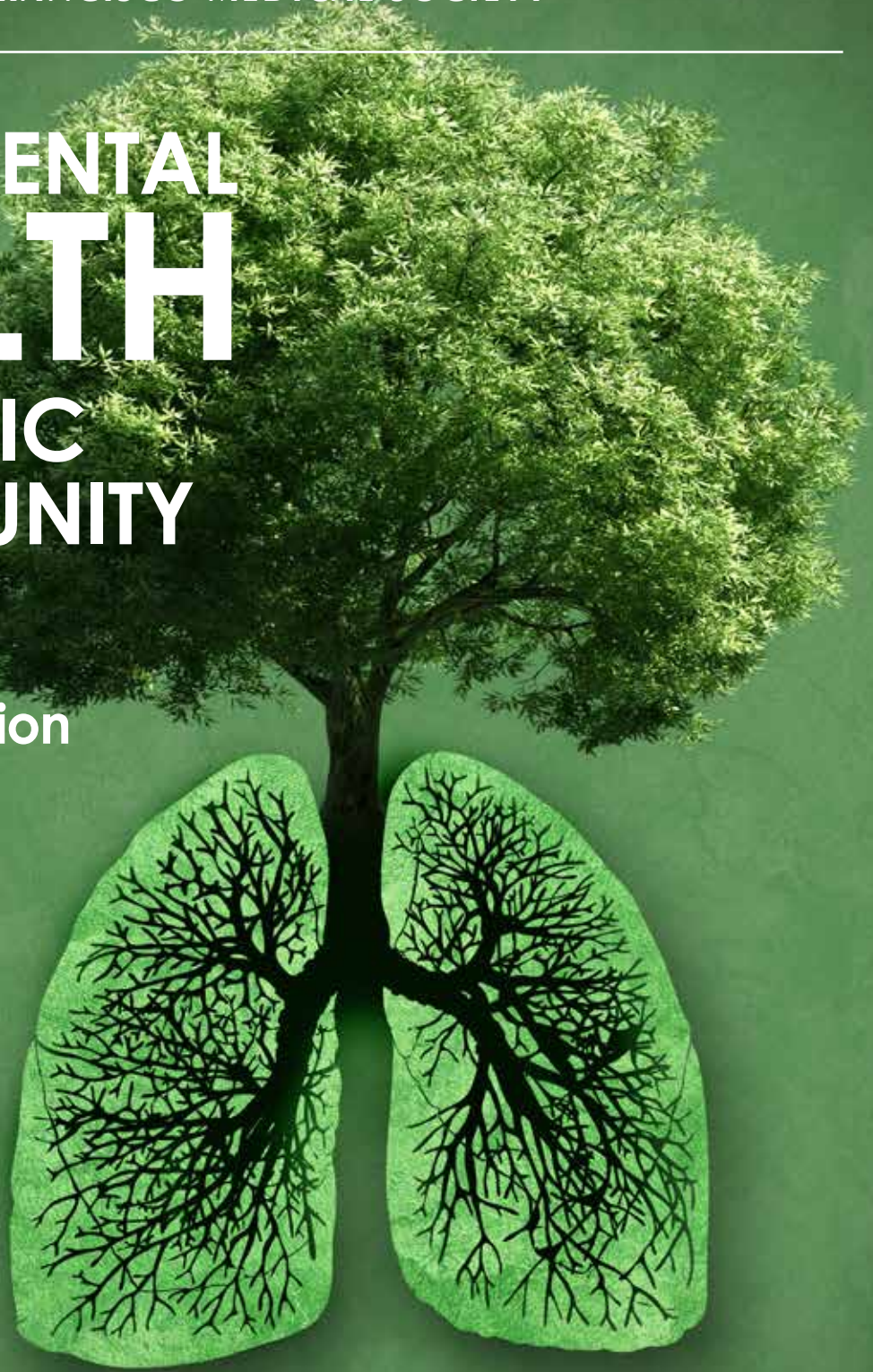
SAN FRANCISCO MEDICINE

JOURNAL OF THE SAN FRANCISCO MEDICAL SOCIETY

ENVIRONMENTAL HEALTH FROM CLINIC TO COMMUNITY



Environmental Health Literacy

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Climate Change and Physicians

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VOL.89 NO.10 December 2016

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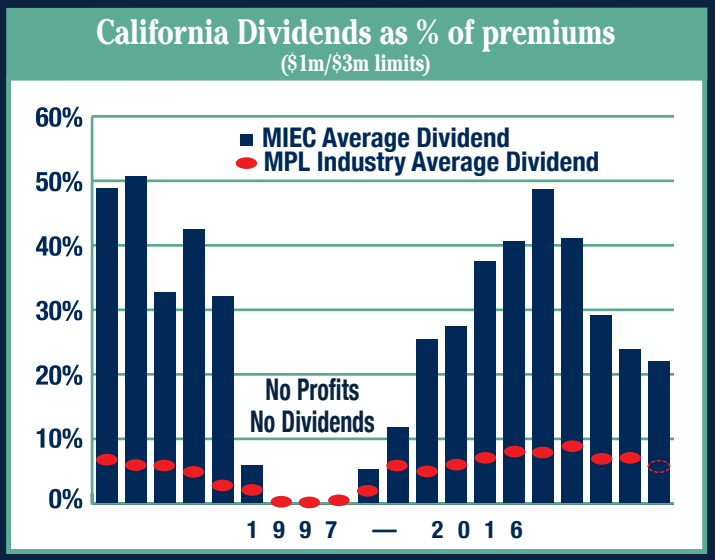

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MONTHLY COLUMNS

OF INTEREST

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MEMBERSHIP MATTERS

Activities and Actions of Interest to SFMS Members

Congratulations to Dr. Man-Kit Leung

Congratulations to the SFMS President-elect Man-Kit Leung, MD for being honored at the recent sixty-fourth Annual "Overseas Chinese Day" Celebration Awards Banquet! Dr. Leung, along with State Assemblyman Phil Ting and four others, were recognized by the Chinese Consolidated Benevolent Association and the Chinese Consolidated Women's Association for their achievements as outstanding individuals of Chinese descent. This is a very prestigious honor and we are so proud that Dr. Leung will be the SFMS President in 2017!

Final MACRA Rule Issued

The Centers for Medicare and Medicaid Services (CMS) issued the final rule on October 14, 2016, outlining the requirements of the new Quality Payment Program for physicians that was created by the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). The American Medical Association (AMA) has created a summary document including details on the various components of the final rule, and notes where key improvements were made to the policies set forth in the original proposed rule. There is also a chart with more abbreviated descriptions of the changes to the original proposed rule that were secured. To help physicians understand the MACRA payment reforms, and what they can do now to start preparing for the transition, the California Medical Association (CMA), AMA, and CMS have published several MACRA resources for physicians. We have provided links to these resources at http://www.sfms.org/for-physicians/macra-resources-for-physicians.aspx.

CMS Announces Additional Opportunities to Join Innovative Care Approaches under QPP

The Centers for Medicare and Medicaid Services (CMS) announced new opportunities for clinicians to join Advanced Alternative Payment Models (APMs) developed by the CMS Innovation Center to improve care and potentially earn an incentive payment under the Quality Payment Program (QPP) created through the MACRA. The QPP rewards clinicians with sufficient participation in Advanced APMs that align incentives for high-quality, patient-centered care. By giving more clinicians the opportunity to participate in these models, CMS will extend the benefits of high-quality, coordinated care to more Medicare beneficiaries. CMS expects to re-open applications for new practices and payers in the Comprehensive Primary Care Plus (CPC+) model and new participants in the Next Generation Accountable Care Organization (ACO) model for the 2018 performance year. In addition, the Innovation Center's Oncology Care Model with two-sided risk will now be available in 2017, which will qualify the model as an Advanced APM beginning in the 2017 performance year. For more information, visit: http://go.cms.gov/2eDRm5P.

Blue Shield Updates Fee Schedule for December 1

Blue Shield recently announced changes to its physician fee schedule that took effect December 1, 2016. The new rates are available on the Blue Shield website, www.blueshieldca.com/provider. Physicians can also request a copy of the new fees for up to twenty codes by completing the allowance review form enclosed with the notice, or by calling the Blue Shield Provider Information and Enrollment Department at (800) 258-3091. As always, physicians are encouraged to carefully review all proposed amendments to health plan or medical group/Independent Physician Association (IPA) contracts.

Last Day to Change your Medicare Participation Status for 2017 is December 31

Physicians have until December 31, 2016, to make changes to their Medicare participation status for 2017. Although MACRA penalties will not kick in until 2019, there are two more years of penalties that will be applied based on 2015 performance—tied to the meaningful use, Physician Quality Reporting System and Value-Based Modifier reporting programs. This will also decrease the limiting charge amounts that nonparticipating physicians can bill to patients for unassigned claims.

As always, physicians have three choices regarding Medicare: Be a participating provider; be a non-participating provider; or opt out of Medicare entirely. Physicians who want to change their participation status for 2017 must send a letter to Noridian, California's Medicare contractor, postmarked by December 31, 2016. The California Medical Association (CMA) has information on physicians' Medicare participation options in CMA On-Call document #7209, "Medicare Participation (and Nonparticipation) Options." On-Call documents are free to members in CMA's online resource library at www.cmanet.org/cma-on-call. Nonmembers can purchase On-Call documents for two dollars per page.

CMA Publishes FAQ and Hosts Webinar on "Surprise Billing"

In September 2016, Governor Jerry Brown signed into law a controversial bill (AB 72) that will change the billing practices of non-participating physicians providing non-emergent care at in-network facilities.

To help clarify the new law and to address physicians' concerns and questions, CMA published, "A Physician's Guide to AB 72: Questions and Answers." CMA also recently hosted a webinar

to provide an overview of the new law: "Assembly Bill 72: Out-of-Network Billing: How it Works, Who it Impacts and How to Avoid it." The FAQ and webinar are available in CMA's online resource library at www.cmanet.org/resource-library.

CMA's Practice Manager Tip of the Month

To protect patient privacy, develop a written policy on camera and smartphone use in the office. Although there is no law prohibiting a patient from taking photos or using mobile technology in a physician office, many practices implement office policies so that it is clear to staff and to patients what is allowed in the office and under what circumstances. For more information, see "Ask the Expert: Smartphones in the Office" available free to members at www.cmanet.org/ces.

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New members who join paying full 2017 dues before January will receive the remaining months of 2016 membership for free. Join today to start receiving your benefits. Visit www.sfms.org/membership for more information about SFMS membership and benefits, or to join online.

Renew Your Commitment to Medicine; Renew Your SFMS Membership Today

Make sure you continue to receive the benefits of SFMS and CMA membership by renewing today. Full dues-paying members enjoy a five percent Early Bird Discount* if your renewal is received by December 15, 2016. There are three easy ways to renew your dues:

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- Renew online at www.sfms.org with your credit card; or
- Enroll in Easy Pay Automatic Dues Renewal Plan** (quarterly installments) by contacting SFMS at (415) 561-0850 or membership@sfms.org.

**Five percent Early Bird Discount applies to 2016 full dues-paying members only who are renewing at the same level for 2017; renewal form and payment must be received by December 15, 2016.*

***Easy Pay Automatic Dues Renewal Plan (quarterly installments) is available to full dues-paying members only; renewing members receiving the Early Bird Discount are not eligible for Easy Pay.*

December 2016

Volume 89, Number 10

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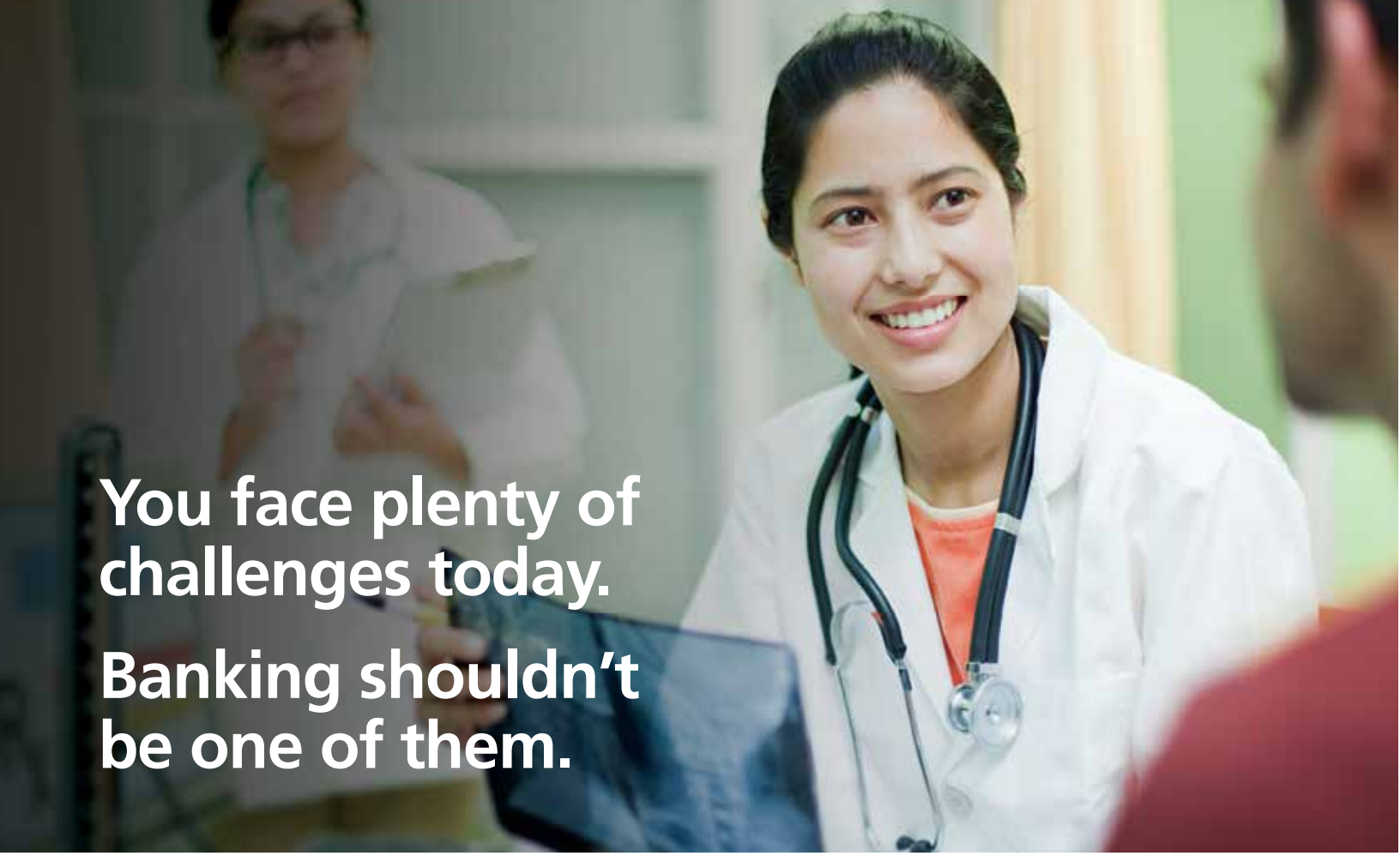

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PRESIDENT'S MESSAGE

Richard Podolin, MD

We Have to Do Something

The SFMS is a politically diverse organization, and rightly so. The values that guide the Society are not exclusive to any political party, they are the values of medicine itself: a belief that all lives have value; a commitment to doing our best for every patient; dedication to advancing public health and healthcare access; and a firm belief that scientific discovery must lead us forward.

These values were not just inculcated into each of us during our training, it was precisely these values that drew many of us to the profession in the first place.

Like many others, I recently watched as our country elected a president whose words and actions revealed values that seem distinctly opposed to those of the SFMS and our profession. I'm sure that there are members of our society who supported President-elect Trump and I'm equally certain that those members hold the values of our Society as close to their hearts as the many of us who were sorely disappointed. They believe that the racism and misogyny revealed during the campaign do not reflect the present character of the man who will lead our nation.

I fervently hope they are right. Perhaps there is some comfort to be taken in Mr. Trump's recent statements that there are aspects of the Affordable Care Act that he will retain, including the ban on denying insurance to people with pre-existing conditions and the provision allowing parents to cover their children to age twenty-six. He did not say what he would do about the over twenty-two million people who will lose health insurance if the Affordable Care Act is repealed. Nor did he articulate a plan for hospitals, which accepted lower payment from government programs in exchange for having to care for fewer uninsured patients.

Whatever changes occur at the federal level, the SFMS will continue to advocate for universal coverage, and we will have many partners in that fight. San Francisco pioneered universal coverage for all uninsured members of our community, regardless of immigration status. We cannot let that progress be lost.

This issue of *San Francisco Medicine* is focused on health and the environment. It could not come at a better time. The President-elect has repeatedly expressed disdain for environmental regulations, which he believes stifle economic expansion and job growth. He has pledged to eliminate those regulations. The utility of any regulation is inevitably a value judgment. How much environmental degradation is acceptable to preserve jobs and sustain affected communities? What limitations on unfettered economic growth are we willing to accept in exchange for protecting our health and our only home? While reasonable people may differ in their answers to these questions, we, as physicians, know that any judgment must be derived from examining, not disregarding, the facts. Mr. Trump's appointment of Myron Ebell to lead the transition at the Environmental Protection Agency is particularly alarming in this regard. Mr. Ebell, who is not a scientist but rather an economist who directs environmental and energy policy at the Competitive Enterprise Institute—a libertarian think tank funded, in part, by the coal industry—is a prominent global warming contrarian despite overwhelming scientific evidence opposed to this position.

Our community looks to the SFMS for its expertise and its commitment to public health. Now, more than ever, we need to arm ourselves with the best available knowledge, derived from scientific inquiry rather than from political ideology.

The evening after the election we convened the first meeting of our New Leadership Council. Listening to the passionate and articulate voices of the early career physicians and medical students who volunteered their time to help move our organization forward, it was clear that the values of our society are secure. A few days later I met Rebecca Gebhart, Interim Director of Alameda County Health Care Services. She described her son's reaction to the election. He's very much an outdoorsman, and was never politically active. He said: "Mom, I feel that I have to do something." He joined the Sierra Club and is planning various ways to get involved. Perhaps if each of us follows the example of that young man, if each of us commits to doing something, we may yet emerge from the next four years a stronger and better nation.

It has been a great honor to serve the San Francisco Medical Society in 2016 as your president. I am deeply grateful to you all for your support.

Dr. Podolin is a cardiologist at St. Mary's Medical Center where he has been chief of the medical staff. Connect with him via the SFMS LinkedIn Group or send him an email at podolin@sfms.org.

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EDITORIAL

Gordon Fung, MD, PhD, and Steve Heilig, MPH

Surviving Political PTSD

Having just endured the nastiest political campaign season of our lifetimes, at this point it is tempting to hide from anything remotely "political." But with many of our colleagues in medicine and public health now more concerned about the future than ever, we aim here to provide some silver linings from the recent election.

In California, at least, the roster of victories is remarkable. Some of the newly-passed laws cap years, even decades, of advocacy, including by SFMS locally and CMA statewide. Our state voters clearly are willing to invest in health and reject obviously self-interested financial lobbying. Consider these victories:

Tobacco Taxes: With two dollar per pack approved by 63 percent of the state's voters, this is the biggest increase in tobacco tax ever adopted, with proceeds to be used for health programs, prevention and research. Big Tobacco spent hugely, but was soundly defeated. This is so significant that leading anti-tobacco advocate Stan Glantz, PhD, of UCSF believes it could be the tipping point toward a truly tobacco-free future. The CMA and SFMS were leaders in giving this battle power and medical credibility.

Soda Taxes: Passed in San Francisco with 62 percent favoring, as well as in Oakland and Albany. The beverage industry not only spent massively to defeat it, but provided clearly deceptive "grocery tax" messages. Voters saw through it and the evidence indicates this will be a real win for the public's health. SFMS played a leading role. The SFMS was a primary advocate here, speaking to both the public and local officials.

Firearms and Ammunition Regulation: Passed with 63 percent favoring, a good step in more rational policy on guns. With a push primarily from Lt. Governor Gavin Newsom and supported by the SFMS.

Medi-Cal Matching Funds Hospital Fee Program: Over two-thirds supported this continued shoring up of the medical safety net. SFMS supported it, as this is as important in our city as anywhere.

Education and Healthcare Tax extension: Adopted by 62 percent of voters, SFMS supported, and again a move to preserve the medical safety net.

Marijuana Legalization, Regulation, and Taxation: Passed by 54 percent, supported by CMA and Lt. Gov. Newsom. SFMS had no position due to concerns regarding implementation, but is very much involved and has endorsed in concept some new "cleanup guidelines" to minimize the downsides of legalization.

The SFMS opposed a poorly-crafted proposal to mandate condoms in "adult" films, and was neutral on the effort to cap some pharmaceutical pricing—both seen as potentially good ideas but with poor proposals. The voters agreed on both. And as the old saying goes, often as California goes, so goes the nation. As the SFMS's John Maa, MD, told the *San Francisco Chronicle* the day after the election regarding the soda tax successes, "The movement has caught fire. It's no longer a David-versus-Goliath battle. It's Goliath versus Goliath."

We note that on most of these issues, the SFMS has long had forward-looking policy—which often became the policy of the CMA, and sometimes the AMA—due to our concerted advocacy work within medicine itself.

On the broader, national scene, much is now uncertain. The ACA, implemented strongly in California, may change dramatically, even if not "repealed" as threatened. Women's reproductive health and rights also suddenly appear even more vulnerable than before. Funding for research in many important areas could suffer as well. These are all areas the SFMS and CMA have been active in advocating for evidence-based, compassionate policy. That will continue, perhaps with even greater urgency than before. As SFMS member Sandra Hernandez, MD, CEO, of the California Health Care Foundation and our city's former health director, warns, "With so many Californians using this new coverage to gain health and financial security, we must not—we cannot—roll back the clock. Our friends, loved ones, and communities must not experience disruptions in access and care."

Regarding this issue's theme, SFMS has been a leader within medicine on environmental health issues since at least 2002, when we hosted a national conference establishing the Collaborative on Health and the Environment, chaired by Philip Lee, MD, Chancellor Emeritus of UCSF. CHE has thrived for fifteen years now, presenting current, evidence-based science and perspectives on a broad range of topics from leaders. And every two years for this theme issue we tap CHE for some of the field's leading authors—here they summarize current knowledge on topics like endocrine disruption, climate change and health, women's health, pesticides, food production, radiation, cancer, and more. Their expertise and commitment is impressive.

Finally, we still wish that every elected official would take a vow to "Do No Harm," and that every legislative proposal or regulation—and arguments thereof—would be vetted for scientific and practical validity. But that's for another time. So for now, despite some of the most "interesting" times of our lives, we trust all to carry on in the interests of health. And wish all our readers the best of holidays.

ENVIRONMENTAL HEALTH

An Emerging New Normal In Healthcare

Patrice Sutton MPH, Linda Giudice MD, PhD, Jeanne C Conry MD, PhD, Tracey Woodruff PhD, MPH

Recognizing the importance of the environment in advancing health, the past few years have ushered in a sea change in awareness and action among reproductive and other health professionals about exposure to toxic environmental chemicals. The scientific evidence linking myriad adverse health outcomes to ubiquitous exposure to industrial chemicals in our air, water, food, consumer products, and workplaces has skyrocketed. So too has health professionals' recognition that embedding environmental health in healthcare offers a powerful opportunity for keeping our families and communities healthy now and across generations.

In 2013, U.S. Obstetricians and Gynecologists (OBGYNs) called for "timely action to identify and reduce exposure to toxic environmental agents while addressing the consequences of such exposure."[1,2] In 2015, doctors around the world were mobilized on the issue by the publication of a policy statement by the leading global voice of reproductive health professionals, the International Federation of Gynecology and Obstetrics (FIGO).[3] FIGO's Opinion outlined four mutually reinforcing recommendations for action by OBGYNs, women's health nurse practitioners, nurses, and other health professionals, and each of these recommendations has in turn garnered significant traction. FIGO also established an action plan and Reproductive Development Environmental Health Work Group to ensure enduring uptake of its recommendations on a global scale.[4]

Together, these changes herald the emerging normalization of environmental health in healthcare delivery and practice. Below we highlight some of the key areas where health professionals are advancing the goal of a healthier environment as a pathway to prevention.

Health professionals around the world have become part of the global movement for preventing exposure to toxic chemicals. In the past year, FIGO has advocated on behalf of improved policy at the U.S. Food and Drug Administration to reduce exposure to phthalates in our food supply, and has joined leading scientists from across the European Union to address concerns about criteria for identification and regulation of endocrine disrupting chemicals.[5,6] An important area of work has been on public policy that governs how toxic chemicals enter the market place and, as a result, our bodies. Over the past several years, U.S. reproductive and other health professional societies have advocated for reforming the U.S. law responsible for regulating the tens of thousands of industrial chemicals in commerce. The law, the Toxic Substances Control Act (TSCA) of 1976, was weak and ineffective—a state of affairs succinctly characterized by Carl Cranor, a professor at the University of California, Riverside as allowing people to be "legally poisoned."[7] Health professionals told Congress that the law should be changed to protect the safety and health of their most vulnerable patients and the public from unsafe chemicals. In June, President Obama signed the Frank R. Lautenberg Chemical Safety for the 21st Century Act, which importantly requires the U.S. Environmental Protection Agency (EPA) to consider the impacts of industrial chemical exposure on vulnerable populations at greatest risk, such as pregnant women and workers.[8]

However, this positive change is unfortunately coupled to other principles and ideas proposed by the chemical industry, many of which directly conflict with approaches recommended by many medical, public health and environmental groups.[9] For example, the Lautenberg Act does not require that industry provide a minimum set of data that would help establish whether a substance poses a risk in the first place, so the most basic information needed to protect patients and populations in a timely way will still be largely missing. EPA is also not required to account for the fact that patients are exposed to the same chemicals from many different pathways, e.g., food, water, and air, and nor is it required to consider that they also incur simultaneous exposures to different chemicals which can lead to the same health impact. So the true health hazards of environmental chemicals may be underestimated by EPA decision-making. Moreover, the timeframe for undertaking evaluations of the thousands of existing chemicals is exceedingly slow. As such, patients and populations will continue to be "legally poisoned" well into the future. In light of these strengths and weaknesses, health professional engagement in EPA's decision-making process as it develops regulations and guidelines for the new version of TSCA will be critical to making sure the agency adopts the most health-protective strategy using the best available science.[10]

Health professionals have been working to ensure a healthy food system for all. The power that health professionals and their institutions can have over preventing chronic disease by working for a healthy and equitable food system is exemplified by over two decades of policy work developed by the California Medical Association. Early initiatives raising concerns about pesticide use and health impacts within agricultural areas and schools laid the basis for follow-on comprehensive healthy food policies, that were in turn supported at the national level by the American Medical Association.[11] Today there is strong momentum for leveraging the billions of dollars in purchasing power of healthcare institutions to create a healthy food system for all. For example, in California one in four hospitals participates in the Healthy Food In Health Care Program, and almost half of the fresh produce purchased for patients at Kaiser Permanente are sustainably produced and/or locally grown.[12,13] As a result of community and market-based interventions by the health care sector, healthier food is increasingly available to racially and socioeconomically diverse popula-

tions as well as healthcare workers.[14]

The success of various Health Care Without Harm-related practices over the past twenty years has already made an indelible impact on the environmental footprint of the healthcare sector. For example, these practices have advanced: safer alternatives to mercury in medical devices; sustainable health care waste management practices; the growing movement by hospitals and health systems toward low-carbon health care delivery and away from fossil-fuel based energy development; and, a worldwide health care movement for environmental sustainability called Global Green and Healthy Hospitals whose membership now includes organizations representing over twenty thousand hospitals in thirty-eight countries.[15]

Change is coming to the exam room where asking patients about their exposure to toxic chemicals should no longer be equated with "opening Pandora's box." Healthcare professionals can now feel more comfortable in opening up a conversation with their patients about their home and workplace exposures, as they can now draw on many science-based resources and patient-education tools and can consult with expert medical colleagues at trusted sources such as the University of California, San Francisco (UCSF), who can share evidence-based answers to patient questions or challenging clinical presentations. For example, clinicians in a network of Pediatric Environmental Health Specialty Units (PEHSUs) at UCSF and throughout North America are ready, willing, and able to respond to patient queries, as are experts at the National Institute for Occupational Safety and Health (NIOSH), who are available to consult on workplace exposures to toxic chemicals.[16,17] Through the use of apps, in particular SafetyNest, developed in partnership with medical institutions, reproductive health professionals can become even more adept and confident in the science at counseling their patients about chemicals in their work and home environments on a routine basis.[18] Environmental health is becoming embedded in medical research, training, and education. Efforts are now underway at the UCSF School of Medicine to infuse environmental health knowledge and practice into its research portfolio and new medical curriculum. Faculty have been engaged to integrate climate change and sustainability themes into existing courses, with the aim of normalizing environmental health and justice as benchmarks of core healthcare practice among the next generation of physicians. Networking events organized by UCSF's Environmental Health Initiative have already facilitated collaboration by pediatric and environmental health researchers on work exploring connections between autism and air pollution and led to the expansion of the scope of UCSF's premier Truth Tobacco Industry Documents Library to include chemical industry documents. [19,20]

Doctors are also sounding the alarm about climate change. A two-year statewide initiative by the California Medical Association (CMA) Foundation is focused on mobilizing health provider champions to increase public understanding about climate change and to build public support for climate change solutions.[21] Nationally, OBGYN leaders have defined climate change as an urgent women's health concern and have called for government action to curb greenhouse gas emissions.[22] The Canadian Medical Association has divested its fossil fuel holdings to send an urgent message to decision-makers as to the need to address climate change, and British doctors and other health professionals have called it "imperative" to phase out coal rapidly to improve health and reduce healthcare costs.[23,24]

In summary, health professionals now recognize that human health and environmental health are inextricably linked. Dr. Alex Schrobenhauser-Clonan, co-organizer of the EARTHEALTH1 conference on Earth Day at UCSF this year described "EARTHEALTH1" as "a declaration of interdependence: what is happening to our earth and earth systems mirrors what is happening to our health and our health systems."[25] Such understanding and actions continue to expand throughout our healthcare system, and are fostering the creation of a new generation of physicians for whom the health of their patients is inseparable from the health of the planet that sustains us all.

Patrice Sutton, MPH, is director of Research Translation at the UCSF Program on Reproductive Health and the Environment. Linda C. Giudice, MD, PhD, MSc, is the Robert B. Jaffe, MD, Endowed Professor in the Reproductive Sciences at UCSF and Co-Chair FIGO Work Group on Reproductive and Developmental Environmental Health. Jeanne C. Conry, MD, PhD, is assistant physician in chief for the Permanente Medical Group and co-chair of the FIGO Work Group on Reproductive and Developmental Environmental Health. Tracey J. Woodruff, PhD, MPH, is professor and director of the UCSF Program on Reproductive Health and the Environment.

Funding for this work was provided to the UCSF Program on Reproductive Health and the Environment by the Barbara and Donald Jonas Family Fund. A full list of references may be found at www.sfms.org.

OUR STOLEN FUTURE

Twenty Years Later

Pete Myers, PhD

Everything has a beginning. For me, the Big Bang occurred just after I had finished a lecture in the Washington DC area in 1988 and a tall, thin woman strode up to me from the back of the room, put both her hands on my shoulders, and said, "Pete . . . I'm Theo Colborn, and we have to talk." Within two years she became a Senior Fellow at the W. Alton Jones Foundation where I had just become Director, and six years after that, in 1996, along with Dianne Dumanoski we published *Our Stolen Future*.[1]

Our Stolen Future (OSF) was the first major public exploration of endocrine disruption—how chemicals interfere with hormone action—and now, twenty years later, it is still for sale, still used in classrooms, still read widely. More than a few people, often researchers or physicians, have come up to me and said, "I chose my career because of that book." A friend reported seeing a Congressional aide last year reading OSF on Washington DC's Metro.

Later in 1996, Congressman John Porter (R, IL) held budget hearings. At the time he was chair of the House Subcommittee on Health Appropriations. He invited me to attend, where I watched him hold up OSF and suggest to then-National Institutes of Health (NIH) director Harold Varmus that he should read it.

I doubt that Varmus did, but I do know that Porter repeatedly found ways to add resources to NIH and the Centers for Disease Control and Prevention (CDC) that strengthened their abilities to fund research on, and monitoring of, the health effects of chemicals in the environment, including endocrine disruptors. Since then, the governments of the U.S., Japan, the European Union and elsewhere have put literally hundreds of millions of dollars into answering research questions we raised in OSF, and much more. These investments have yielded a revolution in our understanding of Endocrine-Disrupting Compound (EDC) science.

Importantly, none of the core themes we explored in OSF have been scientifically rebuked. Instead, the research that has emerged has deepened and widened concerns. For example, while writing OSF we did not anticipate obesogens or metabolic disruptors and now it is well understood that chemicals can interfere with metabolism and body weight regulation.[2] We must acknowledge now that virtually any hormonal signaling is theoretically vulnerable to disruption, and that we still likely have barely scratched the surface because of the tens of thousands of chemicals now in commerce that are novel molecules in the human body. Because of the impact of EDCs on fertility and reproduction, it is quite possible that molecular evolution is currently underway.[3]

Like any other scientific revolution, endocrine disruption stands on the shoulders of giants, notably research on diethylstilbestrol's effects in the U.S. by Arthur Herbst, John McLachlan, Retha Newbold, Howard Bern and others.[4,5] McLachlan's insights led him to convene two prescient conferences (1979 and 1985) on 'estrogens in the environment' and then a highly influential series of annual meetings, e.hormone, at Tulane University beginning in 1999.[5] Another important early body of work came out of efforts to understand what Niels Skakkebæk and colleagues have termed 'testicular dysgenesis syndrome' (TDS).[6] TDS is characterized by testicular cancer, hypospadias, cryptorchidism and poor semen quality. Considerable evidence now exists linking these conditions to fetal exposure to EDCs.[6]

What might be called the 'modern' era of EDC research was launched at the 1991 Wingspread Conference, where Colborn gathered twenty-one scientists whose research provided extremely diverse insights into how chemical contaminants might interfere with hormone action, and what some of the consequences might be.[7]

My role at Wingspread was to guide the workshop toward a consensus statement patterned after the Intergovernmental Panel on Climate Change (IPCC)'s executive summary statement of 1990. That document's genius structure provided policy makers and journalists a sense of the broad agreement existing among scientific experts about the reality of climate change, but satisfied scientists because it also allowed disagreement and debate over details that remained uncertain. Fresh off a writing project about the complexities of climate disruption, I suggested at the workshop that 'endocrine disruption' captured the complexity of what we were discussing.[8] The term has since taken root.

The research funding noted above unleashed a torrent of scientific results that together have solidified a series of overarching conclusions:

- Exposure to EDCs can have biologically adverse effects at doses well beneath those typically considered in toxicological experiments;[9]
- Exposures during fetal life can set in motion consequences that play out over the lifetime of the individual, and which often are not clearly evident at birth;[10]
- Exposures to EDCs are ubiquitous, in part because of the pervasive distribution of persistent compounds like polychlorinated biphenyls (PCBs) and many pesticides that volatilize and are distributed by air currents; in part because these chemicals have been incorporated into consumer products used worldwide in homes and offices and hospitals, etc.; and in part because EDCs are key components of industrialized agriculture and thus are found abundantly in the human food supply ;[11]
- People are exposed to mixtures of EDCs continuously, never one chemical at a time;[12,13] and
- Risk assessment as practiced by public health agencies like the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency, and their counterparts around the world use tools that are incomplete, out-of-date and delegitimized by thoroughly falsified assumptions.[9]

The final point warrants elaboration. The tools used by regulatory agencies are incomplete for EDCs because *at best* they consider only chemical effects on the estrogen and androgen system. All other EDC mechanisms are ignored, including thyroid, which is evaluated solely by hormone levels in the blood. They are out-of-date because they use assays that date, in the most extreme case, back to the 1930s, and fail to incorporate our current understanding of the complexity of these systems using the plethora of assays that have been developed by NIH-funded scientists over the past three decades. They are delegitimized because at least two assumptions core to regulatory testing have been extensively falsified: (1) Standard protocols test the effects of high doses and assume those tests can be used to estimate the adverse effects of lower doses. Nonmonotonicity (U-shaped or inverted-U-shaped) is a common feature of EDC dose-response curves.[9] Doses well beneath those caused by high exposures can even cause exactly the opposite effect observed at high doses (see figure 1). (2) All tests are done one chemical at a time. The real world is very different. Even pesticides are tested one chemical—the 'active' ingredient—at a time, not the complex mixture that is the pesticide as it is sold. That is farcical: the mixture is designed to enhance the effectiveness of the active ingredient.[14] Finally, this testing also assumes that high-dose short-term exposures are generalizable to low-dose, life-long exposures despite empirical evidence in humans that this assumption is not true.

The research community responded strongly to the availability of research funding to study EDCs. In retrospect, it was very important that many of the researchers recruited to the issue were not trained in toxicology but instead were steeped in a wide range of other biological arenas, and they brought new tools and new thinking to bear upon the issue of EDC hazard. More than a few of the scientists new to EDCs literally stumbled into them because they discovered their animal or cell models were contaminated by seemingly inert plastics. Moreover, they were not hobbled by one of the limitations of many scientists (but by no means all) in toxicology, close financial association with an industry that seeks to protect its products and works to diminish concerns about chemical safety.

While researchers leapt in, the evidence had to build before it reached mass critical enough to attract the attention of practicing physicians. What might be considered a tipping point arrived in June 2005 with a symposium in San Diego organized by Andrea Gore for The Endocrine Society (TES), the world's largest professional association of endocrinologists. Roughly seventy percent of its membership is practicing physicians. Gore has since become an editor-in-chief of *Endocrinology*, the society's flagship journal.

TES has since become a major international player in promoting understanding of EDCs and encouraging development and adoption of public policies designed to reduce EDC exposures. They have published two major reviews on EDCs, a 'statement of principles' and formed a Global EDC Task Force, which has been particularly active in bringing EDC science to bear upon policy decisions currently underway in the European Union.[3,15]

In 2012, a report from the World Health Organization and the United Nations Environment Program concluded EDCs are a global public health threat, and that (1) disease risks due to EDCs may still be significantly underestimated and (2) that significant opportunities for disease prevention by reducing exposures may be within reach.

Other medical and scientific associations have also engaged, including: the American Public Health Association, the American Chemical Society, the American College of Obstetricians and Gynecologists, the American Society of Reproductive Medicine, and the Royal College of Obstetricians and Gynecologists.[3]

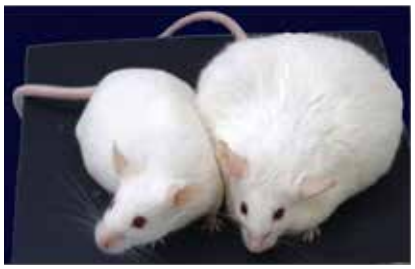
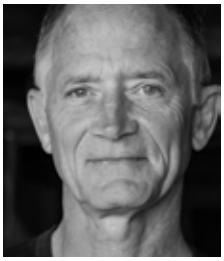


Figure 1. Neonatal exposure to 1 ppb/day body weight of diethylstilbestrol, an estrogenic EDC, for 5 days causes morbid obesity in adulthood (experimental animal on right; control on left). In contrast 1000 ppb causes weight loss compared to control (not shown).[20] Photograph courtesy of Retha Newbold.

In 2015 and 2016, a team of EDC specialists and economists estimated the annual economic costs of adverse effects resulting from EDC exposures were in excess of one hundred eighty billion dollars in the European Union, and in excess of three hundred forty billion dollars in the U.S. The team describes the results as very conservative because the data requirements requisite by procedures adopted from the U.S. Institute of Medicine and the World Health Organization could be met by only fewer than five percent of known EDCs.

In 2016, the National Institutes of Health honored, for the first time ever, twelve "Champions of Environmental Health Research." Four of those twelve have feet partly or completely planted in the field of EDCs (including me). While everything has a beginning, this saga does not yet have an end. The scientific basis for concern has grown massively since we wrote OSF. Public awareness is creating markets for companies that want to reduce EDC use in their products. Some chemists and companies have responded strongly, and even collaborated to produce an intellectual framework for how chemists could avoid EDC hazard in the synthesis of new molecules.[16] But there have been missteps in this process, with regrettable substitutions of poorly known replacements for bad actors like BPA: regrettable because some of the replacements being sold as "BPA-Free" are likely as bad or worse than BPA.[17]

Sadly, policy responses lag significantly. The recently passed Lautenberg Chemical Safety Act does little to advance regulations of EDCs, consigning the next several generations of America's children to more EDC exposures. More progress is evident in the European Union because of several laws that have been passed there over the past decade. However, their implementation is being fought bitterly by private interests 'manufacturing doubt' to forestall regulations.[18,19] Hopefully, the growing public awareness of EDC risks, engagement by scientific and medical societies and market opportunities for chemists to make money by avoiding these hazards will over time reduce the burden of EDC related diseases. It's all possible, as we continue to get traction with the science, and the public demands safer products.



Pete Myers is founder, CEO, and Chief Scientist of Environmental Health Sciences. He holds a doctorate in the biological sciences from UC Berkeley and a BA from Reed College. A full list of references is available at www.sfms.org.

CLIMATE CHANGE, HEALTH, EQUITY

A Physician's Guide

Linda Rudolph, MD, Catherine Harrison, RN, MPH

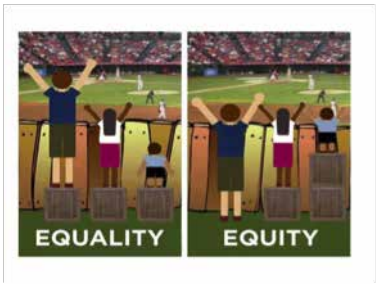
Climate change and health inequities are the greatest global public health challenges of the twenty-first century.[1,2] As trusted voices in clinics, communities and policy arenas, physicians play a critical role in addressing these challenges and protecting the public's health in the era of climate change. To facilitate this, the Public Health Institute's Center for Climate Change and Health has partnered with the California Medical Association Foundation Network of Ethnic Physician Organizations and the National Medical Association to train and support a statewide cohort of Climate Change and Health Champions. Physician champions receive training and hands-on support at multiple levels to address climate change and its various health impacts, which are already being experienced by their patients and communities. In particular, the program focuses on the disproportionate impacts that climate change has on low-income communities and communities of color, acting as a "threat multiplier" for existing health inequities.

As part of the project, the Center has developed "A Physician's Guide for Climate Change, Health and Equity," a resource for physicians and other health professionals to strengthen and inform their voices on climate change and health equity. The Guide is full of useful information about the complex and multifaceted connections between climate change and health, and disproportionate burdens on vulnerable populations. It also offers solutions for action at a variety of levels, from patient care to policy advocacy and community action.

The Guide covers a wide variety of topics, beginning with foundational pieces on Climate Change 101, Climate Change and Health Equity, a Physician Action Guide and Physician Surveys on Climate Change and Health. From there, it dives deeper into various climate change and health impacts, such as those from drought, wildfires, extreme heat, air quality and allergens, as well as issues related to food security, mental health and others.

Each of these sections is full of data and examples to help physicians understand the health effects of the particular climate change impact, and, importantly, the way in which climate change acts as a "threat multiplier" for existing health inequities. For example, low-income communities are more likely to live near busy roadways with high pollution exposure. Warmer temperatures from climate change combine with this pollution to worsen asthma and other respiratory conditions, which are already more prevalent among low-income communities.

Gratefully, each topic sheet also includes a myriad of actions solutions physicians can engage in with their patients, communities and policymakers. For example, there is information for advising patients about the effects of extreme heat on certain medications and how they can protect themselves during heat waves. In addition, there are resources to help physicians



advocate for more trees and parks in their communities, especially those that are park poor and at greater risk for the "urban heat island" effect. Bringing more trees and parks into these areas can protect against heat (and flooding), help clean the air and provide safe spaces for recreation and community-building. Solutions are designed to protect patient and community health, slow climate change and address historical and contemporary inequities that perpetuate health disparities.

There are also several special focus topics in the Guide that examine health impacts of climate change on children, pregnant women and workers as vulnerable populations. The next edition of the Guide (coming in 2017) will expand this section to look at impacts on specific racial and ethnic groups, global contexts and intergenerational equity considerations. It will also include patient education materials.

Lastly, the Guide provides an in-depth look at climate and health co-benefit strategies in four areas: transportation, energy, agriculture and urban greening. Together, action in these areas provides the majority of solutions that are good for climate and good for health. For example, reducing the forty percent of food that is wasted every year in the U.S. would improve food security for many hungry families and reduce greenhouse gas emissions from decaying food in landfills. Likewise, increasing biking and walking (and infrastructure to support it) reduces emissions from vehicles and improves health through physical activity.

While the Guide is an educational resource, its ultimate purpose is for action. Some examples of ways physicians can put it to use include:

- Taking steps to reduce their own carbon footprint, including making their homes and clinics energy-efficient, reducing vehicle use and using transit or active transportation.
- Advising patients on how climate change can affect their health and what they can do to prevent such impacts.
- Advocating for efforts to address and slow climate change in radio, television or newspaper outlets.
- Educating colleagues or their professional organizations about the health impacts of climate change and the disproportionate burden on low-income communities and communities of color.
- Testifying on climate change legislation or otherwise advocating for climate change solutions with elected officials.

For more information about the project or "A Physician's Guide to Climate Change, Health and Equity," you can email Catherine.harrison@phi.org or visit http://climatehealthconnect.org/our-work/projects/climate-change-physician-education.

Linda Rudolph, MD, is the Director of the Center for Climate Change and Health at the Public Health Institute. She has been a leader in the implementation of Health in All Policies, and in the integration of climate change into the work of public health agencies. Linda helps to host the U.S. Climate and Health Alliance, and was selected as a White House Champion of Change for her work on Climate Change and Public Health. She previously worked as the Deputy Director for Chronic Disease Prevention and Health Promotion at the California Department of Public Health, and the Health Officer/Director of Public Health for the city of Berkeley.

Catherine Harrison, RN, MPH, is a Program Manager for the Center for Climate and Health, leading efforts to increase the physician voice around climate change, its health impacts and co-benefit solutions for climate and health within community, media and policy arenas. In the past she served as the Public Health Nursing Supervisor at the University of Minnesota Boynton Health Service, the Executive Director of Rural Health Care Initiative in Tikonko, Sierra Leone, and an adult medical-surgical nurse in Denver, Colorado.

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GETTING INVOLVED

Many physicians believe, now more than ever, that advocacy matters. Here are some medical and public health oriented groups to consider - besides the SFMS and CMA, of course.

- **American Public Health Association -** The largest such professional association, focused on many issues: www.apha.org/become-a-member
- **Physicians for Social Responsibility -** Originally and still focused on nuclear issues, but with a much broader public health focus: www.psr.org
- **Physicians for Reproductive Health -** The leading medical "pro-choice" and more association: www.prch.org
- **Collaborative on Health and the Environment -** SFMS's partner in all things related to human health and the environment: www.healthandenvironment.org

Welcome New Members

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Floria Wei Chi, MD | *Family Medicine*
Sharad Jain, MD | *Internal Medicine*
Kathleen T Jordan, MD | *Infectious Disease*
Anna Clarice Loeb, MD | *Family Medicine*
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Tammy Duong, MD | *Psychiatry*
Malia Ann Kiyomi Honda, MD, MS | *Internal Medicine*
Amanda Katharine Johnson, MD, MBA | *Internal Medicine*
Elaine Ching-feng Khoong, MD | *Internal Medicine*
Erica Langnas, MD | *Anesthesiology*
Tyler E Mains, MD | *Internal Medicine*
Braden Kent Mogler, MD | *Internal Medicine*
Nadine Pardee, MD | *Internal Medicine*
Jane Park, MD | *Internal Medicine*
Jennifer Paz Pons, MD | *Internal Medicine*
Emily Herron Thomas, MD | *General Practice*
Jessica Wang, MD | *Internal Medicine*

INSEPERABLE FUTURES

Healthy Food and Sustainable Agriculture

Ted Schettler, MD, MPH

Reviews of the government's 2015 to 2020 Dietary Guidelines for Americans were mixed. Most nutritionists welcomed recommended limits on added sugars, sodium, and saturated fat combined with emphasis on healthy fats and overall eating patterns rich in fruits, vegetables, and whole grains. But notably missing from recommendations was the Dietary Guidelines Advisory Committee's advice to reduce consumption of red meat, particularly if processed, and sugary beverages. And any mention of the sustainability of food production, a major part of the committee analysis, was gone. Critics denounced the politics behind what was left out.

The advisory committee said that sustainability plays a critical role in meeting current and future nutrition needs. Promoting healthy dietary patterns that are produced more sustainably will conserve resources for present and future generations and help ensure long-term food security. But Big Agriculture would have none of it, lobbying successfully to reject sustainability in the final guidelines.

Big Ag's program of high-input, large-scale monocultures and factory farms that produce abundant cheap calories while putting workers and communities at risk, degrading soil, and fouling air and water with noxious pollutants and greenhouse gases is threatened by a sustainability goal.

But a diverse and growing food movement in the U.S. and abroad has different ideas. At its core it embraces the need to address the sustainability of food systems and equitable access to healthy food as essential to protect public and planetary health using approaches shaped by local circumstances.

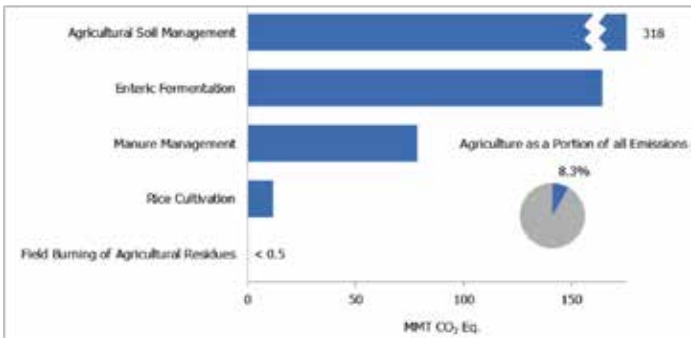
The dominant agricultural system in the U.S. relies on government support and public acceptance of externalized costs of pollution, loss of biodiversity, and ecosystem degradation. It is based on tenuous and often baseless assumptions of climate stability, reliable water sources, and cheap energy. Structural vulnerabilities of the entire enterprise are increasingly obvious.

In Iowa, the heart of corn production, the Des Moines Water Works has brought a lawsuit against three drainage districts to recover costs of removing agriculture-related nitrates from their drinking water. Schools and their advocates in California demand extended pesticide-spraying buffer zones to protect their children from drift. Ranchers in the West are selling off cattle earlier because of feed and water shortages. Weather patterns are changing. Wells are drying up. Conflicts over access to surface- and groundwater are growing. Food systems that do not adapt will be increasingly at risk from conditions that they helped create.

Climate Change and Agriculture

In the US, the EPA attributes about 8.5 percent of all greenhouse gas (GHG) emissions to agriculture (Figure 1), but this is an underestimate since the agency's GHG inventory assigns production of energy-intensive nitrogen-containing fertilizers to the industrial sector, carbon releases from agriculture-related land use change to a land-use change category, and carbon from on-farm energy use and food transport to the energy sector.

Figure 1: 2014 US Agriculture Greenhouse Gas Emission Sources (MMT CO2 Eq.)[1]



Agriculture contributes three GHGs—carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). Their turnover rates and global warming potentials (GWP) differ. For a one-hundred-year timeframe, equivalent masses of CH4 and N2O have an estimated twenty-three and three hundred times the GWP, respectively, as CO2.[2]

Animal agriculture in the U.S. accounts for about half of EPA's inventory of agriculture-related GHG emissions, although globally livestock are responsible for about fourteen percent of all GHG emissions.[3] Much of that excess comes from the release of enormous amounts of carbon stored in forests and grassland soils converted to corn and soybean production for animal feed to satisfy the rapidly growing appetite for meat, particularly in developing countries.

Enteric fermentation of feed in cattle and sheep is the largest source of agriculture-related CH4 in the U.S., representing nearly twenty-five percent of total emissions from anthropogenic activities. About eighty percent of all N2O emissions come from fertilized soil, nitrogen runoff, and manure.[4] Manure management accounts for about fourteen percent of the total GHG emissions from agriculture.

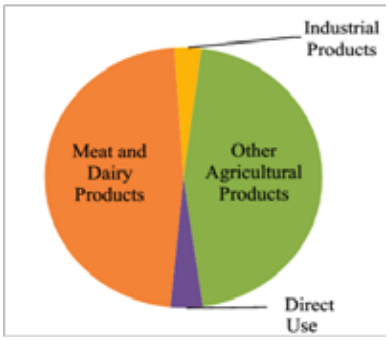
Tens of millions of acres of corn production largely in the upper Midwest, more than thirty-five percent of which is processed for animal feed, is heavily dependent on use of energy-intensive nitrogen-containing fertilizer. Nitrogen leaching is not only a source of N2O but also unsafe spikes of excessive nitrates in drinking water sources. Elevated levels of nitrate in drinking water can increase the risk of birth defects and thyroid cancer in communities downstream and contribute to eutrophication of freshwater and marine aquatic systems.[5,6,7]

Analyses of the carbon footprint of various protein sources find that beef production is responsible for far higher emissions of GHGs than others. Expressed as CO2 equivalents/kg protein, beef is responsible for 50-600 kg CO2e/kg protein, varying with feeding and production practices, pork for 20-55, poultry for 10-30, and pulses—e.g. lentils, chickpeas, dry beans—for 4-10.[8]

Water in Agriculture

Livestock alone accounts for more than eight percent of total global water use, most of which goes to irrigate feed crops.[9] Irrigation withdrawals increasingly exceed supply rates, for example, in the Ogallala aquifer underlying the Great Plains.[10] In California, long embroiled in conflicts over competing water uses, more than ninety-percent of the state's "water footprint" is associated with agriculture (Figure 2). Meat and dairy products have especially large water footprints due to the amount of water-intensive feed required to raise the animals. A study of virtual water content of various food products using intensive systems in CA finds that beef requires 100,000 L/kg protein compared to 47,619 for pork, 30,303 for poultry, and 13,158 for beans.[11]

Figure 2. California's Water Footprint by Sector[12]



Healthy Food, Sustainable Agriculture

Achieving food system sustainability is critical in order to meet current and future nutrition needs. Soil and ecosystem degradation, chemical contamination, unsustainable water use, and climate change are driving development of new models of food production. Among current efforts: organic farming, rebuilding soil carbon through reduced tillage, more extensive use of cover crops, restoring grasslands and biodiversity, improved grazing management, and combining crops, trees, and animal husbandry in integrated systems.[13,14,15] The good news is that truly healthy diets can be produced with sharply reduced environmental and public health impacts.

Local, regional and institutional efforts are gaining traction around the country. In the health care sector, the Healthy Food in Health Care program of Health Care Without Harm is deeply engaged in this transformation.[16] Health care systems, professionals and communities have forged partnerships with food producers, processors, and distributors in order to align purchasing with sustainable agricultural practices.[17] Early projects that focused on rejecting the routine use of antibiotics in meat production are expanding to include a less meat-better meat approach and increasing plant-based protein alternatives. Hospitals around the country are hosting farmer's markets and community supported agriculture distributions featuring healthy local and regional food produced more sustainably. In higher education, Real Food Challenge recently developed a set of sustainable food standards for evaluating the ecologic, sociologic, and economic impact of food products to inform purchasing decisions in universities.[18]

Perhaps the next iteration of Dietary Guidelines for Americans will reflect the obvious need for sustainable food production over the long-term. If not, it will become irrelevant, as drivers of new agricultural models are not waiting for the government to catch up. The world is warming, oceans are acidifying, rainfall and weather patterns are changing, soil is degraded, and water supplies are dwindling. We can respond now to help mitigate these changes and their impacts or force current and future generations to adapt to an uncertain future in which food security becomes more and more tenuous for large and growing numbers of people around the world.

Ted Schettler, MD, MPH, is Science Director of the Science and Environmental Health Network. He also serves as Science Director of the Collaborative on Health and Environment and has been engaged in the work of Health Care Without Harm for many years. A full list of references is available online at www.sfms.org.

AIR POLLUTION AND CHILDREN

UNICEF is calling on world leaders to reduce air pollution, saying it leads to the deaths of more children yearly than malaria and HIV/AIDS combined. Around 600,000 children under age 5 die every year from diseases caused by or exacerbated by outdoor and indoor air pollution, especially in poor nations. UNICEF is asking world leaders to take four steps:

- Reduce pollution by cutting back on fossil fuel combustion and investing in energy efficiency.
- Increase children's access to health care, including more immunization programs and information programs about pneumonia, a leading killer of children under 5.
- Minimize children's exposure to air pollution by keeping schools away from factories and other pollution sources and using cleaner cookstoves in homes.
- Improve monitoring of air pollution.

The "Clear the Air for Children" report can be found at - http://weshare.unicef.org/Package/2AMZIFKPWU1

PESTICIDES AND HUMAN HEALTH

The Missing Toxicants

Robin Mesnage, PhD, and Michael N. Antoniou, PhD

There are 'invisible' toxicants in the commercial formulations of pesticides, which could be a major public health threat because they are not fully disclosed or regulated. This is the conclusion of multiple studies investigating the effects of pesticide ingredients as sold and used commercially. We reveal that the presence of these compounds in glyphosate-based herbicides could contribute to toxic effects at low concentrations relevant to human real-world exposures.

The U.S. Center for Disease Control and Prevention's fourth national report on human exposure to environmental chemicals reveals that human tissues are impregnated with pesticide residues.[1] Some pesticides may cause cancer and affect the nervous system, or even interfere with endocrine functions, resulting in metabolic and reproductive defects.[2] Regulatory studies have often been unsuccessful at predicting the toxic effects of these pesticides based on the multiple tests conducted prior to commercial approval.[3] A number of pesticides were initially approved but were later banned because certain unexpected toxic effects were found to occur in human populations following major accidents or contamination events, or after decades of exposure highlighted by epidemiological studies. Unregulated toxicants present in commercial formulations of pesticides could provide a missing link between observed negative health outcomes and pesticide exposure, even at low doses.

Commercial formulations of pesticides are invariably not single ingredients. Instead they are cocktails of chemicals, composed of an active principle accompanied by "other ingredients." Sometimes also called "inerts," these additional ingredients are specifically added to influence the absorption and stability of the active principle, and thus promote its pesticidal action. The identity of these "inert" additional ingredients, also collectively referred to as "adjuvants," are frequently undisclosed as they are considered to be confidential commercial information. As they are proffered as "inert," they are ignored by regulatory agencies in the determination of acceptable levels of daily intake, a threshold of value of exposure to a pesticide below which it is deemed unlikely that the dose received will result in any negative health effects. Tests conducted for regulatory purposes are thus performed with the industry-stated active principle alone. Commercial formulations of pesticides as used in both agricultural and urban/domestic environments are never tested for their chronic effects on mammals. Nonetheless, exposure to environmental levels of some of these adjuvant mixtures has been associated with human disease. For example, in epidemiological studies of farming populations, people exposed to supposedly inert ingredients such as solvents or petroleum distillates present a higher risk of developing hypospadias and present more allergic and non-allergic wheeze.[4,5] Effects in the general population are not characterized because these substances are not monitored in human biological fluids.

We have extensively studied the composition and the toxicity of the different ingredients that constitute glyphosate-based herbicides (GBHs), which are the most heavily applied pesticides in the world, with usage rising. A comparison of the toxicity of different brands of GBHs in tissue culture cell assays showed that several commercial formulations were up to one thousand times more toxic than glyphosate, the regulated active ingredient.[6] Our results also revealed that one component of the adjuvant mixture in some GBHs, a surfactant called polyoxyethylene tallow amine (POEA), classified as an inert ingredient, was ten thousand times more cytotoxic than glyphosate itself when applied to human tissue culture cells.[6] This and other work led the European Commission to recommend a ban on the use of POEA in GBH products. More recently, we showed that the chronic administration of a GBH induced liver toxic effects in rats at an environmental concentration and daily intake of active ingredient declared safe.[7] However, further research is required to elucidate whether the glyphosate, the adjuvants, or the combination of the two is at the basis of the observed liver and kidney toxicity seen in these animals. In addition, the finding that POEA is widely found in fields in the U.S. where GBH are applied raises concerns that this and other classes of pesticide adjuvants may be entering the food and feed chain undetected, with as yet unknown health consequences.[8]

In conclusion, evidence suggests that the so-called inert ingredients constitute the "dark matter" of pesticide toxicology. As the dark matter in the universe is responsible for most of its structure and bearing, the "other ingredients" are an all-pervasive toxic fraction of a pesticide. While invisible, under certain circumstances they can account for most of the toxic potency of a commercial formulation. The study of the effects of chemical mixtures on health indicators is frequently aired as a priority for the toxicology of twenty-first century. However, within this framework, ignoring the toxicity of the combination of each active ingredient with its adjuvants could lead to misrepresentations of the safety profile that may be revealed by investigating combinations of active ingredients alone.

Dr Michael Antoniou is Head of the Gene Expression and Therapy Group in the Faculty of Life Sciences and Medicine and Department of Medical and Molecular Genetics, King's College, London. Dr. Robin Mesnage leads the molecular toxicology programme in the Department of Medical and Molecular Genetics, King's College London. A full list of references is available at www.sfms.org.

PREVENTION IS THE ONLY OPTION

Are We Finally Sick of Nuclear Weapons?

Robert M. Gould, MD

Paramount among the issues of trust raised in our Presidential election were concerns focusing on the character of the person who would have their finger on the nuclear button. In his recent article "Preventing Sudden Unexpected Death on a Massive Scale" Dr. George Lundberg, Editor-at-Large of *Medscape Medical News,* writes, "To the greatest extent possible, physicians should endeavor to assure that the leaders who could authorize the first strike be mature, sane, cool under pressure, loving humanity and their lives and families, capable of exercising self-control, crisis-tested, and who fully comprehend the enduring consequences."[1]

At the same time, our risks of annihilation are tied more fundamentally to the historic systems of nuclear war fighting and targeting that are beyond the design and capability of any individual. This is underscored by hundreds of examples showing how close the world has come to accidental and catastrophic detonations of nuclear weapons, as amply documented in Eric Schlosser's 2014 "Command and Control," recently released as a gripping and ominous movie for our times.

In clear violation of their Nuclear Non-Proliferation Treaty (NPT) obligations, the U.S., Russia, and all other nuclear weapons states (NWS) at the United Nations (UN) Review Conference in 2015 once again refused to move towards the elimination of nuclear weapons. Our own government instead has made a commitment towards modernizing our nuclear arsenal at an estimated cost of one trillion dollars over the next thirty years (four million dollars an hour),[2] a decision spurring other dangerous weapons programs throughout the world.

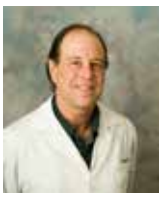
The twin U.S. policy of promoting global export of nuclear power also fosters weapons proliferation. An egregious example has been the U.S.–India nuclear deal, which allows India, a non-signatory to the NPT, to receive advanced nuclear technologies and redirect its budget towards weapons development. Pakistan has responded by increasing its production of weapons-grade fissile materials and warheads, raising the stakes of regional conflict exemplified by the recent exacerbation of hostilities in Kashmir.

Even a nuclear exchange of approximately one hundred "small" Hiroshima-sized weapons would likely cause twenty million regional deaths due to the predictable consequences of heat, blast and radiation. Moreover, recent studies indicate that the nuclear-incineration of numerous cities in South Asia in such a scenario would have dread global consequences. With sunlight blocked by the massive amount of soot and other debris caused by the infernos, it is estimated that over a decade there would be a massive crash in global production of crops such as maize, rice, and wheat that could result in the worldwide deaths of a range of one to two billion people.[3,4]

Such updated information regarding the "Humanitarian Impacts of Nuclear Weapons" has revitalized a global movement exemplified by the International Campaign to Abolish Nuclear Weapons (ICAN), supported by Physicians for Social Responsibility and its global affiliates in the 1985 Nobel-Prize winning International Physicians for the Prevention of Nuclear War (IPPNW). With the NWS blocking any move towards the elimination of nuclear weapons within the NPT process, this movement has pressed the development of a treaty to ban nuclear weapons modeled on the successful (Land) Mine Ban Treaty adopted in 1997.

This campaign has drawn the increasing support of numerous world and religious leaders, Nobel Prize laureates, and the vast majority of the world's nations. Numerous global health organizations such as the International Red Cross and the International Red Crescent have joined the call to abolish nuclear weapons, and in June 2015 the American Medical Association adopted a resolution urging "the U.S. and all national governments to continue to work to ban and eliminate nuclear weapons."[5] Early in 2016, the World Federation of Public Health Associations, the World Medical Association, and the International Council of Nurses, representing over seventeen million global health professionals worldwide, joined IPPNW in a statement declaring, "The only way to prevent the use of nuclear weapons is to ban and eliminate them."[6]

Such a ban was recently endorsed at the UN by 123 nations, that, resisting great pressure by the U.S. government and opposition of most of the NWS, voted to begin negotiations in 2017 on a new treaty to prohibit the possession of nuclear weapons. At a time of daily reminders of the increasing dangers of nuclear conflict posed by U.S.-Russian flashpoints ranging from Ukraine to Syria, this vote by the majority of the world's nations is a wake-up call to stem our collective slide towards species suicide, and echoes Dr. Lundberg's concluding advice for our times: "There is no adequate medical response to nuclear war. Prevention is the only option."



Robert M. Gould, MD, is an Associate Adjunct Professor in the Program on Reproductive Health and the Environment at University of California, San Francisco School of Medicine. He is immediate Past-President of National Physicians for Social Responsibility (PSR), and President of SF-Bay Area PSR.

A full list of references is available at www.sfms.org.

A STORY OF HEALTH

Filling a Gap in Environmental Health Literacy for Health Professionals

Mark D. Miller, MD, Maria Valenti, Ted Schettler, MD, MPH, and Brian Tencza, MEd

Narrative approaches and storytelling are emerging as powerful health promotion tools that can spark interest, increase understanding of determinants of health, and translate complex science. *A Story of Health*, a multimedia e-book with continuing education (CE) credits, was designed to harness the power of storytelling to increase environmental health literacy. Health professionals are a key audience. They recognize that patients may be suffering from preventable illnesses of environmental origin but often feel ill-equipped to educate individuals and families about risks associated with common exposures. *A Story of Health* seeks to fill this gap and help readers develop the competencies they need in order to help patients make informed choices, reduce health risks, improve quality of life, and protect the environment. Americans rate nurses and medical doctors as having the highest honesty and ethical standards of all professions. These medical professionals can play a key role in changing patterns of patient behavior and influencing public policies. The e-book provides an easily accessible method of developing environmental health competency. The multimedia format with graphical interpretations allows for quick reviews of topics or for more in-depth analysis via links to additional resources. The CE evaluations have been overwhelmingly positive.

Introduction

Narrative approaches and storytelling are emerging as powerful health promotion tools that can increase understanding of determinants of health and translate complex science.[1] Case-based learning has long been used in medical education. A Story of Health multimedia e-book with continuing education (CE) credits was designed to harness the power of storytelling to increase the environmental health literacy of health professionals, policy makers, and health advocates; encourage inclusion of anticipatory guidance in professional practice, and stimulate policy changes.

A Story of Health capitalizes on the narrative approach to teaching by using fictional stories to convey how multiple environmental factors interact with genetics to affect health across the life span. The first installment of the 150-page peer-reviewed e-book, which includes chapters on asthma (Brett's story), developmental disabilities (Amelia's story), and childhood leukemia (Stephen's story), was released in 2015 and is available online without cost (http://wspehsu.ucsf.edu/for-clinical-professionals/training/a-story-of-health-a-multi-media-ebook/). Free CE credits are offered through the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR). About two-thirds of the downloads are accompanied by CE registration suggesting that CE credits are an incentive for health professionals to read A Story of Health.

The stories explore influences of the natural, built, chemical,

food, economic, and social environments on health across the life span—from conception to elder years. The individual stories reveal how these environments are further expressed through education, family structures, housing, nutrition, access to health care, social supports or stressors, and more. Collectively, these multi-level variables interact to create conditions conducive to health and wellness—or vulnerability and disease. Health promoting interventions from the individual level to the policy level are highlighted to encourage action.

Improving Environmental Health Literacy through an Ecological Approach

A Story of Health's ecological approach is central to the concept of environmental health literacy, a relatively new subdiscipline that "combines key principles and procedural elements from the fields of risk communication, health literacy, environmental health sciences (EHS), communications' research and safety culture."[2] According to the Society for Public Health Education (SOPHE), the measure of environmental literacy is the capacity to understand how "people and societies relate to each other and to natural systems," as well as the ability to "read, understand and act on information regarding the environment."[3] Health literacy means the ability to "understand, evaluate, and act on oral, written, and visual health information in order to mitigate risk and live healthier lives."[3] A Story of Health integrates these two concepts to help readers develop environmental health literacy. Finn and O'Fallon conclude that environmental health literacy can potentially lead to "greater understanding of specific risks, the reduction of exposures, and the improvement of health outcomes for individuals and communities."[2]

Filling a Gap in Health Professionals' Environmental Health Literacy

Health professionals are a key audience for A Story of Health be-

cause they are highly regarded. For example, Americans rate nurses and medical doctors as having the highest honesty and ethical standards of all professions.[4] They can play a key role in changing patterns of patient behavior as well as influencing public policies.[5,6] However, research shows that many health professionals feel ill-equipped to meet the needs of patients regarding environmental health anticipatory guidance or to inform public policy. In a 2011 review, Gehle et. al pointed out that environmental medicine is "largely omitted in the continuum of U.S. medical education," which has been demonstrated in a variety of surveys of medical practitioners.[7]

According to the American Academy of Pediatrics (AAP), "Parents of young children are intensely interested in the impact of the environment on their children's health. They may look to their pediatrician for guidance about how to evaluate news reports about potential hazards in the air, water, and food."[8] Pediatricians, however, report low self-efficacy in taking an environmental history and being able to follow-up on environmental concerns related to their patients' health. In surveys conducted in New York, Wisconsin, Minnesota, and Michigan, more than one thousand pediatricians agreed that children are suffering preventable illnesses of environmental origin, but they feel ill-equipped to educate families about common exposures.[9,10,11] The authors concluded that "gaps persist in practitioner knowledge about environmental health nationwide and across disciplines," and "significant demand exists for specialized centers of excellence that can evaluate environmental health concerns and for educational opportunities." [9,11,12] These conclusions were mirrored in a similar survey of 695 pediatricians, childcare specialists, and nurses conducted in northwest China, with respondents indicating they "have strong beliefs regarding the role of the environment in children's health, and frequently identify affected children."[13] However, "few are trained in environmental history taking or rate self-efficacy highly in managing common hazards."[13]

A 2015 survey of more than two hundred pediatric oncologists, fellows, and nurse practitioners also underscored the need for increased training about environmental health exposures related to cancer.[14] Although eighty-eight percent of respondents reported receiving questions from families about environmental exposures and cancers, "a lack of comfort with these topics seems to have limited their discussions with families about the role of environmental exposures in childhood cancer."[14] In addition, more than ninety percent felt that more knowledge about associations between environmental exposures and childhood cancer would be helpful in addressing these issues with their patients.[14]

A recent national online survey of more than twenty-five hundred fellows of the American Congress of Obstetricians and Gynecologists (ACOG) also revealed that routine guidance to patients on the health effects of environmental exposures was not a high priority.[15] Although more than three-quarters of the fellows agreed that they could reduce patient exposures to environmental health hazards by counseling patients, half reported that they rarely take an environmental health history, and fewer than twenty percent reported routinely asking about common environmental exposures, including several known developmental toxicants with widespread exposures.[15]

Acquiring the knowledge and skills to counsel patients and families about the risks associated with exposure to environmental toxicants may be challenging for health care providers because of busy schedules, required continuing medical education in their specialties, and the relative scarcity of professional training about environmental health. A Story of Health provides an alternative method of developing environmental health competency for health care providers, as it can be easily accessed online and reviewed at the time and pace of one's choosing. The multimedia format with graphical interpretations allows for quick reviews of topics, or more in-depth analysis via links and references to additional resources. Web-based medical education matches the efficacy of more traditional forms of delivery, such as face-to-face conferences and lectures, without the time and financial costs associated with the latter.[16,17] A Story of Health CE course compares very favorably to other environmental health courses offered by ATSDR/CDC, such as Principles of Pediatric Environmental Health, Asbestos, and Polychlorinated Biphenyls (PCBs) Toxicity. During a one-year period, A Story of Health CE course received more than double the registrations of one of the most popular ATSDR/CDC courses.

Topics and Themes

Although the fictional narratives in A Story of Health describe the lives of people with different diseases, several common themes resonate throughout the e-book:

- Important environmental influences come from the natural, chemical, food, built, and social environments.
- Although there are exceptions, most diseases, as well as good health, are the result of complex interactions between genes and multiple environmental influences.
- Early-life experiences, particularly during critical windows of development, can have profound beneficial or detrimental lifelong effects, even into elder years.
- Preventing disease and promoting health require actions and commitments from the individual, family, community, and society, as they are all interconnected.

A Story of Health team is currently developing the fourth story for the e-book on infertility and reproductive health—Reiko and Toshio's Story—that echo these common themes.

Framework and Content Development

A Story of Health is designed to convey complex concepts about multi-level influences on health through a family reunion scenario (image below). A nested ecological framework sets the stage for stories to emerge about family members who are experiencing a range of diseases and disorders. As the narratives unfold, the constellation of genetic and environmental circumstances that might contribute

Continued on the following page . . .

to disease are described based on current scientific understanding.

A Story of Health is designed to convey complex concepts about multi-level influences on health through a family reunion scenario. It sets the stage for stories to emerge about family members and friends who are experiencing a range of diseases and disorders. As the narratives unfold, the constellation of genetic and environmental circumstances that might contribute to disease are described based on current scientific understanding.

The fictional cases are communicated in text, illustrations, graphic images, videos, and links to additional resources and journal references. The stories include the following key concepts:

- Early origins of childhood and adult disease
- Epigenetics
- Mechanisms of action
- Allostatic load
- Windows of susceptibility and opportunity
- Effect modifiers
- Environmental justice and health disparities

The stories weave in relevant information about disease trends and demographics. They also include potential interventions, policy recommendations, and helpful tools, such as environmental exposure checklists, for practical application in the real world. The e-book draws content from the research of the top scientists in their fields and brings the collective expertise of the Pediatric Environmental Health Specialty Units network and the National Institute of Environmental Health Sciences Children's Environmental Health Centers into the e-book in a variety of ways.

Promotion

Promoting the availability of the e-book online via web sites, listservs, newsletters, YouTube presentations, and social media has been essential for reaching key audiences. A Story of Health was developed through a cooperative effort of the ATSDR, the Collaborative on Health and the Environment, the California Environmental Protection Agency Office of Environmental Health Hazard Assessment, the Science and Environmental Health Network, and the Western States Pediatric Environmental Health Specialty Unit. Leveraging the resources and networks of all the partners has also been an important outreach strategy.

Continuing Education Course Evaluations

Currently, more than thirty-three hundred health professionals, including physicians, nurses, and health educators, have registered for the online course. Evaluations have been overwhelmingly affirming. In an analysis of responses from users in the second quarter of 2015, more than ninety-five percent indicated that A Story of Health filled a gap in their skills or knowledge, and more than eighty-nine percent reported they plan to apply the new knowledge to develop strategies and interventions in their practices (Table 1).

Next Steps

With additional funding, and with new CE evaluation tools being developed by the CDC, the authors hope to conduct follow-up surveys of those who have taken the CE course to further evaluate the impact of the e-book.

Table 1 — Strongly Agree+ Agree= Total in %

Evaluation Feedback Questions	Brett N=225	Amelia N=45	Stephen N=34
1. The content and learning materials addressed a need or a gap in my knowledge or skills.	96	95	100
2. The difficulty level was appropriate.	97	98	97
3. The content expert(s) demonstrated expertise in the subject matter.	97	98	94
4. The delivery method used (e-learning, etc.) was appropriate for the subject matter and helped me learn the content.	93	98	91
5. The instructional strategies (lecture, case scenarios, figures, tables, media, etc.) helped me learn the content.	95	98	94
6. Did you experience technical difficulties with this activity?	No 90	No 93	No 88
7. This activity effectively met my educational needs.	96	93	95
8. I will be able to apply the knowledge gained from this activity to increase or maintain my competence.	93	93	97
9. I will be able to apply the knowledge gained from this activity to my practice.	91	84	89
10. I will be able to apply the knowledge/skills gained from this activity to develop strategies/provide interventions.	89	91	89
11. I will be able to apply the knowledge gained from this activity to improve performance.	88	89	86
12. Do you anticipate barriers applying this knowledge?	No 93	No 93	No 91

Table 1 – Continuing education feedback (April through June 2015) for three stories in A Story of Health: Brett's story (asthma), Amelia's story (development disabilities), and Stephen's story (childhood leukemia).

To download A Story of Health

http://wspehsu.ucsf.edu/for-clinical-professionals/training/a-story-of-health-a-multi-media-ebook/

To access CE registration

www.atsdr.cdc.gov/emes/health_professionals/index.html

Reprinted from Environmental Health Perspectives August 2016 Volume 124, Issue 8. http://ehp.niehs.nih.gov/ehp222/. A full list of references ia available at www.sfms.org.

Photo on page 20: Lee Smith (left) and Sharyle Patton (right) assist director Miranda Kahn with the puppets during the production of the shadow puppet play "Love in the Time of Toxicants" (photos:Victoria Leonard)

Editors' note: *As of September 30, 2016, forty-six hundred health professionals, including physicians, nurses, and health educators, have registered for the online course.*

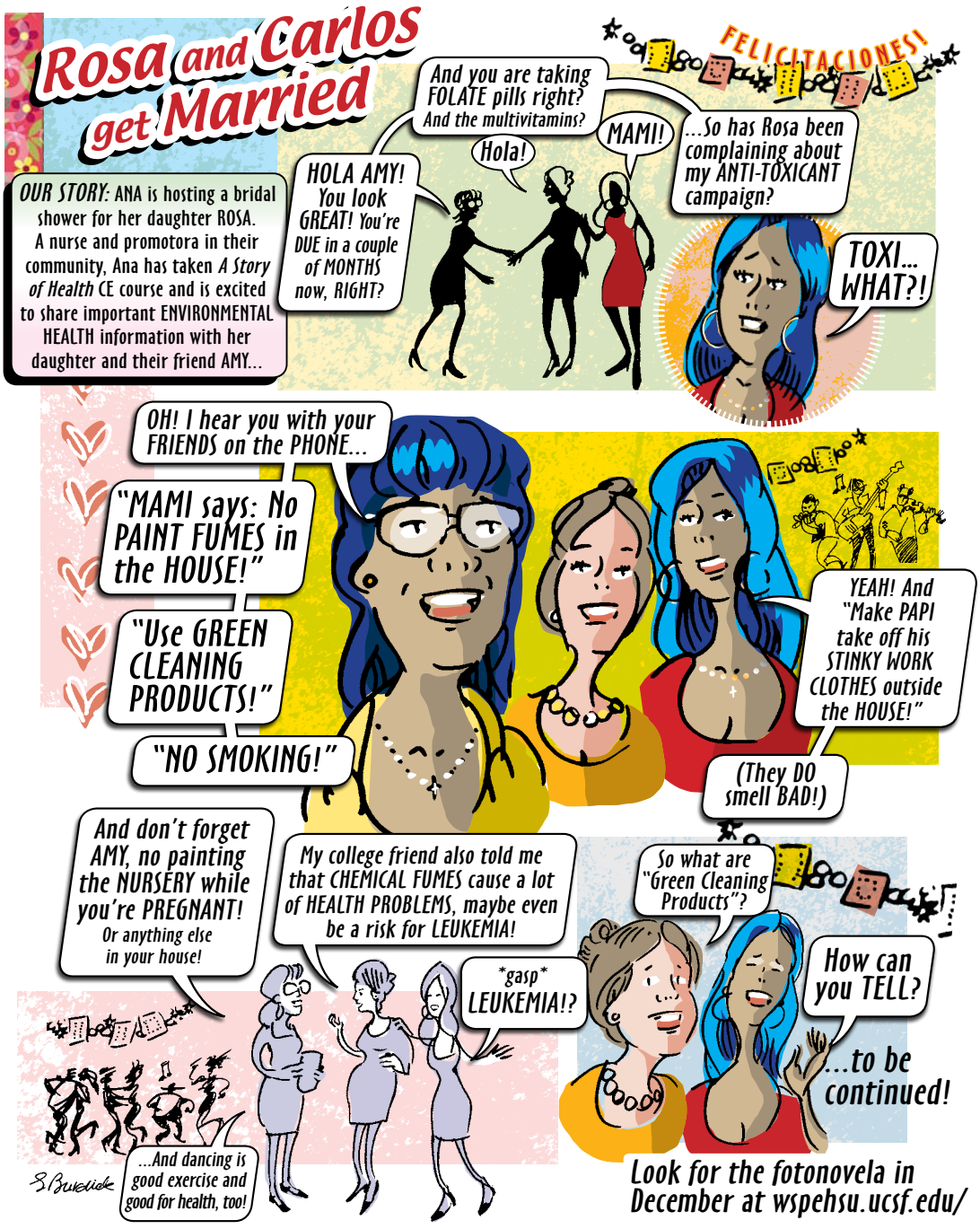
LOVE IN THE TIME OF TOXICANTS

IMPROVING ENVIRONMENTAL HEALTH LITERACY IN COMMUNITIES THROUGH CREATIVE APPROACHES

Young adults and prospective parents are a key audience for messaging on how and why avoidance of toxic exposures, good nutrition, regular exercise, positive social interaction, and stress reduction can help create the conditions for health across the lifespan. Improving Environmental Health Literacy of Young Adults, a project of the Center for Integrative Research on Childhood Leukemia and the Environment at the University of California, Berkeley, in collaboration with the Western States Pediatric Environmental Health Specialty Unit (PEHSU) and the nonprofit research and education center Commonweal, is developing innovative educational materials to reach, initially, the young adult Latino population.

Materials include the fotonovela "Rosa and Carlos get Married" and a shadow puppet play "Love in the Time of Toxicants," designed to create awareness of the role of pre-conception and prenatal environmental influences on a range of health conditions from childhood leukemia to asthma to reproductive health. Materials are based on A Story of Health eBook and free Continuing Education (CE) course. (CE course offered through the Agency for Toxic Substances and Disease Registry/Centers for Disease Control and Prevention.) Look for the new community outreach materials in late 2016 at http://wspehsu.ucsf.edu.

Below: Scenes from the bridal shower in the fotonovela "Rosa and Carlos get married" Illustrations: Stephen Burdick Design.



THE SAN FRANCISCO MEDICAL SOCIETY REQUESTS

THE PLEASURE OF YOUR COMPANY

2017 Annual Gala

January 27, 2017 | 6:30 PM - 9:00 PM
Asian Art Museum of San Francisco
200 Larkin Street, San Francisco, CA 94102

Celebrate SFMS' 149 years of physician advocacy and camaraderie, as well as the installation of Man-Kit Leung, MD as the 2017 SFMS President.

Guests are treated to an exquisite reception with elegant hors d'oeuvres, libations, and exclusive access to the Asian Art Museum's second floor galleries.

Black tie optional. RSVP required.

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Regular (RSVP by 1/19/17)	$105.00	$110.00

For more information, go to
www.sfms.org/Events/AnnualGala.aspx
or contact SFMS at (415) 561-0850 x200.

A HEALTH PROFESSIONALS' DECLARATION ON CLIMATE CHANGE

American Lung Association
October 2016

We, as public health and medical professionals, reiterate our commitment to address climate change on behalf of our patients and communities. We know that the health of every American is threatened by climate change. This statement articulates our agreement on the urgency of addressing climate change to protect human health.

The health impacts of climate change demand immediate action.

Delay only undermines our success, and the longer we wait, the more lives will be affected. The science is clear; communities across the nation are experiencing the health impacts of climate change, including:

- Exacerbated ozone and particulate air pollution, linked to asthma attacks, cardiovascular disease and premature death;
- Extreme weather patterns, such as heat and severe storms, that cause droughts, wildfires and flooding that destabilizes communities, especially those least equipped to defend themselves; and
- Increased vector-borne diseases by expanding seasons and geographic ranges for ticks, mosquitoes and other disease-carrying insects.
- The most vulnerable—children, seniors, people with chronic disease, as well as those living in low income communities and some communities of color—disproportionately bear the health impacts of climate change.
- Bold action is needed to address climate change by cleaning up major sources of carbon pollution, methane, and other greenhouse gases, including power plants and other industrial sources, and cars, trucks, and other mobile sources.
- Communities must have the tools and resources to adapt to and mitigate the unique impacts of climate change in their communities. Taking action to cut carbon pollution and other greenhouse gases will help the U.S. mitigate climate impacts, and lead the world in our global climate efforts.

— Signed by over 2000 clinicians and public health professionals nationwide

To see the full list of supporters, visit:

http://www.lung.org/get-involved/become-an-advocate/advocacy-alerts/health-professionals-climate-change.html

TARGETING ENVIRONMENTAL NEURO-DEVELOPMENTAL RISKS

The TENDR Consensus Statement

Reprinted from Environ Health Perspectives - *July 2016, Volume 124, Issue 7*

Summary Children in America today are at an unacceptably high risk of developing neurodevelopmental disorders that affect the brain and nervous system including autism, attention deficit hyperactivity disorder, intellectual disabilities, and other learning and behavioral disabilities. These are complex disorders with multiple causes—genetic, social, and environmental. The contribution of toxic chemicals to these disorders can be prevented.

Approach Leading scientific and medical experts, along with children's health advocates, came together in 2015 under the auspices of Project TENDR: Targeting Environmental Neuro-Developmental Risks to issue a call to action to reduce widespread exposures to chemicals that interfere with fetal and children's brain development. Based on the available scientific evidence, the TENDR authors have identified prime examples of toxic chemicals and pollutants that increase children's risks for neurodevelopmental disorders. These include chemicals that are used extensively in consumer products and that have become widespread in the environment. Some are chemicals to which children and pregnant women are regularly exposed, and they are detected in the bodies of virtually all Americans in national surveys conducted by the U.S. Centers for Disease Control and Prevention. The vast majority of chemicals in industrial and consumer products undergo almost no testing for developmental neurotoxicity or other health effects.

Conculsion Based on these findings, we assert that the current system in the United States for evaluating scientific evidence and making health-based decisions about environmental chemicals is fundamentally broken. To help reduce the unacceptably high prevalence of neurodevelopmental disorders in our children, we must eliminate or significantly reduce exposures to chemicals that contribute to these conditions. We must adopt a new framework for assessing chemicals that have the potential to disrupt brain development and prevent the use of those that may pose a risk. This consensus statement lays the foundation for developing recommendations to monitor, assess, and reduce exposures to neurotoxic chemicals. These measures are urgently needed if we are to protect healthy brain development so that current and future generations can reach their fullest potential.

Organizations that Endorse or Support the TENDR Consensus Statement

American College of Obstetricians and Gynecologists (ACOG)
Child Neurology Society
Endocrine Society
International Neurotoxicology Association
International Society for Children's Health and the Environment
International Society for Environmental Epidemiology
National Council of Asian Pacific Islander Physicians
National Hispanic Medical Association
National Medical Association

Uppsala Consensus Statement on Environmental Contaminants and the Global Obesity Epidemic

Editor's note: this statement was excerpted from Environ Health Perspect*; May 2016, Volume 124, Issue 5*

On October 8-9, 2015, leading researchers met for the Second International Workshop on Obesity and Environmental Contaminants in Uppsala, Sweden. From the lectures presented at the workshop, it became evident that the findings from numerous animal and epidemiological studies are consistent with the hypothesis that environmental pollutants could contribute to the global obesity epidemic.

Obesogen Hypothesis

Growing scientific evidence indicates that the imbalance of caloric consumption and exercise does not fully explain the obesity epidemic. Nor can DNA mutations explain the global obesity trends, because changes in genes rarely occur over the short period of human history during which obesity has become a problem. A recently published study that used data from the U.S. National Health and Nutrition Examination Survey (NHANES), which has been collected over nearly four decades, showed an increase in both caloric intake and body mass index (BMI) over time. Surprisingly, this study demonstrated that for a given amount of caloric intake, macronutrient intake, or leisure-time physical activity, the predicted BMI was significantly higher in 2006 than in 1998. The article concluded that, "Factors other than diet and physical activity may be contributing to the increase in BMI over time."

Over the past decade, many research studies have evaluated the hypothesis that environmental contaminants could contribute to obesity, and evidence is rapidly accumulating in support of this hypothesis. Of special interest are studies that have evaluated prenatal exposures because exposure during this sensitive period of early development is likely to induce more profound or irreversible effects than are exposures that occur later in life.

Experimental animals exposed to environmental contaminants such as bisphenol A (BPA), dichlorodiphenyltrichloroethane (DDT), phthalates, perfluorooctanoic acid (PFOA), dioxins, and tributyltin (TBT) during pregnancy are more likely to give birth to offspring that display increased fat accumulation leading to obesity. The exposure levels used in many of these studies were similar to those measured in human populations. Exposure to DDT during pregnancy can reduce basal metabolism in the offspring, a fact that could explain why these offspring gain extra weight for a given energy intake. Furthermore, exposure to BPA has been reported to lead to increased food intake due to changes in the brain resulting in stimulated appetite.

During the workshop, attendees also discussed human studies demonstrating that exposure of pregnant women to environmental contaminants is associated with increased weight gain of their babies. Numerous studies have shown that prenatal exposure to dichlorodiphenyldichloroethylene (DDE), a DDT metabolite, is associated with rapid weight gain in children and that higher levels of DDE in the blood of pregnant mothers is associated with obesity in the adult offspring. Similar associations have been seen with other pollutants such as hexachlorobenzene (HCB), as well as mixtures of organochlorines. The findings from these studies support the hypothesis that the obesogenic effects noted in experimental animals are also relevant for humans.

Obesogens and Metabolic Disruption

To highlight the importance of obesogens and metabolic disruption, the workshop attendees also discussed the multiple health effects of obesity. For example, when fat accumulates in abnormal locations, such as in the liver or surrounding the gut, heart, and kidneys, multiple other disorders often develop such as lipid disturbances, fatty liver, diabetes, and high blood pressure. Obesity and these other accompanying disorders are major risk factors for additional diseases that occur later in life such as cardiovascular disease, some common cancers, reproductive disorders, and even dementia, which are all responsible for reduced quality of life and premature death. Not only have environmental contaminants been linked to the development of obesity, but several pollutants, such as polychlorinated biphenyls (PCBs), dioxins, BPA, and pesticides have also been associated with mitochondrial dysfunction, lipid disturbances, insulin resistance, diabetes, and high blood pressure in both animal and human studies. Moreover, these conditions can be induced experimentally in mice by environmental contaminants independently of obesity. Thus, animal studies indicate that exposure to environmental contaminants may be a contributing factor not only to obesity but also to diseases associated with obesity and an altered metabolism.

Impact on Future Generations

A recent and important finding in mice showed that the obesogenic effect of TBT appears not only in the first generation of mice but is passed on. This phenomenon, called transgenerational effect, has been shown to be due to epigenetic mechanisms in other experiments. Epigenetic events do not involve alterations in the genetic code, but rather mitotically stable changes in the regulation of gene expression. In the case of TBT, this contaminant activates a part of the cellular machinery that continues to drive increased development of fat cells in future generations. Such effects are more pronounced when the experimental animals are maintained on a high-fat diet.

Recommendations for an Action Plan

Based on results discussed at the workshop, the authors

Continued on page 28 . . .

The Collaborative on Health and the Environment Consensus Statement

This statement was developed when CHE was founded at the SFMS in 2012, at a meeting chaired by Philip R. Lee, MD, chancellor emeritus of UCSF and former United States Assistant Secretary of Health. While we might wish to update some aspects of the statement, more than four thousand CHE partners have signed onto the statement and we still feel it is valid. For much more information, see CHE's website at www.healthandenvironment.org.

Background

The Collaborative on Health and the Environment (CHE) is a nationwide network of concerned people and organizations working together toward the shared goal of improving public and individual health. CHE partners include representatives of patient organizations, health professional and scientific societies, community organizations, environmental health advocates, funders, and indeed all those interested in working together to improve public and individual health. To that end, we begin with a statement on environmental hazards and human disease and disabilities, followed by the consensus statement that identifies the facts and principles upon which CHE partners agree (below).

The Problem: Human Diseases and Disabilities and Environmental Hazards

Chronic diseases and disabilities have reached epidemic proportions in the United States, affecting more than 100 million men, women, and children, which is more than one-third of our population. Asthma, autism, birth defects, cancers, developmental disabilities, diabetes, endometriosis, infertility, Parkinson's disease, and other diseases and disabilities are causing increased suffering and concern. The human cost for families and communities is immeasurable, particularly those already disadvantaged by persistent economic disparities. The economic cost of these diseases exceeds $325 billion yearly in health care and lost productivity.

Scientific evidence increasingly indicates a relationship between a range of environmental factors and these diseases and conditions. One important contributor may be increased exposure to the wide array of chemical substances that are used in modern industrial society, including diverse synthetic chemicals, compounds, metals, and related elements such as lead, mercury, and arsenic, as well as other pollutants in food, water, and air. Since World War II, more than 85,000 synthetic chemicals have been registered for use in the United States and another 2,000 are added each year, and few are adequately tested for their potential impacts on health. Other forms of pollution are increasing as well.

These pollutants have become widespread in our air, water, soil, food, homes, schools, and workplaces, and thus also in our bodies. The sources of these exposures are manifold. They include pesticides, industrial chemicals, chemicals found in the home and workplace, personal care products, and pharmaceuticals to which

people are widely exposed. Recognizing these links between chemicals and human effects, the Institute of Medicine emphasizes the importance to health of minimizing environmental exposures to "chemical and physical hazards in homes, communities, and workplaces through media such as contaminated water, soil, and air."

Low-income communities and communities of color often bear a disproportionate burden of health risks from such environmental contamination. In developing an inclusive network of people concerned with environmental health, we seek to address the need for more and better science, cooperation, and ultimately, health and equality.

Consensus Statement

1. The State of the Science

The public believes what scientists have long known, that environmental factors are important contributors to disease and developmental disabilities. The understanding of risk varies widely among individual toxicants and diseases. The developing human fetus appears to be uniquely at risk of harm from environmental toxicants, and such damage can be profound and permanent. Although some linkages are well established and knowledge about others is emerging, more research is needed regarding the mechanisms, levels, and types of exposures that can adversely affect health. Research must include the study of interactions among chemicals and longitudinal studies examining links between early developmental exposures and health challenges much later in life, in order to determine what might be making us sick and how to prevent future illnesses.

2. The Need for a Heightened Public Health Response

Many cases of some diseases and developmental disabilities could likely be prevented if exposure to contributory environmental factors before and after birth were lessened or eliminated. Some strategies for prevention are well known, but more resources need to be devoted to prevention research and practice than is currently the case. Better epidemiological tracking of chronic diseases and de-

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CHE Consensus Statement
Continued from the previous page . . .

velopmental disabilities is needed. More detailed and widespread monitoring of human exposure to toxicants is vital. This should include health tracking of conditions, including disease surveillance, biomonitoring to inform individuals and health care professionals regarding the extent of actual "body burdens" of known and suspected toxicants, and rapid-response epidemiology where indicated. Innovative, scientifically reliable methods are needed to study communities with clusters of diseases versus unaffected populations. Where the weight of plausible scientific evidence shows that contaminants are likely to contribute to increased disease, exposures should be reduced or eliminated. Good, uncompromised science must be the underpinning of all such efforts.

3. The Importance of a Precautionary Approach

The precautionary principle should become a guiding factor in public health and environmental policy. The precautionary principle indicates that, when there is plausible scientific evidence of significant harm from a proposed or ongoing activity, preventive or corrective action should be taken to reduce or eliminate that risk of harm, despite residual scientific uncertainty about cause-and-effect relationships. Implementing the precautionary principle requires assessment of how to accomplish desired goals, looking for the safest alternatives, democratic participation, and reversal of the burden of proof. That is, the proponent of an activity bears the burden of assessing its safety and of showing that it is both necessary and the least harmful alternative. Decisions affecting public and environmental health should be fully participatory.

4. The Need for New Models of Collaboration in Environmental Health

Efforts in environmental health have too often been fragmented. Medical, patient, public health, and environmental groups and others sharing some convictions too often have not worked together toward common goals. Our emerging realization of the scale of the problem, and the growing body of scientific information linking plausible cause with effect, encourages a commensurate response. A new emphasis on a diverse and inclusive collaboration is essential to successfully reducing public exposure to environmental toxicants and helping to implement preventive strategies.

Established researchers and health-affected (or patient/client) groups can collaborate in conducting important new research. Medical organizations can also work with health-affected groups toward better approaches to treatment, services, or interventions. Organizations that are engaged in the issues of environmental justice, poverty, civil rights, and human rights must be represented and work together as equal partners. Everyone concerned—health-affected groups, scientists, health professionals, and environmental organizations—can serve as resources for each other in collaborations such as these that will help reduce public exposure to environmental toxicants and contribute significantly toward creating a healthier society.

The Collaborative on Health and the Environment (CHE) has been established to address this need and to take environmental health efforts into a new era of improved scientific understanding, cooperation among diverse interests sharing similar goals, and better policies and preventive efforts.

Uppsala Consensus Statement
Continued from page 26 . . .

suggested several actions that should be taken to restrict the potentially harmful effects of environmental contaminants on metabolism:

- Increase research initiatives and funding to further explore mechanisms associated with chemical obesogen-induced metabolic disruptions, to examine mixtures, and to use exposure levels relevant to those encountered by human populations.
- Educate physicians and other health care professionals regarding the effects of environmental contaminants on metabolism to increase the awareness of this problem, and how they could guide their patients, as well as the general population, to limit their exposure to these contaminants.
- Ensure that knowledge of obesogenic environmental chemicals is incorporated into regulatory- and policy-making.
- Demand that new chemicals that are to be released onto the market are tested in an appropriate fashion regarding their effects on metabolism.
- Demand that all chemicals included in consumer products are disclosed in order to increase public awareness of their use and to provide individuals with the information they need to avoid exposures.
- Find additional ways to increase public awareness about factors beyond caloric balance that are involved in obesity development, including the role of some environmental contaminants.
- Increase awareness about the potential of these exposures to generate effects in future generations. This action item should also include education on how to avoid exposure to these contaminants.

Summary and Conclusions

In conclusion, since there are now numerous animal and epidemiological studies indicating that environmental pollutants could contribute to the global obesity epidemic, there is an urgent need to reduce the burden of environmental contaminants so that obesity does not become the normal outlook in the future. The workshop attendees concluded that public health efforts should focus on the importance of early obesity prevention by means of reducing chemical exposures, rather than only treating the established disease. Just as a bad start can last a lifetime and beyond, a good start can last a lifetime as well.

Full report with references at http://ehp.niehs.nih.gov/15-11115/

A Three-Dimensional Approach to Food Addiction

Food Addicts in Recovery Anonymous (FA) is an international non-profit recovery program modeled on the principles of Alcoholics Anonymous (AA). FA is free of charge and is a fellowship of adults and teens who have struggled with overeating, compulsive dieting, purging, obsession with food or weight, and the multiple health problems accompanying these behaviors. In a 2016 self-reported FA survey of 4,238 members, many reported significant health improvements since joining FA.

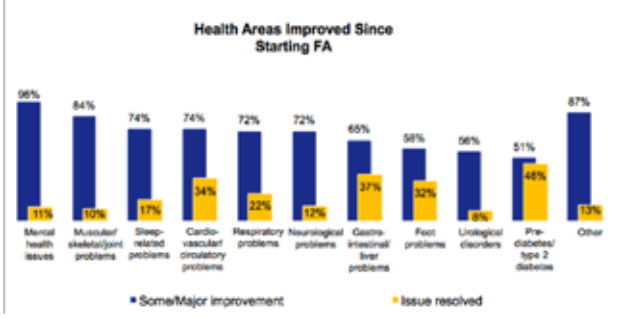
Of members with health issues:

- 96% reported improvements in mental health; over 95% in physical health.
- 46.5% reported reducing medications due to no longer needing them.
- 39.78% reported discontinuing medications with their doctor's approval.

Of the 562 members who had been diagnosed with type 2 diabetes, ninety-three percent reported improvement, and forty percent reported that this issue was resolved and no longer a problem. In addition, of those who had taken medication for diabetes, fifty-one percent were able to discontinue their oral diabetes medication, and fifty-three percent no longer had to take insulin. FA is distinctive because it focuses on addiction. Food addicts have a relationship with food that parallels an alcoholic's relationship with alcohol. No amount of will power can lead the food addict to normal eating or sane attitudes about food or body size. FA understands addiction as a physical, mental and spiritual disease, and addresses these three dimensions with a structured, balanced food plan, daily help from a sponsor and fellow members, and ongoing support in working the Twelve Steps of AA as adapted for food addiction. Using the disciplines of FA, many food addicts in recovery have been able to refrain for decades from addictive behaviors around food.

For more information, contact Food Addicts in Recovery Anonymous at (781) 932-6300, or www.foodaddicts.org.

From 2016 FA Membership Survey



Tell the US Chamber of Commerce to stop their global promotion of smoking

Ten thousand people have signed the SFMS' Dr. John Maa's call for action—join them!

John Maa, MD

As a general surgeon, I have seen the consequences of smoking on my patients firsthand. I have dedicated my professional career to scientific research and advocacy to reduce the burden of smoking-related disability and death worldwide. Along with organizations like the American Heart Association, the American Lung Association, and the Campaign for Tobacco Free Kids, our efforts led to critical anti-smoking reforms and the landmark Tobacco Master Settlement of 1998, after which tobacco companies experienced plummeting domestic profits. But today, Big Tobacco is seeing a rebound of profits, despite major U.S. chains like CVS refusing to carry cigarettes. What's the secret to the turnaround?

A *New York Times* report revealed that the United States Chamber of Commerce (the largest lobbying group in the U.S.) has been helping Big Tobacco export its deadly product internationally by lobbying against global anti-smoking efforts championed by the World Health Organization (WHO). It's been a major and lethal success.

Join health experts from around the country in supporting my petition calling on the U.S. Chamber of Commerce to halt all advocacy efforts on behalf of Big Tobacco in other nations. This lobbying is accelerating the dramatic increase of smoking in the developing world. Many other nations, particularly in the developing world, lag behind such anti-tobacco efforts, and the tobacco industry has exploited that gap by increasingly promoting tobacco use there, including marketing to youth, fighting or dismantling any restrictions on marketing and public smoking, and so forth.

The U.S. has so much to offer the world in terms of innovation and products.

The major U.S. pharmacy company CVS laudably quit the U.S. Chamber of Commerce over its pro-tobacco activities. The California Medical Association, following a San Francisco Medical Society proposal, now urges any other conscientious companies that are members of the U.S. Chamber of Commerce to call for an end to all pro-tobacco efforts within the organization, and if necessary to follow the lead of CVS pharmacies and quit their membership to protest such anti-health efforts.

As of early November, ten thousand people have signed my change.org petition to tell the U.S. Chamber of Commerce to stop its lobbying efforts on behalf of U.S. tobacco companies in opposition to the WHO tobacco control treaty. Tobacco remains the leading cause of preventable death and disability worldwide. The last thing America should be exporting is a preventable public health crisis.

This petition will be delivered the U.S. Chamber of Commerce. To read it and sign on, see: https://www.change.org/p/us-chamber-of-commerce-stop-your-global-promotion-of-smoking.

REPORT FROM THE CALIFORNIA MEDICAL ASSOCIATION ANNUAL MEETING

Gordon Fung, MD, and Steve Heilig, MPH

The 2016 meeting of the CMA's House of Delegates was historic in at least one regard—it was the premiere of an entirely new, streamlined process for policy-making. In other words, CMA entered the digital era fully and for real, with the bulk of deliberations conducted online and only two days for the actual in-person meeting. Like most big changes, there were attendant pains and other annoying symptoms, but overall it was a big and healthy step.

The bulk of the discussion concerned policy reports developed prior to the meeting in six subject areas:

- MACRA
- ACA Changes Under 1332 Waiver
- Opioids
- Physician Burnout
- Recertification/Maintenance of Certification
- Development of a Five-Year Public Health Plan

Each report represented considerable preparation of both background information and action proposals. Discussion was lively and at times contentious, but the reports were all adopted to guide CMA's work in coming years. More details will be forthcoming as the implementation goes forward; for now we thank our dedicated and active delegation for the time spend guiding CMA policy—which then can have a significant, even defining, impact on state medical policy and beyond. And as some of these photos attest, there was some fun too.

Photos: SFMS delegation at the CMA HOD and Gala.

THE 2016 SFMS DELEGATION

Gordon Fung, MD, Chair
Katherine Herz, MD
Man-Kit Leung, MD
Lawrence Cheung, MD
Mihal Emberton, MD
Richard Podolin, MD
Andrea Wagner, MD
George Fouras, MD
Keith Loring, MD
Stephanie Oltmann, MD
Judy Silverman, MD
Steven Fugaro, MD
Pratima Gupta, MD
Amy Whittle, MD
Robert Margolin, MD
Ameena Ahmed, MD
Mark Schrumpf, MD
Roger Eng, MD
Charles Binkley, MD
Shannon Udovic-Constant, MD
Eric Tabas, MD
John Maa, MD
William Goodson, MD

Medical Students included:
Rachel Ekaireb
Amy Pugh
Alexandra Rojek

Thank you PAC Contributors!

Thank you to all the physicians who made donations to the SFMS Political Action Committee in response to our summer donation request letter. Your contributions help SFMS work with its elected officials to keep MICRA protections in place, to defeat numerous scope-of-practice incursions, and to fight big tobacco and soda interests, and more.

While your names are not listed here, we also appreciate those of you who contribute to the SFMS PAC with your dues. We could not do the work we do on your behalf without your help! Thank you.

Nancy Bohannon, MD
Andrew F. Calman, MD
Richard L. Caplin, MD
Lawrence Cheung, MD
Lucy Crain, MD
Roger S. Eng, MD
George A. Fouras, MD
Benjamin Franc, MD
Steven H. Fugaro, MD
Brian Grady, MD
Pratima Gupta, MD
Robert A. Harvey, MD
Katherine Herz, MD
Sally Kaufmann, MD
J. Meiling Kwei, MD
Benjamin C.K. Lau, MD
Man-Kit Leung, MD
Todd LeVine, MD
Ronel Lewis, MD
Ingrid T. Lim, MD
Raymond Liu, MD
Keith E. Loring, MD
John Maa, MD
Kimberly L. Newell, MD
Stephanie Oltmann, MD
Richard A. Podolin, MD
Michael H. Rokeach, MD
Monique Schaulis, MD
Michael C. Schrader, MD
Ira Sharlip, MD
San Francisco Women's Healthcare, Inc./Rachel Shu, MD
Dennis Song, MD, DDS
Peter W. Sullivan, MD
M. Y. Winnie Tong, MD
Turek Clinic/Paul Turek, MD
Shannon Udovic-Constant, MD
John I. Umekubo, MD
Charles J. Wibbelsman, MD

2016 SFMS Election Results

2017 Officers

One-year term
President-Elect: John Maa, MD
Secretary: Brian Grady, MD
Treasurer: Kimberly L. Newell, MD
Editor: Gordon L. Fung, MD, PhD, FACC, FACP

2016 President-Elect, Man-Kit Leung, MD, automatically succeeds to the office of President.

2016 President, Richard A. Podolin, MD, FACC, automatically succeeds to the office of Immediate Past President.

Board of Directors

Seven elected for three-year term 2017-2019
David T. Duong, MD, PhD
Robert A. Harvey, MD, FACS, MBA
Dawn D. Ogawa, MD
Ray Oshtory, MD, MBA
Justin P. Quock, MD, FACP
Dennis Song, MD, DDS
Joseph W. Woo, MD

Nominations Committee

Four elected for two-year term 2017-2018
Kamal S. Ghei, MD
Gary Y. Huang, MD
Erica M. Metz, MD
Robert J. Purchase, MD

Young Physicians Section Alternate

One-year term 2017
Meghan D. Gould, MD

Delegation to the CMA House of Delegates

Two-year term 2017-2018

Delegates

Lawrence Cheung, MD, FAAD, FASDS
Gordon L. Fung, MD, PhD, FACC, FACP
John Maa, MD (automatically serves in his capacity as SFMS President-Elect)
Richard A. Podolin, MD, FACC

Alternates

Mihal L. Emberton, MD, MPH, MS
Pratima Gupta, MD
John Landefeld, MD (Resident)
Robert J. Margolin, MD
Andrea M. Wagner, MD
Amy E. Whittle, MD

MEDICAL COMMUNITY NEWS

SPMF

Robert Osorio, MD, FACS

A healthy environment is the cornerstone of a healthy population. In the Bay Area, we are fortunate to have safe drinking water, adequate sanitation, and readily available technology for clean cooking, heating, and lighting. But most of us, and many of our patients, don't escape the environmental impact of working long hours at jobs that involve sitting for much of the day.

A recent study at University of Texas Health Sciences Center, School of Public Health, analyzed more than nineteen hundred people employed for at least ten years and showed a dose-response relationship between work hours and the incidence of cardiovascular disease. The most substantial risk is among those working forty-six or more hours a week for at least ten years. The risk of cardiovascular disease was sixteen percent higher for those who worked fifty-five hours a week, thirty-five percent higher for those who worked sixty hours a week and fifty-two percent higher for those who worked sixty-five hours a week. These potentially modifiable environmental factors may conceivably, at some point, be added as variables to cardiac risk models.

Given the demands of Bay Area occupations, Dr. Nancy Wiese, Sutter Pacific Medical Foundation's Occupational Medicine specialist, advises that cardiac disease prevention includes the hard work of encouraging patients to stay active and watch for mounting work schedules, and the even harder work of following the advice ourselves. Staying active at work may involve small shifts such as setting the printer away from the desk, pacing the room while talking on the phone, texting on the move (but not while crossing the street), and standing up sooner rather than later when entering data in the electronic health record. Talking with patients about being active and managing their own work schedule is an easier sell if you are over that hurdle yourself.

SFVAMC

C. Diana Nicoll, MD, PhD, MPA

The San Francisco Veterans Affairs Health Care System (SFVAHCS) has a strong commitment to meeting the environmental health needs of its Veterans. A cornerstone to this care is our Environmental Medicine Clinic, whose health providers serve as an important resource for Veterans and for referring health care providers alike.

One of the greatest challenges in the field of Environmental Medicine is the specialized nature of the problems that this field must tackle. For the Veteran community, this can include identified, specific toxic hazards that may have been encountered in military service, such as potential dioxin exposure through contaminated defoliant used in Vietnam (Agent Orange) or radiation received in the course of weapons testing.

There are also exposure scenarios for which the precise exposures have not been well characterized and can include a mix of agents, and with potentially broad adverse health outcomes—what has come to be called "Gulf War Syndrome" is a prime example.

One way in which the Department of Veterans Affairs (VA) has addressed this important need is to establish a series of health registries for discrete military exposure scenarios such as Agent Orange, Depleted Uranium, or Gulf War service. Any Veteran with one or more of these issues can be examined at our SFVAHCS Environmental Medicine Clinic.

If adverse health findings are found, our Environmental Medicine practitioners also can assess a Veteran's potential relationship to exposure and refer on for additional VA care as needed. Beyond these specific registries, the Environmental Health practice also can address other exposures linked to military duties. These can include many of the hazards encountered occupationally by the civilian workforce such as asbestos, solvents, and irritant fumes or gases. Primary Care providers are encouraged to refer patients with possible environmental exposures to this clinic for a thorough evaluation.

Kaiser Permanente

Maria Ansari, MD

Last year, we opened Kaiser Permanente's most environmentally sustainable medical office building to date. The Mission Bay Medical Offices, which opened to members on March 8, 2016, received a Leadership in Energy and Environmental Design (LEED) Platinum Certificate, a designation that makes it one of the "greenest" buildings in Kaiser Permanente's portfolio.

As clinicians, we're extremely proud to provide excellent care for our patients in a building that emphasizes the use of natural light, calm environments, and fine art. When patients come to the medical offices, potentially under stress, we are able to offer them a therapeutic environment.

The nine-story Mission Bay Medical Office Building is part of a new wave of Kaiser Permanente medical office buildings that emphasize environmental responsibility. For example, solar panels are installed on the roof of the parking garage opposite the building and provide a percentage of the structure's power.

Throughout the building, non-critical outlets turn off automatically at night and clocks are controlled via satellite making the need to switch the time for Daylight Savings unnecessary. Patients experience the health benefits of one hundred percent fresh air throughout the facility as all internal air comes directly from outside, nothing is recirculated. The building's temperature is also automated using advanced technology, which controls the interior climate with sensors.

Design materials, such as flooring, paint, and carpeting, all meet the highest standard of low-toxins, gas emissions, and safe chemicals. Additionally, efficient plumbing fixtures reduce water use by over forty-three percent, which includes the installation of low-flow toilets, urinals and lavatories, resulting in a projected savings of seven hundred thousand gallons/year. Kaiser Permanente's commitment to healthy communities means holding itself to the highest standards of environmental stewardship, including how we construct all new facilities moving forward.

SFHN
Karen Cohn MS

Lead Poisoning: Still a Hazard to four hundred SF Children a Year. For October's Lead Poisoning Prevention Week, the SF Department of Public Health's care delivery system, the San Francisco Health Network, and the Population Health Division's Childhood Lead Prevention Program used social media to draw attention to the four hundred San Francisco children detected with lead exposure each year. In the first half of 2016, the Health Network's Primary Care Division referred thirty-two lead-exposed children to CLPP.

Any San Francisco medical provider, regardless of affiliation, can request proactive lead hazard home assessment for their patient, regardless of whether blood lead testing has been ordered or completed. Families can also call directly to ask for this free service. Clinicians are urged to refer families with young children, or those anticipating the birth or adoption of a child because:

• Eighty-five percent SF housing stock was built during the time of lead paint use.

• Lead paint coatings are crushable by thumb pressure.

• Young children are chronically exposed by touching surfaces with damaged paint or dust, followed by hand-to-mouth behavior causing them to ingest lead.

The SF Health Code defines lead hazards as a public health nuisance, reflecting well-established medical evidence of the lifelong neurological and developmental effects caused by fetal and early childhood lead exposure. Both the 2013 U.S. Environmental Protection Agency report and 2016 American Academy of Pediatrics policy reinforce evidence of no safe lead level in children. In addition to proactive lead hazard home assessments, the Lead Prevention program receives blood lead testing results from all labs and contacts the families of all children with positive findings (≥2.2 mcg/dL) to offer free lead hazard home assessment. The program also assigns a public health nurse to case-manage children with higher lead exposures.

SMMC
Robert Weber, MD

As I complete my tenure as chief of staff at Dignity Health St. Mary's Medical Center, I am reminded of the rich history of this hospital, which is especially relevant as we complete a celebration of the Year of Mercy in honor of the Sisters of Mercy, our sponsoring organization.

St. Mary's was founded by the Sisters of Mercy in 1857 after the Archbishop of San Francisco asked the Sisters of Mercy at the Convent of Mercy in Dublin, Ireland, to come to America to care for the influx of gold prospectors. The Sisters were unwavering in their care of the many affected by the 1906 earthquake and epidemics of cholera and smallpox. This history is an inspiring testimonial to the tireless efforts of the Sisters, outstanding physicians, and the many other dedicated individuals who committed their talents and resources to serving the community of San Francisco. Interestingly, of the initial 12 members of the medical staff, one went on to found what is now UCSF, and a second what is now Stanford University School of Medicine.

As we look toward the future of St. Mary's, I want to welcome Carl Bricca, DO, who was appointed the new chief of staff. He understands and appreciates the traditions of St Mary's as he completed his internal medicine residency here and has had a long career providing exemplary primary care to many St. Mary's patients.

During my tenure as chief of staff, I learned the value of an organized medical staff in providing the necessary oversight in guaranteeing quality care to our patients. St. Mary's has maintained an exceptional quality standard and this does not come without hard work and the dedication of all of the staff and physicians. I want to thank everyone for all of their support and I look forward to continuing to support this exemplary medical center.

CPMC
Edward Eisler, MD

Congratulations to Dr. Thomas Peitz, who was reappointed to a five-year term as Chair, Department of Emergency Medicine. Many adults with chronic hepatitis B have the 'E-antigen negative' form, which is treated indefinitely. For the first time in the U.S., a new National Institutes of Health-funded study will attempt to validate findings from the European groups and determine if stopping antiviral therapy can be safe, prevent recurrent disease, and achieve near cures in ethnically diverse people with E-antigen negative chronic hepatitis B. Beginning this fall and expanding upon an initial pilot study at California Pacific Medical Center (CPMC), the BeNEG-DO study will test the effects of stopping antiviral treatment in eighty people with E-antigen negative chronic hepatitis B who have been treated successfully for at least 3.7 years.

CPMC's eleventh Annual Symposium, "Current Topics in Cardiovascular Medicine," which took place at the Monterey Intercontinental Hotel this past October, proved to be yet another successful conference. The two-day conference, which was attended by almost two hundred physicians and nurses.

Dr. Nobl Barazangi, Director of CPMC's Stroke and Neurocritical Care Research and Education Program, spoke at this year's WorldWideWomen Girls' Festival held in San Francisco's Fort Mason this past October. The daylong event aims to empower girls of all ages through mentoring opportunities, interactive workshops and educational resources. "It was a tremendous honor to participate in this festival and empower women with knowledge to help them proactively foster their personal goals and become leaders in their communities," said Barazangi. "I was also able to offer suggestions on career paths and new opportunities to pursue in science and medicine."

UPCOMING EVENTS

SFMS Annual Gala - Friday, January 27, 2017 | 6:30 p.m. to 9:00 p.m. | Asian Art Center, San Francisco | Join SFMS for our Annual Gala! Come together with many of San Francisco's most influential stakeholders in the medical community to celebrate SFMS' 149 years of physician advocacy and camaraderie. Man-Kit Leung, MD will be installed as the SFMS President. Guests will be treated to an exquisite reception with elegant hors d'oeuvres and libations. Ticket information will be available online soon at www.sfms.org and invitations will be mailed in early December. If you have any questions, please contact Posi Lyon at (415) 561-0850 x260.

Minority Women Professionals are MVPs Conference - Saturday, January 28, 2017 | 8:00 a.m. to 3:00 p.m. | Preservation Park, Oakland, CA | Join Inspire Health at the launch of a nationwide women's empowerment conference series to celebrate the achievements of Minority Women Professionals. This one-day seminar focuses on providing attendees the tools for success and showcasing endurance from prominent women of color or disadvantage. Hear more about the book and the movement, MWPs are MVPs!, authored by Dr. Nwando Olayiwola, world-renowned physician leader, professor, author and change agent. Register at https://shop.inspirehealthllc.com/pages/live-mwps-are-mvps-conference-registration.

Upcoming CMA/AMA Events

AMA Webinar – MACRA Education - December 6, 2016 | 11:00 a.m. to 12:30 p.m. | The AMA will host educational webinar sessions to help physicians prepare and understand what the final MACRA rule means for their practice. Physicians and medical society staff are welcome. Register at http://bit.ly/2g00hU2.

AMA/CMA MACRA Regional Seminar - December 10, 2016, 9:00 a.m. | Marriott Marquis, 780 Mission Street, San Francisco | Prepare for Medicare payment reform and understand what the MACRA final rule means for your practice. The AMA and California Medical Association invite physicians and medical staff to an educational session to prepare and understand what the final rule means for their practice and what they need to do as part of the Quality Payment Program (QPP). Register at www.ama-assn.org/events/macra-regional-seminar-san-francisco.

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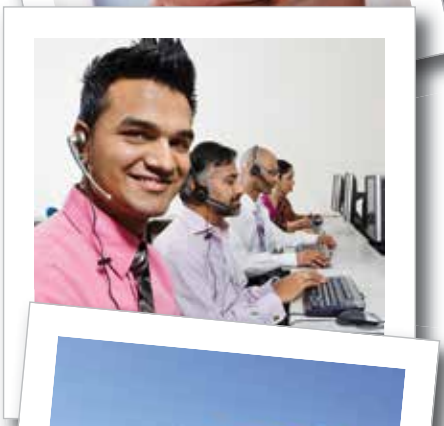

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