing spread of disease.
Core Clinical Quality Measures ² (Physician EHR must report all of them if they have eligible patients)	Blood pressure measurement Smoking screening/smoking cessation Adult weight screening and follow-up	All are key primary and secondary preventive services recommended by the US Preventive Services Task Force
Alternative Core Measures (Physician EHR must report if no patients reported in one or more core measure)	Weight assessment and counseling for children and adolescents Childhood immunization status Influenza immunization patients 50 years old or older	
Additional Care Quality Measures (Physician EHR must report 3 applicable to practice)	19 of the 39 additional quality measures deal with primary or secondary prevention of various conditions	

Note: these two references apply to the table above

- Centers for Medicare & Medicaid Services. 2011-2012 Eligible Professional Clinical Quality Measures (CQMs). http://www.cms.gov/EHRIncentivePrograms/Downloads/CQM_EP_S_2012_02_02.pdf. Accessed 2/26/2012, 2012.
- Centers for Medicare & Medicaid Services. Eligible Professional Meaningful Use Table of Contents Core and Menu Set Objectives. <http://www.cms.gov/EHRIncentivePrograms/Downloads/EP-MU-TOC.pdf>. Accessed 2/26/2012, 2012.

Figure 1.
Reported Use of Electronic Health Records by Physicians

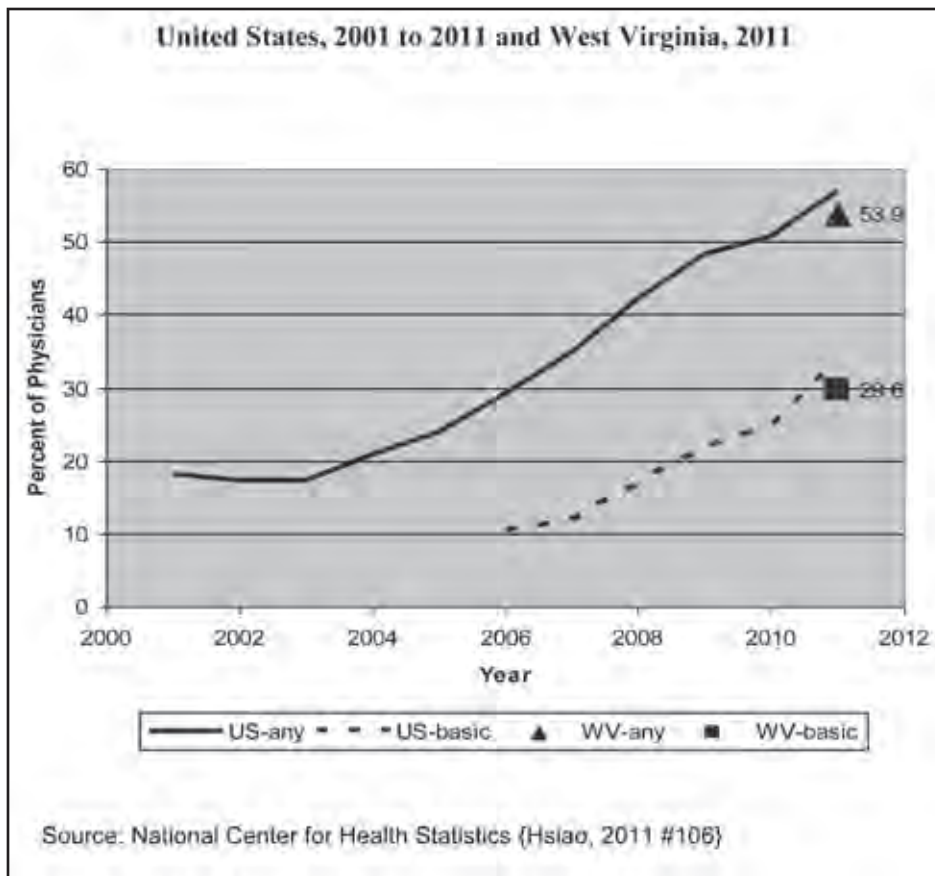


Table 2. Total West Virginia EHR Incentive Payments to Hospitals and Eligible Professionals

August – December 2011

Number of Hospitals	Hospital Amount	Number of EPs*	EP Amount	Total Providers	Total Amount
9	\$ 11,621,027	250	\$ 5,241,670	259	\$ 16,862,697

*Eligible professional: a physician as defined in the Social Security Act.

and support under the ARRA and HITECH Acts is one reason for this rapid increase in EHR acquisition.

According to the NAMCS survey, only 29% of West Virginia practitioners are planning to seek incentives for Meaningful Use. The national average is 52%. Although, given the incentives and eventual penalties, it is unclear why participation isn't higher. It has been postulated that factors negatively influencing practitioners' decisions may include: constraints on time/

resources to commit to the process; public/small community perception of incentives (given unemployment rates and level of poverty in many areas of the state); access, availability, costs associated with consistent Health IT expertise /support; communication infrastructure (broadband) limitations; and the financial capacity of some primary care practices to fully implement and sustain all the mandated requirements within such a short (5 year) time line. This issue has

been recognized by the federal government; the Secretary of the Department of Health and Human Services recently announced that the deadline for achieving Stage 1 of Meaningful Use would be delayed by one year to 2013.

As of December 2011, WVRHITEC exceeded expectations by recruiting over 1,000 eligible primary care practitioners and nearly 150 specialists. In order to qualify for Stage I CMS Meaningful Use incentive payments under Medicare, eligible professionals must be using a certified EHR system for at least 90 days and report thresholds for 15 Core Set objectives and 5 of 10 Menu Set objectives. In West Virginia, of those recruited into the WVRHITEC program, 90 eligible professionals successfully reached this goal under Medicare in 2011. For practitioners with at least 30% of their patient mix comprised of Medicaid beneficiaries (20% for pediatricians), Medicaid accepted applications from 259 practitioners who could document they had acquired, implemented or upgraded to a certified version of an EHR. Most of the state's community health centers, OB/GYNs, and pediatricians who could meet these thresholds submitted and received payment. Table 2 presents a summary of the incentive payments by Medicaid from August to December 2011.

Over the past year, practitioners have learned they have significant needs beyond implementation of their EHR system. This has resulted in increased demands for assistance in data management and analysis, clinical customization of systems, and ongoing coaching and support in project management and work flow. These services keep the practices prepared for anticipated IT challenges and help to establish quality improvement programs within the practices. Meaningful Use has provided a good basic

platform on which more advanced data management, preventive care/quality improvement practices, and information sharing is facilitated and advanced at the individual practice level.

Our experience in assisting practices with quality improvement and outcome measurement parallels the experiences described by Langley and Beasley.¹⁹ In their visits to many primary care settings, the authors concluded that most primary care practices are engaged in two distinct types of clinical improvement activities: (1) those attainable through the direct application of information technology to improve operational processes and care documentation (e.g., billing, e-prescribing, computerized physician order entry and identification of drug interactions); and (2) those attainable only through systems that allow continuous measurement and ongoing improvement to a system of care, (e.g., planning and delivering care to a population and whole patient views for comprehensive individual care).

The rapid saturation and expansion of Health IT has had some unintended consequences. Some primary care practices have been left to sort through redefining and improving internal operational processes on their own. Vendor support is limited, costly and not necessarily sensitive to, or focused on, the practitioner's clinical customization needs. Most reported studies derived from the practice level reflect the focus on process improvements, including the incorporation of care standards and automation of clinical protocols. Taplin et al. eloquently describe the process for translating cancer screening into practice using the EHR.²⁰ Measurement of process and health outcomes is far more complex from a clinical perspective – and each EHR system structures, captures,

and processes this data differently. At the same time, national and state professional debates indicate the need for more pragmatism in the definition of population attribution and the development of evidence-based protocols to assure “apples to apples” comparisons.

Discussion

Many experts believe there is overwhelming support for integrated, intelligent and aligned health system changes to assure the provision of high quality, safe, affordable and accessible care to patients.²¹ In this regard, medical professionals clearly share common ground with government, payers, and the general public.

The major barriers preventing practitioners from optimal use of Health IT, especially for improving health outcomes and managing populations, are less about the use of technology and more about a shift in how physicians will function in a changing health system. Fortunately, there is more opportunity than ever to be actively engaged in shaping that role and defining how technology will be used to support it. Active, ongoing participation in EHR selection/implementation/optimization processes at the practice level is a good start. Membership in local or state medical/professional societies, contributions to requests for comments on key rule making and legislation, and discussions with peers through educational forums on optimal use of EMR's are examples of how physicians can get involved. The WVRHITEC and WVMi provide channels for physician input and expertise to advance HIT in practice. Primary care practitioners continue to face significant shortages of resources (financial, expertise, and personnel) to manage the numerous changes in the care environment and advocacy is essential to guide the change process.

In West Virginia the vast majority of medical practice takes place in small practices with less than 4 practitioners. The typical staffing arrangement is comprised of an office manager, one or two office assistants, and the physician. EHRs are complicated systems that require hands on clinical and technical expertise and management from the point of selection to implementation and beyond. Most practices lack the technical expertise or clinical time resources to successfully navigate the change process on their own. In some cases, and at significant costs, some practices have hired additional full time staff to “manage” achievement of Meaningful Use.

Our role is to assist primary care practitioners and other providers to meet important HIT and QI outcomes, but more importantly,



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to build the capacity to effectively demonstrate practice performance improvements. In the past, this role has included participation in many collaborative efforts to promote HIT use and providing expertise and resources to practitioners in order to facilitate practice-level advances in exchange of information (Accenture Project), information technology adoption (Doctor’s Office Quality-Information Technology – DOQ-IT, WVRHITEC), e-prescribing, privacy/security (Health Information Security and Privacy Collaborative – HISPC), and consumer engagement.

The capability to translate science from peer reviewed studies into evidence-based practice varies greatly among EHR systems. The clinical optimization of practice-based systems does not begin when the systems are implemented. Most certified systems have standard

features and capabilities that can quantify and track the provision and outcomes of certain preventive health services. However, the time lag for engaging practitioners in more advanced levels of clinical optimization usually begins after (at least) a year of experience with the EHR and stabilization of internal work flow processes. The first glimpse at performance data often is enough incentive to stimulate a practitioner’s drive to enhance and improve the system of care.

Conclusion

Although impressive, the financial incentives offered through the ARRA probably are not the most significant drivers of the technology transformation of health care in West Virginia. Achieving the goals put forth in the ARRA/HITECH legislation is far more

complex than acquiring and using electronic technology meaningfully. Most physicians and health care practitioners are challenged to adopt and integrate technology into the daily care of patients while mitigating the unintended consequences resulting from heightened security/privacy requirements, limitations of systems interoperability, vendor limitations/costs, legal and safety issues impacting important functions (e.g., e-prescribing), and the considerable resources necessary for data analysis, quality improvement, patient engagement, and population management.

The knowledge we have gained regarding practice resource needs, the changing EHR vendor markets, and the effect of the health care reform legislation, has led to a clearer understanding of the ongoing technology and support needs of



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small group practices, if the effort and investment to date are to be sustained. Our success in assisting practices to achieve Meaningful Use is largely the result of active, engaged physician leadership at the practice level. Our experience indicates that the major drivers leading physicians to engage in HIT is the new capacity to more efficiently manage administrative burdens and the hope of refocusing on the basic tenants of medicine - the early identification, prevention, and/or treatment of individuals at risk for or subjected to illness, which if accomplished in a timely, appropriate, safe manner, should contribute to a reduction in the overall health system costs and improved health outcomes.

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CME POST-TEST

- The three stages of meaningful use are:
 - Data capture and sharing
 - Health information exchange and increased reporting thresholds
 - Enhanced reporting and Quality Improvement
 - None of the above
 - a, b, c, above
- EMRs are standardized in how they capture, manage, and report data. **a. True** **b. False**
- What are three factors contributing to delays in advancing health technology at the practice level?
 - Financing
 - Lack of in-house technical or clinical expertise
 - Ability to effectively manage the change process
 - All of the above.

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Extraskkeletal Effects of Vitamin D: Potential Impact on WV Disease Morbidity and Mortality

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Abstract

Vitamin D is an essential nutrient and a secosteroid hormone that regulates many physiologic processes beyond calcium and bone homeostasis. These “extraskkeletal” effects are impacted by the circulating levels of the storage form of vitamin D, 25-hydroxyvitamin D3. Levels of vitamin D can be detected after completing a simple 25(OH)D blood test. Vitamin D deficiency (<30 ng/mL) is associated with a higher risk of many chronic diseases including, but not limited to, fourteen types of cancers, type 1 and 2 diabetes mellitus, obesity, cardiovascular disease, hypertension, stroke, and asthma. This article explores the association between vitamin D deficiency and the burden of chronic diseases in West Virginia.

Introduction

Vitamin D has well-established roles in calcium and bone homeostasis. Recently, this necessary nutrient has been shown to regulate many other disease and metabolic processes. These “extraskkeletal” effects of vitamin D include potential beneficial effects on the prevention of cancer, obesity, diabetes, cardiovascular disease, stroke, and asthma. These diseases burden West

Virginia with significant impact on morbidity and mortality (**Table 1**).

Many variables affect these chronic diseases. West Virginia leads the nation in the following: current smokers (25.6%), limitation in physical activity (27.1%), insufficient sleep and rest (52.6%), and self reported poor health (25.8%).¹ West Virginia ranks second in the nation for obesity (32.5%) and for percent of population > 65 years of age.^{1,4} In addition, West Virginia has one of the lowest yearly solar irradiance rates in the country which affects the cutaneous synthesis of vitamin D (**Figure 1**).⁵

The principal mechanism for synthesis of the storage form of vitamin D, a potent fat-soluble secosteroid hormone, is skin exposure to sunlight, a mechanism that is less efficient with increasing

age.⁶ Cutaneous production of vitamin D is dramatically altered by sunblock application (SPF 15; 99% reduction in synthesis) and seasonal effects due to location with negligible production from mid-October to mid-March in West Virginia (**Figure 2**).⁶ Additionally, an increase in body mass index (BMI) decreases the bioavailability of fat-soluble vitamin D with a 1% increase in BMI associated with a 5% decrease in serum vitamin D levels.^{6,7,8} As obesity increases in West Virginia, so does the risk of vitamin D deficiency. All of these factors (inactivity, obesity, location and age) make the risk of vitamin D deficiency greater for our population.

The storage form of vitamin D, 25-hydroxyvitamin D3 or 25(OH)D, can be determined with a simple blood test with deficiency defined

Table 1. Important WV chronic diseases affected by Vitamin D levels.¹

Disease (alphabetical)	Prevalence in WV	Vitamin D connection
Asthma	8.8%	Yes
Cancer	10.4%	Yes
Diabetes	12.4% (1st highest in US)	Yes
Heart Disease	10.3% (1st highest in US)	Yes
Hypertension	38.4% (2nd highest in US)	Yes
Obesity	32.5% (2nd highest in US)	Yes
Stroke	3.7% (3rd highest in US)	Yes

Objectives

The objective of this article is to explore the association of vitamin D deficiency on major contributors to West Virginia disease morbidity and mortality.

as less than 30 ng/mL.¹¹ Vitamin D deficiency reportedly affects about 50% US adults, with up to 54% deficiency prevalence noted among adolescent females.¹²⁻¹⁵ Because of increasing evidence linking vitamin D deficiency with chronic diseases, diagnosis and prevention beginning in childhood is paramount.

The purpose of this review article is to use current data to explore the association between vitamin D deficiency and the burden of chronic diseases in West Virginia.

Normalcy

The human body uses about 3000 to 5000 IU vitamin D3 per day.¹⁶ If cutaneous synthesis is altered (sunblock, season, age, skin coloration and disease states), it is very difficult to obtain this amount from a non-supplemented diet, even with a diet rich in fatty wild-caught fish.^{6,14,17} Because of this, numerous health care leaders have proposed a dramatic increase in the adequate intake of vitamin D over current recommendations.¹⁸ Many of the supplementation protocols used in studies cited in this manuscript have not accounted for the discrepancy in total daily use (4000-5000 IU/d) and recommended adequate intake (from 200 IU/d to 600IU/d; dependent on age and pregnancy) of vitamin D3. We therefore have placed more emphasis on studies that have conclusions based on direct testing of 25(OH)D and its impact on chronic diseases.

Cancer

The prevalence of cancer in West Virginians is 10.4%.¹ Numerous studies have shown a correlation between 14 cancers, including colorectal, breast, and prostate, and vitamin D deficiency.¹⁹ Data is inconsistent regarding vitamin D supplementation and lowered cancer risk. For example, the

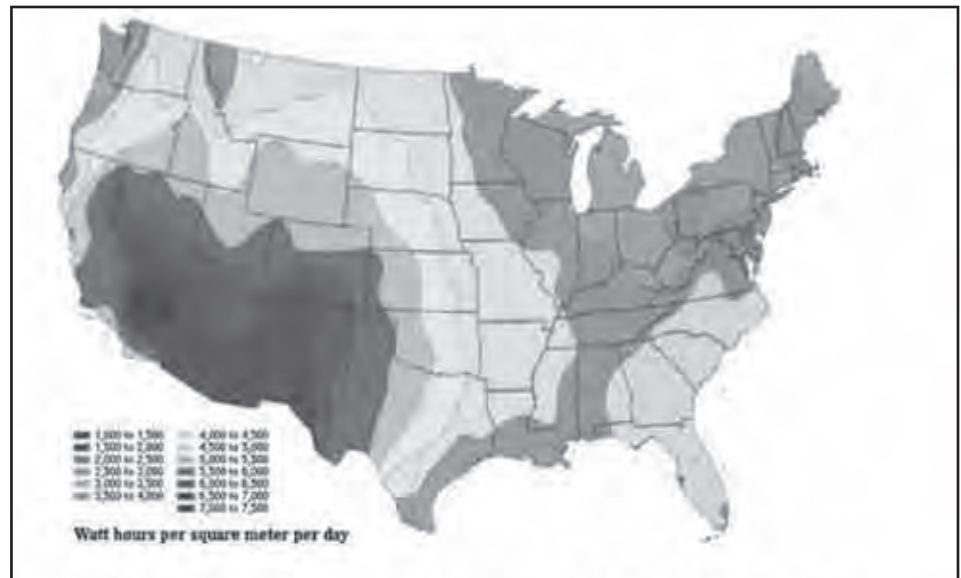


Figure 1. *United States Solar Irradiance Map. The average yearly solar irradiance in Watt/hr is demonstrated. West Virginia has one of the lowest rates in the contiguous US. Source: National Renewable Energy Laboratory.³ Available at <http://www.nrel.gov/gis/solar.html>*



Figure 2. *37th Parallel and effect on vitamin D production. West Virginia is above the 37th parallel resulting in negligible cutaneous production of vitamin D from mid-October to mid-March. When the leaves are falling, so are 25(OH)D levels. There is a direct correlation with vitamin D deficiency and distance from the equator.^{9,10}*

Women's Health Initiative showed supplementing 400 IU of vitamin D3 combined with 1000 mg calcium daily to have no effect on the incidence of colorectal cancer or breast cancer.^{20,21} Lappe et al.

showed a significant reduction in all-cancer risk for women taking 1100 IU of vitamin D3 and 1500 mg of calcium supplementation.²² The direction of association is dependent on sufficient levels of 25(OH)D.

Cancer risk is decreased when levels of 25(OH)D are at least 32 ng/mL.²³ Gorham et al., demonstrated a 50% reduction in colorectal cancer risk at 33 ng/mL 25(OH)D with a World Health Organization (WHO) working group identifying colon cancer as the greatest risk associated with poor vitamin D status.²⁴ Garland et al., showed a 50% reduction in breast cancer risk at 52 ng/mL 25(OH)D.²⁵ In general, the levels of circulating 25(OH)D needed to reduce cancer risk in the population are much higher than current vitamin D adequate intake recommendations.

Cardiovascular disease (CVD), Hypertension, Stroke

West Virginia has the highest rate of cardiovascular disease in the US; 10.3% of our population has symptomatic coronary artery disease.¹ The mechanisms in which vitamin D may lower cardiovascular risk have not been fully elucidated, but many possible mechanisms have been proposed. For hypertension, the renin-angiotensin-aldosterone system (RAAS) appears to be suppressed by vitamin D with the risk of hypertension increasing from south to north in the Northern hemisphere.^{26,27} Thus, a deficiency may lead to hypertension, a risk factor for CVD. Deficiency of vitamin D is associated with poor glycemic control²⁸, another risk factor for CVD. The presence of vitamin D decreases inflammatory markers and even increases anti-inflammatory markers, each of which is beneficial to the cardiovascular system.^{29,30} Vascular smooth muscle and endothelium responds to vitamin D in a cardioprotective way by decreasing smooth muscle cell proliferation³¹, inflammation¹⁶, and thrombosis.³³ Each of these is a risk factor for cardiovascular disease. Unfortunately, adequate clinical trials looking at vitamin D

supplementation with cardiovascular endpoints are lacking. The Framingham Offspring Study demonstrated an 80% greater risk for cardiovascular disease when vitamin D levels were less than 10 ng/mL compared to participants with a 25(OH)D level greater than 15 ng/mL.³⁴ Both the Nurse's Health Study and the Health Professionals Follow-up Study found an increased incidence of hypertension when 25(OH)D levels were below 15 ng/mL compared to levels above 30 ng/mL.³⁵

A more recent study showed postmenopausal women with 25(OH)D3 levels <20 ng/mL to have increased cardiovascular risk factors as well as an increased risk of cardiovascular disease, cerebrovascular disease, and death when compared to the non-deficient (>20 ng/mL 25(OH)D3) group. Another recent study, which followed suspected acute coronary syndrome patients for 2 years, reported an inverse relationship with death within that 2 year period and vitamin D status. Clearly, vitamin D plays a role in the health of the vascular system, but research to determine the optimal level of vitamin D and the role of supplementation is needed.³⁶

Clinical trials examining the effect of Vitamin D supplementation on blood pressure have variable results. One meta-analysis of 8 clinical trials demonstrated a significant 3.1 mmHg reduction in the diastolic pressure with a non-significant 3.6 mmHg reduction in systolic pressure when vitamin D was supplemented.³⁷ Another meta-analysis of 10 trials found that most did not show statistically significant effects on blood pressure.³⁸ Meta-analysis of trials investigating the effects of vitamin D supplementation on cardiovascular outcomes, including myocardial infarction, stroke, and other cardiac and cerebral outcomes showed no statistically significant effects.³⁸ Trials performed to date,

however, have significant variation in the vitamin D levels that were used to define insufficiency, measured outcomes, doses used, and identified confounders.³⁸

Multiple studies have demonstrated an association between vitamin D insufficiency and cerebrovascular disease mortality with one recent study showing twice the risk of stroke from lowest (<9.8 ng/mL 25(OH)D) to highest quartile (>21.5 ng/mL 25(OH)D).^{39,40,41} Carrelli et al. found a correlation between carotid atherosclerosis, a major risk factor for stroke, and 25(OH)D status.⁴² A population-based study found data that suggests a reduced intake of vitamin D in elderly patients, along with low serum concentrations of 1,25-dihydroxyvitamin D, leads to an increased risk for future strokes.⁴³ With numerous studies revealing an association between vitamin D status and cerebrovascular risk, future research should be directed at determining whether a causal relationship exists through clinical supplementation trials.

Asthma

Asthma is a chronic inflammatory airway disease caused by a combination of environmental and genetic factors. In recent years, the prevalence of children with asthma was significantly higher in WV than the nation as a whole. According to a CDC report based on 2009 data, around 9% of West Virginians carried a diagnosis of asthma.¹ With such a strong prevalence, it is crucial to continually seek new methods to treat and reduce the incidence of this common disease.

Vitamin D receptors are located in multiple lung cell types and have beneficial effects on asthma control. Several mechanisms are used to promote these effects including reducing hyperplasia and airway

smooth muscle proliferation, decreasing inflammation, promoting lung immunity, slowing cell cycling, and enhancing the effects of exogenous steroids.^{44,45} An inverse relationship between vitamin D status and serum IgE levels was demonstrated by Ma and Zhen.⁴⁶ This supports the idea that vitamin D deficiency is related to increased risk of asthma and allergy.⁴⁷ A study by Alyasin et al. in 2011 showed that serum 25(OH)D levels were inversely associated with asthma.⁴⁸ This was a cross-sectional study conducted with children and, after adjusting for age, BMI, and sex, the correlation between vitamin D and asthma increased. The study also found a significant relationship between pulmonary function test outcomes, such as FEV1 and FEV1/FRC, and vitamin D levels. Similarly, a case control study by Ehlayel et al. in 2011 suggested a link between vitamin D deficiency and development of asthma and allergic

diseases.⁴⁹ Vitamin D levels were lower in asthmatic children than in control subjects.⁴⁹ Furthermore, a Chinese case-control cohort study revealed that genetic polymorphisms of vitamin D binding protein increase the susceptibility of asthma within the Chinese Han population.⁵⁰ Searing et al. demonstrated *in vitro* that vitamin D can enhance the action of glucocorticoids on inflammation.⁵¹ Thus, correction of vitamin D deficiency, which is often associated with asthma, could be a possible therapeutic option for glucocorticoid resistant asthma. The exact role 25(OH)D plays on the pathogenesis of asthma is still under investigation, but a significant correlation has been made to higher serum levels of vitamin D and reduction of asthma.

Diabetes and Metabolic Syndrome

West Virginia ranks among the highest in the nation for prevalence

of diabetes with estimates for adults approximately 12.4%.¹ West Virginia also ranks second nationally for obesity rates with a prevalence of 32.5%.¹ Several studies show an inverse relationship between BMI and concentrations of 25(OH)D.^{7,8} Because vitamin D is fat soluble, it is readily taken up by fat cells, and this sequestration of vitamin D likely plays a large role in its decreased bioavailability.⁸ Decreased levels of 25(OH)D associated with higher BMI may play a key role in insulin resistance and thus type-2 diabetes in metabolic syndrome. Research in this area is relatively new, and there are some conflicting findings. One analysis showed an association between higher vitamin D concentrations and a reduced risk for developing type 2 diabetes mellitus in men only.⁵² Chiu et al. found increased risk for metabolic syndrome with lower 25(OH)D levels.²⁸ Additionally, they found that vitamin D is

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directly associated with insulin sensitivity and release from beta-cells.²⁸ Unfortunately, randomized trials investigating the effects of vitamin D supplementation have failed to consistently demonstrate a beneficial effect on insulin resistance or insulin secretion.⁵³ Most of these studies were very short in duration (4 days to 2 years), which may not be long enough to show clinically significant beneficial effects.

Vitamin D receptors are present in activated T and B-lymphocytes and in activated macrophages, which make up a portion of our immune response. Mouse models were used to show that reduction in the incidence of type 1 diabetes was achieved if the mice received 1,25(OH)₂D₃ early in life.⁵⁴ Of note, the autocrine production of the locally active form of vitamin D, 1,25(OH)₂D₃, is critically dependent on adequate concentration of 25(OH) D.⁵⁵ Another study in by Hyppönen et al. followed a cohort of children for the first 31 years of life. They observed that children who received 2000 IU vitamin D during their first year of life decreased their risk of developing type 1 diabetes by 78% compared to children who did not receive supplementation.⁵⁶ A meta-analysis by Zipitis and Akobeng demonstrated significant reduction in the incidence of type 1 diabetes with supplementation of vitamin D in the first year of life.⁵⁷ Follow-up studies are needed to establish the best treatment regimen for vitamin D supplementation.

Vitamin D Levels for Extraskkeletal Benefit

Currently, vitamin D intake recommendations are based solely on bone health and do not consider the potential extraskkeletal benefits of higher vitamin D levels. Bischoff-Ferrari et al. suggested target concentrations of at least 30 ng/mL, with ideal levels of 25(OH)D around 36-40 ng/mL.⁵⁸ They also estimated that to bring half the population to

Table 2. Indications for 25(OH)D Testing that may be eligible for Medicare Reimbursement.⁵⁵

Disorders of parathyroid gland	Other hyperparathyroidism
Hypoparathyroidism	Rickets, active
Osteomalacia, unspecified	Unspecified vitamin D deficiency
Disorders of phosphorus metabolism	Disorders of calcium metabolism
Chronic kidney disease (CKD)	Secondary hyperparathyroidism (of renal origin)
Osteoporosis	Other osteoporosis
Disorder of bone and cartilage, unspecified	Paget's Disease
History or risk of falls	Fibromyalgia
Malabsorption syndrome	History of bariatric surgery
Liver Disease	Anticonvulsant use

the ideal concentration of 25(OH)D, daily intake between 700 and 1000 IU of vitamin D would be required.⁵⁸ Lappe, however, estimated optimal levels of 25(OH)D to be as low as 30-32 ng/mL.⁵⁵ Heaney projected that supplementing the entire population with 2000 IU/day of vitamin D₃ would result in at least 80% of the population having a 25(OH)D level greater than 32 ng/mL.⁵⁹ Daily intake and production of vitamin D varies widely with age, BMI, outdoor activity level, sunblock use, various disease states (e.g. kidney or liver disease preventing key hydroxylation reactions), time of the year, and latitude.⁶ The only way to diagnose and safely treat vitamin D deficiency is to measure serum 25(OH)D. Unfortunately, insurance coverage for measurement is limited.⁵⁵ Current indications for obtaining 25(OH)D levels are listed in Table 2. Laboratory testing reimbursement can occur up to 4 times per annum with levels determined following supplementation protocols to correct vitamin D deficiency.

There are three ways to impact vitamin D stores: sun exposure, diet

or supplementation. In people with light skin coloration, sun exposure below the minimal erythema dose (skin redness) is usually enough to make sufficient daily vitamin D requirements. This is typically about 10 minutes during the day from 10:00 am to 3:00 pm without sunscreen and with minimal clothing (i.e. swimsuit).⁵⁵ However, at latitudes above 37 degrees North, from mid-October to mid-March, no vitamin D is made cutaneously due to the steep solar angle.⁵⁵ **(Figure 2)** Current public sensitivity connected to sun exposure is worth noting. Early studies demonstrated that skin cancer rates increased with sun exposure, however, non-skin cancer rates actually decreased.^{60,61,62} Additionally, one should emphasize that many of our vital processes have an evolutionary dependence on sun exposure and vitamin D production (e.g. immunity) with over 20 photoactive products produced cutaneously following sun exposure.⁶³ The ultimate effect of blocking normal cutaneous photoproduct synthesis with sunblock is not known.

The second way to alter vitamin D status is through diet. Many foods are fortified with vitamin D, and foods such as wild-caught salmon, tuna, cod liver oil, and beef liver naturally contain vitamin D. However, NHANES III data demonstrate that diet supplies very little of the 4000 to 5000 IU of vitamin D₃ used per day.¹⁵

The third way to affect vitamin D status is supplementation. One should know that both D₂ (plant) and D₃ (animal) are available over the counter with D₃ more effective in raising 25(OH)D levels.^{64,65} We recommend following current recommendations for supplementation and testing protocols as highlighted in the *New England Journal of Medicine*.⁶

Conclusion

Vitamin D receptors are located in many cell types throughout the body, and vitamin D plays a regulatory role in many physiologic processes. Low levels of the storage form of vitamin D, 25(OH)D, are correlated with higher risk of many diseases including, but not limited to, asthma, cancer, type 1 and 2 diabetes mellitus, obesity and metabolic syndrome, cardiovascular disease, hypertension, and cerebrovascular disease. These diseases in particular have a high prevalence in West Virginia as well as the U.S. With the current epidemic of hypovitaminosis D, it is essential to test for and correct this modifiable risk factor by educating patients about appropriate sun exposure, proper nutrition, availability, and proper usage of vitamin D supplements.

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CME Post-Test

19. Vitamin D deficiency is best assessed by a simple blood test for which of the following?
 - a. 1,25-hydroxyvitamin D3
 - b. 24-hydroxyvitamin D3
 - c. 25-hydroxyvitamin D3
 - d. 1,24-hydroxyvitamin D3
20. Extraskelatal effects of vitamin D were discussed. Which disease is associated with vitamin D deficiency?
 - a. Diabetes Mellitus
 - b. Obesity
21. The human body uses how much vitamin D3 per day to carry out normal physiological processes?
 - a. The current recommended adequate intake (from 200 IU/d to 600 IU/d)
 - b. About 1000 IU/d
 - c. About 3000 to 5000 IU/d
 - d. Over 5000 IU/d

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A Review of Depression Prevention in Primary Care

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Abstract

The treatment of depression in primary care has become a pressing clinical topic in recent years. Research has detailed the chronic, common, and costly nature of the disease. In an effort to meet the proactive preventive challenge of physicians, this review integrates current research and suggestions for practice across the spectrum of preventive medicine. Patient education, screening, and follow up care are among the topics discussed with a special consideration for the unique cultural, environmental, and demographic influences of West Virginia residents. The overall objective of this review is to raise awareness of depression and increase access to mental health services within primary care.

A Review of Depression Prevention in Primary Care

The evaluation and management of depression in primary care has become a key clinical topic. Research has provided convincing evidence of the chronic, common, and costly nature of the disease among adolescents and adults. Preventive methods can be used not only to prevent the development of depression, but can delay the onset and minimize the consequences of the disease. The following review presents an integration of recent

research and suggestions for better practice that target education, screening, assessment, and interventions across the spectrum of preventive medicine. Considerations of the unique environmental, demographic, and cultural features of West Virginia residents are included.

Nature of the Disease

There is fairly strong agreement that depression is in fact a chronic illness that is frequently recurrent throughout the lifespan. Despite this fact, research suggests that few primary care patients being treated for depression receive continuation and maintenance phase treatment.¹ To meet this need, there have been an increasing number of quality improvement techniques and models for chronic disease management that specifically address depression management.²

In addition to the chronic nature of the disease, depression is also exceedingly common. Telephone interviews of West Virginia residents (ages 18-64) found that nearly 1 in 3 persons (31%) reported symptoms of depression within a week of the interview.³ This is relatively high when compared with the national prevalence of 10.3% within a 12-month period.⁴ Depression represents a major cause of disability in the US and worldwide.^{5,6} It accounts for a large number of days missed and lost productivity among employees, who struggle to have

the energy to complete tasks and the focus to sustain work. Furthermore, depression frequently co-occurs with other chronic disorders such as diabetes,⁷ myocardial infarction,⁸ congestive heart failure,⁹ chronic fatigue syndrome,¹⁰ HIV,¹¹ and rheumatoid arthritis.¹² Depression often becomes an added weight to patients who are already suffering the effects of other chronic diseases.

Depression is costly. A study estimated that 5.6 hours per week were lost from employees with untreated depression, compared with an average of 1.5 productive hours of work lost from those without depression.¹³ Depression was estimated to cost employers \$51.5 billion per year in lost productivity.¹⁴ On the clinical side, depression creates a financial burden of unnecessary tests and medical workups in an attempt to diagnose the patient's unexplained symptoms. Often, a simple depression assessment is not administered, which may have saved the physician, patient, and system valuable time, effort, and resources.

Emphasis on Primary Care

There is a high occurrence of depression in primary care. This incidence has been noted by several researchers,^{15,16,17} and is not expected to decrease. Looking at the percent of *new* antidepressant prescriptions written by primary care physicians in comparison

Objectives

The primary objective of this manuscript is to develop a comprehensive understanding of the needs of depression care in order to meet the challenges of today's primary care practice. Specifically, current education, screening, assessment, and interventions are discussed. Consideration is also taken to the unique cultural, environmental, demographic influences of West Virginia. Overall, readers will be more aware of the challenges of depression care with the consequences of not meeting this need within primary care.

to psychiatrists or psychiatric nurses, it was found that 70% of antidepressants were prescribed by primary care physicians.¹⁸ Another 15% were prescribed by specialists (OB/GYNs, rheumatologists, cardiologists, etc.), and only 15% of all new prescriptions were by psychiatrists or psychiatric nurse prescribers. Conversely, this same study looked at both *new* and *refill* prescriptions, and found that less than half (48%) of all antidepressants were written by psychiatrists. These findings bring up an interesting discussion about the reasons for the discrepancy between new and refill prescriptions at different levels of care.¹⁸ The researchers propose several justifications for these numbers. One possible explanation is that psychiatrists are simply treating a more chronic population and thus keeping patients on medication longer, or that psychiatrists follow the recommended guidelines for acute and maintenance phase care more closely. On the other hand, perhaps primary care physicians are treating other conditions with short term antidepressant therapy.

Regardless of the exact rationale behind the high number of antidepressants being prescribed in primary care, it is clear that much of the mental health care in the United States is occurring in primary care. It is estimated that 24% of frequent users of primary care meet the criteria for a depressive mood disorder.¹⁹ Rural residents have an increased likelihood of suffering from depression; approximately 2.6 million rural adults across the country suffer from the disease annually.²⁰ In West Virginia, rural residents face many challenges that are associated with increased incidences of depression. Among the challenges, heavy alcohol consumption, increased poverty, and physical inactivity have all been associated with increased morbidity.²⁰ Lower education level

and unemployment have also been identified as risk factors for the persistence of depression.²¹

Depression in primary care can be characterized as being under-diagnosed and inadequately treated. The rate of non-detection in depressed primary care patients ranges from 30% to 70%.²² Furthermore, researchers have identified that primary care physicians rarely follow acute, continuation, and maintenance phase treatment recommendations for depression.^{23,24} The problem lies not in the lack of compassion or good intentions of primary care physicians, but in the inherent difficulty continuation and maintenance depression care presents. In response to the need for improved treatment within primary care, primary, secondary, and tertiary preventive strategies are discussed in the following sections.

Primary Prevention

Primary preventive methods are aimed at reducing the incidence of the disorder. These methods typically address early aspects of the lifespan (childhood adversity), or may target specific life events. As a natural hindrance of studying primary prevention, evidence supporting the prevention of the first episodes of depression is not available. However, research about improving coping skills and enhancing protective factors during times of increased vulnerability show promise for primary care physicians. People who have a wide range of coping strategies and resources available to them are less likely to reach the "pathological end-state of depression."²⁵

Primary care physicians can play an important role in intervening before individuals reach the state of pathology. In our experience, many patients do not expect their

primary care physician to ask about critical life events and mental health. When these questions are asked, the stigma surrounding mental health issues is slowly broken down. By offering a counseling referral when complicated grief, parenting problems, or any high-risk life events are present, the physician can place themselves in the most preventive role possible. Another strategy that can be employed in primary care is providing pamphlets in the waiting area for patients about possible warning signs, treatment options, and the course of treatment. Reading materials should emphasize that depression is a medical illness, not a character defect, and that treatment is effective for most patients. Lastly, integrating mental health professionals into primary care makes a strong statement that mental illness is very much a primary care issue. Additional information about integrating mental health care professionals in primary care is provided in the following sections.

Secondary Prevention

Aimed at reducing the prevalence of depression, secondary prevention of depression lies in the early detection of symptoms. Without formal screening procedures, certain populations seem to be overlooked, while others are more readily screened. A chart review of 759 women's charts of rural primary care providers found that primary care providers in rural health clinics are more likely to informally screen women who were younger or patients with a diagnosis of anxiety.²⁶ Furthermore, this study also found that without a protocol in place, formal screening was only documented in 2.4% of patients' charts, and informal screening was documented in 33.2% of charts. Depression is most frequently missed in young men, people presenting

with somatic symptoms, and those who mention emotional disturbance late in the interview.²⁵ In West Virginia, prevalence data suggests that the gender differences typically observed in Major Depressive Disorder are less pronounced.²⁷ It seems to be a product of the disease, that depressed clients do not seek help on their own accord. As few as 50% of those developing depressive disorders seek any sort of help.²⁵ Alternatively, those patients with limitations in their ability to work, grossly impaired functioning, and lower levels of social support are more likely to seek help.²⁵

The US Preventive Services Task Force affirms that routine screening of adults for depression in primary care is important for reducing the morbidity and mortality, *however*, these procedures are only recommended when systems are in place for the assessment, treatment, and monitoring of patients.²⁸ One possible screening tool is the Patient Health Questionnaire-2 (PHQ-2), which has received considerable empirical validation for its reliability and validity. The two questions on the PHQ-2 are sensitive but not specific in their results, therefore requiring additional assessment for positive responses. The longer Patient Health Questionnaire-9 (PHQ-9) that assesses for the intensity of depression is commonly used to follow up the screening as a diagnostic tool.

Treatment algorithms also reflect the need for a stepped treatment approach depending on the severity of the disease. The PHQ-9 fits nicely into this requirement, as the results will indicate a specific level of depression ranging from a false positive to mild, moderate, and severe depression. The stepped treatment approach includes tracking outcomes and adherence proactively. For example, the PHQ-9 can be repeated at follow

up visits to describe the outcomes of antidepressant treatment. An overall goal should be to have a 50% reduction in depressive symptoms by 12 weeks, otherwise a mental health referral, psychiatric consultation, or change in medication is warranted.²

Tertiary Prevention

The final realm of prevention is aimed at reducing the associated disabilities of a disease. The measures suggested in this section lie more in the domain of treatment plans. The National Committee for Quality Assurance's Health care Effectiveness Data and Information Set (HEDIS) depression performance criteria recommends 3 visits in 90 days, essentially one appointment every 4-weeks until remission is achieved. A survey of 297 health plans found that the median performance in meeting this goal was only 20%.²⁹ It has been suggested that more than 50% of patients do not receive adequate dosages of antidepressants.³⁰

Again, primary care physicians are in a unique position to affect the trajectory of the disease. By acknowledging the impact of culture and cultural difference on mental health, physicians are able to provide treatment that patients are more likely to adhere to. A person's cultural and personal experiences directly influence his/her beliefs and in turn attitudes and preferences. If a person's experiences are taken into consideration, openness and readiness for change will be improved. Psychosocial stressors such as transportation, employment, financial stability, housing, food, daycare, etc. are all relevant to a patient's readiness to seek help and adhere to treatment recommendations. Listening for wording that indicates a hesitancy or lack of commitment to change such as, "I will try to..." or "I may..."

is a valuable skill. Look for what is behind the hesitancy and work to acknowledge the obstacles to treatment adherence. Patients are more likely to maintain treatment adherence when they use language that indicates a motivation and steadfastness for change. For example, a patient may say "I will..." or "I am going to..." when referring to treatment. Creating a collaborative environment improves treatment outcomes and patient satisfaction.

Quality Improvement Models

Preventive care for depression works best when integrative, collaborative care is in place. This type of care has demonstrated improvement in treatment adherence, patient quality of life, and depression outcomes. Additionally, depression practice guidelines,³¹ and policy makers, have recommended collaboration between providers of primary care and mental health professionals. A meta-analysis of 37 depression collaborative care studies revealed significant effects on adherence to antidepressants and improved outcomes for up to 5 years.³² Research found that a program to prevent depression relapse in primary care not only yields improved care, but it is also a cost-effective investment of health care resources.³³

Successful programs include organized treatment protocols, systematic monitoring of treatment adherence and effectiveness. A team comprised of a physician, depression case manager to facilitate return visits, consulting psychiatrist to integrate specialty knowledge into primary care, and others are needed to create an effective program. Collaborative care, within primary care, supports patient and provider adherence with guideline-level care, patient self-management, monitoring of patient responses

to treatment, and facilitates a referral to mental health specialists when appropriate.³⁴ Ultimately, a language shift occurs from “your/my patient” to “our patient.”³⁵

System Challenges for Depression Case Management

Creating, and more importantly sustaining, case management in primary care requires key leadership to overcome a multitude of challenges. At the most basic level, lack of funding for behavioral case managers and problematic reimbursement for primary care physicians treating depression creates significant barriers to implementing case management. The West Virginia state legislature has made great strides in recent years to insurance coverage laws, mandating mental health parity for severe mental health illnesses (including depression).³⁶ Now more than ever, more people are able to take advantage of mental health services.

If financial obstacles can be overcome, there may also be difficulty obtaining practice buy-in. That is, other members of the team may not be as convinced about the efficacy or appropriateness of case management, or they may simply feel overwhelmed with adding more complexity to appointments. Additionally, a person designated as the case manager may quickly feel burdened by the volume of patients added to the registry, and the lack of time to adequately manage the data.

Adding to the systematic challenges, difficulties are present in the availability of referrals for patients identified as having depression who require a psychiatrist or patients who would prefer counseling. There is not only a shortage of psychiatrists in West Virginia, but also long wait lists for those who are interested in

counseling. An astonishing 75% of the rural areas in the United States lack even a single psychiatrist.³⁷ In 2011, 22 out of the 55 counties in West Virginia (40%) were without a psychiatrist,³⁸ 81% of which are considered rural counties. Care must be taken to create referral pathways that ensure patients will receive care in a timely manner.

System changes, whether on a large or small scale, are an alteration to a routine and are surely to be met with some resistance. Working through this resistance with possible solutions described below can help make these effective strategies, approaches, and practices of case management feasible.

System Solutions for Depression Case Management

While a surge of funding and added personnel would make adopting case management most accessible to physicians, in reality these are not practical or sustainable solutions. Successful implementation starts on a small scale. Practices can begin by researching successful case management programs looking for effective protocols and materials (e.g., <http://impact-uw.org>) and adjusting them to fit your practice. To start small, set aside a couple hours a week for a nurse to act as a case manager for a small group of identified patients.³⁹ This approach has several benefits: it allows for early protocols to be tested, revisions to be made, and helps create the needed buy-in from members of the team. Track the progress of this small group for 6 months, and hold a meeting to discuss the results, challenges, and directions for the future. As the program develops, consider adding time for case management or hiring graduate students to work as part-time case managers.

Establishing these changes throughout the state and evolving to improve the care of depression in primary care is clearly in the best interest of the patients. Large barriers to success are present, the old adage “you can’t climb a smooth mountain” seems fitting. Adopt creative solutions to navigate the bumps in the road, and make small sustainable changes that can be built upon. As the previous sections have detailed, case management for depression is a favorable approach for not only patients, but providers as well.

Conclusion

To meet the proactive challenge, research indicates a call for primary care physicians to organize their practice to promote prevention of depression on many levels by providing patient education, ensuring close follow-up, monitoring symptoms, side effects and adherence, facilitating return visits for non-responders, and integrating specialty knowledge. Primary care providers can meet this challenge. Routine screening provides an avenue for early identification of depressed patients in rural primary care settings. Diagnosis and timely interventions promise a reduction in morbidity and mortality. “There is little question that the problem of depression and its recurrence represents one of the most pressing clinical, public health, and theoretical concerns for psychopathology research today.”⁴⁰ We agree.

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Please contact the authors for additional references.

CME POST-TEST

22. Patients receiving rural care can be characterized by all of the following except
 - a. Are at an increased likelihood of experiencing depression
 - b. Face unique challenges, such as increased poverty, lower education level, and heavy alcohol consumption
 - c. Not open to medical interventions for mental health
 - d. A diminished gender difference in prevalence
23. A routine screening of adults is recommended
 - a. For high risk clients
 - b. Only when systems are in place for the assessment, treatment, and monitoring of patients
 - c. For all young adults
 - d. Never
24. Programs targeted at improving treatment adherence, such as case management over time describe
 - a. Primary prevention
 - b. Secondary prevention
 - c. Tertiary prevention
 - d. None of the above

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Rational Care or Rationing Care? Updates and Controversies in Women's Prevention

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Editor's Note: This article was originally published in the January/February 2011 issue of the *West Virginia Medical Journal*. The relevance of this article to this special issue on the "Art, Science and Ethics of Prevention," is the reason we have decided to republish it.

New screening recommendations since the first publication of this article are noted by the author in a box at the end of the article.

Abstract

Prevention has potential benefits, but the majority of people undergoing disease screening will receive no benefit and may actually be exposed to health risks. Public opinion is generally very favorable toward prevention. However, many recent guidelines recommend fewer preventive services in women than previously suggested. New recommendations are to wait until 50 for mammography screening, to screen only every other year, and to not teach self breast examinations. Papanicolaou tests for cervical cancer screening are recommended to be done less often (every 2-3 years) and to be started later than previously suggested (not before age 21). Screening for ovarian cancer is not recommended. Guidelines suggest avoiding hormone therapy for primary prevention of coronary heart disease, not giving aspirin to prevent myocardial infarctions in women, and not screening women without risk factors for hyperlipidemia. These recommendations have caused confusion and, because of

being revealed during a national health reform debate, have even been perceived as "rationing care." Others see them as "rational care," because they encourage utilization of beneficial services while discouraging use of those that may lead to more harms than benefits. Development of prevention guidelines requires value judgments, so despite the use of evidence, these recommendations have not all achieved widespread support. Understanding the data behind the guidelines, health care providers can decide how to approach prevention in practice, taking into consideration individual patient risk factors and preferences.

Introduction

Prevention has potential benefits, but the majority of people undergoing disease screening will not be benefitted and may actually be exposed to health risks. Public opinion is generally very favorable toward prevention. Eighty-seven percent of nationally surveyed adults believed cancer screening is almost always good and two thirds indicated that they would be tested even if nothing could be done for abnormal findings.¹ Many women would continue Papanicolaou (Pap) testing to screen for cervical cancer even if their physician recommended against it.² Women who have had a hysterectomy often continue to get Pap tests despite recommendations against doing so.³ Despite this apparent enthusiasm, many beneficial preventive services,

such as breast and colorectal cancer screening, are under utilized.⁴

Experts evaluate several factors to balance potential benefits and harms before recommending a preventive service. USPSTF (United States Preventive Services Task Force) recommendations are considered by many to be the "gold standard" for prevention guidelines. The task force grades the strength of evidence for each service as A or B (recommended), C (recommended against using routinely), D (recommended against), or I (insufficient evidence to recommend for or against). Several guidelines have recently been updated to recommend doing less prevention in women than previously suggested. These recommendations have caused widespread confusion and, because of being revealed during a national health reform debate, have even been perceived as "rationing care." This article reviews recent data and compares different organizations' prevention guidelines for average risk women.

Breast cancer

Breast cancer is the most common non-skin malignancy in US women and the second leading cause of cancer deaths, after lung cancer. 1 in 8 women will get breast cancer in their lifetimes. Fortunately there is a 90% 5-year survival if it is localized

Objectives

Decisions about optimal prevention and screening practices are complex and guidelines often change. The objective of this article is to present up-to-date recommendations from several national organizations about breast cancer screening, cervical cancer screening, ovarian cancer screening, and cardiovascular disease prevention in women. The article will review the evidence behind the guidelines so that health care providers can decide how to approach women's prevention in practice, taking into consideration individual patient risk factors and preferences.

Table 1. Meta-analysis of mammography screening trials, by age

Age group	Number of trials	Pooled RR for mortality	95% CI	NNI	FP per 1000
40's	8	0.85	0.75-0.96	1904	98
50's	6	0.86	0.75-0.99	1339	87
60's	2	0.68	0.54-0.87	337	79

NNI: Number needed to invite for screening

RR: Relative risk

CI: Confidence interval

FP: False positive

Adapted from Nelson. *Ann Intern Med* 2009;151:727-37

at diagnosis, so early detection is important. However, mammography does not prevent a woman from getting cancer, and detecting it early does not necessarily mean a life is saved. Mammography screening has a sensitivity of 77-95% and a specificity of 94-97%. PPV (positive predictive value) varies by age, being lower in women in their 40's compared to women in their 50's and 60's because of the lower prevalence. Evidence indicates reduced mortality with mammography screening. However, there is also potential for harms such as false positives, anxiety, unnecessary procedures, and overdiagnosis. DCIS (ductal carcinoma in situ), a non-invasive cancer, may be an example of overdiagnosis. It has low potential for progression to invasive cancer, with less than half of cases progressing. DCIS cases get treated with surgery and radiation because it is not possible to predict which will progress.⁵

Two recent publications led to changes in USPSTF breast cancer screening guidelines. The first was a meta-analysis of mammography screening trials which included data from 2 new studies since the last USPSTF meta-analysis. These

two new studies both provided data on women ages 39-49. The trials of women in their 40's did not demonstrate significant breast cancer mortality reductions individually, but when pooled together, reductions were significant. Relative risks for breast cancer mortality were significantly lower for all age groups (Table 1). The relative risk reduction was largest for women in their 60's (32%). Although the relative risk reduction was nearly identical for women in their 40's (15%) and 50's (14%), the higher incidence of breast cancer made the absolute risk reduction greater in the older women. The NNI (number needed to invite for screening to prevent 1 breast cancer death) was lower for the oldest group of women (in their 60's) than for women in their 40's and 50's. False positives were higher with younger age and decreased with age.⁶

The second publication was a CISNET (Cancer Intervention and Surveillance Modeling Network) modeling study of screening strategies. Computer modeling is useful because the lengthy follow-up and expense make conduction of randomized controlled screening trials challenging. Models can predict outcomes under different

strategies, adjusting the intervals between screening and the starting/stopping ages. This study compared 20 screening strategies, including 10 different screened age groups, each with annual and biennial testing.⁷

Most of the strategies that were found to be efficient (with efficient strategies having more health gains from fewer resources) utilized a biennial screening interval and initiated screening at age 50. A biennial screening interval was found to be beneficial in terms of both mortality and life-years gained. Harms were greater with annual compared to biennial screening, with more false positives, unnecessary biopsies, and overdiagnosis. Biennial screening was calculated to keep 81% of the mortality benefits of annual screening with about half the harms.⁷

Findings for optimal screening ages were not as clear as findings for interval. Screening initiation at age 50 was efficient for the outcome "mortality." However, initiation at 40 was efficient for the outcome of "life-years gained" due to the additional years of life expectancy. In absolute terms, compared to screening a baseline group of women aged 50-69, it was estimated that adding 10 years of screening to those 70-79 would save 2 lives per 1000 women. If those 10 additional years of screening were instead added to those 40-49, 1 life per 1000 women would be saved (half as many). However, looking at a different outcome, life-years gained would be greater from starting earlier rather than stopping later (33 vs. 24 life-years per 1000 women screened). More harmful false positives and more biopsies would occur with screening initiation at 40 compared to 50. However, overdiagnosis would be more of a problem if 10 years of screening were added by extending screening to age 79 rather than by starting screening at 40.⁷

With the publication of these studies in November 2009, USPSTF updated their screening guidelines

Table 2. Mammography screening recommendations

USPSTF	Routinely begin every 2 years at 50 Individualized decision in 40's
ACP	Routinely begin at 50 Individualized decision in 40's
ACS	Annual starting at 40 Continue as long as good health
ACOG	Every 1 to 2 years in 40's Annual starting at 50
WHO	Every 1-2 years Ages 50-69
Canada	Every 2 years Ages 50-69
Britain	Every 3 years Ages 50-69
Italy	Every 2 years Ages 50-69

USPSTF: United States Preventive Services Task Force

ACP: American College of Physicians

ACS: American Cancer Society

ACOG: American College of Obstetrics and Gynecology

WHO: World Health Organization

to recommend mammograms every 2 years starting at age 50 (**B recommendation**). The new recommendations call for individualized decision-making and consideration of benefits/harms before the age of 50 (**C recommendation**).⁵ The task force had previously recommended annual mammography starting at 40. These guideline changes created a significant amount of controversy, and many politicians, health care organizations, and US women disputed them. One criticism was that USPSTF did not emphasize the data on life-years gained as much as the data on mortality. Also, the CISNET study was limited, as are all computer modeling studies, by the fact that modeling requires assumptions. Many opponents disagreed with the value judgments of the task force, with some believing that additional false positives, anxiety, and cost are worthwhile if even a small number of lives are saved.

Other organizations' screening recommendations vary, as shown in Table 2.⁸⁻¹⁰ ACP (American College of Physicians) guidelines, which

preceded USPSTF, resemble the new task force recommendations, and were based on similar reasoning.⁸ Guidelines in many other countries such as Canada, Britain, and Italy, as well as the World Health Organization, target the age group of 50-69 for screening.¹¹

Screenings with modalities other than mammography have been considered. Breast MRI is more sensitive than mammography but less specific. No mortality data is available. Breast cancer screening with MRI is only recommended by ACS (American Cancer Society), and only for high risk (>15% lifetime risk, which can be determined by online calculators that consider risk factors).⁹ USPSTF gives screening breast MRI an **I statement** for insufficient evidence.^{5,9}

Recommendations for screening with breast examination are shown in Table 3. Clinical breast examination (CBE) has a sensitivity of 40-69%, specificity of 88-99%, and a PPV of 4-50%. There is no mortality data available. While USPSTF says that the evidence is insufficient to address CBE, ACOG

and ACS still recommend it.^{5,9,10}

Breast self examination (BSE) has a sensitivity around 26%. Two large trials including over 300,000 women showed no difference in breast cancer mortality with BSE, and only one showed increased detection. More biopsies were done in the intervention arm so it may do more harm than good.¹² ACS and ACOG (American College of Obstetrics and Gynecology) recommend BSE with some reservations.^{9,10} However, USPSTF now recommends against teaching BSE (**D recommendation**), a change from their previous I statement.⁵ This was announced with their new mammogram recommendations, adding to the screening controversy.

Cervical cancer

Cervical cancer is decreasing in incidence, but is still the 10th leading cause of cancer death in women. Pap tests are the mainstay of screening. HPV is known to be a necessary precursor and HPV testing can be done in conjunction with a Pap test. Most cervical cancer deaths occur in women who had not been screened in the last 5 years. Survival depends heavily on stage at diagnosis. Ninety-two percent will survive 5 years when cancer is localized but only 13% will survive distant disease. The sensitivity of a single Pap test is 60-80% for high-grade lesions. Observational evidence strongly suggests that Pap test screening programs reduce cervical cancer incidence and mortality.⁵ Institution of these programs is considered to be one of the biggest cancer screening success stories. However, potential harms from screening exist. Surgical intervention such as LEEP (loop electrosurgical excision procedure) for cervical lesions has been associated with approximately twice the risk of preterm birth (RR 1.99, 95% CI 1.81-2.2), and some of the increase in US preterm births has been attributed

Table 3. Breast Self Exam and Clinical Breast Exam Recommendations

CBE	BSE
USPSTF	Insufficient evidence to address CBE. (I statement)
ACS	Recommend against teaching BSE. (D recommendation)
ACOG	Optional starting at 20
	Inform of benefits/limitations
	Lacks definitive data, has potential to detect
	Can be recommended

CBE: Clinical breast exam

BSE: Breast self exam

USPSTF: United States Preventive Services Task Force

ACS: American Cancer Society

ACOG: American College of Obstetrics and Gynecology

to these interventions.^{13,14} Cone biopsy procedures have also been associated with increased rates of low birth weight, PPRM (preterm premature rupture of membranes), and perinatal mortality.¹⁵

USPSTF strongly recommends Pap tests (**A recommendation**) beginning within 3 years of sexual activity or

21 (whichever comes first).⁵ ACS generally agrees with the task force, but ACOG has recently suggested that Pap test screening before age 21 should be avoided, regardless of the age of starting sexual activity.^{9,16} ACOG's recommendations are based on the potential harms and a less than 1 in a million chance of

cervical cancer in women under 21.¹⁷ The rationale is that most dysplastic lesions are low-grade and transient, and treating lesions that will regress spontaneously could lead to inappropriate interventions that may do more harm than good.

USPSTF and ACOG both recommend stopping screening

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around age 65 if the woman has had adequate recent normal Pap tests. Both organizations also recommend stopping after hysterectomy done for benign reasons. Because there is a long progression time of preinvasive lesions to invasive cancer (around 10 years), USPSTF guidelines recommend a Pap test screening interval of every 3 years. ACOG and ACS now agree that annual screening is too frequent unless there is a history of cervical cancer or dysplasia, with ACOG recommending Pap tests every two years before the age of 30. After the age of 30, ACOG guidelines state that screening can be done every 3 years if there have been 3 negatives. If HPV testing is done and is negative in women >30, they also recommend not screening more often than every 3 years.^{5,9,16}

These new ACOG cervical cancer screening guidelines were released in November 2009, just days after the release of the USPSTF mammogram guidelines. The concept of annual lifetime Pap testing had been widely embraced in the US despite the fact that USPSTF had been recommending longer cervical cancer screening intervals since 1996. The news of these ACOG recommendations to start Pap tests later and to do them less often seemed to some like a radical shift that would take care away from women.

Ovarian cancer

Ovarian cancer does not have a high prevalence, striking only 50 of 100,000 women. However, it is important in terms of mortality. It is the 5th leading cause of cancer death in US women. Treatment is more effective for presymptomatic disease, with an estimated 40% reduced mortality with early diagnosis. One reason for the high fatality rate of ovarian cancer is that >70% of women are diagnosed with advanced stage disease.

The CA-125 test is often elevated in ovarian cancer, a finding that led to considering use of the test for ovarian cancer screening. Despite the fact that ovarian cancer would be a good disease for a screening program, the CA-125 doesn't have the test characteristics necessary for a screening test. It has a very low PPV because of the low prevalence of the disease,⁵ and abnormal CA-125 tests often require ultrasounds or even surgery to make a definitive diagnosis. There is currently no data showing a decreased mortality with testing, but the Prostate, Lung, Colorectal and Ovarian (PLCO) trial is an ongoing large randomized controlled trial looking at mortality. It involves screening women with both a CA-125 and a transvaginal ultrasound vs. usual care. Recently, data has been evaluated from women in the intervention arm after the first 4 rounds of screening. Only 6 invasive cancers were detected per 10,000 screens. The surgery to detected cancer ratio showed that 20 oophorectomies were done to find 1 case of invasive cancer. 72% of the detected cancers were stage III and above, so it did not find early cancers as had been hoped. The PPV was poor at around 1%.¹⁸ Women sometimes ask their providers to order CA-125 tests, but while final results are pending, there is no current evidence for screening with either CA-125 or transvaginal ultrasound. Routine ovarian cancer screening has never been recommended by any organization, and USPSTF has recommended against it since 1996 (**D recommendation**).⁵

Without a good screening test, diagnosing ovarian cancer early requires having a low threshold for working up symptoms such as pelvic pain, increased abdominal size, urinary urgency, and bloating. These symptoms are nonspecific and often seen in primary care patients without cancer. In cancer patients compared to primary care

patients, symptoms were recently found to be significantly more frequent (20-30 times per month vs. 2-3 times per month). Symptoms were also of shorter duration in cancer patients (3-6 months) vs. primary care (12-24 months).¹⁹ An ovarian cancer symptom index is being tested in combination with CA-125 for screening.²⁰ Until better ovarian cancer screening methods are found, if a woman presents with these common symptoms, particularly if they are occurring almost daily (at least 12 days/month) or if they are new (starting in the last year), it is important to evaluate them for ovarian cancer.

Cardiovascular disease

Heart disease is the leading cause of death in women, and preventing it could have a large public health impact. The mainstay of prevention involves reducing modifiable risk factors such as hypertension, hyperlipidemia, and smoking. Women's later development of CHD (coronary heart disease) compared to men seemed to be associated with loss of the protective effect of estrogen, which led to the use of hormone therapy at menopause for CHD prevention. That fell out of favor after the Women's Health Initiative trial showed no benefit and possible harm.²¹ Aspirin and medications to reduce lipid levels are routinely used as CHD chemoprophylaxis in men, but recent studies have suggested that responses to these agents may vary by gender.

Aspirin

The Women's Health Study was the largest trial of aspirin for primary prevention in women, following almost 40,000 health professionals for 10 years. For the primary end point of major cardiovascular events, there was a non-significant finding (RR 0.91, 95% CI .80-1.03). No effect was seen on risk of MI (myocardial infarction) or death from cardiovascular causes. Aspirin

lowered women's stroke risk (RR 0.83, 95% CI .69-.99) with a number needed to treat of 444. The benefit of aspirin for stroke was offset by an increased risk of GI bleeding with a number needed to harm of 553 for GI bleeding requiring transfusion. Only in a subgroup analysis of women older than 65 was a reduced risk seen for MI and major cardiovascular events. This study's findings were opposite to other studies' findings of reduced risk for MI but not stroke in men using aspirin. Limitations included the low dose of aspirin of 100 mg every other day and the low risk characteristics of the study population, including a young mean age of 55.²²

USPSTF updated their guidelines for aspirin for primary prevention after this study was published, noting that aspirin does not decrease MIs in women. For stroke prevention, they recommend using aspirin in women when potential benefits outweigh potential for GI bleeding (**A recommendation**). A table available on the USPSTF website can help with this tricky risk-benefit analysis. If used, aspirin is not recommended until age 55, which is 10 years older than the recommended starting age for MI prevention in men.⁵

Lipids

In a systematic review of lipid lowering for primary prevention in women, only one of four trials reported lower mortality in treated women. In the pooled analysis, there was no significant reduction in mortality, CHD mortality, nonfatal MI, CHD events, or revascularization. These results were limited by short follow-up, a young mean age of 60, and a low number of events.²³

Despite widespread agreement that further research with longer follow-up is needed, in 2008 USPSTF scaled back their recommendations for lipid screening in women. The task force had previously recommended routinely screening women at age 45 and screening

anyone high risk at 20. The new recommendation is to screen women only if they have increased risk at any age (**A recommendation** for age 45 or greater, **B recommendation** for ages 20-45). They give no recommendation for or against screening women who are not at increased risk (**C recommendation**). Their rationale is that the known benefits of lipid treatment only outweigh the harms (which are admittedly small) when the CHD risk is substantial.⁵

Conclusions

Many recent guidelines recommend doing less prevention in women than previously suggested. Some of the new recommendations are to wait until 50 for mammography screening, to screen only every other year, and to not teach SBES, although not all organizations are in agreement. Pap tests for cervical cancer screening are recommended to be done less often (every 2-3 years) and to be started later than previously suggested (not before age 21). Screening for ovarian cancer is not recommended. Guidelines suggest avoiding hormone therapy for primary prevention of coronary heart disease, not giving aspirin to prevent MIs in women, and not screening women without risk factors for hyperlipidemia.

Some perceive these guidelines as "rationing care." Others see them as "rational care," because they encourage utilization of beneficial services while discouraging use of those that may lead to more harms than benefits. Development of prevention guidelines requires value judgments, so despite the use of evidence, these recommendations have not all achieved widespread support. Understanding the data behind the guidelines, health care providers can decide how to approach prevention in practice, taking into consideration individual patient risk factors and preferences.

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Updates since 2011

Cervical cancer screening

In an effort to make the U.S. Preventive Services Task Force (USPSTF) recommendations clearer and its processes more transparent, the Task Force started posting draft Recommendation Statements online for public comment in 2010. The Task Force accepted public comments on a draft recommendation on screening for cervical cancer from October 19–November 30, 2011. The final recommendations have not been published yet, but may ultimately be different from the prior recommendations which were cited in this article.

Ovarian cancer screening

At the time of this article's original publication, the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Randomized Trial was ongoing but final results had not been published. This trial evaluated the efficacy of transvaginal ultrasound and serum cancer antigen 125 (CA-125) as screening tools to reduce ovarian cancer mortality. In June 2011, the trial's results were published in *JAMA*. In this randomized controlled trial of over 78,000 women, there was no significant difference found with screening in ovarian cancer diagnosis, ovarian cancer mortality, or deaths from other causes. Over 1000 women underwent surgery for false positive results, and of those, 15% experienced at least one serious complication¹. These results are generally consistent with preliminary findings cited in the manuscript, and screening for ovarian cancer with transvaginal ultrasound or CA-125 testing is still not recommended.

1. Effect of Screening on Ovarian Cancer Mortality The Prostate, Lung, Colorectal and Ovarian (PLCO) Cancer Screening Randomized Controlled Trial. *JAMA.* 2011;305(22):2295-2303.

CME POST-TEST

25. According to USPSTF and ACOG guidelines, which of the following statements about Pap tests for cervical cancer screening are true?
 - a. After having a hysterectomy for fibroids, a woman can stop having Pap tests.
 - b. After having a hysterectomy for fibroids, a woman should have Pap tests every three years.
 - c. A woman older than 70 who has had recent negative Paps should have Pap tests yearly.
 - d. A woman older than 70 who has had recent negative Paps should have Pap tests every 3 years.
26. According to USPSTF guidelines, which of the following is the most appropriate approach to ovarian cancer screening?
 - a. Blood test for CA-125.
 - b. Transvaginal ultrasound.
 - c. Blood test for CA-125 and transvaginal ultrasound.
 - d. No screening.
27. According to USPSTF guidelines, which of the following statements about breast cancer screening is true?
 - a. Women should get mammograms every year.
 - b. Women should get mammograms every three years.
 - c. Women should start getting mammograms routinely at age 50.
 - d. Women should be taught how to do a self breast examination.



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Pediatric Bicycle Injury Prevention and the Effect of Helmet Use: The West Virginia Experience

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Abstract

Objectives: The primary objective was evaluation of the injury pattern of children 14 years old or less involved in bicycle accidents and comparison of the differences between those wearing a helmet and not wearing a helmet.

Methods: This was a retrospective cohort study of all pediatric patients involved in bicycle crashes from 2008 through 2010 who were treated within the West Virginia Trauma System. A case was selected for further analysis if "bicycle" and "blunt cause of injury" were present in the Mechanism of Injury field and if age was 14 years old or less. Descriptive statistics were calculated on all variables.

Differences between the helmeted and un-helmeted cohorts were tested using the Wilcoxon test or Fisher's exact test as appropriate. In all cases an alpha of 0.05 was selected as the threshold for statistical significance. **Results:** The helmeted group had a concussion rate of 19.4% while concussions were noted in 37.4% of the un-helmeted group ($p=0.0509$). Additionally, there was a significant difference in the rate of skull fractures seen. Skull fractures occurred in 3.2% of the helmeted and 17.4% of the un-helmeted ($p=0.0408$) riders. The rate of intra-cranial hemorrhage was 0% in helmeted riders and 17.4% in un-

helmeted riders ($p=0.0079$). Finally, perhaps the largest indicator of the effectiveness of helmets in the pediatric bicycle population is the mortality rate. While not statistically different, 100% ($n=2$) of the deaths occurred in the un-helmeted group. **Conclusion:** This study of the West Virginia pediatric population demonstrates findings similar to prior studies looking at the effectiveness of helmets in preventing injuries during a bicycle crash. Bicycle helmets were shown to significantly reduce the rates of both skull fractures and intracranial hemorrhage. Based on this, the expanded use of helmets within the pediatric population should continue to be encouraged both from an educational and legislative standpoint.

Introduction

Bicycles are a popular pastime and mode of transportation for many people in the United States. Learning to ride a bike is often a rite of passage for children growing up. By the second grade approximately 80-90% of children own bicycles.¹ Bicycle riding is a major source of trauma in the United States. Over 550,000 people are treated annually in the Emergency Department due to bicycle crashes,² most of whom are children, costing about \$8 billion per year.³ Head injury is the leading cause of disability from bicycle crashes and accounts for up to 62% of bicycle-related deaths.² Of all traumatic brain injuries in the US, about 7% are

caused by bicycle crashes.⁴ Given this, bicycle helmet use has become a part of many state and local laws to promote helmet use. Although prior studies have supported the use of bicycle helmets, many do not focus on the pediatric population.

Over 40% of all bicycle-related deaths were in children less than 15 years old and greater than 75% of all head injuries from bicycle crashes seen in the Emergency Department were in children 14 years of age or younger.² Children can suffer long lasting effects even after fairly minor head injuries resulting in a concussion. Consequences of concussion can include difficulty concentrating, irritability, headaches, and decline in school performance. While helmets can be effective in protecting riders, only about 15% of children less than 15 years old regularly use a helmet while riding a bicycle.³ Education of children and caregivers about the benefit of helmet use should be part of annual well child visits to their primary care provider. Preventing injuries by using helmets requires active intervention of the parent or caregiver to monitor a child's use of a helmet every time the bicycle is used until helmet use becomes a habit. There are many reasons offered for failure to use a bicycle helmet including cost, lack of knowledge about effectiveness, and

Objectives

We had multiple objectives for this paper. The primary objective was to evaluate the injury pattern of children less than 15 years old involved in bicycle accidents and compare the differences between those wearing a helmet and not wearing a helmet. This was done to demonstrate the effectiveness of helmet use in this age group in order to further promote their use. Further, we wanted to support the discussion on the legislative support of helmet use, whether it is expanding the laws or enforcing the ones already in existence. This paper can also be used as a point for education for parents and caregivers of the importance of helmets in children while riding on a bicycle.

concern regarding the opinions of peers.⁵ Given the potential of helmets to reduce morbidity and mortality caused by head injuries from bicycle crashes,⁶ this study was developed to evaluate the effectiveness of helmets in children less than 15 years of age involved in a bicycle crash in West Virginia from 2008-2010.

Methods

Design and Setting

This was a retrospective cohort study of all pediatric patients involved in bicycle crashes from 2008 to 2010 who were treated within the West Virginia Trauma System. The West Virginia Trauma and Emergency Medical System was mandated by West Virginia Code §64-27-1 to designate various health care facilities in the State of West Virginia as meeting specific levels of care capability as trauma and emergency care centers or facilities. There are 33 trauma centers designated within West Virginia with the following distribution: Level 1 (2), Level 2 (4), Level 3 (2), and Level 4 (25). A Level 1 center is recognized as being capable of providing the highest level of care. All 33 designated trauma centers in the State of West Virginia are required to submit medical records information from all trauma patients seen and treated at the center on an ongoing basis to the West Virginia Trauma System for inclusion in the West Virginia Trauma Registry. Registry data were extracted from 2008-2010.

Selection of Cases

A case was selected for further analysis if "bicycle" and "blunt cause of injury" were present in the Mechanism of Injury field and if age were less than 15 years. For the purposes of analysis, cases were considered to be wearing a 'helmet' if "Helmet/Hard Hat" or "Protective Clothing" was present in the data file. Cases were

Table 1. Bicycle crash diagnoses totals by helmet use.

Diagnosis	No Helmet n =340	%	Helmet n =31	%	P value*
Concussion	127	37%	6	19%	.0509
C spine Fx	1	0%	0	0%	1
Facial Fx	36	11%	4	13%	.7602
Femur Fx	14	4%	4	13%	.0532
Foot Fx/Dislocation	2	1%	4	13%	.0005
Foot STI	4	1%	0	0%	1
Forearm Fx/ Dislocation	134	39%	11	35%	.7056
Forearm STI	34	10%	5	16%	.3517
Hand-Wrist Fx/ Dislocation	12	4%	1	3%	1
Hand-Wrist STI	31	9%	3	10%	1
Head and Neck STI	220	65%	23	74%	.3292
Intra-Abdominal Injury	32	9%	3	10%	1
Intra-Cranial Hemorrhage	59	17%	0	0%	.0079
Intra-Thoracic Injury	14	4%	0	0%	.6177
Lower Leg Fx/ Dislocation	12	4%	3	10%	.1208
Lower Leg STI	31	9%	1	3%	.4990
Lumbar Spine Fx	0	0%	0	0%	1
Pelvis Fx	2	1%	0	0%	1
Rib Fx	4	1%	0	0%	1
Skull Fx	59	17%	1	3%	.0408
T Spine Fx	5	1%	0	0%	1
Trunk STI	64	19%	8	26%	.3462
Upper Arm Fx/ Dislocation	34	10%	2	6%	.7539
Upper Arm STI	42	12%	8	26%	.0506
Upper Leg STI	67	20%	9	29%	.2444
Other Injury Location not Specified	22	6%	0	19%	.2383

* Fisher's exact test

STI = abrasions, lacerations, contusions

Fx = fracture

Intra-Cranial Injury = subdural, subarachnoid, epidural, intraparenchymal, cerebral contusion

Upper Arm = scapula, humerus, clavicle

Forearm = elbow, radius, ulna

Lower Leg = knee, tibia, fibula, ankle

Foot = talus, calcaneous, metatarsal, phalanges

considered to be un-helmeted if “none”, “unknown”, or “not applicable” was present in this field.

Data Analysis

Descriptive statistics were calculated on all variables. Differences between the helmeted and un-helmeted cohorts were tested using the Wilcoxon test or Fisher’s exact test as appropriate. In all cases an alpha of 0.05 was selected as the threshold for statistical significance.

Results

During the 2008 through 2010 study period, there were 6128 total patients enrolled in the WV State Trauma Registry less than 15 years of age with 371 (6.1%) of these injured in a bicycle crash. Of these patients, 31(8.4%) were wearing a helmet at the time of the injury, and 340 (91.6%) were not. The average age in the study group was 9.3 years old (range 1-14) with a gender split of 277 (74.7%) males and 94 (25.3%) females. There was no statistical difference in the utilization of helmets by average age (un-helmeted 9.3 years old vs. helmeted 9.4 years old; $p=0.9084$) or gender (helmeted female 9.57% vs. helmeted male 7.94%; $p=0.6668$).

While not statistically significant ($p > 0.05$), of all children arriving to the Emergency Department by way of helicopter, six children were un-helmeted. There was also a trend towards higher trauma team consultation in the Emergency Department in the un-helmeted group (helmeted 32.3% vs. un-helmeted 45%; $p=0.1901$).

Another trend in the data was the utilization of the ICU. Overall, 16.5% of children not wearing a helmet required ICU admission for advanced monitoring and treatment, while only 6.5% of helmeted children were admitted to the ICU during their hospital stay ($p=0.1965$). There was also a non-significant trend towards a higher Injury Severity Score (ISS) in the un-helmeted

patients (6.7) when compared to the helmeted patients (5.1; $p=0.2978$).

When comparing specific injuries incurred by helmeted vs. un-helmeted children, several statistically different injury pattern frequencies are noted (Table 1). Un-helmeted children had increased frequencies of injuries and sustained more severe injuries. The helmeted group had a concussion rate of 19.4% while concussions were noted in 37.4% of the un-helmeted group ($p=0.0509$). Additionally, there was a significant difference in the rate of skull fractures seen. Skull fractures occurred in 3.2% of the helmeted and 17.4% of the un-helmeted ($p=0.0408$) riders. The rate of intracranial hemorrhage was 0% in helmeted riders and 17.4% in un-helmeted riders ($p=0.0079$). Finally, perhaps the largest indicator of the effectiveness of helmets in the pediatric bicycle population is the mortality rate. While not statistically different, 100% ($n=2$) of the deaths occurred in the un-helmeted group.

Discussion

Previous studies have found head injuries to be one of the most frequent and consequential injuries incurred while cycling.² These injuries with potential lifelong disability have led the CDC to develop a number of recommendations regarding the use of bicycle helmets:

- **Recommendation 1:** Bicycle helmets should be worn by all persons (i.e., bicycle operators and passengers) at any age when bicycling.
- **Recommendation 2:** Bicycle helmets should meet the standards of the American National Standards Institute (ANSI), the Snell Memorial Foundation, or the American Society for Testing and Materials (ASTM).
- **Recommendation 3:** To effectively increase helmet-use rates, states and communities must implement programs that

include legislation, education and promotion, enforcement, and program evaluation.⁷

Following these recommendations, the West Virginia Legislature adopted legislation in 1996 requiring the use of helmets in children less than 15 years old on public roads and pathways. The stated purpose of this legislation was “to reduce the incidence of disability and death resulting from injuries incurred in bicycling crashes by requiring that while riding on a bicycle on public roads, public bicycle paths and other public rights-of-way of this state, all bicycle operators and passengers under fifteen years of age wear approved protective bicycle helmets.”⁷ In this study, we found that un-helmeted children in a bicycle crash were both more likely to have skull fractures and to sustain an intracranial hemorrhage. These injuries have the possibility to have long term, even lifelong consequences for the patient, their family and society. While not statistically significant, all of the deaths and all of the pediatric patients transported by helicopter for evaluation after a bicycle crash were within the un-helmeted group.

Limitations

The main limitation of this study was that it was retrospective. The implications of this are that

- 1) Only pediatric patients with a diagnosis of bicycle crash among their list of injuries were included in the study;
- 2) There is a lack of information on long-term follow up of these children to determine the outcomes or significance of their injuries;
- 3) The data were collected only from hospitals participating in the State Trauma Registry, which comprise only 33 of the 52 acute care hospitals in WV;
- 4) Patients with less serious injuries seen and discharged from a non-participating hospital were not

captured, possibly underestimating the number of injuries.

Conclusion

Based on this, the expanded use of helmets within the pediatric population should continue to be encouraged. Bicycle helmets were shown to significantly reduce the rates of both skull fractures and intracranial hemorrhage. Less than 10 percent of children enrolled in the State Trauma Registry were using helmets. Helmet use is an “active” injury prevention measure. To be effective, a helmet must be used every time the child rides a bicycle. This requires caregivers and riders to be invested in the value of helmet use. Caregivers and parents should monitor helmet use on an ongoing basis to ensure compliance. The results of this study can be cited by primary care providers in annual well child visits to help educate West Virginia parents, caregivers and children of the benefits of helmet use in reducing serious head injuries.

The current “WV Child Bicycle Safety Act” has the following legislative finding: “Disability and death of children resulting from injuries sustained in bicycling accidents are a serious threat to the public health, welfare, and safety

of the people of this state, and the prevention of such disability and death is a goal of such people”.⁸ The current legislation limits jurisdiction to bicycle use on public roads, public byways, and public right of ways. It does not cover bicycle use on private roads or private property. Expanding the scope of legislation to include “non-public” areas in West Virginia and riders of all ages would emphasize the value of helmet use and eliminate confusing double standards that are difficult for children to understand. Several cities in West Virginia have already extended the requirement for helmet use to riders of all ages. Enforcement of the current West Virginia laws should be encouraged, as prior studies have shown that enforcement of existing laws can play a significant role in helmet utilization.⁹ However, with public safety departments’ budgets stretched, enforcement will continue to largely be the responsibility of West Virginia caregivers.

Acknowledgement

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CME POST-TEST

28. Most children who die from bicycle crashes are:
 - a. Younger than 5 years of age
 - b. Wearing a helmet
 - c. Related to trauma to the abdomen
 - d. Related to trauma to the chest
 - e. Related to trauma to the head
29. Children who are un-helmeted and in a bicycle crash have
 - a. The same amount of skull fractures as helmeted children
 - b. Double the amount of skull fractures as helmeted children
 - c. Triple the amount of skull fractures as helmeted children
 - d. More intracranial hemorrhages than helmeted children
 - e. Less intracranial hemorrhages than helmeted children
30. Which of the following describes the number of WV children wearing helmets as a percentage of children less than 15 years of age who were involved in bicycle crashes?
 - a. 4%
 - b. 8%
 - c. 12%
 - d. 20%
 - e. 25%

Preventive Services for Older Adults: Recommendations and Medicare Coverage

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Introduction

In 1965, Medicare was originally designed to cover acute illness and short-term rehabilitation; routine physicals and preventive screenings were not covered at that time. The Medicare law (42 USC 1935y, Sec. 1862) explicitly stated, and still states categorically, that Medicare unless specifically provided for, does not cover items and services “not reasonable and necessary for the diagnosis or treatment of illness or injury or to improve the functioning of a malformed body member.”¹

Over the past 30 years, because of the evolving importance and acceptance of preventive medicine, several exceptions providing for specific preventive services were subsequently added to the covered benefits of Medicare Part B for our senior outpatients (note: unless otherwise specified all items discussed in this article apply to Medicare Part B outpatient coverage only). Medicare first began covering preventive services in 1981 with the pneumococcal vaccination. The Balanced Budget Act (BBA) of 1997²

added cervical, breast, colorectal, and prostate cancer screenings, diabetic supplies, and osteoporosis screening. The Medicare Modernization Act (MMA) of 2003³ further expanded covered preventive services by including the “Welcome to Medicare” exam and cholesterol and diabetes screenings. The Deficit Reduction Act of 2005 added an aortic aneurysm (AAA) screening benefit.⁴ Most recently, the Patient Protection and Affordable Care Act of 2010 added an “Annual Wellness Visit” under Medicare effective 2011.^{5,6} Consequently Medicare now pays for most commonly performed cancer and other screenings in accordance with the recommendations of the American Cancer Society (ACS)⁷ and US Preventive Services Task Force (USPSTF, <http://www.uspreventiveservicestaskforce.org/>) and in fact is now mandated to pay for all preventive services rated “A” and “B” by the USPSTF with no deductibles or coinsurance.⁸ Most other commercial insurance plans will also face the same requirements, however this discussion is limited to Medicare-age older adult patients (i.e. over 65). Each of the Medicare covered preventive services, listed in Table 1, will be discussed in some detail.

For additional information, Medicare’s official “Medicare Claims Processing Manual” Chapter 18 (www.cms.gov/manuals/downloads/clm104c18.pdf)⁵ and other pages on Medicare’s web site (www.medicare.gov) provide the most current and complete information on Medicare’s benefits, guidelines and coverage information for both providers and the public/beneficiaries.

Cancer screenings

Cervical cancer screening, including Pap smear and pelvic exam, has been covered by Medicare since 1990. The schedule allows for an exam every 2 years for average-risk individuals. High-risk women may receive a Pap test and pelvic exam every 12 months. It should be noted that current USPSTF guidelines suggest discontinuing screening among women aged 65 years or older who have had adequate screening and are not otherwise at high risk.⁹

Breast cancer screening has been covered by Medicare since 1991. Mammography screening for breast cancer is covered every 12 months for women older than 40. A single baseline examination is permitted for beneficiaries aged 35 to 39. While ACS and USPSTF recommend mammography every 1-2 years after

Objectives

Upon completion of this article, the reader will be able to:

- 1) Counsel older adult patients on which preventive services are recommended by the U.S. Preventive Services Task Force and which are covered by Medicare.
- 2) Individualize preventive care for elderly patients based on age, gender, individual risk factors and preferences.
- 3) Perform an Initial Preventive Physical Examination and Annual Wellness Visit including Medicare’s required components.

Table 1. Summary of Medicare Covered Preventive Services

- One-time “Welcome to Medicare” Examination (IPPE) (First 12 months on Medicare Part B only)
- One-time aortic aneurysm screening (male smokers 65-75 only, must be ordered at IPPE only)
- Annual Wellness Visit (Starting 2011; must be at least 1 year after above)
- Cardiovascular screening blood tests (lipid profile)
- Cancer tests:
 - Breast cancer screening (mammography)
 - Pap smear and pelvic examination
 - Colorectal cancer screening (FOBT, sigmoidoscopy, colonoscopy or BE)
 - Prostate cancer screening (DRE and PSA)
- Bone mass measurements
- Diabetic screening, supplies, self-management training
- Medical nutrition therapy for individuals with diabetes or renal disease
- Glaucoma tests
- Smoking cessation counseling
- Alcohol misuse counseling
- Depression screening
- HIV screening (in pregnant women, anyone at risk or who requests testing)
- Vaccinations:
 - Influenza
 - Pneumococcal
 - Hepatitis B (Hemophilia, ESRD or immunosuppressed patient)
 - Zoster/Shingles (Medicare Part D)

Note: All items covered by Medicare Part B unless otherwise noted. The Affordable Care Act requires Medicare and other insurance plans to cover all preventive services rated “A” or “B” by the USPSTF (Ref. 8) but only those in this list are applicable/covered in the Medicare age group. For additional information and the latest complete list of Medicare covered preventive services, see Ref. 5 and www.medicare.gov/http://www.medicare.gov/navigation/manage-your-health/preventive-services/preventive-service-overview.aspx.

age 40 or 50, it should be noted that upper age limits are poorly defined for this and all cancers. For the very elderly, with only a few years’ life expectancy (e.g. over age 85), it is reasonable to decrease or discontinue most routine screenings.¹⁰

Colorectal cancer screening has been covered by Medicare since 1998. Tests may include fecal occult blood testing (FOBT), screening

sigmoidoscopy, or colonoscopy or barium enema (BE). For beneficiaries over 50, FOBT is covered once per year. Sigmoidoscopy is covered once every 4 years. Colonoscopy is covered once every 10 years for average-risk individuals and once every 2 years for high-risk individuals. Barium enema may be substituted for sigmoidoscopy or colonoscopy if the physician judges

it more appropriate or accessible; it is covered every 4 years for average-risk individuals and every 2 years for high-risk patients. Newer methods such as CT colonography and fecal DNA testing are not routinely covered. These recommendations are consistent with ACS and USPSTF guidelines which also note that routine colorectal cancer screening may be reconsidered after age 75 and discontinued after age 85.¹¹

Prostate cancer screening. A digital rectal exam and PSA blood test are covered in all men aged 50 and older once every 12 months. HCPCS Code G0103 should be used when ordering the PSA test for prostate cancer screening, and a digital rectal exam may be billed separately using HCPCS Code G0102. It should be noted that American Cancer Society Guidelines suggest men over 50 should be offered prostate cancer screening but only with a life expectancy of greater than 10 years and with understanding of the risks and uncertainties of such testing.⁷ Similarly the USPSTF concludes that the evidence is insufficient to recommend for or against routine screening for prostate cancer using PSA and in fact states “do not screen for prostate cancer in men age 75 years or older (Grade D recommendation).”¹²

Other Screening Tests

In addition to cancer screenings, Medicare now covers several other screening tests, specifically for cardiovascular disease, diabetes, glaucoma, and osteoporosis.

Cardiovascular disease screening refers to a cholesterol/lipid profile rather than tests for actual cardiovascular disease such as an ECG or stress test, though a screening ECG may be ordered in association with the Initial Preventive Physical Examination (*vide infra*). A lipid panel blood test, and/or total

cholesterol, high-density lipoproteins (HDL), and triglycerides ordered separately, are covered once under Medicare Part B every 5 years in accordance with the National Cholesterol Education Program¹³ which recommends a cardiovascular and risk factor evaluation every 5 years in all asymptomatic adults over age 20. Other cardiovascular tests remain noncovered for routine screening in asymptomatic patients. It should be noted that the value of cholesterol screening and treatment is controversial in elderly individuals.¹⁰

Diabetes screening includes fasting or postprandial plasma glucose for any individual at risk for diabetes (including anyone older than 65). Individuals with prediabetes may be tested twice per year, and those without prediabetes may be tested once per year. Diabetic testing supplies, therapeutic shoes and inserts, and insulin pumps are also now covered, along with diabetes self-management training and medical nutrition therapy. Note that although the American Diabetes Association does recommend routine screening for type 2 diabetes for anyone over 45, particularly if overweight or obese,¹⁴ the USPSTF concluded that the evidence is insufficient to recommend for or against routinely screening asymptomatic adults for type 2 diabetes, impaired glucose tolerance, or impaired fasting glucose. However the USPSTF provided a “grade B” recommendation for type 2 diabetes screening for adults with hypertension or hyperlipidemia (<http://www.uspreventiveservicestaskforce.org/uspstf/uspsdiab.htm>).

Glaucoma testing, including an eye exam and intraocular pressure measurement, is covered by Medicare once every 12 months for beneficiaries at high risk for

glaucoma, people with diabetes, or anyone with a history of glaucoma. This examination must be done under the supervision of an optometrist or ophthalmologist, not by a primary care physician. The USPSTF found insufficient evidence to recommend for or against screening adults for glaucoma (<http://www.uspreventiveservicestaskforce.org/uspstf/uspsglau.htm>).

Osteoporosis screening via bone mass measurements covered by Medicare include FDA-approved radiologic procedures (e.g., DEXA scan) to evaluate bone density in estrogen-deficient women at clinical risk for osteoporosis (i.e. all older women). Other eligible risk groups include any individual with vertebral abnormalities, receiving long-term steroid therapy, or being treated and monitored with an approved osteoporosis drug. Bone density tests are generally covered once every 24 months, more often if medically necessary. The USPSTF recommends that all women aged 65 and older should be screened routinely for osteoporosis (grade “B” recommendation) however the task force concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for osteoporosis in men (<http://www.uspreventiveservicestaskforce.org/uspstf/uspsoste.htm>).⁸

Abdominal Aortic Aneurysm screening is the most recently implemented Medicare screening benefit, effective 2007. The Deficit Reduction Act of 2005 provided for Medicare coverage of a 1-time AAA ultrasound screening, which must be ordered at the time of the IPPE.⁴ Beneficiaries must be males aged 65 to 75 and must have smoked at least 100 cigarettes or manifest other risk factors, as

recommended by the USPSTF (grade “B” recommendation).⁸

Vaccinations

Medicare Part B now covers three recommended adult immunizations – influenza, pneumococcal, and hepatitis B. Any and all other federally recommended vaccinations are covered under Medicare Part D since 2008. Pneumococcal vaccination has been covered for all Medicare beneficiaries over 65 since 1981. One pneumococcal vaccination for patients over age 65 is generally considered to provide sufficient coverage for a lifetime, but Medicare will also cover a 1-time booster vaccine for high-risk persons if 5 years have passed since their last vaccination, in accordance with current CDC guidelines.¹⁵ Influenza vaccination has been covered by Medicare since 1993. Vaccination is covered once every year or flu season. Current guidelines recommend immunization of all adults 50 years and older and all healthcare workers. For both influenza and pneumococcal vaccination, there is no deductible, coinsurance, or copayment required, and both the cost of the vaccine and administration by providers is covered. Other services and procedures may be provided and billed the same day without any modifiers necessary. Note that the intranasal influenza live-attenuated vaccine is only recommended for persons 49 and younger and so is not appropriate or covered for Medicare beneficiaries; adults over 65 may receive either the standard influenza vaccine or the high-dose (Fluzone) influenza vaccine.¹⁵

Since 1984, hepatitis B vaccination has also been covered for Medicare beneficiaries considered to be at high risk for the disease (those with end stage renal disease or hemophilia, immunosuppressed patients,

homosexual men, and residents of institutions for the mentally handicapped). Neither hepatitis A nor hepatitis B vaccinations are generally recommended for routine use in adults in the absence of high-risk indications.¹⁵

Somewhat surprisingly, tetanus vaccination was not routinely covered by Medicare even though it has long been recommended every 10 years for all persons of all ages after an initial primary series usually given in childhood. Patients should be made aware that they may have to pay for routine tetanus boosters out of pocket, however, tetanus vaccination, when administered as part of treatment for an injury or potential exposure, should always be covered by insurance. Since 2008, tetanus immunization should be covered under Medicare Part D when not covered by Part B. Tetanus-diphtheria (Td) combined vaccine is usually recommended for adult booster vaccination and as a primary series for those who have not been previously vaccinated. The newer Tdap vaccine (tetanus, diphtheria and acellular pertussis) is also now approved for adults 65 and over in substitution for one booster or primary series dose if not received before.¹⁵

In October 2006, the CDC's Advisory Committee on Immunization Practices (ACIP) recommended all adults over 60 receive one dose of the new shingles (herpes zoster) vaccine (Zostavax) and the FDA has since approved the vaccine for adults over 50 as well.¹⁶ This vaccination is more than 60% effective in preventing shingles and post-herpetic neuralgia and is thus quite worthy of consideration, though under used because of the somewhat confusing coverage. This vaccine, which costs about \$150-200, is *not* covered by Medicare Part B but rather by Part D Prescription

Drug Plans (PDP's) which reimburse pharmacies rather than physicians. Exact costs/copays must be verified by the pharmacy with each patient's individual plan. Physicians may purchase and store the vaccine (which must be frozen until used), then bill the managed care plan if covered or bill the patient, who then can try to get reimbursed by the PDP. Alternatively, physicians may give the patient a prescription to obtain the vaccine from a pharmacy, which itself may then bill the patient or be reimbursed by the PDP. The vaccine then will have to be delivered to the physician's office for administration, unless able to be given directly by a qualified nurse or pharmacist directly in the pharmacy. Although Medicare Part B does not pay for the vaccine itself, an administration fee may be charged if injected in the physician's office or clinic. Other than the tetanus and zoster exceptions discussed, all the other aforementioned vaccines continue to be covered by Medicare Part B as in the past. Non-Medicare insurance plans may have their own varying rules.

The complete current list of recommendations for adult vaccinations may always be found on the following web site: <http://www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm#print>. The *Annals of Internal Medicine* also publishes the latest CDC vaccination guidelines yearly.¹⁵

Initial and Annual "Physicals"

In addition to the aforementioned specific screenings and vaccinations, Medicare Part B now covers two new types of routine physicals, though these are considerably different than the "annual physical" typically conducted by physicians. Other than the Initial Preventive Physical and Annual Wellness Visit Medicare covers no other periodic or routine

examinations (i.e. those provided in the absence of symptoms).

The Initial Preventive Physical Examination (IPPE, also known as the "Welcome to Medicare" exam), was established in 2005 subsequent to the Medicare Modernization Act of 2003. This optional exam, covered only once per beneficiary per lifetime, must be performed during the first 12 months (formerly 6 months) of Medicare Part B coverage (i.e. usually at 65-66 years old). This exam includes several mandatory elements: a comprehensive medical and social history, review of risk factors for depression, functional and safety assessment, a focused physical exam including height, weight, blood pressure and visual acuity, and education and counseling regarding any issues identified in the previous elements and regarding other available preventive services under Medicare. The IPPE may be performed by a physician or qualified non-physician practitioner (physician assistant, nurse practitioner, or clinical nurse specialist). The healthcare common procedure coding system (HCPCS) code G0344 is used for the IPPE; and code G0366 is used for an associated ECG tracing, interpretation, and report (no longer required but still optionally covered). Other covered preventive services listed above, and if appropriate, other medically necessary evaluation and management (E/M) services, may be performed and billed at the same visit using modifier -25. Other than the IPPE and Annual Wellness Visit (see below), routine or annual physicals are not covered by Medicare Part B, despite the existence of an appropriate CPT code 99397 and the need to see patients regularly to perform all the above mentioned tests. Due to the numerous specific requirements of this Initial Preventive Visit and the Annual Wellness Visit, it is advisable to use prepared

templates to be sure all included elements are completed.¹⁷ Both the IPPE and AWV have been under utilized and criticized by physicians as being unorthodox compared to the expectations of a traditional “annual physical” and thus of dubious utility¹⁸

The “Annual Wellness Visit” (AWV) is another new type of routine/annual examination established by the ACA beginning 2011.^{6,19} This optional visit may be performed one year after the IPPE and then annually. Rather than a routine physical it is a compilation of geriatric and risk factor assessments, culminating in “personalized prevention plan services” (PPPS). The following

components must be included, again preferably via a preprinted template: Updated medical and family history, list of current providers and suppliers of medical care and equipment, height, weight, blood pressure and other measurements as deemed appropriate, detection of cognitive impairment and depression, and review of functional ability and level of safety. A list of risk factors and scheduled preventive services and referrals should then be produced for the patient. End of life counseling is a controversial optional component of both the IPPE and AWV. Code G0438 is used for the AWV + PPPS. Both the IPPE and AWV carry an average

payment of about \$150 as of 2011. Changes in Medicare reimbursement rates and possible legal challenges to the Patient Protection and Affordable Care Act of 2010 are still pending as of this writing (Dec. 2011).

In conclusion, Medicare has appropriately evolved with modern medical practice to include most commonly recommended preventive screenings and vaccinations. Of course, virtually any test or examination may be done and billed to Medicare when medically necessary and accompanied by a relevant diagnosis. However routine physicals or any routine or screening tests other than those

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specifically discussed above and listed in Table 1 are NOT covered. Clinicians and patients should take advantage of these new and evolving Medicare-covered benefits to foster preventive health at any age.

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CME POST-TEST

31. Medicare now covers an annual physical examination.
 - a. True
 - b. False
32. Aortic Aneurysm screening is covered by Medicare in all male smokers at any time.
 - a. True
 - b. False
33. Medicare covers annual pap smears in all elderly women.
 - a. True
 - b. False

Non-Pharmacological and Pharmacological Prevention of Episodic Migraine and Chronic Daily Headache

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Abstract

Episodic Migraine and Chronic Daily Headache are common disorders affecting millions of Americans, with a significantly disproportionate affect on women. West Virginia, due to its high obesity rates and lower socioeconomic status, is likely more heavily affected by these conditions.

Prevention of episodic migraine goes well beyond the limited scope of medications and includes many areas which physicians need to be knowledgeable, including lifestyle modifications, trigger avoidance, and relaxation therapies. The prevention of progression of episodic headaches to chronic headaches includes a number of options, possibly most importantly the prevention of medication overuse from either over-the-counter or prescription medications.

Despite limited evidence based pharmacologic options for the prevention of headaches, there are many safe and effective mechanisms in which physicians can help their patients limit the burden of migraine and prevent the progression toward chronic daily headache.

Introduction

Migraine is the most common moderate to severe headache disorder worldwide, disproportionately

affecting women, and causing significant healthcare utilization. Annual costs of migraine disorders, including medication, provider visits, emergency room utilization, absenteeism, and loss of productivity, have been estimated at \$13 billion dollars annually in the United States.¹ This number does not include the treatment of other co-morbid and/or secondary conditions such as depression, anxiety, and renal disease secondary to excessive NSAID use. Risk factors for migraine include obesity and low socioeconomic status, thus leading to an even greater burden in West Virginia. West Virginia had the nation's largest increase in drug mortality overdoses in 1999 to 2004, with 93% of the decedents taking opioid analgesics.²

The one-year prevalence of migraine ranges from 0.7% to 16.1% for men and 3.3% to 32.6% for women. Women have a lifetime prevalence three times greater than men, with 18% of women experiencing migraine compared to 6% of men.³ The significantly higher prevalence of migraine disorders in women further fuels the rising costs of migraine in the United States, as women continue to become increasingly represented in the workforce.

Unfortunately, despite the significant personal, social, and societal impact of migraine, pharmacologic treatment options have remained limited in number and effect. NIH funding for migraine research has been nearly non-existent, and the burden of drug discovery has been left entirely to the pharmaceutical industry. We will discuss the advances in this area later, but the focus of this report is the non-pharmacologic prevention of episodic migraine headache and tools to avoid the progression to chronic migraine.

Prevention of Episodic Migraine

Episodic migraine is thought to be a genetic condition, and therefore, there is no true method of preventing its development in a predisposed individual. However, prevention of migraine in frequency and severity, and therefore in disability and impact, is well proven and multifaceted. Prevention includes lifestyle modification, trigger avoidance, non-pharmacological interventions, treatment of co-morbidities, and pharmacotherapy. It is the responsibility of the medical provider to be as informed about all means of migraine prevention as he/she is about preventive medications.

Objectives

After reviewing this article, the physician should:

1. *Recognize the significant burden of migraine and headache disorders, especially on women*
2. *Have knowledge of both the pharmacological and non-pharmacological approach to the prevention of episodic migraine*
3. *Recognize and help patients avoid risk factors for the progression from episodic to chronic daily headache.*

Lifestyle modification is an often overlooked, under-utilized tool in the prevention of episodic migraine. In general, healthy lifestyle choices are also helpful for migraine. Two important areas of possible intervention include sleep hygiene and exercise. Lack of quality sleep, whether from inadequate time in bed, inconsistent bedtimes, sleep cycle disruption from medications, or obstructive sleep apnea, can greatly increase the susceptibility to develop migraine. Providers need to stress the importance of regular sleep schedules including set bedtimes and waking times, avoidance of caffeine especially in the afternoon and evening, and limited use of benzodiazepines which disrupt sleep architecture. Patients should be encouraged to avoid taking work or stress to bed, watching television or doing computer work in bed. Any patient with complaints of daytime sleepiness, morning headaches, or obesity should be screened for obstructive sleep apnea. Exercise of 40 minutes three times per week was recently shown to be as effective in preventing migraine as topiramate.⁴

Migraine triggers are wide ranging and variable between patients. Common triggers include dietary triggers, hormonal fluctuations, dehydration, fluorescent and strobe lighting, sleep disruptions, stress, and weather changes. Many of these triggers can be avoided or minimized, especially dietary triggers. Although there are a multitude of dietary triggers which have been reported, the more common ones include monosodium glutamate (MSG), nitrates, and red wine. MSG is present in many snack foods such as potato chips as well as in canned soups. Nitrates are used as preservatives in many processed meats, such as prepackaged deli meat, hotdogs, bacon, and sausage. It is nearly impossible for patients to avoid all dietary triggers all the

time, but it is important that they try to limit their exposure. It is also important for patients to keep headache and dietary calendars, at least temporarily, and for providers to review these with patients to look for other potential triggers which could be avoided. There are many “migraine diets” available on the internet, but many of these are overly inclusive of all reported dietary triggers and may lead to avoidance of foods which are not triggers of the individual patient.

Other triggers are more difficult to avoid (hormonal therapy in estrogen induced migraine is beyond the scope of this article), but patients who are aware of their triggers can prepare more adequately by ensuring appropriate sleep, good hydration, and even closer monitoring of dietary limitations.

Non-pharmacologic approaches in the prevention of migraine include biofeedback and cognitive behavioral therapy, as well as other less well proven but promising therapies including relaxation therapy, massage, acupuncture, and other physical therapies. Biofeedback training is a technique where patients become aware of physiologic processes such as heart rate and breathing and learn to exert a level of control of them. Biofeedback has been shown to significantly decrease the frequency of migraine attacks.⁵ Cognitive Behavioral Therapy (CBT) has also been shown to be effective in preventing migraine headaches.⁶ CBT deals primarily with stress management and identifying/treating common co-morbidities with migraine such as mood and sleep disorders. These methods return control to the patient by helping patients recognize how decisions and approaches will affect the severity and frequency of migraine, which has shown improvement in quality of life scores.⁷

Lastly, pharmacologic treatment to prevent episodic migraine may be warranted. Many patients who suffer from migraine and should be treated are not on preventive medication. The American Migraine Prevalence and Prevention (AMPP) trial revealed that approximately 40% of participants may have benefited from preventive therapies but were not receiving it.⁸ The FDA has approved only four medications for the prevention of migraine: propranolol, timolol, valproate, and topiramate. Propranolol is often started at relatively low doses, such as 20mg bid, but often requires titration up to 120-240mg per day in divided doses. Timolol doses range from 20-60mg daily in divided doses. It is important to remember that asthma and depression can be aggravated by the use of beta-blockers, so care must be taken to monitor for side effects. Valproate is commonly initiated at 125-250mg bid and then titrated to 1000-1500mg daily. Weight gain and hair loss are potentially troublesome side effects, and great caution is required to prevent its use during pregnancy. Valproate can affect neural tube development, which occurs early during pregnancy, often even before the patient knows that they are pregnant. Topiramate has shown efficacy in migraine prevention in doses ranging from 100-200mg in divided doses, although it can be given once daily for improved compliance or to reduce daytime side effects. It should be initiated at 25mg per day and then titrated upward slowly to minimize paresthesias. Other potential side effects include appetite suppression and changes in taste (especially carbonated beverages) and cognitive changes. Other commonly used preventive agents include atenolol, nadolol, verapamil, amitriptyline and gabapentin.⁹ There are a few “natural” supplements which have sufficient evidence to consider for

prevention of episodic migraine, including magnesium,¹⁰ riboflavin, coenzyme Q10, and butterbur (butterbur 75 mg BID has been shown to decrease migraine frequency).¹¹ It is important to remember that most of the commonly used preventive medications work to reduce headache frequency by 50% in 50% of patients. Therefore, patients are likely to continue to have some migraines requiring abortive therapy.

Prevention of Chronic Daily Headache

Chronic Daily Headache (> 15 days per month of headache) is present in up to 4% of the adult population. Most of the patients with Chronic Daily Headache (CDH) began with episodic headaches and progressed to CDH over time. CDH affects women twice as often as men. In a one-year study of episodic migraine subjects, 2.5% developed chronic migraine by the end of the year.¹² There are a number of risk factors associated with progression to CDH, and it is the modifiable risk factors which will be addressed further. Risk factors for progression to CDH include lower socioeconomic status, not being married, obesity, snoring and other sleep disorders, co-morbid pain conditions, head and neck injuries, stressful life events, smoking, caffeine intake, and overuse of pain medications. High frequency (9-14 days/month) episodic migraine has also been shown to increase the risk for progression to CDH.

Obesity has been shown in multiple studies to increase the risk of progression to chronic daily headache. Scher et al demonstrated an odds ratio of 5.53 for the one-year incidence of chronic migraine in obese subjects. Patients should be encouraged to aggressively pursue weight loss measures, including dietary modification and exercise. Consultation with a dietician may be necessary to develop an understanding of their current

dietary intake and strategies for change. As in episodic migraine, snoring and sleep disorders are a risk factor for CDH progression from episodic, and this risk is independent of factors such as obesity.¹³ Patients should be evaluated for sleep disorders and sent for polysomnography if obstructive sleep apnea or other physiologic sleep disorder is considered. Physicians need to take the time to counsel patients regarding sleep hygiene as described above. Adequate treatment of underlying sleep disorders can improve or resolve many types of headaches including migraine.¹⁴

Likely the most important role of the physician in preventing the progression from episodic to chronic headaches is to prevent the overuse of pain medications and the subsequent development of medication overuse headache (MOH). MOH is defined as 15 days of headache per month in the setting of overuse of medication for 3 months, and should remit within 2 months of discontinuation. However, care must be taken that one overused medication is not simply substituted for another, such as a patient stopping acetaminophen but changing to an ibuprofen/caffeine combination. It is estimated that 30% of CDH sufferers have MOH.

Medications of overuse can include over-the-counter medications such as acetaminophen and caffeine containing medications and prescription medications, most importantly opioid and butalbital containing compounds. Over-the-counter medications can be especially problematic because they are available without a prescription, very inexpensive, and often initially effective. Bigal and Lipton reported that "individuals with chronic migraine were more likely to be high caffeine consumers while they had episodic headaches, as compared with individuals that did not develop chronic migraine."¹⁵ Patients must be advised against the frequent use of these medications,

likely limiting their use to no more than 2 days per week. The AMPP trial revealed butalbital and opioids to be independent risk factors for the progression to Chronic Migraine from episodic over a one-year period, whereas other abortives such as triptans and non-steroidal anti-inflammatories were not.¹⁶

The AMPP trial also revealed that high frequency episodic migraine (9-14 days per month) was a risk factor for progression to chronic migraine, even without MOH. It is especially important for physicians and patients to adequately track migraine frequency and to consider aggressive preventive strategies discussed earlier such as pharmacologic treatment and trigger avoidance.

The only FDA approved treatment for Chronic Migraine (as opposed to the prevention of migraine) is the recently approved injection of onabotulinum toxin type A in a fixed site, fixed dose approach. It's use is limited by significant costs, insurance restrictions, and few providers trained in the injection paradigm.

Lastly, physicians need to be aware of the availability of vast numbers of patient educational resources online. While not all sources are of the same quality, there are a number of very well done and accurate sites to which patients can be directed for information regarding headaches and communication with other people who suffer similarly. Some examples of these include the National Headache Foundation (www.headaches.org), the American Headache Society Committee on Headache Education (www.achenet.org), and www.migraine.com.

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CME POST-TEST

34. A 35 year old woman presents to your office with complaints of increasing frequency of migraine headaches. She is now having migraine three times per week. She is treating with sumatriptan and gets relief of her pain within two hours, but due to quantity limits by her insurance, is having trouble being able to treat all of her headaches. Which of the following is an apparent risk factor for her to develop chronic migraine?
 - a. Age of 35 years
 - b. Use of sumatriptan
 - c. Frequency of headaches between 9-14 per month
 - d. Lack of preventive medication use
35. A 42 year old man reports that he is now suffering from headaches at least 4 times per week, and often more than this. His headaches cause his nausea and he is sensitive to light and noise. He is having trouble maintaining his employment due to missing work. He is currently treating his headaches with a combination over-the-counter medication containing acetaminophen and caffeine. On review of systems he reports poor sleep and daytime fatigue. On exam he is obese with a BMI of 35, but has a normal exam otherwise. Which of the following is the most appropriate next step?
 - a. Advise to continue with his medication since it seems to work
 - b. Advise patient on exercise and weight loss and prescribe preventive medication
 - c. Switch patient from current medication to butalbital
 - d. Advise patient that there is nothing that can be done until he gets in shape
36. A 26 year old female with migraines occurring 18 days per month presents to your office for advice. She is otherwise healthy. She has been prescribed by another physician amitriptyline for prevention of her headaches without relief, and is using a butalbital/caffeine combination medication as needed for her headaches, but is seeing diminishing benefit. Her exam is normal. Which of the following is the most appropriate next step in the management of her chronic daily headache?
 - a. Advise her to increase the dose of her as needed medication to improve the benefit
 - b. Add another preventive medication
 - c. Advise her to alternate the use of her current as needed medication with over-the-counter medications
 - d. Advise her to eliminate the use of her as needed medication and provide alternative treatment with strict frequency limitations

Screening Mammograms in Alzheimer's Disease Patients

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Abstract

Very little guidance exists to help clinicians and families decide whether mammograms are useful in elderly women with Alzheimer's Disease (AD). We present a case of a patient with moderate AD who had a positive mammogram and discuss the dilemma faced by the family and clinician in deciding what was best to do for the patient. In this case, the family opted for breast conserving surgery (BCS) followed by palliative care which brought up the question of whether screening was appropriate with this treatment goal in mind. We reviewed the literature on AD and breast cancer screening and summarize these findings in our discussion.

Introduction

Alzheimer's Disease (AD) is the sixth leading cause of death in the United States with a current prevalence of about 5.4 million Americans and expected to rise to 16 million by the year 2050. In 2011, nearly \$183 billion was spent on health care, long term care, and hospice care costs for people

with AD and other dementias.¹ Few articles exist that help guide clinicians on whether screening mammograms would benefit patients with AD. We present the case of a patient with moderate AD who continued to receive mammograms and the lesson learned from this case when it became evident that the family did not want aggressive treatment of the patient's cancer.

Case presentation

An 82-year-old female presented with memory loss at age 75 and her mini-mental status at that time was 29/30 (normal 26-30). She had a gradual loss of memory over the ensuing 7 years and was diagnosed with AD. At age 82 she was ambulating without assistance and, aside from a history of osteoporosis, she had no other medical problems. She continued to have regular preventive care including yearly mammograms, but a dilemma arose when her mammogram showed a 14 mm lesion in the left breast highly suspicious for cancer. Unfortunately, her memory had declined to a mini-mental status score of 19 consistent with moderate dementia and she was unable to make decisions for herself. After discussion with the family, the patient was referred to a surgeon and a lumpectomy

was performed which revealed a 1.3 cm grade 1 infiltrating lobular carcinoma that was completely excised. The tumor was ER positive, PR negative and Her2 negative. At this point the family decided not to put the patient through any more treatment. She lived two more years and over that time had a gradual decline in her functional status and memory, eventually becoming bedfast and requiring nursing home care before she died.

Discussion

This 82-year-old patient with moderate AD continued to receive breast cancer screening which may not have been appropriate. Some may argue that even healthy 82-year-old women should not receive breast cancer screening. The US Preventive Services Task Force (USPSTF) concluded that evidence as to whether breast cancer screening for women 75 years or older has any benefit is lacking since randomized controlled trials of breast cancer screening did not include this age group.² The American Geriatric Society Clinical Practice Committee recommends biennial or every three year screening for women over age 75 years as long as their life expectancy is at least four years.³ The Cochrane review analysis of

Objectives

After reading this paper the reader will be able

1. To state the evidence for breast cancer screening in the elderly patient.
2. To discuss the ethical dilemma of screening mammograms in the Alzheimer's patient.
3. To formulate a plan to follow the breast cancer screening needs of the patient with dementia.
4. To decide which of their patients with dementia might benefit from screening mammograms.
5. To be aware of treatment issues of early stage breast cancer in patients with dementia.

seven randomized trials comparing screening mammography versus no screening revealed three well designed trials which did not show any significant decrease in breast cancer mortality and four less optimally designed trials showing a significant decrease in breast cancer mortality.⁴ The overall evidence for a benefit of screening mammography in women over age 75 is not clear.

The ethical dilemma of whether or not to recommend screening mammography among AD patients has been discussed by Raik et al.⁵ They considered the benefits such as improved survival from early detection and treatment, and reassurance of negative examination, which will possibly benefit mildly impaired patients, but not moderately or severely demented patients who may not understand the reassurance of a negative scan.

The burdens of mammography can be due to overdiagnosis with false positive screening results leading to diagnostic mammograms and biopsies or overtreatment of premalignant conditions such as ductal carcinoma in situ. Additional harm may occur from subjecting cognitively impaired patients to a procedure that they do not understand. Raik et al suggested withholding screening mammography for patients with advanced dementia, significant comorbidity, or a life expectancy of less than 5 years. However, patients with mild dementia who may have the capability to understand benefits and harms should be given the opportunity to decide for themselves about screening after a discussion with their primary care provider.

When considering breast cancer screening in patients with AD, the

goals of care for the individual patient should be discussed. Goals of care have been classified by Sachs into prolongation of life, some limitations on life prolonging treatment weighing treatment benefits and burdens, and palliation.⁶ Although for most people, including many AD patients, life prolongation is the major goal, this may change as the disease progresses. Cassel suggested that a good rule to follow would be that if surgery would be performed should a lump be discovered then mammography should be continued.⁷ A study about the importance of screening for breast cancer involving 23 caregivers of women with dementia revealed that most caregivers of women with mild to moderate dementia have the intent to continue screening, while caregivers of women with severe dementia did not perceive screening

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as important.⁸ Moreover, similar to the family in our case, their opinions on appropriate treatment if the patient with AD developed breast cancer was toward non-aggressive or comfort care. Unfortunately, families often schedule the mammogram without discussing it first with the primary care provider. In order to avoid being surprised with the dilemma of dealing with an abnormal mammogram in a patient with AD whose goal is palliation, preemptive discussion about the appropriateness of continuing screening mammography needs to take place at least annually.

Older women with a life expectancy of less than five years are less likely to benefit from screening mammography. A study of the impact of cognitive impairment on screening mammography found that although women with severe cognitive impairment have a lower rate of mammogram utilization compared to women without cognitive impairment, an estimated 120,000 screening mammograms were performed among women with severe cognitive impairment, a group with a median survival of just 3.3 years.⁹ This represents a use of medical resources that may not be having much benefit. Larson et al¹⁰ showed that unsteady gait, wandering, incontinence of urine, low score on mini-mental status exam at presentation or drop of 5 points in first year, and pre-existing heart disease or diabetes predict shorter life expectancy among patients with AD. Physicians need to be aware of factors causing shortened survival in AD so they can better advise their patients and families on the merits of breast cancer screening.

Our patient's family opted for breast conserving surgery (BCS) alone as treatment for her early stage breast cancer. This is a fairly common

choice according to a cohort study of 50,460 breast cancer patients of whom 1,935 patients had a diagnosis of AD which concluded that women with AD more often chose BCS than those without AD.¹¹ Moreover, the AD patients were less likely to receive any treatment for their breast cancer.

Different treatment modalities among patients over age 70 years with early stage breast cancer have been discussed by the International Society of Geriatric Oncology.¹² BCS is currently preferred over mastectomy especially in the elderly as it may lead to a better quality of life with no difference in overall survival or disease-free survival compared to total mastectomy, however local recurrence is increased with BCS alone. Radiotherapy reduces local recurrence rate, however, there is controversy in its overall survival benefits. Patient's health status, functional capacity, comorbidities, and risk of local recurrence should be considered before offering radiotherapy. Adjuvant hormonal therapy with either tamoxifen or aromatase inhibitors typically will benefit older patients with hormone sensitive breast cancers. The decision to give adjuvant chemotherapy should include consideration of absolute benefits, individual patient tolerance, life expectancy, and other comorbidities.¹¹

In conclusion, screening mammograms should not be used in severely demented patients. Those with mild or moderate AD should decide about screening based on comorbidities, life expectancy, and intent to treat the cancer once discovered. Healthcare providers of patients with AD should have periodic discussions regarding the appropriateness of screening mammograms as the disease progresses and goals of care change.



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CME POST-TEST

37. Regarding the evidence for screening mammograms for women over age 75 years:
 - a. The USPSTF states that screening is definitely indicated and supported by evidence.
 - b. The American Geriatrics Society states that mammograms could be offered every 2-3 years in the elderly with at least 4 years of life expectancy.
 - c. Most clinical trials of screening mammography included women over age 75.
 - d. The best designed clinical trials showed a decrease in breast cancer mortality.
38. According to Raik et al, which of the following was appropriate:
 - a. Mammograms should be withheld from patients with less than 10 years life expectancy
 - b. Patients with mild to moderate dementia would not benefit from screening mammograms
 - c. Patients with severe dementia would not benefit from reassurance of a negative exam.
 - d. One of the burdens of mammography is the cost to the patient.
39. Regarding treatment of breast cancer in Alzheimer's disease
 - a. Total mastectomy is preferred by most patients.
 - b. Radiation therapy helps prevent distant metastasis.
 - c. Hormonal therapies are rarely used in the elderly.
 - d. Breast conserving therapy for early stage disease has no difference in survival compared to total mastectomy.



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Injury Prevention and Recreational All-Terrain Vehicle Use: the Impact of Helmet Use in West Virginia

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Abstract

All-terrain vehicles (ATVs) are a popular source of outdoor activity in the United States, particularly in West Virginia. During the period of time from 1999 to 2007, deaths associated with ATVs in West Virginia increased by 28%. Helmet use among bicycle and motorcycle riders has been shown to decrease morbidity and mortality following trauma. *Methods:* We performed a retrospective observational study to compare injury patterns, hospital course, and resource utilization of non-helmeted and helmeted riders involved in ATV accidents using data from the West Virginia Trauma Center System. Descriptive statistics were calculated for all study variables and comparisons were made between helmeted and non-helmeted riders. *Results:* In 2010, there were 1,059 patients aged 18 and over with traumas resulting from ATV accidents within the System. Riders involved in ATV trauma occurring on farms and streets were significantly more likely to be non-helmeted, while those using ATVs for recreational purposes were more likely to

be helmeted. Non-helmeted riders were significantly more likely to arrive to the hospital via helicopter than helmeted riders, and were less likely to be discharged home from the ED compared to helmeted riders. Non-helmeted riders sustained significantly more head, neck, soft tissue injuries, concussions, intracranial hemorrhages, facial fractures, skull fractures, and thoracic spine fractures than helmeted riders. *Discussion:* The findings of the current study support previous studies documenting that helmet use is protective against intracranial injury and other injuries of the head and neck. ATV use continues to be a significant contribution to trauma morbidity and mortality in West Virginia. *Conclusion:* Efforts that focus on increased helmet use have the potential to significantly reduce morbidity and mortality following ATV trauma. Enforcement of the current West Virginia ATV Law should be encouraged. Legislation expanding the mandatory use of safety equipment and rider training should be enacted in West Virginia..

Introduction

All-terrain vehicles (ATVs) are a popular source of both outdoor activity and functional work in the United States, particularly in West Virginia. ATVs were introduced in the 1970s and are primarily used as recreational vehicles. West Virginia has hundreds of miles of sanctioned ATV trails, most notably the Hatfield and McCoy Trail, providing a significant tourism impact to the economy. WV State tourism promotional monies help advertise

these trails on the World Wide Web. Countless additional miles of trails exist on private lands. Three-wheeled vehicles were demonstrated to be associated with significant morbidity and mortality and were removed from production in 1987. Today's ATVs are four-wheel vehicles similar to motorcycles in their method of control and riding position.

In West Virginia the death rate associated with ATV injury during the 1990s was 8 times the national average.¹ In response to these findings, legislation was passed in 2001 to improve safety measures. This law prohibited ATV operation on paved roads with a center line, unless the vehicle was traveling a distance of ≤ 10 miles and at a speed of ≤ 25 miles per hour. The statute also required helmet use and training for ATV riders aged < 18 years of age, regardless of where the ATV was ridden.^{1,2}

Injuries and fatalities continued to increase after this legislation was enacted. During the period of time from 1999 to 2007, deaths associated with ATVs in West Virginia increased by 28%.² Deaths were more likely to occur in the following groups: pediatric patients, adults with lower socioeconomic status, those with fewer years of education, and those involved in rollover accidents. Brain and spine injuries were

Objectives

All-terrain vehicles (ATVs) are a popular source of outdoor activity in the United States, particularly in West Virginia. The objective of the current study was to describe and compare the demographic variables, injury patterns, hospital course, and resource utilization of non-helmeted and helmeted riders involved in ATV accidents using data from the West Virginia Trauma Center System. We discuss impact of helmet use on injuries and emergency department and hospitalization as well as implications for helmet legislation throughout the state of West Virginia.

found to occur in 80% of fatal ATV crashes in West Virginia in 2006.²

ATV trauma results in specific injury patterns as documented previously.^{3,4} Head injuries, facial injuries, and orthopedic injuries are the most common ATV crash injuries to require medical care. It has been shown previously that children and adolescents sustain a disproportionately large percentage of injuries due to ATV use.⁵ In recent years the number of persons aged greater than 50 years sustaining ATV injuries has increased.⁶

Helmet use among bicycle and motorcycle riders has been shown to decrease morbidity and mortality following trauma. Several studies examining ATV crashes have shown helmet use among riders to be approximately 20%.^{7,8} Findings in prior studies have demonstrated helmet use is likely to decrease admission to intensive care unit, the number and severity of head injuries, and the likelihood of death. It has been estimated that helmet use for all riders might reduce the risk of death by 42% and the risk of nonfatal head injury by 64%.¹ Prior studies have examined the demographics, injury patterns, and resource utilization of ATV crash injuries; however, few have compared results between helmeted riders and non-helmeted riders.

We performed a retrospective observational study to compare injury patterns, hospital course, and resource utilization of non-helmeted and helmeted riders involved in ATV accidents. Data from the WV State Trauma Registry for 2010 were compiled from the 33 acute care hospitals participating in the WV Trauma Center System.

Methods

Design and Setting

Data were extracted from the West Virginia Trauma Center System

registry, a statewide registry that compiles trauma data from 33 acute care hospitals in West Virginia. Patients are enrolled in the registry for the following reasons: the trauma team was activated during their emergency department evaluation, they are admitted or observed in the hospital for a traumatic injury, they arrive at the hospital by aero-medical transport with a traumatic injury, they have an operative procedure for a traumatic injury, or they die in the ED resulting from a traumatic injury. We analyzed the trauma registry data from the year 2010 for this retrospective cohort study. This study was approved by the West Virginia University Institutional Review Board (Protocol Number H-23530).

Selection of Cases

Cases were selected for analysis if "ATV" was included in the "Blunt Cause of Injury" field and if age was greater than 18 on the data abstraction form. Cases were

considered to be "helmeted" if "Helmet/Hard Hat" was present in the "Protective Devices" field. All other entries, including "none", "unknown", and "not applicable" were considered to be "non-helmeted." Age, sex, place of injury, mode of transportation to the ED, injury pattern and severity, ED treatment and disposition, and hospitalization course and disposition were examined and compared for helmeted and non-helmeted cases meeting the inclusion criteria.

Data Analysis

Descriptive statistics (frequencies, percentages, means and standard deviations) were calculated for all study variables. Differences between helmeted and non-helmeted patients were calculated using chi-square for categorical data and t-tests for continuous variables. Statistical significance was set to alpha <0.05 for all analyses. Data

Table 1. Demographics of ATV Traumas in 2010

	Non-Helmeted (n=861)		Helmeted (n=198)		p-value*
Age (M, SD)	37.5	(14.8)	37.1	(14.0)	0.766
Sex (n, %)					
Male	643	(74.7)	156	(78.8)	0.227
Female	218	(25.3)	42	(21.2)	0.227
Injury Severity Score (M, SD)	8.6	(8.1)	7.6	(7.8)	0.124
Location of Injury (n, %)					
Farm	54	(6.3)	2	(1.0)	0.001
Home	118	(13.7)	28	(14.1)	0.883
Recreation	319	(37.0)	93	(47.0)	0.009
Street	115	(13.4)	16	(8.1)	0.041
Other [†]	255	(29.6)	59	(29.8)	0.955
Mode of Arrival (n, %)					
Ambulance	385	(44.7)	92	(46.5)	0.646
Helicopter	68	(7.9)	6	(3.0)	0.015
Private Vehicle/Walk-in	375	(43.6)	96	(48.5)	0.211
Other [‡]	33	(3.8)	4	(2.0)	0.283

*Differences determined by t-tests or chi-square and fisher's exact test as appropriate

[†] Includes locations of "industry", "mine", "public building", "unspecified", "unknown" and "other location"

[‡] Includes "unknown", "n/a", and "other"

were analyzed using SPSS Version 19.0 (SPSS, Inc., 2011, Chicago, IL).

Results

There were 1,059 traumas enrolled with “ATV” as the “blunt cause of injury” in the WV trauma registry in 2010. This number is 5.4% of the 19,604 total traumas entered into the WV Trauma Registry for patients 18 and over for this year. Of these, 861 (81%) were non-helmeted and 198 (19%) were helmeted riders. The mean age for all cases was 37.4 years (*SD* = 14.7) and most (75%) were males. As can be seen in Table 1, there were no significant differences in helmet use by age or

sex. Riders involved in ATV trauma occurring on farms and streets were significantly more likely to be non-helmeted, while those using ATVs for recreational purposes were more likely to be helmeted. Furthermore, non-helmeted riders were significantly more likely to arrive to the hospital via helicopter than helmeted riders (Table 1).

As can be seen in Table 2, significantly fewer non-helmeted riders (33.1%) were discharged home from the ED compared to helmeted riders (44.9%, *p* = 0.002). There were no significant differences between helmeted and non-

helmeted riders in terms of hospital disposition to home, however.

When patterns of injury were compared, significant differences were found between the proportion of helmeted and non-helmeted riders for various injuries. Specifically, when compared to helmeted riders, non-helmeted riders sustained significantly more head and neck soft tissue injuries (STI; 81% vs. 56%), concussions (60% vs. 38%), intra-cranial hemorrhages (22% vs. 6%), facial fractures (21% vs. 12%), skull fractures (19% vs. 9%), and thoracic spine fractures (11% vs. 5%). Helmeted riders sustained significantly more STIs to the trunk (66% vs. 39%), upper arm (31% vs. 22%) and lower leg (17% vs. 11%), as well as significantly more forearm and foot fractures (15% vs. 10% and 0.2% vs. 2.0%, respectively) than non-helmeted riders.

Table 2. Emergency Department and Hospital Dispositions for Non-Helmeted and Helmeted Cases

	Non-Helmeted (n=861)		Helmeted (n=198)		p-value
	n	%	n	%	
ED Disposition					
Home	285	(33.1)	89	(44.9)	0.002
Floor†	297	(34.5)	58	(29.3)	0.162
ICU	138	(16.0)	22	(11.1)	0.082
OR	43	(5.0)	9	(4.5)	0.769
Transfer	11	(1.3)	3	(1.5)	0.734
Stepdown	36	(4.2)	9	(4.8)	0.850
Other‡	51	(5.9)	7	(3.5)	0.180
Death	0	--	1	(0.5)	0.187
Hospital Disposition					
Home§	795	(92.3)	187	(94.4)	0.306
Inpatient Facility	19	(2.2)	4	(2.0)	1.000
Rehab Facility	15	(1.7)	3	(1.5)	1.000
Skilled Nursing Facility	7	(0.8)	0	--	0.360
Residential Institution	2	(0.2)	0	--	1.000
Morgue	5	(0.6)	1	(0.5)	1.000
Other¶	18	(2.1)	3	(1.5)	0.781
Discharge Status					
Dead	5	(0.6)	1	(0.5)	1.000

*Differences determined by t-tests

† Includes dispositions of “floor”, “observation” and “telemetry”

‡ Includes dispositions of “unknown”, “AMA”, “n/a”, and “other”

§ Includes dispositions of “home, no assistance” and home, health care”

|| Includes dispositions of “acute care hospital” and “ICF”

¶ Includes dispositions of “unable to complete treatment”, “n/a”, and “other”

Discussion

The results of this study reveal several differences in location of injury and resource utilization after ATV trauma. Specifically, non-helmeted riders were more likely to be injured on farms and streets and were more likely to be transported to the hospital via helicopter than helmeted riders. Significantly more riders who were riding ATVs for recreational purposes were wearing helmets, suggesting that educational efforts should be expanded to promote wearing helmets on farms and for transportation as well as during recreational activities. Furthermore, as nearly half of helmeted riders (44.9%) were discharged from the ED compared with 33.1% of non-helmeted riders, wearing a helmet was associated with a greater likelihood of discharge from the ED as opposed to hospital admission. There were no significant differences in the number of deaths between helmeted versus non-

Table 3. Injury Patterns of Helmeted and Non-Helmeted ATV Riders Involved in Trauma

	Non-Helmeted (n = 861)		Helmeted (n = 198)		p-value*
Diagnosis (n, %)					
Head and neck STI [†]	700	(81.3)	111	(56.1)	<0.001
Concussion [‡]	513	(59.6)	76	(38.4)	<0.001
Trunk STI	336	(39.0)	131	(66.2)	<0.001
Upper leg STI	211	(24.5)	55	(27.8)	0.339
Intra-cranial hemorrhage [§]	188	(21.8)	11	(5.6)	<0.001
Facial fracture	182	(21.1)	23	(11.6)	0.002
Upper arm STI	178	(20.7)	42	(21.1)	0.867
Skull fracture	161	(18.7)	17	(8.6)	0.001
Intra-thoracic injury	147	(17.1)	32	(16.2)	0.757
Rib/Sternum fracture	143	(16.1)	43	(21.7)	0.089
Upper arm fracture	134	(15.6)	42	(21.2)	0.054
Forearm STI	112	(13.1)	41	(20.7)	0.006
Lower leg fracture	105	(12.2)	21	(10.6)	0.533
Lower leg STI	97	(11.3)	33	(16.7)	0.037
T spine fracture	94	(10.9)	10	(5.1)	0.012
Lumbar fracture	89	(10.3)	13	(6.6)	0.105
Intra-abdominal injury [¶]	88	(10.2)	23	(11.6)	0.563
Forearm fracture	84	(9.8)	29	(14.7)	0.044
Hand STI	68	(7.9)	23	(11.6)	0.092
Pelvis fracture	63	(7.3)	14	(7.1)	0.905
C spine fracture	48	(5.6)	14	(7.1)	0.419
Hand fracture	45	(5.2)	13	(6.6)	0.455
Femur fracture	33	(3.8)	6	(3.0)	0.589
Foot STI	18	(2.1)	6	(3.0)	0.423
Foot fracture	2	(0.2)	4	(2.0)	0.013

*Differences determined by t-tests

[†] Soft tissue injury (STI) includes: lacerations, contusions, abrasions, hematomas and tissue avulsions to the body area. STI excludes fracture to the body area.

[‡] Includes: loss of consciousness and concussion

[§] Includes: subdural hemorrhage, subarachnoid hemorrhage, intra-parenchymal hemorrhage, epidural hematoma and cerebral contusion

^{||} Includes: pneumothorax, hemothorax, myocardial contusion

[¶] Includes: liver laceration, bowel injury, aortic injury

^{***}Total percentages will exceed 100% due to multiple diagnoses per patient

helmeted riders; however there were only 5 helmeted deaths and 2 non-helmeted deaths recorded in the database during this time period. This is fewer than predicted by

studies of death certificates, showing 27-46 deaths annually from ATV-related trauma.² This may reflect the fact that many ATV riders die outside of the hospital setting. ATV riders

pronounced dead at the scene are not included in the Registry and as a result not included in this study. Further study is needed in this area.

It is well documented that helmet use in bicycle riding, motorcycle riding, and ATV use is protective against intracranial injury and other injuries of the head and neck. The findings of this study were reflective of this as well. Specifically, 22% of non-helmeted riders sustained intracranial injuries, whereas only 6% of helmeted riders sustained this type of injury. Non-helmeted riders were also more likely to have facial fractures and skull fractures. These injuries are associated with decreased independence and increased disability which is reflected in the fact that significantly fewer non-helmeted riders were discharged to home after hospitalization.

Limitations

Our data are limited to ATV trauma evaluated in the ED or hospital setting. Comparison of death rate to prior studies is not possible due to lack of data relating to out of hospital deaths. Another limitation is that the data were collected from hospitals participating in the State Trauma Registry, which only represent 33 of the 52 acute care hospitals in the state. Higher acuity patients initially seen at a nonparticipating hospital were likely transferred to higher level of care facilities. The transferred patients were likely captured in the data. However, minimally injured patients, who were seen and discharged home from a non-participating hospital, would not be captured. This would have increased the number of lower severity injuries within the data sets.

Conclusion

Recreational ATV use has become a significant part of the tourism sector of the West Virginia economy.

Figure 1.*Call to Action: Physician Interventions to Reduce ATV-Related Injuries*

- **Educate yourself on current guidelines for protective equipment use and rider training**
- **Provide anticipatory guidance to your patients regarding proper use of protective equipment and the need for rider training and certification**
- **Provide this information in your waiting room and on your practice's website**
- **Provide written information to your at risk patients with their aftercare instructions**
- **Support community based campaigns to expand ATV safety awareness and rider training and certification**
- **Support legislative initiatives to expand mandatory helmet use and mandatory rider training**

In addition, recreational ATV use continues to be a significant contribution to trauma morbidity and mortality in West Virginia. Legislative efforts have focused on helmet use for pediatric riders and limiting use to smaller or rural roadways. Despite legislation enacted in 2001, the rate of morbidity and mortality has continued to increase. Our study examined adult ATV riders. In this population helmet use was very low (19%). Non-helmeted riders that sustained ATV-related trauma utilized more healthcare resources and experienced increased numbers of severe head and neck injuries. Non-helmet use was also associated with increased likelihood of hospital admission. Helmet use is an active form of injury prevention. Efforts that focus on increased helmet use have the potential to significantly reduce morbidity and mortality following ATV trauma. However, for a helmet to be effective it must be worn every time the ATV is ridden. Enforcement of the current West Virginia ATV Law should be encouraged and consideration given to expanding

the scope of the legislation. Based on the data in this study we recommend mandating helmet use on all WV lands for riders of all ages.

ATV safety is a complex issue. Several factors contribute to the growing number of injuries. The ATV industry continues to develop larger, more powerful machines. Helmet legislation is difficult to enforce and limited in scope at this time in West Virginia. Overall, there is a low rate of safety training prior to operation of these machines and an infrequent use of protective gear.

Several studies have shown promise for improving ATV safety. Legislative efforts that focus on safety training and improved awareness of existing laws have been demonstrated to be effective. Campaigns that involve community groups developing and implementing safety training and awareness have had significant impact on these communities. Surveys have shown that patients would be appreciative of safety information provided by primary care physicians at regular health care appointments. Studies have demonstrated that

health care providers can improve safety awareness and impact the behaviors of their patients. Anticipatory guidance has been shown to be most effective when used to develop preventive behaviors. Data demonstrates that the pediatric population is much safer on ATVs when the guidelines for ATV use, developed by the American Academy of Physicians, are followed; however many doctors that practice anticipatory guidance are not aware of these guidelines.

Physicians have a responsibility to contribute to the safety of the patients and communities which they serve. Recreational ATV use is an area where much work is yet to be done to improve safety. Figure 1 summarizes interventions West Virginia physicians should implement to prevent ATV injuries.

Physicians should support legislative efforts to require helmet use and training for all riders in all venues in West Virginia. Physicians should support administrative and legislative efforts designed to implement safety training programs for ATV riders as well as support efforts to implement awareness of current laws and guidelines for ATV use. The American Academy Pediatrics has developed guidelines specific to pediatric use. Physicians who see children and adolescents in their practice should be aware of these guidelines and discuss them with their patients. There are currently no guidelines developed by physicians for adult riders. This is an area that has promise for improved safety. All patients should be encouraged to use helmets and other protective equipment when riding an ATV. Community awareness programs including poster contests, movie trailers, school training videos, and ATV safety rodeos have improved community safety. Physicians

can promote and contribute to these activities in many ways.

Acknowledgement

The authors gratefully acknowledge the assistance of the West Virginia Office of Emergency Medical Services for access to the data in the West Virginia State Trauma Registry. In particular, we would like to recognize Sherry Rockwell, Trauma Designation Coordinator, and Office of Emergency Medical Services for her assistance in this project.

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CME POST-TEST

40. According to the 2001 ATV Safety Legislation passed in West Virginia, when riding an ATV you may travel no more than ___ miles and must keep your speed below ___ miles per hour on a paved road with a center line.
- a. 1, 5
 - b. 2, 10
 - c. 10, 20
 - d. 10, 25
 - e. 35, 50
41. Which of the following statements is supported by the data obtained in this study?
- a. Females were involved in the majority of ATV-related trauma.
 - b. Females involved in ATV accidents were more likely to be helmeted compared to males.
 - c. Non-helmeted ATV trauma victims were more likely to be transported to the hospital by helicopter.
 - d. Approximately 80% of all ATV trauma victims in this study were helmeted.
 - e. Helmeted riders sustained significantly fewer soft tissue injuries to the trunk and upper arm than non-helmeted riders.
42. Which of the following is true regarding helmet use in the setting of ATV trauma in this study?
- a. There was a significant difference in the number of deaths between helmeted vs. non-helmeted riders.
 - b. Hospital length of stay and ICU length of stay were similar between helmeted and non-helmeted ATV riders.
 - c. The need for admission to the hospital was not affected by helmet usage.
 - d. Significantly more non-helmeted riders were discharged to home after hospitalization compared to helmeted riders.
 - e. Helmet use does not affect the incidence of traumatic intracranial hemorrhage.

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CONTROLLED SUBSTANCES BILL BIGGEST HEALTHCARE ISSUE OF SESSION

Governor Tomblin signed into law SB 437 on March 29, 2012. This was the biggest healthcare related piece of legislation of the Session and is the most comprehensive approach taken in recent history on addressing the epidemics of prescription drug diversion and substance abuse. The bill was offered by the Governor following regional meetings held around the state which included stakeholders from all sides of the issue. The bill included many recommendations issued last fall by the WVSMA in our report "Physician Leadership in Addressing Prescription Drug Diversion".

The bill contains five main areas of focus:

- Implements additional regulation of opioid treatment centers (Methadone Clinics);
- Establishes licensing and regulation of Chronic Pain Clinics;
- Establishes review capabilities of the Controlled Substances Database under the Board of Pharmacy to flag abnormal or unusual usage patterns of controlled substances by patients and unusual prescribing or dispensing patterns by licensed practitioners;
- Implements a requirement for continued education for physicians and other prescribers, dispensers and persons who administer controlled substances; and,
- Regulates the sale of pseudoephedrine.

The following is a brief synopsis of the law. For a detailed synopsis of this bill and the other healthcare related legislation that passed or failed please visit www.wvsma.com:

1. Methadone clinics are subject to monitoring by the

DHHR; additional education and safety training for employees is established and the clinics must follow national guidelines that include a recovery model in the individualized treatment of care, among other regulations.

2. Requires licensure of "pain management clinics" which are defined as: All privately owned pain management clinics: (1) Where in any month more than fifty percent of the patients of the prescribers or dispensers are prescribed or dispensed opioids or other controlled substances specified in rules for chronic pain resulting from non-malignant conditions; (2) The facility meets any other identifying criteria established by DHHR rule.

Chronic pain is defined as: "pain that has persisted after reasonable medical efforts have been made to relieve the pain or cure its cause and that has continued, either continuously or episodically, for longer than three continuous months. Chronic pain does not include pain associated with a terminal condition or with a progressive disease that, in the normal course of progression, may reasonably be expected to result in a terminal condition."

There is a lengthy list of exemptions from this regulation including all practices associated with medical schools and hospitals, hospice, nursing homes and ambulatory care facilities. There are many specific operational requirements set in law.

3. The 2 hours of CME in "end of life care and pain management" is removed from law. A new biennial requirement is established for "drug diversion training" and "best practices for prescribing of controlled substances training"

for prescribers, dispensers and those who administer controlled substances.

4. Prescribing a combination of buprenorphine and naloxone to treat opioid addiction is limited to sublingual film unless the film is clinically contraindicated.

5. An Advisory Board of physicians and pharmacists is established under the Board of Pharmacy to review the controlled substances database and "develop, implement, and recommend parameters to be used in identifying abnormal or unusual usage patterns of patients in the state..." A Database Review Committee of physicians, prosecutors and a pharmacist is established to make determinations on specific unusual prescribing or dispensing patterns.

6. Prescribers and dispensers are granted immunity for reporting suspected doctor shoppers.

7. All prescribers and dispensers are required to check the controlled substances database upon initially prescribing or dispensing a pain relieving controlled substance to a patient for chronic nonmalignant, non-terminal pain and annually thereafter.

8. It is now a felony for unauthorized use or disclosure of the controlled substances database information and is punishable by imprisonment for 1-5 years or fined \$3,000-\$10,000, or both.

9. The sale of pseudoephedrine products at retail pharmacies is further regulated by requiring the use of a Multi-State Real-Time tracking system and limiting the sale to individuals without prescription to 3.6g per day, 7.2 grams monthly and 48 grams annually.

2012 SUPREME COURT ELECTION

Know the Candidates!

Two seats on the West Virginia Supreme Court of Appeals are up for election in 2012, one open seat and one incumbent seat. Justice Robin Jean Davis, last elected in 2000, is running for re-election, while Justice Thomas E. McHugh, who was appointed to the Court in 2008 by former Governor Joe Manchin after the passing of Justice Joseph Albright and then was elected in 2010 to complete the unexpired term, is retiring.

Protecting our hard fought medical liability reform is of critical interest to West Virginia physicians, which makes the State Supreme Court race one of the most

important elections on the 2012 ballot. The State Supreme Court has five (5) Justices, each who serve a term of 12 years.

In 2011, the Court issued a significant decision upholding a key component of our 2001/2003 medical liability reform. The vote was 4-1 to uphold the law. With two (2) seats up for election this year, it is easy to understand why this election is so important to physicians and their patients. There are six candidates running on the Democratic Primary ballot for two spots in November. Two Republican candidates will automatically advance.



J.D. Beane (D)

Judge J.D. Beane was appointed by Governor Joe Manchin, III in 2006 to serve as Circuit Court Judge for Wood and Wirt Counties. He received a certificate of completion for General Jurisdiction in July 2007 from the National Judicial College. Judge Beane was then elected in 2008 to an eight-year term on the bench. He has served as Chief Judge since 2011 and was previously a circuit judge member on the judicial investigation committee.

Before becoming Circuit Judge, he was elected to 9-consecutive terms in the WV House of Delegates serving from 1990 to 2006. During this time he also had a law practice in Wood County. **Judge Beane's father, John E. Beane, MD is a family physician in Parkersburg. While in the House of Delegates Judge Beane was always endorsed by the WVSMA's Political Action Committee WESPAC and a staunch advocate for the physician community.**

Judge Beane holds a law degree from Capital University Law School and attended summer law programs at Ohio State University College of Law and Oxford University. He received a Bachelor of Arts degree from West Virginia University and attended public schools in Wood County. Judge Beane's website is: www.J.D.Beane.com



Robin Jean Davis (D)

Justice Robin Davis was born and raised in Boone County, West Virginia and attended West Virginia Wesleyan College, after which she earned both her master's and law degrees from West Virginia University.

From 1982 to 1996, Justice Davis was a member of the six-person law firm Segal and Davis, L.C., with her husband, Scott Segal. She concentrated in the areas of employee benefits and domestic relations and in 1993 became the first lawyer in West Virginia inducted into the American Academy of Matrimonial Lawyers. In 1991

the West Virginia Supreme Court of Appeals appointed her to the seven-person West Virginia Board of Law Examiners, on which she served until her election to the West Virginia Supreme Court in 1996. Initially elected to a four-year unexpired term, Justice Davis won election in November, 2000, to a full 12-year term.

Currently, Justice Davis is the Supreme Court's designee to the Judiciary's Initiative on Truancy, an effort to combat high absenteeism and early drop outs and keep students in the classroom and out of the courtroom. Davis is the author of West Virginia Law Review articles and has co-authored books on the rules of civil procedure, punitive damages, and Workers' Compensation litigation.

Justice Davis recently voted to uphold the constitutionality of an essential element of the 2001/2003 medical liability reform law, the critically important non-economic damages cap. Judge Davis' website is: www.JusticeRobinDavis.com



James J. "Jim" Rowe (D)

Judge Jim Rowe has been a circuit judge in Greenbrier and Pocahontas counties since being appointed to the position by Governor Caperton in 1997. Before becoming a judge, he served four terms in the House of Delegates where he held the powerful positions of House Majority Leader and Judiciary Committee Chairman.

Today, he is a member of the Governor's Committee on Crime, Delinquency and Corrections, the Domestic Violence/Child Victimization Study and the Policy Work Group and the Education Committee of the West

Virginia Judicial Association. He is also a charter member of the American College of Business Court Judges.

In 2004, in a bid for a seat on the Supreme Court Judge Rowe was endorsed by the WVSMA's Political Action Committee WESPAC and strongly supported by the physician community.

Judge Jim Rowe grew up in rural Monroe and Pendleton Counties where he attended public schools and graduated from Franklin High School. After earning an undergraduate degree from West Virginia University, Judge Rowe served his country as a member of the United States Air Force. He is a graduate of the School of Law at George Mason University. Judge Rowe's website is: www.JimRoweforSupremeCourt.com



Letitia "Tish" Neese Chafin (D)

Tish Chafin is a graduate of Marshall University and earned her law degree from the West Virginia College of Law where she was a member of the National Moot Court Team. She is managing partner at the H. Truman Chafin Law firm, together with her husband Senator H. Truman Chafin, where she has worked since graduation from law school.

Licensed to practice in both West Virginia and Kentucky, Chafin has also been admitted to practice before the United States Supreme Court, Fourth Circuit of the United States Federal Court and the Southern District of West Virginia.

She is a member of the Marshall University Board of Governors, and serves on the Board of Directors of the West Virginia Education Alliance and the West Virginia Children's Home Society. She is an Elder of First Presbyterian Church of Charleston. Chafin is an immediate past President of the West Virginia State Bar and has served on the Board of Governors as an Ex Officio member of the state's Judicial Advisory Commission. Chafin's website is: www.Chafin2012.com



Louis Joseph Palmer (D)

Louis Palmer was born in Savannah, Georgia and later moved to New York. After graduating from high school, Palmer joined the Marines. Upon receiving an honorable discharge, Palmer obtained a college degree from City University of New York in 1983, and a law degree from West Virginia University College of Law in 1992. In between obtaining the two degrees, Palmer was employed as a social worker in New York where he focused his work on the foster care and juvenile justice systems.

Palmer has been a Law Clerk for the West Virginia Supreme Court of Appeals since 1996. As a member of the Supreme Court's law clerk staff for over 15 years, Palmer has provided legal advice to the Court on thousands of cases.

He is a distinguished author, including authoring and co-authoring over 15 legal books and legal encyclopedias and 4 law review articles. He has published books on West Virginia's rules of civil procedure, criminal procedure, magistrate court procedures, and the state's criminal justice system. Palmer has also been a professor at West Virginia State College and Fairmont State College. Palmer's web site is: www.PalmerSupremeCourt.com.



Allen Hayes Loughry II (R)

Allen Loughry is currently a Judicial Law Clerk for the West Virginia Supreme Court of Appeals and has served in that position for the past eight years. He also has experience in local, state and federal governments and during his career, he has served as: Senior Assistant Attorney General; Special Prosecuting Attorney; Assistant to the Prosecutor; Direct Aide to Governor Gaston Caperton; Special Assistant to a U.S. Congressman; and Adjunct Professor at the University of Charleston.

Loughry is a writer as well and authored the book "Don't Buy Another Vote, I Won't Pay for a Landslide" on the sordid and continuing history of political corruption in West Virginia.

Loughry has four separate law degrees from American University's Washington College of Law, the University of London, and Capital University School of Law. He also studied law at Oxford University in England. He is a life-long

West Virginia resident and native of Tucker County and currently lives in Charleston. Loughry's website is: www.AllenLoughry.com



John Christian Yoder (R)

Judge John Yoder is currently circuit judge in the 23rd circuit of West Virginia, which includes Jefferson, Berkeley and Morgan Counties.

After serving four years as a state circuit judge from 1976-1980, Judge Yoder was selected by the United States Supreme Court to serve as a Supreme Court Fellow in 1980. Following his fellowship, Yoder was hired by the Chief Justice to work on his staff. President Reagan next appointed him to establish and run a new subdivision at the U.S. Department of Justice. He was elected West Virginia State Senator and served two terms from 2000 to 2008.

Judge Yoder holds a B.A. degree with majors in government and economics from Chapman University, a Juris Doctor degree from the University of Kansas School of Law, and an M.B.A. at the University of Chicago. He is also a graduate of several programs at the National Judicial College and the National College of Juvenile Justice. Judge Yoder's website is: www.JudgeYoder.com

H. John "Buck" Rogers (D), is another Democratic candidate for the State Supreme Court, but no campaign website was available for information on his candidacy.

2012 WESPAC Contributors

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WESPAC is the West Virginia State Medical Association's bipartisan political action committee. We work throughout the year with elected officials to make sure they understand the many facets of our healthcare system.

WESPAC's goal is to organize the physician community into a powerful voice for quality healthcare in the West Virginia Legislature. We seek to preserve the vital relationship between you and your patients by educating our legislators about issues important to our physicians.

WESPAC contributions provide critical support for our endorsed candidates. Your contribution can make the difference between a pro-physician/patient candidate winning or losing.

To make a contribution to WESPAC, please call (304) 925-0342, ext. 12

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Jason Stewart, MD

Ohio County Medical Society

Lowell Shinn, MD

Please direct all membership inquiries to: **Mona Thevenin, WVSMA Membership Director at 304.925.0342, ext. 16 or mona@wvsma.com.**

Time to Evaluate the Swimming Hole

How's the Water?

As summertime approaches, we think about the things-of-summer; including a splash in the pool, a visit to the beach or our local "blue hole".

Periodically, we need to evaluate the conditions of our favorite swimming location for changes made from year to year. Those changes may include the cost of a summer pass for the kids, the cost of gasoline to drive to the beach, and even the changes to the safety conditions at "blue hole".

The same thing applies to your medical professional liability insurance; a periodic assessment is needed to determine if you are receiving the best value for the dollars you are spending; "are you swimming in the best pool?"

Note some changes about the West Virginia Mutual Insurance Company in the last year:

1. The Mutual has been assigned an A- (Excellent) rating by A.M. Best Company.
2. The Mutual has reduced its base rates another 5% effective January 1, 2012 for new business and business renewing thereafter.
3. The Mutual is continuing its 12% renewal credit for 2012.
4. The Mutual Board of Directors has selected a physician, R. Austin Wallace, MD, of Charleston, to not only chair its board, but also to become (effective 1/1/2012) the president of the company.

All positive signs for West Virginia physicians who have found themselves in the "pool" of risks insured by the Mutual.

Are You in the Right Pool?

If there is a negative in 2011, it is the fact that we have seen an increase in the number of medical liability claims/lawsuits being filed in the State.

A total of 373 lawsuits were filed in 2011 (253, if you eliminate 120 filed in Raleigh County against one doctor: an abnormality) which is up from 170 in 2010, 208 in 2009, 178 in 2008, 174 in 2007 and 154 in 2006. It's the most since 276 in 2005, one year after enactment of the medical professional liability civil justice reform.

Although, the West Virginia Insurance Commissioner's 2011 5% Medical Malpractice Insurers Market Share Report addresses 2010 data, a look at the 2011 information from the files of the only two carriers which represent more than 5% of the medical liability marketplace may shed some light on the current claims situation of these two carriers.

In 2011, the loss ratios for the two carriers identified in the 2010 Insurance Commissioner's 5% Market Share Report depicted varying results. The West Virginia Mutual Insurance Company posted a very favorable pure direct loss ratio of 31.3%. Medicus Insurance Company, the other carrier writing at least 5% of the market in 2010, experienced a less attractive pure direct loss ratio of 125.1% in 2011. Direct loss ratio is the ratio of incurred losses (a monetary payment and/or reserves to cover claims of the insureds which are payable in the future) to earned premiums. When a ratio is over 100%, the insurer has more loss potential than premiums earned for the same time period.

For more information on these Supplements contact the offices of the West Virginia Insurance Commissioner (304-558-3386). For a copy of the Supplements, please call Steve Brown, Agency Manager, at 1-800-257-4747 ext. 22 (304-925-0342 ext 22).

For more information on how to become an insured of the West Virginia Mutual Insurance Company, contact Steve Brown, Agency Management, 304-925-0342 ext 22 (1-800-257-4747 ext 22) or at steve@wvmsma.com.

WVMIC* = 74% market share of admitted market; 43% of entire WV market.
 Medicus = 11.3% market share of admitted market; 6.5% of entire WV market.

	WVMIC* (West Virginia, Only)	Medicus (West Virginia, Only)
Direct Premiums Written	\$32,677,159	\$5,984,271
Direct Premiums Earned	\$35,287,909	\$5,539,308
Direct Losses Paid		
Amount	\$19,681,125	\$2,248,038
# Claims	143	8
Direct Losses Incurred	\$11,050,076	\$6,930,431
Direct Losses Unpaid		
Amount	\$28,895,501	\$3,094,000
# Claims	164	37
Direct Losses IBNR*	\$18,787,764	\$4,907,350

*West Virginia Mutual Insurance Company

* IBNR – Incurred But Not Reported

Source: Supplement "A" To Schedule T, Exhibit of Medical Professional Liability Premiums Written Allocated by States & Territories Supplement to the 2011 Annual Statements of: The West Virginia Mutual Insurance Company and Medicus Insurance Company

Change the Future WV

In 2009, West Virginia received one of 44 grants awarded nationwide through the American Recovery and Reinvestment Act (ARRA) to reduce obesity and obesity related chronic disease by implementing policy, systems and environmental change interventions. The Centers for Disease Control and Prevention (CDC) awarded a two-year grant of \$4.5 million to the WV Department of Health and Human Resources (WVDHHR) to target obesity prevention in a six-county region of the Mid-Ohio Valley through the Communities Putting Prevention to Work (CPPW) initiative. The WV initiative, entitled *Change the Future WV*, was designed to improve nutrition/dietary behaviors and increase physical activity through a number of regional and local strategies. A partnership was formed with the Mid-Ohio Valley Health Department (MOVHD) to implement the project in Calhoun, Pleasants, Ritchie, Roane, Wirt and Wood counties. Our evaluation partner is the West Virginia University (WVU) Health Research Center.

Below are some examples of accomplishments:

- Healthy checkout aisles have been established in area WalMart and Foodland grocery stores as well as in-store promotion of fresh fruits and vegetables (FFV) including FFV tastings.
- A jurisdiction-wide policy was enacted by the MOVHD to encourage placement of FFVs in convenience stores. Food permit costs were reduced or eliminated based on convenience stores' efforts to make FFVs available.

- Three new farmers markets were established. A jurisdiction-wide policy was implemented to waive the cost of a food permit for all farmers' market vendors.
- Nine local organizations developed policies related to increasing the number of healthy food choices at their concession stands.



- Additional physical education (PE) teachers were hired in 14 secondary schools and all teachers in the region were trained in techniques for providing quality PE.
- The MOVHD hired a contractor to document all trails in the six-county region (existing or under development). A trail report was compiled for each county. This information was used to identify trail signage needs, to plan for new trails, and to determine how to connect existing trails.
- County coalitions were awarded funds to improve the physical activity environment

- by: (1) improving trails, (2) installing fitness equipment on trails, and (3) installing new and improved playground equipment for youth.
- In addition to changes to the environment, several communities, businesses, and organizations have passed policies to push for sustainable change. Such policies include: (1) complete streets policies in several towns with local parks and organizations agreeing to host physical activity events, (2) county land use and sidewalk improvement resolutions, (3) agreements with WVU Extension to provide healthy lifestyles workshops at farmer's markets, (4) agreements with organizations to allow the use of facilities and outdoor recreational opportunities to community members, (5) the establishment of a city bicycling advisory board, and (6) the institution of flexible time for physical activity and staff wellness programs at places of employment.
- All six counties held connectivity forums to determine how to proceed with new development to allow access to existing sidewalk and trail infrastructure including ways to link pedestrians and cyclists to major destinations.

Joe Barker, MPA
 Director, Office of Community Health
 Systems and Health Promotion and Principal
 Investigator, *Change the Future WV*
 WV Bureau for Public Health

Data provided by the West Virginia University
 Health Research Center

Dr. Joseph Shapiro named dean of Marshall University medical school

Kidney disease researcher and medical device inventor to take helm July 1



Joseph Shapiro, MD

Dr. Joseph I. Shapiro, a nephrologist with more than 30 years of clinical and teaching experience, has accepted the position of dean of the Marshall University

Joan C. Edwards School of Medicine effective July 1, Marshall President Dr. Stephen J. Kopp announced earlier this spring.

Shapiro currently serves as associate dean for business development and chair of the department of medicine at the University of Toledo College of Medicine in Toledo, Ohio.

Shapiro succeeds Dr. Robert C. Nerhood who has been serving as interim dean following former dean Dr. Charles H. McKown's appointment to vice president for health sciences advancement last summer. Nerhood will continue to serve in his interim role while Shapiro makes the transition to full time at Marshall. He will be the fifth dean since the School of Medicine was established.

"The School of Medicine at Marshall University has a rich history of educating the doctors our community needs the most," Kopp said. "Dr. Shapiro has been described by references as the epitome of academic medicine. He is a dedicated researcher, a consummate clinician, an exceptional teacher and a highly capable administrator. He brings to Marshall an impressive business acumen, a tremendous wealth of research knowledge and an

impressive professional and clinical experience base. More than anything else, however, we believe he embraces the ideals that distinguish our School of Medicine, and he knows the direction we must take to continue to build on the great tradition and proud heritage at Marshall."

Nerhood said he is delighted Shapiro has accepted the position. "After my first interaction with him, I was convinced that he was the person for the job," Nerhood said. "His broad background in all aspects of medical education, medical research and clinical care have prepared him exceptionally well to lead the School of Medicine into the next decade. I think that the future of the medical school under the leadership of Dr. Shapiro will be really exciting and I am certain the students, residents, staff and faculty will be stimulated, enriched and benefit from his skills and expertise."

"It is a great honor and privilege to be associated with this fabulous organization, and I firmly believe that the coming years will present great opportunity for the school to expand its purview in the areas of education, research and service as we pursue our mission to improve the health of West Virginia," Shapiro said.

Shapiro's medical teaching career began at the University of Colorado after completing his fellowship in 1987. He served as an instructor, assistant professor, and associate professor of both medicine and radiology at the University of Colorado until 1997 when he joined the faculty at the University of Toledo College of Medicine (formerly Medical College of Ohio at Toledo).

Since 1999, he has served as chair of medicine, and in 2006 was

appointed associate dean for business development at the University of Toledo. He also is president of the University of Toledo Physicians, the university's medical practice plan.

In addition to his numerous teaching, clinical and administrative responsibilities at the University of Toledo, Shapiro has served as principal investigator or co-investigator on nearly three dozen grant-funded projects totaling more than \$30 million and has been involved with the creation of three spin-off companies from that research.

Additionally, Shapiro holds the patents on 14 medical inventions.

He is the author or co-author of more than 100 original research articles, many of them focusing on his chosen specialty, nephrology.

A native of Newark, N.J., Shapiro received his medical degree from the University of Medicine and Dentistry of New Jersey in 1980. He earned his bachelor of arts degree in mathematics from the University of Pennsylvania. After completing a medical residency in internal medicine at Georgetown University, he trained as a fellow in renal diseases at the University of Colorado. He is board certified in internal medicine and nephrology.



Incoming dean of the Joan C. Edwards School of Medicine, Joseph Shapiro, M.D. (center), shown receiving a white coat from interim dean Robert Nerhood, M.D., while Marshall President Stephen J. Kopp looks on.

New study shows WVSOM is a leader in contributing physician workforce for Appalachia

The April 2012 issue of *Academic Medicine* has recognized the West Virginia School of Osteopathic Medicine (WVSOM) as the No. 1 institution in the nation graduating primary care physicians who practice in rural Appalachia.

The school secured the top rank among other U.S. medical schools for students graduating between 1991 and 2005 in primary care, according to information released by the publication. Primary care specialties include family medicine, internal medicine, pediatrics and OB/GYN. The purpose of the journal's report is to identify U.S. medical schools with the most graduates practicing in rural, urban and economically distressed areas of Appalachia.

The report concluded that, overall, physicians practicing in Appalachia are largely graduates of medical schools in or near the region.

"As a state funded institution, we feel an enormous responsibility to serve the residents of West Virginia," said Dr. Michael Adelman, WVSOM President. "In fact, the commitment to provide primary care in rural areas is expressly stated in our mission. This commitment infuses our programs and curriculum from the moment a student walks through our doors until the moment he or she graduates."

That commitment is paying dividends, as the study also ranked WVSOM among the top 10 medical schools for graduating non-primary care physicians in rural Appalachia, and both primary and non-primary care physicians in Appalachia's most economically distressed and at-risk counties.

Historically, the Appalachian region of the U.S. has been associated with rugged geography and scenic beauty, but also with economic challenges and inadequate health care. According to the Appalachian Regional Commission, more than 24 million people live in Appalachia, which encompasses 13 states. West Virginia is the only state in the region in which Appalachia encompasses every county.

"During the period of this research, between 34 percent and 54 percent of WVSOM graduates were practicing primary care medicine in rural areas of Appalachia," said Dr. James Nemitz, Vice President for Administration and External Relations, and one of the collaborators on the study. "This region faces a growing need for primary care physicians and there continues to be a large gap between the percentage of residents living in rural areas and the percentage of doctors who

practice in those areas. WVSOM is working hard to reduce that gap, especially in West Virginia."

Although more physicians have chosen to practice in Appalachia in recent years, the region continues to struggle with physician shortages. This is why, now more than ever, it is important that medical schools in those areas remain true to their core missions — to graduate physicians who will serve the health care needs of local communities.

For 40 years, WVSOM has worked to serve, first and foremost, the state of West Virginia and the special health care needs of its residents.

"The institution's consistent appearance among top 10 rankings for rural medicine and primary care is a cause for celebration," said Dr. Adelman, "but it's also cause for reflection. Appalachia is a region characterized by poor health and health disparities — our students and faculty still have important work to do."

To see the entire report, visit the *Academic Medicine* website at <http://journals.lww.com/academicmedicine/pages/default.aspx>.

WVSOM ranked by U.S. News as top medical school

Once again the West Virginia School of Osteopathic Medicine (WVSOM) is recognized by *U.S. News & World Report* as one of the nation's top medical schools.

The institution is ranked No. 12 in both rural medicine and family medicine by the "Best Graduate

Schools" 2013 annual publication. The rankings highlight the top programs in business, law, medicine, engineering and education, among other specialties. This is the 14th consecutive year WVSOM has been listed in the rankings for its medical programs.

"Our graduates continue to

specialize in family medicine and practice in rural areas," said Dr. Lorenzo Pence, vice president for academic affairs and dean. "This reinforces that WVSOM continues to meet its mission in training osteopathic physicians who serve rural areas."

WVU medical grads selected for residency training

Two newlyweds were among the students in the West Virginia University School of Medicine Class of 2012 who found out where they would begin the next chapter in their medical careers. Lucky for the new Mr. and Mrs. – and soon-to-be Dr. and Dr. – they get to keep their hearts in Morgantown.

Medical students throughout the nation learned of their residency selections at noon on Friday, March 16, at Match Day ceremonies. This year's WVU celebrations were held simultaneously at Lakeview Golf Resort and Spa in Morgantown, the Charleston Division Education building in Charleston and the Eastern Division's Educational Building in Martinsburg.

One third of the WVU School of Medicine Class of 2012 will continue training in the state. "My heart, our hearts are in West

Virginia," said newlywed Hilary Hickman. She and her husband, Chad Morley, met while in medical school at WVU and say they are excited to stay in the area together.

"We have seen our students heavily recruited by residency training programs all over the country, from coast to coast. This class enjoyed a 100 percent pass rate on the USMLE Step 2 examination, and with their superb clinical training, everyone wanted them," Norman Ferrari, M.D., senior associate dean of medical education and professor in the WVU Department of Pediatrics, said. "We are pleased that many have chosen to stay in West Virginia showing their loyalty to our state and recognizing the strong training offered by our programs. With such a high percentage training in Appalachian states, we are hopeful

to continue our significant impact on the region and rural America."

Forty-two percent of the graduates will train in internal medicine, pediatrics, family medicine or obstetrics/gynecology, fields that typically represent a person's primary healthcare. Other popular fields this year were the specialties of neurology, radiology and anesthesiology.

"Our students matched in 21 different fields and will go to 18 different states," Dr. Ferrari said.

WVU has the largest number of graduate medical education offerings in the state, with more than 50 specialty training programs, all of which are fully accredited. One-half of the training programs are the only such specialty programs offered in the entire state. Residency training begins at WVU the week of June 20 for 107 new interns

WVU Health Sciences programs rank high in U.S. News Rural Medicine in top 10, Pharmacy No. 26

The West Virginia University School of Medicine has once again ranked in the top 10 programs nationwide for rural medicine, tying at number nine. The WVU School of Pharmacy tied at No. 26 on the list of best pharmacy schools in the country. The rankings are published in the latest issue of *U.S. News and World Report's* 2013 edition of "America's Best Graduate Schools" and available online at USNews.com.

Other School of Medicine programs had notable rankings: primary care at 52, physical therapy at 63, research at 86 and occupational therapy at 116.

The medical school rankings are based on ratings by medical school deans and senior faculty in the nation's 126 accredited medical schools and 23 accredited schools of osteopathic medicine.

The School of Pharmacy's No. 26 ranking among 124 schools of pharmacy is a significant jump

from its 2008 rank (the last time pharmacy schools were rated).

This year's edition of "America's Best Graduate Schools" also included the nursing school ratings from 2011, which listed the WVU School of Nursing as one of the top 100 schools of nursing in the country.

The *U.S. News and World Report* 2013 edition of "America's Best Graduate Schools" is now available in bookstores or online at U.S. News Store.

CME Answer & Registration Form

This special issue of the *West Virginia Medical Journal* is jointly sponsored by CAMC Health Education and Research Institute, a continuing education enduring material.

Name: _____

Degree/Specialty: _____ Hospital/Institution: _____

Address: _____

Phone: _____ Email address: _____

Answers *(please circle your response)*

1) a b c d

12) a b c d

23) a b c d

34) a b c d

2) a b c d

13) a b c d

24) a b c d

35) a b c d

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20) a b c d

31) a b

41) a b c d e

10) a b c d

21) a b c d

32) a b

11) a b

22) a b c d

33) a b

42) a b c d e

	Content relevant to my practice Score Relevance					Review of Individual Article Score Article				
	No	Some			Very	Poor	Satisfactory			Excellent
	1	2	3	4	5	1	2	3	4	5
1. Falls and Dilemmas in Injury Prevention in Older West Virginians										
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3. Screening Children for Hyperlipidemia by Primary Care Physicians in West Virginia										
4. Interdisciplinary Treatment of Adolescent Eating Disorders in West Virginia										
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10. Pediatric Bicycle Injury Prevention and the Effect of Helmet Use: The West Virginia Experience										
11. Preventive Services for Older Adults: Recommendations and Medicare Coverage										
12. Non-Pharmacological and Pharmacological Prevention of Episodic Migraine and Chronic Daily Headache										
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Course Evaluation

	Poor	Satisfactory			Excellent
	1	2	3	4	5
Score Presentation 1 to 5					
Extent to which the course objectives were met					
Potential impact on your practice					
Appropriate, qualified authors					
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Your overall evaluation of the course					

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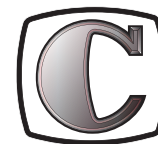
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Obituaries

The WVSMAs remembers our esteemed colleagues...

Robert A. Lewine, M.D.

Robert A. Lewine, M.D., 85, from Wheeling, WV, passed away peacefully on January 26, 2012 at home in Scottsdale, AZ surrounded by his loving family. He was born in Brownsville, PA.

Dr. Lewine personified a life well lived. He served as a Staff Sergeant in a medical unit in WWII. He attended Johns Hopkins University, the University of Pittsburgh, and was a 1953 graduate of the University of Pittsburgh School of Medicine. He completed his internship at West Penn Hospital and his residency at Columbus Children's Hospital. He was a dedicated pediatrician who practiced for 44 years in Wheeling and as a Clinical Professor of Pediatrics at West Virginia University. He was a Fellow of the American Academy of Pediatrics and served three years as President of the West Virginia Academy of Pediatrics. In 1996, he was named West Virginia Pediatrician of the Year.

Dr. Lewine was a member of the teaching faculty of Pediatrics and Family Practice Residency Program at Ohio Valley Medical Center and Wheeling Hospital. He was the Chairman of the Department of Pediatrics and he served as Chief of Staff at both hospitals. He was a member of the Fort Henry Academy of Medicine, the Ohio County Medical Society, the Jacob Schwinn Study Club, the Board of Directors of Temple Shalom, and the Oglebay Institute.

Dr. Lewine worked in "retirement" as a mentor to medical students and residents at the College of Osteopathic Medicine in Glendale, AZ, as Chief Investigator at Hilltop Medical Research in Phoenix, AZ, as a volunteer at the Phoenix Indian Medical Center, and as part of an international medical relief team in Honduras. He cared for thousands of children and touched many lives in the course of a long career.

He was a devoted husband, father, and grandfather. Bob and wife Seena were inseparable in their 60+ year marriage. He also loved to fish, golf, travel, and cheer for the Steelers. Son of Maurice Lewine (z"l) and Mary Kaufman Lewine (z"l), he will be missed by his beloved wife, Seena; daughter, Barbara; sons, Alan, Barry (Janet), and Michael (Rachel); eight grandchildren, Amy, Marc, Eric, Chase, Florie, Hanalei, Jaclyn, and Aliya; as well as cousins, nieces, nephews, and innumerable friends.

Contributions suggested to Temple Shalom, Oglebay Park, Easter Seals Rehabilitation Center- Wheeling, or the charity of your choice.

Robert Carl Ovington, MD

Dr. Robert Carl Ovington, 86, passed away on February 14, 2012, in Overland Park, Kan., where he has lived for the last three years, since his retirement. Dr. Ovington lived in Charleston for fifty years, where he had a private medical practice in psychiatry, and raised three children.

Dr. Ovington was preceded in death by his parents, Thomas Carl Ovington and Naomi Robinson Ovington; his sisters, Alice Ovington and Gertrude.

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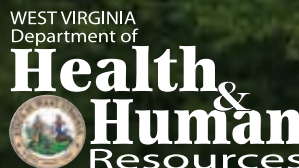
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