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VACCINES: FACT AND FICTION

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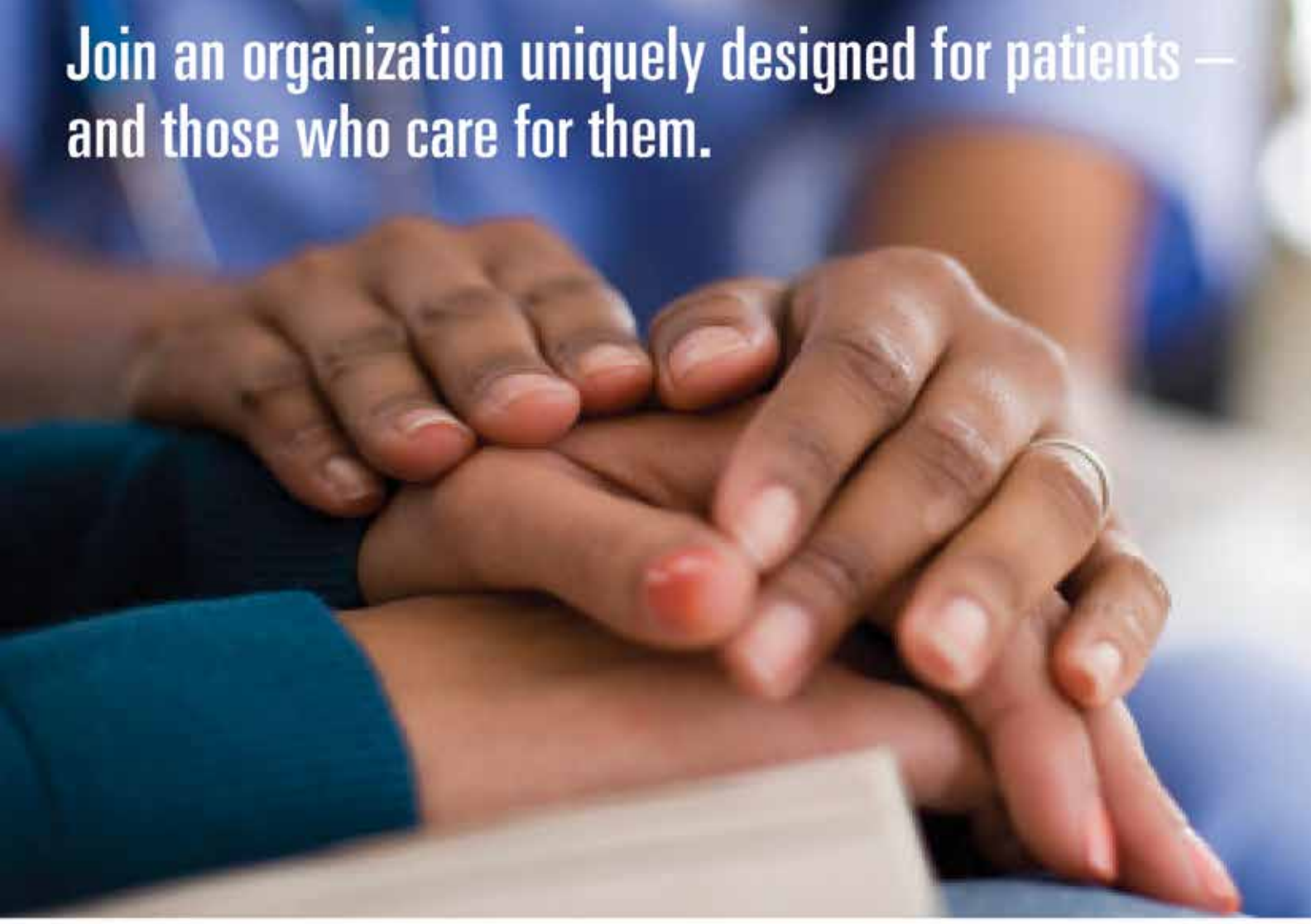

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contents

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On the Cover: Vaccines: Fact and Fiction

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Editorial

Jane Lochrie, M.D.

Jane Lochrie, M.D.

Vaccine-preventable diseases are still threatening our nation's population. Prior to the availability of the measles vaccine, measles infected 3 million-4 million people in the United States every year. Of those that were infected, 500 died, 48,000 were hospitalized, and 1,000 suffered permanent brain damage from encephalitis. Worldwide, 146,000 people still die from the disease. So why would anyone refuse to have their child vaccinated? Read this issue of *Worcester Medicine* to find the answer.

An increasing number of parents are delaying vaccinations for their children or are refusing them altogether, citing religious or philosophical exemptions from state laws that require children to be vaccinated in order to attend school. As a result, there have been recent outbreaks of serious diseases that vaccines had virtually wiped out in the U.S., including measles, mumps, pertussis and *haemophilus influenzae* type B (Hib), which was once the most common cause of bacterial meningitis in children.

All 50 states require vaccinations for children before entering school. Medical exemptions are allowed in all 50 states, and religious exemptions are allowed in 48 states (excluding Mississippi and West Virginia). Philosophical exemptions are permitted in 19 states. With the re-emergence of vaccine-preventable diseases, the American Medical Association adopted a policy that would require states to block non-medical exemptions to immunization requirements at its annual meeting June 8, 2015.

In the first article, Dr. Esposito details the impact of vaccines on preventing morbidity and mortality from the historical point of view. He points out that though we have a multitude of antibiotics and antiviral drugs, no specific treatment exists for many of the vaccine-preventable diseases.

Dr. Hirsh gives us the perspective of the commissioner of public health. He reminds us of how fragile "herd immunity" is and the risk of not vaccinating the population at large. "Public Health is everyone's business."

Dr. Slota speaks from the point of view of a pediatrician who faces this dilemma on a daily basis. She perceives that there is more than a misunderstanding about the safety of vaccines that is preventing parents from immunizing their children. She senses an erosion of trust in the physician and the drug companies that make the vaccines.

We are reassured by Dr. Roula Choueiri that the measles, mumps and rubella vaccine (MMR) is safe and effective. She describes the circumstances around the article in *The Lancet* that linked MMR to autism. The validity of the findings has been refuted, and the author was barred from practicing medicine in the United Kingdom. She also informs us that there has never been a study linking thimerosal to autism.

Ms. Dunn, MS, RN, and Ms. Griggs, MSN, RN, stress the importance of the education of parents and the necessity of giving caretakers an opportunity to express their concerns. Nurses are in the perfect position in these discussions, as they are often the ones to administer the injections and the last health care professional the patient encounters before administration of the vaccine.

And finally, we have reprinted Dr. Thoru Pederson's article from the *Federation of American Societies for Experimental Biology (FASEB) Journal* regarding the 75th anniversary of the March of Dimes. He gives a heart-wrenching account of his personal encounter of a neighbor with polio. He takes us back to the time when polio was the most dreaded word in the dictionary and to the hysteria and horror that polio triggered. He recounts how the March of Dimes campaign was started by Franklin D. Roosevelt.

Before you leave, please read As I See It, an account of an eight-week Mini Medical School at Baystate Medical Center, our President's Message regarding fluoridation and Society Snippets.

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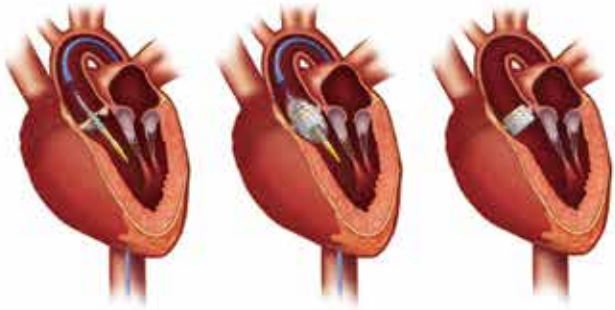

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Resolved: Fluoridation is a public health victory

Frederic Baker, M.D.

Frederic Baker, M.D.

Recently, the town of Shrewsbury soundly rejected efforts to repeal fluoridation of the water, and that should be good news to many. What's sad is that there is still a "debate" about the merits and safety of fluoride. Community water fluoridation is hailed by the Centers for Disease Control as one of the Ten Great Public Health Achievements of the 20th Century. It celebrates 70 years, impacts about 75 percent of communities in the U.S. that use public water, and benefits all ages. People living in communities with fluoridated water had fewer cavities and healthier teeth than those living in communities where the water was not fluoridated. For every $1 spent on oral health preventive measures, estimates are that American taxpayers save as much as $38-$50 in restorative and emergency procedures for the under and uninsured, not to mention the unforeseen and high societal costs of absenteeism, ER visits and lost productivity. With pediatric dental disease cited as the number one disease in most industrialized nations, exceeding asthma fivefold, dental disease remains one of the most expensive health care costs society must bear, particularly hardest felt by those less fortunate.

Fluoridation entails a small supplementation of a naturally occurring element, with no known harm at low levels, to the water supply. Despite claims to the contrary on the safety of fluoride by some parties, the CDC, Surgeon General and World Health Organization acknowledge that the safety and efficacy of fluoride has been long established by numerous studies. A broad coalition of health care experts unequivocally supports fluoridation as one of the most cost-effective ways to reduce dental caries and health care disparities. The only harms are fluorosis, a cosmetic staining of the teeth, seen only at higher-than-approved levels, and skeletal disease, seen only at toxic levels.

Opposition to public fluoridation also invokes passionate arguments that question the authority or trust of a government that seeks to "impose a treatment" that violates the absolute of personal autonomy. Consider this: The Wachusett Water Treatment Center, which provides the potable water to the Wachusett communities, adds a compound to the water supply that, unlike fluoride, is not naturally occurring in the environment. Furthermore, this compound is far more toxic than fluoride in that it can cause irritation of the eyes, skin and respiratory and gastrointestinal systems at high levels and death at even higher levels. That compound is sodium hypochlorite. That's right; bleach is added to water at very low levels safe for consumption to protect the public from harmful bacteria and microorganisms. What is even more amazing is that there is no outcry or effort to repeal such a treatment! The authority by which the government is charged with treating the water is explicitly acknowledged in The Safe Drinking Water Act (SDWA). Originally passed by Congress in 1974, the SDWA is a federal law that requires the EPA to protect the public by regulating contaminants that pose health risks, which may be present in public drinking water; sets standards used to treat drinking water quality; and oversees the states, localities and water suppliers who implement those standards. Even more reassuring is that the Public Health Service recently lowered the dose of fluoridation needed to prevent cavities from the range of 0.7-1.2 mg/dl to 0.7 mg/dl based on continuous and comprehensive and multiyear assessments of fluoride needs.

Although the private sector, nonprofits and individuals contribute much to community health, governments have the primary responsibility to promote and pursue sound health policy, as they often have the resources, infrastructure and the authority to make it more widely available and cost-effective. Furthermore, they have an added duty to represent *all* members of a community. Ideally, our government is one freely chosen by the people to serve the people and their best interests while upholding the laws and dignity for all. There has to be some element of trust in government; if not, public health policies will suffer or fail, and the implication is that people are voting against their best interests. The next time someone refutes the merits of fluoride or alleges there are more harms than benefits, ask them what experience they have had examining mouths, treating dental pain, providing restorative care, treating sepsis or even witnessing death as a complication from dental caries, which could be easily prevented through fluoridation. Likewise, the next time a public official or citizen proudly embraces a platform of reducing taxpayer waste, lowering health care disparities and improving the lives and outcomes of a community, while proudly proclaiming their rejection of fluoridation, tell them you are with them on all but the latter. Studies on fluoridation yield those very positive outcomes. Ask them how they can justify or reconcile spending – and indeed wasting – your tax dollars on higher Medicaid costs by denying fluoride? Studies consistently show communities without fluoride incur far more Medicaid costs. Ask them if they also believe that purifying the water should be an individual choice and not an "imposed treatment." Adopting great health policy takes courage, consistency, vision and an appreciation and respect for scientific/scholarly facts and historical trends. Communities that have embraced fluoridation and universal vaccinations have enjoyed far better outcomes at far lower costs, precisely because they took such an approach, with guidance from trusted experts determined to benefit all members of a community. The great city of Worcester seeks and deserves to be one of the healthiest cities in New England. The question now is: What are the citizens of Worcester willing to hear, choose and do differently to achieve such a goal?

Frederic Baker, M.D., a board-certified attending physician in family medicine, has a full-time outpatient practice in Holden, providing comprehensive care from newborn to advanced elderly patients in Central Massachusetts. He is also an instructor in family medicine and community health at the University of Massachusetts Medical School.

We welcome and encourage your feedback and ideas on this article at fgrillb@aol.com.

For additional reading, I would direct you to some of the very sources I referenced:

1. http://www.publichealthreports.org/documents/Surgeon_General_Perspective_FG.pdf
2. http://www.mwra.com/04water/html/watsys.htm
3. http://www.cdc.gov/fluoridation/pdf/communitywaterfluoridationfactsheet.pdf
4. http://www.ada.org/en/public-programs/advocating-for-the-public/fluoride-and-fluoridation/fluoridation-facts
5. http://www.ilikemyteeth.org/cut-cost-medicaid-fluoridate/
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7. http://www.who.int/water_sanitation_health/publications/fluoride_drinking_water_full.pdf?ua=1

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Vaccines and public health in the United States of America: A bouquet of medical miracles

Anthony L. Esposito, M.D., FACP

Anthony L. Esposito, M.D., FACP

The absence or virtual absence of so many infectious diseases in the United States has spawned a belief among some citizens that their health and well-being reflects the natural order of things – the fruit of clean living and good breeding, perhaps. Such a rosy view overlooks the real threats posed by communicable diseases and the remarkable benefits of vaccines. Glimpses into the potential carnage of vaccine-preventable illnesses do occur when, for example, the seasonal influenza vaccine is not well matched to the prevalent strain. In such circumstances, the sunny belief that wholesome lifestyles and sturdy genes prevent infectious diseases dims, albeit transiently.

The magnitude of the impact of vaccines in preventing human suffering and premature death can be appreciated from a historical Worcester perspective and from a broader view offered by national data from the Centers for Disease Control (CDC). This brief overview will highlight both perspectives.

Imagine you are reading the *Worcester Telegram* in November 1903, a time before vaccines and antibiotics. As is often the case in 2015, the front page is splashed with graphic reports of murder and mayhem: Lead stories include "Shot after Drink with Actresses," with a subtitle, "Young Businessman of Missouri Killed by a Traveling Salesman after a Quarrel and a Dare to Fire." A second front page story reports, "Cuts Her Lover's Throat Fatally," with the subtitle, "William Peasely finds his Wife with John Beardsley and Strikes Before a Pistol is Drawn." Beyond the banner headlines were back page stories of outbreaks of communicable illnesses and premature deaths, such as "Irene McNamara has the Diphtheria Now. Spencer Cases Increase and the Quarantine Lines will be Drawn Closer," and "Suffers with Diphtheria. Wife of Dr. Everett L. Foster Sick at Northboro." Reports of specific children – Mary Flowers and Elise Hatch – dying of vaccine-preventable illness also appear in the edition.

In the early 1900s, the Board of Health of the City of Worcester issued an annual report of communicable diseases and related deaths. In 1903, the board reported 180 cases of diphtheria, with 11 deaths and 493 cases of measles with 32 deaths. Although mortality rates associated with diphtheria and measles were relatively low – at 6.1 percent and 6.5 percent, respectively – the deaths usually occurred in children, and, of course, all would have been prevented if vaccines had been available. Of note, three cases of smallpox were also reported in 1903.

How prevalent were communicable illnesses in the nation in the pre-vaccine era? The Centers for Disease Control and the National Institute of Allergy and Infectious Diseases report that during the 20th century and prior to the introduction of effective vaccines, 500,000 cases of measles, 175,000 cases of diphtheria and 48,000 cases of smallpox occurred annually in the United States. Moreover, prior to the introduction of immunization programs, 152,000 cases of mumps, 174,000 cases of pertussis, 47,000 cases of rubella and 16,000 cases of polio occurred each year. And what has been the impact of effective vaccines? In 2009, there were 71 cases of measles and no cases of diphtheria reported in the United States. Both polio and smallpox have been eradicated. And a bacterium, *Haemophilus influenza*, type B, which only three decades ago caused 20,000 infections annually – including meningitis, epiglottitis and pneumonia – and 1,000 deaths in infants and children, has almost become a disease of historical interest: The incidence of invasive infection among children less than 5 years of age has declined from about 25/100,000 in the late 1980s to less than 0.25/100,000 today.

Clearly, children born in the present era, as well as adults, benefit enormously from completing vaccination programs. Models created by the CDC yield simply stunning data: Among children born between 1994 and 2013, vaccinations will prevent an estimated 322 million illnesses, 21 million hospitalizations and 732,000 deaths over the course of their lifetimes. The benefits include $295 billion of savings in direct costs and $1.38 trillion in total societal costs. Expressed another way, each dollar expended on vaccination programs produces $5 in savings in direct costs and $11 in indirect costs.

While it is also clear that advances in public health and sanitation have had a substantial impact on the prevalence of certain infectious diseases, such as malaria and typhoid fever, in the United States, public health interventions, improvements in living conditions and advances in the population's general state of health would not obviate certain communicable illnesses, such as measles and mumps. Although it is true that contemporary physicians have an armamentarium that includes many powerful antibacterials and some antiviral drugs, no specific therapy exists for many of the illnesses for which effective vaccines have been developed; for example, there is no effective agent with which to treat measles. Further, even though a number of antibacterials are available to treat children with *Haemophilus influenzae* meningitis, survival from the infection is often accompanied by severe neurological impairments. Thus, although the mortality rate for children with *Haemophilus influenzae* meningitis is less than 6 percent, 15 percent to 30 percent of survivors experience hearing loss or other permanent neurologic sequelae. Such complications again highlight the importance of primary prevention.

In summary, no medical interventions have had a greater impact on human existence than have vaccines, and it is likely that none ever will. In addition, work to improve the performance of currently available vaccines and scientific efforts to create new vaccines to prevent illnesses like malaria remain ongoing. The medical and lay communities should embrace vaccines, support the continued development and enhancement of vaccines, and understand the role that vaccines play in maintaining our health and well-being.

Anthony L. Esposito, M.D., FACP, is the chief of the Department of Medicine at Saint Vincent Hospital and professor of medicine at University of Massachusetts Medical School.

Vaccines: A public health perspective

Michael Hirsh, M.D.

Michael Hirsh, M.D.

Edward Jenner, British surgeon and father of immunology, developed the first modern vaccination program against smallpox in 1800. He is widely applauded for wiping out the disease, which killed significant portions of the population of England every year. He was recently named as one of the Top 100 Britons in History. In the beginning of the 20th century, death from infectious diseases made up a majority of premature deaths in the United States. With the refinement and development of the vaccine therapy that Jenner inaugurated, entire classes of disease were eradicated, and cardiovascular disease, cancer and trauma overtook infectious disease as the chief mortality causes. This was looked at as an amazing triumph of preventive medicine and as a shining example of how all disease entities should be approached.

This progress in care caused the World Health Organization of the United Nations send a call to arms to try to spread this vaccine therapy to the Third World. And whenever newer outbreaks have occurred, the public and our governments call out to the medical community to quickly develop new vaccines, whether it is HIV, Ebola or swine flu.

So, the recent return of previously eradicated diseases like measles and polio came as an unfortunate surprise to the public health community. The myths about vaccinations somehow having a correlation with the increase of autism, perpetuated by a now-debunked British scientist and a group of ill-informed celebrities, took hold in areas of the country with civil libertarianism, people distrustful of the government and undocumented immigrants with poor access to vaccinations. This led to the recent measles outbreak in 17 states. This reminded us of how fragile "herd immunity" can be. Public health is everyone's business. And the risk that non-vaccinated people place on the rest of our vulnerable populations – such as the elderly, the young and the expectant mothers – must not be worth the benefit of defying medical science and logic. As physicians, we should be able to work with our patients to ensure that our populace doesn't march backwards into the medical dark ages.

Michael Hirsh, M.D., is the commissioner of the Worcester Division of Public Health.

Vaccines: Is the safety net unraveling?

Janet A. Slota, M.D., FAAP

Janet A. Slota, M.D., FAAP

Never in my nearly 20 years as a pediatrician did I think we would reach this crossroads. The crossroads between vaccine acceptance and refusal. As a young doctor, I incorrectly surmised that there was no question about the value of vaccines – for both personal and public health. That particular question had been asked and resoundingly answered. How wrong I was. Now, I am left wondering what to do.

Alarming headlines are everywhere. A cursory Internet search reveals these articles from *The Washington Post*: "113 Countries have Higher Measles Immunization Rates Than the U.S. for One Year Olds" and "Measles Vaccinations. Tanzania Does Better Than U.S." As a pediatrician dedicated to the health of children, I take these exhortations to heart. In my office, though, I have a nagging feeling things are not going well.

I struggle to try and understand where this has gone wrong. Perhaps it started to grow out of proportion with the article published in *The Lancet,* tying the MMR vaccine to autism. As we all know, the findings in that article have been completely debunked, but that has garnered far less attention in the lay press. Those headlines appear to be far less riveting than what Jenny McCarthy has to say.

The conventional wisdom tells us that we are so removed from the era of vaccine-preventable disease that parents no longer understand the risk. No doubt, this is part of the problem; however, I sense that something more sinister is at play here. It involves the erosion of trust: in the physician, in the drug companies that manufacture vaccines and so on. There seems to be a multitude of conspiracy theories on vaccines, especially on the Internet. This is why explaining risk ratios and providing limitless evidence-based reassurance to parents is not working. Indeed, a 2014 NPR story on the flu vaccine revealed that providing education to people uneasy about the flu vaccine reduced the misperceptions about the vaccine, but also reduced the likelihood that they would get the vaccine! Countering belief systems with science may not work. My evidence-based heart sinks as we try to figure out what to do.

On a daily basis, I have parents who refuse all vaccines, refuse some vaccines or who desire to construct some novel vaccine schedule of their own, even asking me to help construct it! To say the least, I have mixed feelings when accommodating these families. I don't want to deliberately participate in the fraying of the safety net. I spend a lot of time and energy probing for the basis of the refusal to perhaps assuage their anxieties. I work really hard to remain open so that things do not become contentious – to try to continue to build a relationship so that I might persuade them to vaccinate in the future. I have to say, though: This takes lots of energy and often leaves me and my colleagues feeling drained and not a little disappointed.

Of course, the disappointment reflects what's ultimately at stake here: the health and well-being of these unvaccinated children, as well as those who cannot be vaccinated. My colleagues and I struggle with this every day, as the community is put at greater and greater risk. What do we do for these children who are deliberately unvaccinated?

Some states tolerate religious exemptions, moral exemptions or personal belief exemptions. In some states, it seems far too easy to obtain a personal belief exemption. I think it is necessary to employ a reasonable standard to permit these exemptions, but who should set the standard: State government? Federal government? Doctor's offices? Schools? The path forward is so ill-defined. Some states are starting to introduce legislation that would require parents to provide various forms of documentation to support their objection. Other states are proposing removing the religious and philosophical exemption altogether. While that may seem like progress, it is disappointing to note that some states are still adding exemptions.

Some practices are starting to dismiss families who don't adhere to a standard vaccine schedule. I must admit that the straightforwardness of this approach is somewhat appealing. It sends a clear, unequivocal message. However, at this point, I don't have the heart to close the door on these patients – at least not yet.

These days, when a family agrees to fully vaccinate their child, I enthusiastically thank them. I thank them for protecting the child and for protecting the community. I take a few moments to go over what is happening in this country and how it is putting us all at risk. Some families immediately see the risk that their young unvaccinated children are exposed to, and they are appalled. I urge these families to go back to their communities, including their online communities, and enter the fray, to leverage their anger into something productive. It is apparent that this is battle should be hard fought in public and private spaces. The health of all of us is at stake.

Janet A. Slota, M.D., FAAP, is a pediatrician at Reliant Medical Group, site chief at the Plantation Street Office and clinical assistant professor of pediatrics at the University of Massachusetts Medical School. She can be reached at jslota4kids@hotmail.com.

Immunizations and autism

Roula Choueiri, M.D.

Autism is used interchangeably in this article with Autism Spectrum Disorders (ASD). Autism is a neurodevelopmental disorder that includes delays in social skills and communication, as well as repetitive and restricted interests (DSM-5, 2013). Early signs of autism can be seen clinically in some cases by 12 months of age. There is a natural history of regression or stalling in development in up to 20 percent to 30 percent of the time, and this happens usually between 12-24 months of age, most often between 15-18 months of age. Most of the time, language and development pick up afterwards, usually after starting specialized services and having received the diagnosis of autism. The cause of this regression is not yet totally understood, which led to speculations about possible causes, including immunizations, as this is an active time when young children receive several immunizations.

The suggestion that the MMR (Measles, Mumps, Rubella) vaccine may be associated with autism started with Andrew Wakefield, a gastroenterologist in the United Kingdom. In 1998, he published an article on 12 children in *The Lancet* – the only single study that found a connection between MMR and autism – claiming that the measles virus included in the MMR vaccine caused a bowel disease that allowed harmful proteins to cross the blood-brain barrier and cause regression in development, thus causing autism clinically in those 12 children. The validity of his findings was later refuted and eventually discredited after an investigation found Wakefield did not disclose he was being funded for his research by an anti-vaccine lobby.

The findings of Wakefield were never reproduced. Journalist Brian Deer, starting in 2004, published in the BMJ a series of papers after finding the 12 children in the original Wakefield paper. He found that all of the 12 cases reported in the 1998 *Lancet* paper have had alterations in their history and that the medical records could not be fully reconciled with the descriptions, diagnoses or histories published in the journal.

The Lancet retracted this paper in 2010. Wakefield was barred from practicing medicine in the United Kingdom.

Since then, there have been more than 20 studies and articles that refuted the connection between the MMR vaccine and the development of autism. A Cochrane database systematic review completed in February 2012 ("Vaccines for Measles, Mumps and Rubella in Children." Demicheli V., et al.,www.ncbi.nlm.nih.gov/pubmed/22336803) examined several studies involving, in all, 14,700,000 children and assessed effectiveness and safety of the MMR vaccine (2004-11). The MMR vaccine was unlikely to be associated with autism. Another large study examined the trends in autism and MMR immunization coverage in California, looking at children born from 1980-94 enrolled in California kindergartens (survey sample of 600-1,900 children each year). No association between MMR and autism was found ("Time trends in autism and in MMR immunization Coverage in California." Dales L., et al., JAMA 2001; 285 (9): 1183-5. www.ncbi.nl.nih.gov/pubmed/11231748.)

Then, there was the suggestion that mercury could be contributing to the increased prevalence of autism, particularly thimerosal; this is a mercury-containing organic compound and has been used as a preservative in several vaccines used in the 1990s. Thimerosal was never present in MMR. It was removed from all routine vaccines used in childhood, with the exception of certain vaccines against the flu, in 2001.

It is important to know that thimerosal breaks down in the body into ethylmercury and *not* methylmercury. The body uses ethylmercury differently than methylmercury; ethylmercury is broken down and clears out of the blood more quickly. Low-level ethylmercury exposures from vaccines are very different from long-term methylmercury exposures since the ethylmercury does not stay in the body.

Today, the only childhood vaccines that have trace amounts of thimerosal are: one DTaP vaccine and one DTaP-Hib combination vaccine. Among flu vaccines that might be given to children, one manufacturer's single-dose formulation (tradename Fluvirin), which is approved for use among children 4 years and older, has trace amounts of thimerosal. All other single-dose formulations of flu vaccine have no thimerosal.

There has been no study linking thimerosal and autism. The American Academy of Pediatrics (AAP), the American Medical Association (AMA), the CDC and the Institute of Medicine (IOM) agree that science does not support a link between thimerosal in vaccines and autism. For the IOM report, please go to http://www.iom.edu/CMS/3793/4705/4717.aspx.

Every physician is mandated to report adverse effects of vaccines to the Vaccine Adverse Event Reporting System (VAERS) so that the event may be studied further. Any adverse effects are acted upon immediately when there appears to be an association. The VAERS website is available at http://vaers.hhs.gov.

Roula Choueiri, M.D., is a neurodevelopmental disabilities pediatrician, an associate professor of pediatrics and division chief of Developmental and Behavioral Pediatrics at UMass Memorial Children's Medical Center in Worcester.

To read further on this and to have access to the latest studies and fact sheets that you could distribute to families, please go to:

1. www.cdc.gov/vaccinesafety/Concerns/thimerosal/
2. https://www2.aap.org/immunization/families/faq/vaccinestudies.pdf
3. https://www2.aap.org/immunization/families/autismfacts.html
4. www.vaccineinformation.org

Let's talk about pediatric vaccines

Melissa Dunn, MS, RN and Stephanie Griggs, MS, RN

Melissa Dunn, MS, RN **Stephanie Griggs, MS, RN**

Introduction

It is estimated that immunizations will prevent 322 million illnesses and 732,000 premature deaths among children born between 1994 and 2013 during the course of their lifetimes. [1] Vaccines are a widely discussed topic among healthcare providers and patients. Vaccines prevent deadly and harmful diseases in children. Improvement in vaccination rates requires a collaborative relationship and discussion between the health care provider, patient and family. There are steps both providers and patients can take to have effective discussions surrounding vaccines. In order to make an informed decision, patients and families need: the right information, essential resources, emotional support and opportunities to participate in the discussion. [2] Patients and families often seek guidance and education regarding vaccinations from the nurses they encounter while seeking care. Nurses can be an important resource for families who have questions about the safety and necessity of vaccines.

Background

The World Health Organization and the Centers for Disease Control and Prevention (CDC) and many other government and professional organizations advocate for the administration of vaccines to prevent disease and improve the health of communities. [3] Parents and health care providers should obtain the most current schedules from the CDC Vaccines and Immunization website (www.cdc.gov/vaccines/schedules). This is the schedule that is widely followed in the United States. For children, vaccine schedules can be customized on the CDC site, allowing families to have personalized vaccine schedules. Information about individual vaccines and the diseases that they are intended to protect against are also published by the CDC and available online.

Discussion

Parents choose to vaccinate to protect their child, family and the general public from preventable diseases. In Massachusetts, some vaccines, such as MMR and varicella, are required to send children to school. School requirements may influence a parent's decision to vaccinate. Parents obtain information about vaccinations from many informal sources, including friends, family, the media and their own personal experiences with vaccinations. Parents can also obtain information from the child's health care provider (including nurses), the American Academy of Pediatrics (AAP), their local health department and government sites, such as the Centers for Disease Control and Prevention (CDC) and the Massachusetts State Department of Public Health website (http://www.mass.gov/eohhs/docs/dph/cdc/immunization/guidelines-childhood.pdf).

Families may choose not to vaccinate or to delay vaccines for a number of reasons. Potential reasons for declining vaccines include religious beliefs, concerns about side effects, exposure to preservatives in vaccines, the number of vaccines administered in a single visit, preference for development of natural immunity and other personal reasons. In Massachusetts, vaccine exemptions are allowed in the school setting for medical and religious reasons. Families need to be given the opportunity to express concerns and have a meaningful discussion related to vaccinations with their providers. Whether a family is committed to following the CDC recommended vaccine schedule or not, providers should continue to educate and engage the family in discussions related to vaccines. Nurses have an important role in that discussion. Often, a nurse administers the vaccinations and is the last person a patient encounters prior to the administration of a vaccine. Nurses often provide emotional support to families and children during and after vaccine administration. Patients and families should articulate which sources they use for vaccine information and express questions and concerns during health care visits. Knowing where families obtain vaccination information allows for a better, more informed conversation between the health care provider and the family. Parents may delay vaccines due to misinformation on the Internet. If families choose not to vaccinate at a given visit, the door should remain open to continue the conversation in future encounters.

Health care providers recommend that *all* children be vaccinated on time and without delay.[4] When a vaccination is delayed, the child and the public are at risk. If a delay has occurred, the health care provider and family need to work together to get the child back on track. The health care provider should provide families with a catch-up schedule and educate them on what is due at the next visit.

Conclusion

Despite the strong evidence supporting the safety and efficacy of vaccine administration, families often have concerns, including some related to vaccine safety and timing of vaccine administration. Providers and families must engage in productive discussions to address the concerns that may prevent families from consenting to vaccinations for children. Nurses are in an excellent position to address questions and concerns during visits. Key points to include in the discussion are: Vaccinations prevent deadly diseases; protect the child, family and community; and vaccinations are safe. The essential informational resources for patients and families include the health care provider, CDC and American Academy of Pediatrics. Working together to improve immunization rates will save lives.

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Turning on a dime: The 75th anniversary of America's March Against Polio

Thoru Pederson, Ph.D.

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This past January, I had the privilege to give two lectures at the University of Cincinnati. On the second day, an appointment with the erythrocyte physiology and molecular biology pioneer Jerry Lingrel had me walking into a smart, Frank Gehry-designed building, where I saw a display on Albert Sabin in the foyer. Sabin had spent many years at Cincinnati and is, needless to say, as revered there as he is and should be elsewhere. Later, I reflected that 2013, indeed, Jan. 3, to be precise, was the 75th anniversary of something almost as extraordinary as the feat achieved by the good Albert Sabin and Jonas Salk.

A memory

Sometime in 1946, when I was 5, my mother announced at the dinner table that a child in a family we knew had polio and was in an "iron lung." I can still remember the impact of that term for the machine. Even though I was a young child, it sounded like "trapped," and the adjective "iron" added to the locked, incarceration metaphor. The next day, after I came home from kindergarten, my mother and I went to visit the mother and boy. As my mother and his chatted for a moment, I looked down to the other end of the living room and saw the machine. The boy was someone I knew when he was vertical, and this frightening new image was terrifying. I was more upset by the machine than feeling empathy for him – something I should have been ashamed of, but I had not developed enough of an ethical core as a 5-year-old. I was so overcome with fear that I turned around and tried to run out the door. My mother stopped me and as she did so often all my childhood, gave me the courage that I lacked. We walked over to the machine and talked to the boy. My memory of this is so vivid still, after all of these years, and especially how normal his voice and conversation were. He was not sad or angry (his voice had a pleasant bounce); he was just happy to see us (he knew both my mother and me). In my peripheral vision, I could see his mother, tears streaming down her cheeks. It took me many years to realize that this visit was not just for her son but also for her – another lesson my mother taught me that day.

When we returned home, my mother was upset that I had tried to flee when we had arrived at the visit. She said, "Don't ever run from a patient. They do not want to see your anguish over their condition. You need to muster courage and be the uplifting visitor they need and deserve." I was only 5, but her words have been lodged in my hippocampus ever since. She was a nurse and later became an officer of the American Red Cross, so she had some experience in this matter. I remember her admonishment every time I approach a hospital bed or visit a patient at home, and I am grateful to have had this powerful teaching from her – one of so many.

Wanda Wiley (1941–1983), featured in a poster for the March of Dimes; image courtesy of the March of Dimes Foundation.

A picornavirus homing on neurons

At the time my mother and I visited this boy in an iron lung in 1946, polio was one of the most dreaded words in the American lexicon. (It was equally dreaded elsewhere, but my world at the time was that of most Americans, i.e., our shores.) The facile horizontal transmission created water-fountain phobias and resulted in the closing of municipal swimming pools across the United States. The images of debilitating and often permanent paralysis, for those lucky enough to survive, imprinted as vivid and morbid an image in the public consciousness as America had seen since the 1918 influenza pandemic.

Figure 1. *The original photograph of John Enders, taken by Walter Fleischer, is held by the Harvard University Archives.*

One evening in 1951, a physician walked into the St. Botolph Club on Commonwealth Avenue in Boston to join a group of his colleagues for dinner and a lecture. This group of Harvard Medical School physicians had been founded in 1920 and met monthly. After cocktails, they sat down to dinner, and the speaker started his presentation. He told of experiments in his lab that had revealed that it was possible to get poliovirus to replicate in a variety of human non-neuronal cells. The speaker was John Enders of Boston's Children's Hospital (Fig. 1). The experiments he described had been, at least initially, a fluke of design. In a large study, there was one culture tube of human fibroblasts left, and Enders suggested that a lab associate throw poliovirus into it. To their surprise, the virus replicated. Recognizing the potential of this finding, Enders and his colleagues expanded the studies and published a comprehensive and conclusive set of results in two landmark publications,[1-2] thereby demolishing the widely held notion that this virus could only be propagated in neuronal cells. This discovery opened the door to the polio vaccines of Sabin and Salk, as it made it possible to grow the virus at large scale. But, 13 years earlier, another tributary into this story had started to flow.

Disme (as in "Buddy, do you have a . . ."?)

Disme is a word that arose sometime in the ancient language of Gaul, clearly descended from the Latin *decima*. These are the etymological roots of the English word for the dime, and here our story takes off.

Afflicted with the disease himself and catalyzed by a visionary associate, the lawyer Basil O'Connor, President Franklin D. Roosevelt launched the National Foundation for Infantile Paralysis on Jan. 3, 1938. (It is often forgotten that this was actually a volunteer effort by Roosevelt, not an Executive Order.) The American singer-actor Eddie Cantor got the idea that this fundraising effort should be dubbed "The March of Dimes," as a pun on newsreels that ran in movie theaters at the time, called "The March of Time." It was the kind of idea that was as whacky as it was genius, and it stuck.

Shortly after my mother and I visited the boy in an iron lung, she handed me some cards with an array of slots across. Each slot was about ¾-inch wide. I was told that I was to bring these cards home within 1 week, each full of dimes, and that this was "to cure the disease you saw last week." Without knowing the name of the campaign at the time, I had been signed up, as had been hundreds of thousands of children and adults across America.

We had been recruited into the March of Dimes.

A dime in 1946 was not a trivial sum, and yet I remember a very strong sense, even though I was only 5, that this was doable. Had the slots been for quarters or half-dollars (the latter, a jumbo coin in circulation then), maybe people would have been less optimistic. Over the next year or two (1946–1947), Americans slid dimes into those slots and delivered the gravid cards.

My most vivid memory of all of this was that these dimes were going to find the cure. Polio experts and many educated adults realized that prevention was the more plausible scenario, but to us kids, the idea of a cure was very real, as we optimistically hunted down dimes. For me and the many hundreds of thousands of children and adults across the land who were rounding up dimes and bringing them in, well, it just felt like the right thing to do, since it was for a disease that everyone could directly relate to, based on the crippling of loved ones and friends. Polio was not an abstract concept. Fear and the human imperative of self-protection were also at play, but for those of us who were children, pushing our collected dimes into those slots had no sophisticated motive other than it just seemed good, having watched one or more of our friends become afflicted, as I had seen. But many of my friends who were equally zealous about raising dimes didn't know an afflicted child, and so, O'Connor, Cantor, and Roosevelt had managed to touch the collective heart and soul of America.

The campaign went ahead with good momentum for several years and became more broadly recognized after World War II, when Americans could focus on other things. When Roosevelt died in 1945, he had lived to see great initial momentum in this cause. His successor, Harry Truman, had other priorities in the postwar era, but by now, the March of Dimes was really marching. By the time Dwight D. Eisenhower took office, the National Foundation for Infantile Paralysis had become skilled in public relations, with engaging posters appearing in magazines and at the entrances of movie theaters and even restaurants (such as the example presented on the first page of polio patient Wanda Wiley).

The vaccines and beyond

Flying home from Cincinnati, I thought more about Albert Sabin and Jonas Salk and about the boy in the iron lung I had visited

Figure 2. The Mercury (left) and Franklin D. Roosevelt (right) dimes. The Mercury dimes, with Winged Liberty on the obverse side, were in circulation from 1916-1945 and were thus the coins that were being raised when the March of Dimes got underway. When the Roosevelt dime went into circulation in 1946, it was a shinier and less worn coin, which the author and some of his friends hoarded, awaiting more of the Mercury dimes, still in active circulation, to show up and be slipped into the donor cards in place of the more cherished FDRs. Of course, there is some irony there, as FDR was the catalyst for the March of Dimes. Eventually, our parents would discover our hoarded FDR dimes and put another March of Dimes card in front of us.

with my mother. The World Health Organization reported that there were only 650 cases of polio worldwide in 2011. What greater legacy could any medical scientist have left? Many have expressed surprise that neither Salk nor Sabin won a Nobel Prize, an honor that might well have come to them in any of the many years they lived after the vaccines had made both of their names household words. (Sabin died in 1993; Salk in 1995.) Perhaps the Stockholm judges viewed the vaccines to have been production technology, i.e., an obvious step, not an enabling discovery. In 1954, only two years after their key publications, John Enders received the Nobel Prize in physiology or medicine, shared with his colleagues Frederick Robbins and Thomas Weller. The sense was that the Nobel committee had recognized that their discovery was the key to the vaccines.

The first dimes collected were the "Mercury" series (1916–1945), with the winged head of liberty on the obverse side (Fig. 2). In 1946, when the March of Dimes that President Roosevelt had launched was roaring ahead, an ironic twist occurred: He was cast on the next dime (Fig. 2). He was put there for many reasons, of course, but I remember beginning to slide his shining silver face into the slots thereafter and feeling that this March of Dimes was simply the greatest thing; and so it was. Hearing of these dimes and moved by the efforts of school children across America, other donors began to come forward, as Basil O'Connor had so brilliantly anticipated. By 1955, when the Salk vaccine came out, the National Foundation for Infantile Paralysis had raised and distributed $233 million. It is estimated that these funds reached and helped 80 percent of polio patients in the United States.

One sees many marches all the time these days, for many diseases. All who walk and give for medical research and care are to be praised. Here, I have recalled a very great walk, launched 75 years ago: The March of Dimes.

Thanks go to John Potts, Massachusetts General Hospital, who recalled elder members of the dinner group describing John Enders' presentation. The National Foundation for Infantile Paralysis is thanked for providing the March of Dimes poster and for granting permission for its use.

Thoru Pederson, Ph.D., works in the Department of Biochemistry and Molecular Pharmacology at the University of Massachusetts Medical School in Worcester.

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Mini-medical schools

Robert Ryan, Esq., and Daniel Swords, Esq.

A few years ago, a good friend raved about a program that he had attended at Baystate Medical Center in Springfield, called Mini-Medical School. His enthusiasm sparked my interest in exploring further. I contacted a friend and inquired if he would be interested in attending this eight-week program. We both had relatives in the medical profession, yet we had spent our work careers in the legal profession.

We were told when deciding whether to register for Mini-Medical School at Baystate Medical Center that the commitment would be one night a week for eight weeks and that we would hear from doctors at the hospital talk about their specialties. We figured that there are worse ways of spending a couple of hours on a Thursday night. We were given a syllabus and our "white coats" to wear to class.

What we soon discovered was that the school was a series of entertaining lectures from accomplished chairs of departments, interesting exchanges between the presenters and the students, and a behind-the-scenes view of some of the hospital departments. The lectures often began with a historical view of the evolution of the specialty (e.g., surgery, cardiology, anesthesiology, psychiatry, emergency medicine, etc.) that was the night's topic. The presenter then provided the class with the current state of care that is provided by the hospital. The presentations were punctuated with humor and anecdotes that added to the entertainment value of the lectures. The doctors were at times self-deprecating, which seemed to bring them down from their pedestals and made them more engaging. A PowerPoint presentation accompanied the lecture, but the real value of the class was the doctors' ability to connect with the audience.

That connection was made evident by the questions and comments that were elicited from the class that was a mix of people of all ages but with a heavy dose of senior citizens. The presenters comfortably moved around the room of 80 students and fielded both general questions and some that were more specific. This question and answer period was a valuable part of each night's program. Even after the class was over, the doctors often patiently stayed to talk to inquiring students. It was clear that the doctors felt that presenting to the class was a valuable and important exercise that promoted not only their departments but also the hospital as a whole.

We came away from the class with a much better understanding of the capabilities of Baystate Medical Center and a greater confidence in the competence and quality of the staff. And it wasn't just the physicians that were impressive. The Marketing and Communication Department did an excellent job putting the program together; two nurses provided insight into their jobs and opportunities offered to them by the hospital; the head of the kitchen showed how he and his staff are able to deliver thousands of meals a day; technicians in the lab demonstrated the procedures used to test samples; and we were shown how medical students practice their surgical techniques in the lab.

Mini-Medical School was an entertaining and educational eight weeks. It was a fun experience that we looked forward to each week. Not a bad way to spend a couple of hours on a Thursday night.

Robert Ryan, Esq., is the chief probation officer of Belchertown District Court. Daniel Swords, Esq., is the first justice of the Hampden County Juvenile Court.

Protecting community water fluoridation

Six months ago, the Better Oral Health for Massachusetts Coalition, along with the Office of Oral Health at the Department of Public Health, realized that an organized effort was necessary in order to protect what the Centers for Disease Control and Prevention named one of the Ten Great Public Health Achievements of the 20th Century[1] – community water fluoridation. Fluoridation of public water supplies allows for children to build stronger teeth that are less susceptible to tooth decay. Beyond this systemic benefit for children, adults receive a topical benefit from fluoridated water, reducing tooth decay throughout the population.

The Better Oral Health for Massachusetts Coalition (BOHMAC) is a statewide organization that advocates for oral health policies to ensure that Massachusetts' residents, especially those most vulnerable, have comprehensive oral health prevention and treatment services. BOHMAC is committed to working with policy-makers, advocates, community partners and health providers to guarantee that oral health is an essential component of overall health.

In an effort to respond to anti-fluoridation activities throughout the Commonwealth, BOHMAC has been working with local boards of health and community champions. Together, we have been able to organize education panels on water fluoridation, provide information to residents of fluoridated communities, and present the science behind fluoridation. These grassroots efforts to preserve community water fluoridation have seen success in all communities in the state that have discussed the topic since September 2014.

Community water fluoridation continues to be contested in some communities, proving the necessity of organized pro-fluoridation support. For more information regarding community water fluoridation or to request organization around fluoridation in a particular area, email Victoria Chase at vchase@betteroralhealthmass.org.

This article was submitted by the Better Oral Health for Massachusetts Coalition.

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Patricia Hildick Bazemore Maxson, M.D.

As a young girl, Patricia Hildick Bazemore Maxson was routinely asked by her father, "And what have you done for the order today?"

With resounding voices, we can say she has done much: for the most vulnerable populations of Massachusetts, for her family and for Central Massachusetts. A graduate of Radcliffe College and Yale School of Medicine, Dr. Bazemore completed her residency at Bellevue Hospital in New York. Coming to Central Massachusetts, Dr. Bazemore worked tirelessly for the developmentally delayed population of the Glavin Center and then joined the Department of Family and Community Medicine at the University of Massachusetts Medical School, where she directed the medical service contracts at the state schools in Monson and Belchertown. In 1988, she became Chief of Medicine at Worcester State Hospital, where she served for 12 years. Dr. Bazemore became an expert in swallowing and choking disorders in mentally ill patients and published extensively on the subject. She also cared for the vulnerable populations at Taunton State Hospital. An associate professor in the departments of psychiatry and family medicine and community health at UMMS, she served on the admissions committee for 17 years. She also served as a preceptor in the physician assistant's program of the Massachusetts College of Pharmacy and Springfield College.

An accomplished pianist, Dr. Bazemore joined professional colleagues in presenting holiday concerts at Worcester State Hospital. Dr. Bazemore was especially interested in the history of psychiatry, and she became a major force in the preservation of the Clock Tower at Worcester State Hospital.

Devoted to her family, she took legendary and loving care of her father, who predeceased her at the age of 102. She was the proud mother of Jonathan, Katherine (a UMMS graduate) and Mary and proud grandmother of four grandchildren: Elijah, Bexon, William and Michelle. She is also survived by her husband, Stephen Maxson, with whom she shared a love of the church, where she was a member of St. Anne Parish in Sturbridge.

Patricia Bazemore, M.D., died April 16, 2015, at the age of 74. We were both enriched by our friendships and working experiences with Dr. Bazemore in the Worcester community.

– Louis Fazen, III, M.D., MPH, and N. Lynn Eckhert, M.D., Dr.PH

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The Worcester District Medical Society (*WDMS*) congratulates the following members and friends of the WDMS Alliance (*WDMSA*) who have received the Thomas Jefferson Award in recognition of their outstanding volunteerism and public service at the Belmont Street School in Worcester.

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Francine Vakil
Susan Kronlund

WDMS Member
Dr. Mohan Korgaonkar

The award is given both locally and nationally. The mission of the award is to recognize, inspire and activate volunteerism and public service in communities, workplaces and schools across America.

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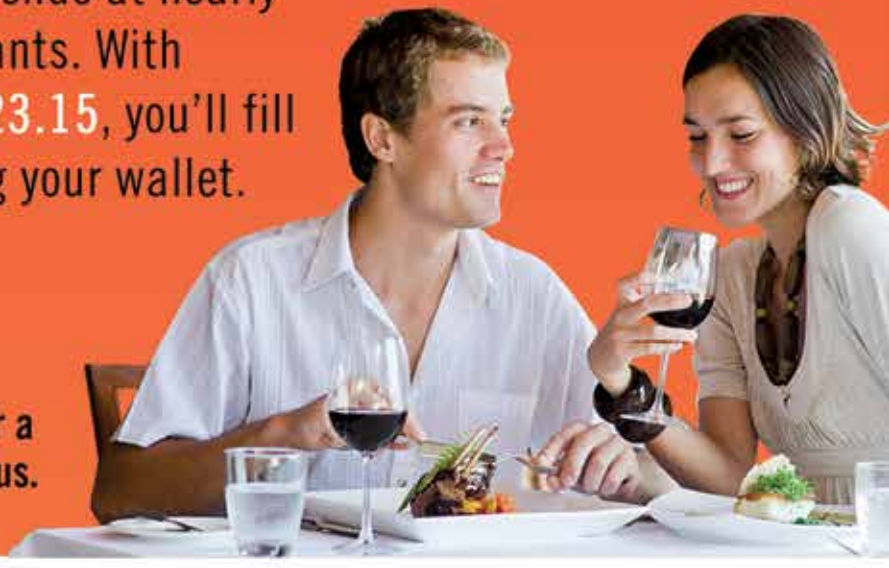

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