the JOURNAL
of the Pennsylvania Osteopathic Medical Association
March 2017

Join us for the POMA 109th Annual Clinical Assembly & Scientific Seminar!

April 26-29, 2017

Radisson Valley Forge &
Valley Forge Event Center

King of Prussia, Pennsylvania

See pages 11-14 for more information & a registration form!

JOIN US ON SOCIAL MEDIA! facebook twitter LinkedIn

Conference Information

LECOM Summer Primary Care 2017 in Sarasota, Florida offers a unique learning experience for physicians and health care professionals seeking the opportunity to learn the latest information on medical advancements and treatment options. LECOM clinical faculty will present topics from the perspective of a primary care physician.

Registration Information

Standard Registration: $1,500
Adjunct Faculty Registration: $1,250
Commuter Registration: $450

Standard and Adjunct Faculty Registration includes CME fee, four (4) nights lodging at the Ritz Carlton, Sarasota, Florida and breakfast Monday through Thursday. Commuter Registration includes CME fee and breakfast. It does not include a hotel stay.

CME Credits

LECOM anticipates AOA and AAFP approval for 20 Category 1-A Credits. All lectures will be held between 8 a.m. and 1 p.m. allowing time for afternoon activities around Sarasota.

How To Register

To reserve your spot for the LECOM Summer CME Conference in Sarasota, Florida, go to **lecom.edu/cme** and click the registration link. Adjunct faculty can receive a discount by emailing the CME conference office or by calling the number below.

Contact Us

1858 West Grandview Blvd., Erie, PA 16509
(814) 860-5125
www.lecom.edu/cme
cme@lecom.edu

March 2017 / Vol. 61, No. 1

THE Journal OF THE PENNSYLVANIA OSTEOPATHIC MEDICAL ASSOCIATION

The Journal of the Pennsylvania Osteopathic Medical Association *(ISSN 0479-9534) is published four (4) times a year, in March, June, September and December, as the official publication of the Pennsylvania Osteopathic Medical Association, Inc., 1330 Eisenhower Boulevard, Harrisburg, PA 17111-2395. Subscription $20 per year, included in membership dues. Periodicals postage paid at Harrisburg, PA, and additional mailing offices. All original papers and other correspondence should be directed to the editor at the above address. Telephone (717) 939-9318 or, toll-free in Pennsylvania, (800) 544-7662. POSTMASTER: Send address changes to* ***The Journal of the Pennsylvania Osteopathic Medical Association****, 1330 Eisenhower Boulevard, Harrisburg, PA 17111-2395.*

CONTENTS

FROM THE EDITOR'S DESK

Alice J. Zal, D.O., F.A.C.O.F.P.

Alice J. Zal, D.O.
Outgoing
Editor-in-Chief

You finally finished your training years, you're paying back any debts you've accumulated and you're busy as can be. When do you "take time to smell the roses," as Carol Hegel Lang said. Physicians' lives have become so hectic that we don't slow down to see what is going on around us.

You have commitments to patients, hospitals, committees and, 'oh yes,' family. When was the last time you listened to a bird's song or watched your garden sprout into a beautiful landscape? When was the last time you went to a show or a sporting event with your family/children without having your pager/phone interrupt the most important moment? And lastly, when was your last real vacation devoid of thinking about your career?

If these questions made you think even for a minute, then you are guilty of "putting things off." My husband and I did this as we were busy 'accomplishing things' in our lives and always said "someday we will do X, Y and Z." However, life is not infinite and, unfortunately, time doesn't stand still, even for the consummate healer, and time ran out for my husband two months ago.

Many of us say that when we retire we will travel more than two weeks at a time, have a vacation home and spend time at it, relax (if we even know what that is) and do all the hobbies we put off doing. We will spend more time with our grandchildren (if they are not too old to make room for you in their scheduled lives), and learn to spend more time with family and friends.

Just as cars need oil and tire changes, people need to refresh themselves. You would never let your vehicle get rusty, so why do you put off your own health needs? Did you get your five year colonoscopy screening done, your yearly PSA or mammography, and your own laboratory blood work? Did you ignore that 'little' chest discomfort or blurring vision? If your car was rattling, I bet you brought it into a mechanic to check it out. How about your rattles? It is so easy to think of ourselves as 'immortal healers of many' that we forget we too are human. Hippocrates made an inspirational statement that, "Life is short, art long, opportunity fleeting, experiment treacherous, judgment difficult." What did he mean by this? Did he mean that if we ignore simple symptoms they will escalate until we can't repair the damage to our bodies? Did he mean that we have to have 'down time' to smell the roses before they wilt on the vine and never have the opportunity again to regale in their beauty? Think about this for a moment. What have you come up with?

If, after reading this, I made you think about the things you have been "putting off," then I have succeeded. There is no reason you cannot slow down a tiny bit to do the things you always thought of doing. Things are not black or white, as I have learned as I get older and, yes, wiser. You can take time out and life waits for you to come back. You can do it all, but you have to prioritize. Don't say "someday I will do A, B and C," make time to do A, B and C now.

Remember, we are human with a finite time on Earth. My late husband, H. Michael Zal, D.O., completed his last book, *A Psychiatrist's Guide to Successful Retirement and Aging: Coping with Change*, just two weeks prior to his life-altering CVA. Take time for your family, friends and even yourself. Take time to continue my husband's legacy of writing. Enter the POMA Clinical Writing Contest. The deadline for it is approaching.

This will be my last editorial. A very capable physician, Mark B. Abraham, D.O., J.D., will be following in the Zal footsteps as the new editor. At this time, I would like to thank Marce Monroe-Ward for her availability and guidance, and the entire POMA staff, along with the Publications Committee. It is hard work to read and judge all of the entries of the Clinical Writing Contest, but it gives us a sense of continuing the quest to disperse our wisdom to future generations.

Fraternally,
Alice J. Zal, D.O., F.A.C.O.F.P.

FROM THE EDITOR'S DESK

Mark B. Abraham, D.O., J.D.

Greetings colleagues! As I assume the role of editor and chair of the Publications Committee, I would like to thank everyone involved in this decision. However, I want to focus on two people in particular — Drs. Michael and Alice Zal. When Dr. Alice Zal became president of POMA, she wanted to increase involvement, and especially that of the younger/newer doctors. At that point, Dr. Michael Zal was appointed to fill the vacancy of editor for *The Journal of the POMA*. He then called me and asked me to start writing a column, "A Young Physician's Perspective."

Dr. Michael Zal was a leader in many ways. He was a successful author and published in various areas, including within his specialty of psychiatry. He continued to look for ways to improve *The Journal*, involvement and the essay contest. He also was a kind person and physician. He will be greatly missed. I aim to continue and expand upon the goals of always moving forward and improving *The Journal* and our publications. That, I believe, is the best way in which I can honor his memory.

These publications are yours; this is your organization. I hope that we will have more students, physicians, and those involved in other ways, contribute. Our families, children and spouses may not be involved in health care, but do support us in what we do. I welcome articles and contributions from them about their experiences and thoughts related to the practice of medicine and health care in Pennsylvania (and the United States).

Students and post-graduates, you all have experiences, be it in your new career in medicine or from life. I am sure that you all have something to contribute. We already have articles from medical students, but that does not mean there must be a limit on the number of students contributing. What would you like to see us do? What would you like to even ask of your colleagues and practitioners? All of that can become part of *The Journal* — perhaps with the help of experienced physicians, we could have a section for questions and answers.

Faculty and researchers at LECOM and PCOM, in addition to your areas of research and expertise, perhaps you may have thoughts or suggestions for articles.

We will also value input and help from individuals who want to become involved in the social media platforms.

Maybe we can have a section devoted to a topic, changing per quarter, where two people express contrasting thoughts and opinions on an issue, such as the Affordable Care Act, and we can publish them in the same edition for comparison.

These are just some things that come to mind. Please let me know your thoughts. I hope to hear from you about your interest in joining the publication committee, writing articles, and helping us continue to improve.

I know Dr. Michael Zal will be proud.

Fraternally,

Mark B. Abraham, D.O., J.D.

Mark B. Abraham, D.O., J.D.
Incoming
Editor-in-Chief

LECOM DEAN'S CORNER

Lake Erie College of Osteopathic Medicine

Silvia M. Ferretti, D.O.
LECOM Provost,
Vice President and
Dean of Academic Affairs

There is great sincerity in the belief that an academic institution possesses a particular optimistic heart, for its leaders and its educators personify distinctive attributes; a set of intrinsic qualities or sum of qualities by which the school may be distinguished from other such institutions. Such qualities represent the heart and soul of an ideal nurtured within the mind as well as a focused higher purpose promulgated through action. Such is the case with the history that has come to form the heritage of the Lake Erie College of Osteopathic Medicine (LECOM).

As the 20th Century drew to a close, and at a time during which much of the medical community did not see a need for additional medical colleges, much less the need for further physicians, those in governance of Millcreek Community Hospital (MCH) in Erie saw it differently. The hospital existed in an area within close proximity to Pittsburgh, Cleveland and Buffalo, an area underserved by physicians. The establishment of a medical college in Erie had the intended effect of allowing the hospital to train needed new doctors and to accommodate the open positions at MCH and at other hospitals throughout the region.

The Lake Erie College of Osteopathic Medicine was established as the 16th college of osteopathic medicine in the nation with its receipt of a Commonwealth of Pennsylvania Charter in December 1992. Since that time, LECOM has granted the Doctor of Osteopathic Medicine (D.O.) degree to more than 5,400 graduates as of 2016.

By 2002, college growth and enrollment required LECOM to triple the size of the original medical school building, adding another 100,000 square feet of modern teaching, learning and research facilities.

A continually growing medical and wellness campus also stretches along Peach Street in Erie as the college and community engage in the whole-body wellness paradigm that has become LECOM Health, the only health system with an Osteopathic Academic Health Center in the United States. The college, Millcreek Community Hospital and Medical Associates of Erie, the clinical practice network of physician offices located in Erie County, form the core of this highly innovative medical education and patient-care system.

True to the college mission, to provide primary health care to Northwestern Pennsylvania, LECOM achieved another milestone with the addition of its School of Pharmacy from which was graduated its first class in June of 2005. Since that time, LECOM has granted the Doctor of Pharmacy (Pharm.D.) degree to more than 1,900 graduates.

In keeping with its proven tradition of leading the field in medical education, LECOM initiated the Master of Science in Medical Education degree program at the Erie campus in 2005. This postgraduate course became the first distance education program at LECOM, and it trains physicians to become teachers and leaders in the clinical education of future physicians. The College also offers the Master of Science in Biomedical Sciences degree and the Health Sciences Post Baccalaureate certificate.

In addition to the original campus in Erie, LECOM further continued its role in the vanguard of national leadership in osteopathic medicine by developing a branch campus in Bradenton, Florida. LECOM Bradenton welcomed its first class of medical students on September 13, 2004. With the enrollment of the Bradenton Class of 2011, LECOM became the largest medical college in the nation. In 2007, the School of Pharmacy also expanded to Florida, offering a traditional four-year Doctor of Pharmacy degree curriculum and graduating the first class from LECOM Bradenton in 2011.

The vision of LECOM continued in 2009, with the extension of LECOM Erie to the campus of the private liberal arts institution of Seton Hill University in Greensburg, Pennsylvania. LECOM Seton Hill now has more than 400 students in total enrollment.

In July 2012, the LECOM School of Dental Medicine welcomed students in Bradenton, establishing yet a new era in the betterment of health care education. The first class of dental students completed their fourth year of study at community-based dental outreach offices in DeFuniak Springs, Florida, and in Erie, Pennsylvania. These sites were chosen, in part,

(continued on page 26)

PCOM DEAN'S CORNER

Philadelphia College of Osteopathic Medicine

Kenneth J. Veit, D.O.
PCOM Provost, Senior Vice President for Academic Affairs and Dean

When thinking about the student-debt crisis in this country, few stop to consider where graduate-level students fit into that discussion. Yet, according to a report from the American Association of Colleges of Osteopathic Medicine, recent osteopathic graduates have a mean debt level of about $230,000.

But despite the high cost of attending medical school, thousands of students still choose to attend each year, in the hopes of making the world a healthier place. And the need for qualified, well-trained health professionals is perhaps stronger than ever — the American Association of Medical Colleges projects a total physician shortfall of up to 125,000 within the next decade.

As medical education institutions, it is imperative for us to not only be cognizant of the effects of that debt on our students — some may postpone home buying, or starting a family, or even chose not to go into a certain specialty — but to also help them develop stronger financial literacy skills, in the hopes that they are better equipped to manage their money once they leave our campuses.

At PCOM, our Office of Financial Aid has implemented a very robust financial literacy program to better inform students about smart borrowing habits by offering information and tactics to help students manage their money more effectively.

The program offers myriad events throughout the students' time on our campuses, including one-on-one appointments that focus on budget coaching and exit counseling for students, and table-top discussions on various financial topics; interactive webinars on Blackboard; a lecture series focused on issues such as home buying, financial planning, and loan repayment; and a reception at the start of the academic year that introduces incoming students to the concept of over-borrowing and the value of budgeting.

And the effects have been quite noticeable: the college has seen a significant drop in its default rate, from 1.6 percent for the cohort default year 2012, to 0.8 percent for the 2013 cohort default year. The ultimate goal is to get that number all the way down to zero.

We have an obligation to our students to provide them with the best education possible; that now includes showing them how to effectively manage their money, so that when they graduate, they can focus on becoming the most effective physicians for their patients.

Fraternally,
Kenneth J. Veit, D.O.

A STUDENT'S VOICE — PCOM

Elisa Giusto, OMS-III, and Olivia Hurwitz, OMS-III

Elisa Giusto
PCOM OMS-III

Olivia Hurwitz
PCOM OMS-III

Although the current state of our national health care system might be in flux, one fact is clear: air ambulances are life-altering in more ways than one. How do you think it feels ending up with an estimated $50,000 bill for the helicopter flight alone? If that doesn't give you a heart attack, we don't know what will. Although air ambulance companies undoubtedly save lives transporting as many as 400,000 people each year, especially in largely rural and critical situations, there is major cause for concern. When patients are in need of an air ambulance, the main priority is getting them care as soon as possible, not checking if it is an in-network provider. However, that little detail makes a huge difference when it comes to the price tag. Besides the emotional distress of dealing with a loved one in the hospital, families around the country, even those with health insurance, have to recuperate from potential financial ruin.

Air Methods, the nation's largest air ambulance operator, generated a revenue of over $1 billion last year, yet continue to raise rates. In 2009, their average bill was $17,262, while in 2014, their average bill was $40,766. How does that add up when the average cost of an air ambulance flight is only $10,000? To add to the problem, private insurance companies that offer ambulance coverage often do not cover the full cost of air ambulances and, with pressure to cut health care costs, further reduce reimbursements. Medicare covers even less of the exorbitant bill, with Medicaid offering the least amount of financial support. Since the 1978 Airline Deregulation Act has prevented states from capping the amount that air ambulances can charge, are patients really being better served as a result? In 2013, there were about 469 flight hours per air ambulance, which is a 20 percent decline from 2006, and the lowest number since 1980. After years of industry expansion and higher bills, the result is now an oversupply of air ambulances run by profit-making entities.

This is just a microcosm of the dysfunctional dynamic between business and medicine that has been plaguing the American health care system for decades. As we rotate through hospitals across Pennsylvania, Delaware and New Jersey, we have become privy to the intimate relationship between insurance companies and health care providers — and it's usually not a healthy one. The cat-and-mouse game hospitals must play with insurance companies in order to get reimbursed ends up placing a lot of extra financial burden upon those we claim to protect. It also places an unreasonable burden upon health care providers to try to navigate a seemingly irrational and labile system in order to get patients the care they need.

The exorbitant costs pervading American health care have recently come under fire in the media, and rightly so. One 2012 study comparing the median costs of hospitalizations for appendicitis across hospitals in California was met with alarming results: a less-than-four-day hospital stay for uncomplicated appendicitis had a median cost of upwards of $33,000, ranging from $1,500 to almost $183,000. Such a bill could, in one fell swoop, easily lead a patient or his family into complete financial ruin. A study by *The Commonwealth Fund* estimated that up to 60 percent of bankruptcy cases in the U.S. are at least in part due to health care costs.

The whole system can be very distressing to a student just on the cusp of entering into the medical world. But even more so than the grotesquely high prices of medical care, the real failing is this: in our first two years of medical education, this issue was never brought up. As third years, we have caught a glimpse of the issue (a patient here or there who says she can't take this medication or have that procedure because she can't afford it). But we have never been offered any solution, and it's unclear if there even is one.

We'll order tests and medications because we have to — many times, as with air ambulances, the cost is unavoidable in order to save a patient's life, and it's hard to put a glass ceiling on that. It's hard to say what will happen to health care policy in the near future, but we can at least keep in mind that the less glamorous business aspects of medicine may actually have the most dramatic impacts on our future patients' lives, and remember that it is our responsibility to use this time as students to learn about all factors in medicine in order to give our patients the best possible health care.

(continued on page 19)

FORTY-THIRD ANNUAL

POMA Clinical Writing Contest

for

• Students • Interns • Residents

First Prize: *$1,000 and Golden Quill Award*

Second Prize: *$500* ***Third Prize:*** *$200* ***Honorable Mention:*** *$100*

First prize winner will be POMA's honored guest for a day at the POMA Annual Clinical Assembly in King of Prussia.

Deadline for Submitting Papers: April 1, 2017

Winners will be announced and prizes awarded during the Annual Clinical Assembly.

- Winning entries will be published in the *The Journal of the POMA*.
- Length of entries: **2,000 to 4,000 words**. Articles under 2,000 words will not be eligible.
- ***Eligible entries must be research based and NOT case reports.***
- Each entrant must supply a photograph of himself/herself, a short biography and two questions for the CME quiz with entry.
- Articles previously published in other journals are not eligible.
- Entrants should see the guidelines for original articles as specified in *The Journal*'s "Information for Contributors," which appears on the back of this flyer.
- The author's DME and/or residency program director must sign off on all papers for appropriateness of submission. Students may have the Dean or his/her designee (including a mentor) sign off on their submission.

Mail or e-mail entries to:

Mark B. Abraham, D.O., J.D.
Chairman, Committee on Publications
Pennsylvania Osteopathic Medical Association
1330 Eisenhower Boulevard, Suite 100
Harrisburg, Pennsylvania 17111-2319
mmonroeward@poma.org

INFO FOR CONTRIBUTORS

What to Submit

Articles relating to osteopathic medicine in either the clinical or scientific area are welcomed. Articles should either document an osteopathic contribution in these areas or contribute to the education of the osteopathic physician. All articles will be reviewed by consultant(s) in the proper field and will be subject to a careful editing process. Interns, residents and fellows should include their trainer(s) as author(s). If the trainee is the sole author and wishes the paper to be published in his/her name only, a letter indicating the trainer's release of the paper from his/her department must accompany the manuscript.

Articles dealing with management problems, current legislation or regulation and similar topics will also be considered for publication. Such articles must be original work.

A short biography (C.V. acceptable), photograph of the author(s) and, in the case of medical articles, three questions (i.e., multiple choice, true/false) pertaining to the article for use in *The Journal's* "CME Quiz" feature should accompany the manuscript.

Types of Articles

Original articles — Original articles present information that is new and important to osteopathic medicine. They may document clinical material, applied research or laboratory research. Article length may range from 2,000 to 4,000 words (approximately 8 to 16 typewritten pages).

Clinical reports — These include case reports and brief descriptions of new techniques, equipment or research. They usually range from 1,000 to 2,000 words. Since they do not require abstracts, a final paragraph should provide a summary.

Reviews — Reviews are comprehensive surveys that synthesize established ideas and develop new ones. They may deal with clinical, investigational or basic science subjects. Length may vary from 3,000 to 5,000 words (12 to 20 typewritten pages).

Special articles — Articles that do not fall into the above categories (i.e., those on history, demographics, education) will be considered for publication as feature articles.

Manuscripts

Authors are encouraged to submit manuscripts via e-mail to *publ@poma.org*. Papers may also be submitted by regular mail. Manuscripts sent by e-mail should be sent as an attachment in .doc, .wpd or .rtf format. Papers submitted by regular mail should be typed in double spacing on 8-1/2" x 11" white paper, one side only, preferably with one-inch margins all around the page. Each page should be numbered. To facilitate the editorial process, authors who submit papers via regular mail are asked to include an original manuscript, one photocopy and a clearly labeled CD containing an electronic version of the text in one of the above formats. Any electronic artwork pertaining to the article should be saved on the disk as a separate file.

The manuscript should include:

- title;
- author(s) name(s) with highest academic degree;
- abbreviated title;
- abstract, if applicable;
- text;
- references.

Submit articles to: publ@poma.org or
The Journal of the POMA, *1330 Eisenhower Blvd., Suite 100, Harrisburg, PA 17111-2395.*

References

References should be typed, double-spaced, on a separate sheet. All references listed should be cited in superscript throughout the text. They should be numbered in the sequence in which they first appear in the text, listing each one only once.

Examples of properly listed references follow:

Journal reference — List the author's name, article title, journal name as abbreviated in *Index Medicus*, year, volume number, page number(s).

Example — Davidson C, Burkinshaw L, McLachlan MSF, et al: Effect of long-term diuretic treatment on body potassium in heart disease. *Lancet* 1976;2:1044.

Book reference — List the author's name, book title, location and name of publisher, year of publication. Exact page numbers are required for direct quotes.

Example — Fudenberg HH, Stites DP, Caldwell JL, et al: *Basic and Clinical Immunology*, ed 2. Los Altos, California, Lange Medical Publications, 1978.

Book chapter reference — List the author's name, chapter heading, editor's name, book title, location and name of publisher, year of publication and page number(s).

Example — Elias M, Elias P: Motivation and activity, in Birren JE, Schaie KE (eds): *Handbook of the Psychology of Aging*. New York, Van Nostrand, 1976, p 357.

References generally should not exceed 30 in major articles, fewer in shorter articles.

Illustrations

Illustrations include photographs, line drawings, graphs and charts. All illustrations should be numbered and cited within the text. X-ray films are generally not acceptable.

Electronic Artwork — Please note that *The JPOMA* cannot use line art or photographs that are inserted, embedded or copied into an electronic text file. Authors are asked to send the original electronic artwork files separately. Line art must be saved in .eps, .jpeg, .tif or .pdf format. Digital photographs should be sent using the highest print resolution available in .jpeg format, whenever possible. The minimum resolution for digital photographs in .jpeg format is 1024x768 pixels; no less than 72 dpi. Compressed .tif files with a minimum of 300 dpi are also acceptable. Scanned photographs should be sent at 100 percent of the original with a minimum resolution of 300 dpi.

Printed Photographs — Please do not bend, fold or use paper clips to attach to the manuscript. Photographs should be unmounted and untrimmed high-quality, glossy, black-and-white or color prints. A label listing the author's name, article title and a number keying the photograph to its place in the article should be affixed to the back of the photograph. *Please note — Photographs that include patients, staff, etc., must be accompanied by a signed legal release form.*

Other Illustrations — Figures, charts and graphs should be of professional quality. Lettering should be large and clear to allow for reduction, if necessary. Glossy, black-and-white prints of drawings, rather than originals, should be submitted whenever possible.

Editorial Review

Each article submitted will be forwarded to the editor-in-chief for review. Articles deemed acceptable will then be sent to the head of the POMA committee related to the subject involved, and an independent reviewer at the editor-in-chief's discretion. Authors whose articles are accepted for publication will be notified in writing, and will be notified if any rewrites or clarifications are needed before publication. Manuscripts submitted cannot be returned.

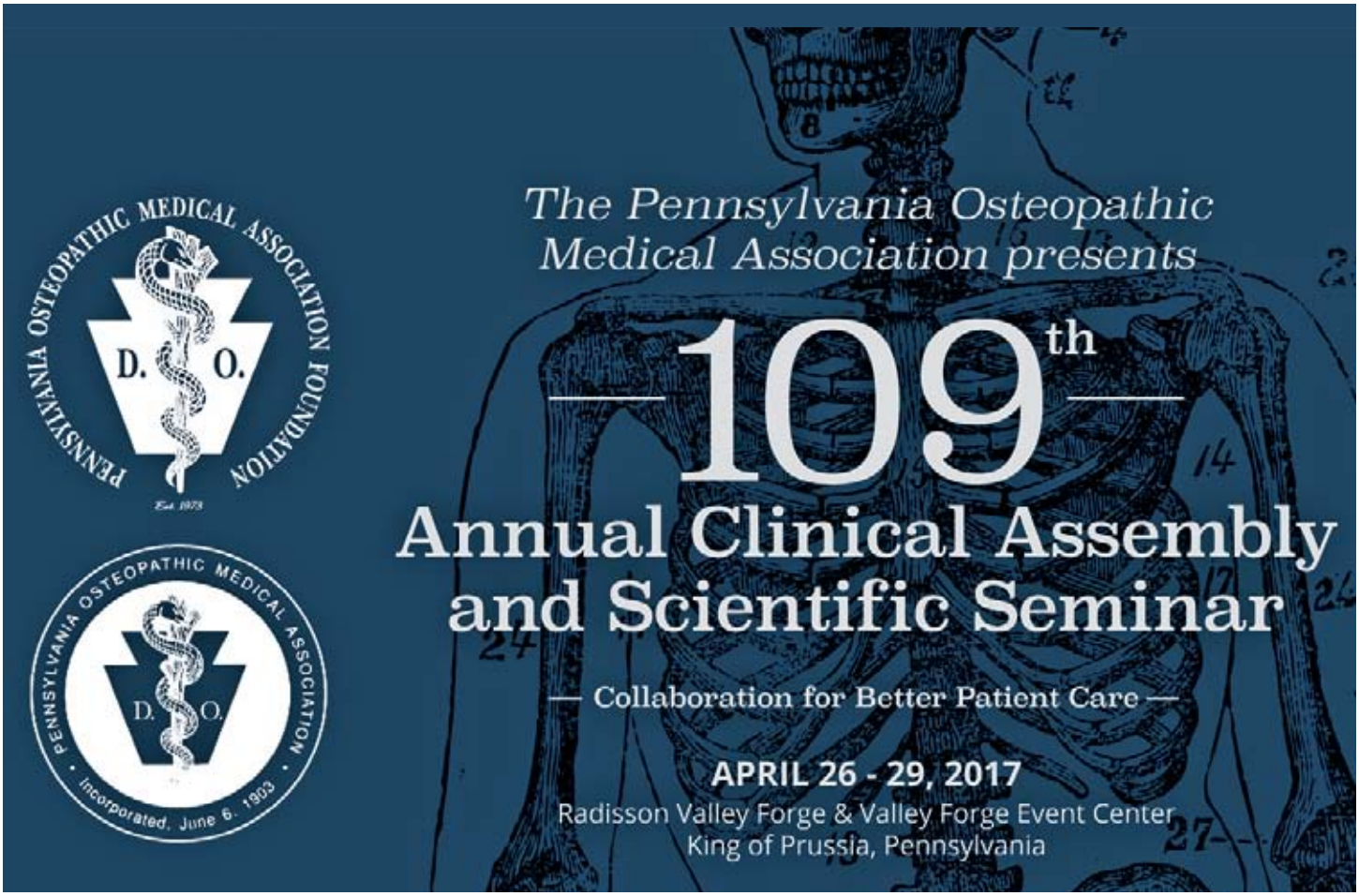


EXHIBIT HOURS

WEDNESDAY, APRIL 26	8:00 AM - 6:30 PM
THURSDAY, APRIL 27	6:30 AM - 6:30 PM
FRIDAY, APRIL 28	6:30 AM - 12:00 PM
SATURDAY, APRIL 29	EXHIBITS CLOSED

SESSION HOURS

WEDNESDAY, APRIL 26	9:00 AM - 10:00 PM
THURSDAY, APRIL 27	7:00 AM - 9:30 PM
FRIDAY, APRIL 28	7:00 AM - 5:15 PM
SATURDAY, APRIL 29	7:00 AM - 5:00 PM

CME Credits Anticipated by Category

Category 1A* (lectures/workshops)	34 credits
Category 1B (audiovisuals)	6 credits
TOTAL CREDITS	**40 credits**

* Program includes patient safety/risk management sessions applicable to Pennsylvania

Questions? Call the POMA Central Office and a staff member will gladly assist you:
717.939.9318 or call toll-free in Pennsylvania **800.544.POMA** | fax: **717.939.7255** | email: **poma@poma.org**

POMA Central Office | 1330 Eisenhower Boulevard, Suite 100 | Harrisburg, PA 17111-2319

The POMA is a divisional society of the American Osteopathic Association | The POMA Foundation is an AOA-accredited continuing medical education sponsor

POMA 109th Annu
April 26-29, 2017 •

WEDNESDAY, APRIL 26

REGISTRATION	New Jersey Room	8:00 AM – 6:30 PM
EXHIBITS	Pennsylvania Room	8:00 AM – 6:30 PM
BREAKFAST	Pennsylvania Room	8:00 AM – 9:00 AM
S. LAWRENCE KOPLOVITZ, D.O., KEYNOTE ADDRESS - Rachel L. Levine, M.D. ***Pennsylvania's Response to Combat the Opioid Crisis*** (PS)	Delaware Room	9:00 AM – 10:30 AM
MICHAEL F. AVALLONE, D.O., OPENING SESSION - POMA Leadership ***POMA on the Move – The Future of POMA in the Osteopathic Profession***	Delaware Room	10:30 AM – 12:00 PM
BASIC LIFE SUPPORT FOR PHYSICIANS - John W. Becher, D.O., and staff	Parkview Ballroom	9:00 AM – 1:00 PM
BREAK – EXHIBITS	Pennsylvania Room	12:00 PM – 1:00 PM
A FULL REVIEW OF CARDIAC RISK FACTORS - Rujul Patel, D.O.	Delaware Room	1:00 PM – 2:00 PM
INHERITED CARDIOMYOPATHY AND THE NEED FOR GENETIC TESTING - Anjali Tiku Owens, M.D.	Delaware Room	2:00 PM – 3:00 PM
BREAK – EXHIBITS	Pennsylvania Room	3:00 PM – 3:30 PM
OSTEOPATHIC COMMENT IN CARDIOLOGY - Jennifer A. Lorine, D.O.	Delaware Room	3:30 PM – 3:45 PM
UP-TO-DATE ON CONGESTIVE HEART FAILURE - Joyce W. Wald, D.O.	Delaware Room	3:45 PM – 4:45 PM
VENOUS INSUFFICIENCY IN 2017: INTERVENTIONAL AND MEDICAL MANAGEMENT - Bryan W. Kluck, D.O.	Delaware Room	4:45 PM – 5:30 PM
TAVR: A CARDIOTHORACIC SURGEON'S PERSPECTIVE - Wilson Y. Szeto, M.D.	Delaware Room	5:30 PM – 6:30 PM
AUDIOVISUALS	Juniper & Maple	7:00 PM – 10:00 PM

THURSDAY, APRIL 27

REGISTRATION	New Jersey Room	6:30 AM – 6:30 PM
EXHIBITS	Pennsylvania Room	6:30 AM – 6:30 PM
BREAKFAST	Pennsylvania Room	6:30 AM – 7:00 AM
ENDOCRINE SESSION INTRODUCTION - Jeffrey S. Freeman D.O.	Delaware Room	7:00 AM – 7:15 AM
THYROID NODULE DISEASE - Marc A. Vengrove, D.O.	Delaware Room	7:15 AM – 8:00 AM
POSTMENOPAUSAL OSTEOPOROSIS - Barry Jacobson, M.D.	Delaware Room	8:00 AM – 8:45 AM
Q&A PANEL DISCUSSION	Delaware Room	8:45 AM – 9:15 AM
BREAK – EXHIBITS	Pennsylvania Room	9:15 AM – 9:45 AM
OSTEOPATHIC COMMENT IN ENDOCRINOLOGY - Jennifer A. Lorine, D.O.	Delaware Room	9:45 AM – 10:00 AM
MIXED HYPERLIPIDEMIA TREATMENT WITH CORONARY DISEASE - Ronald A. Codario, M.D.	Delaware Room	10:00 AM – 10:45 AM
CURRENT TREATMENT MODALITIES FOR TYPE 2 DIABETES - Jeffrey S. Freeman, D.O.	Delaware Room	10:45 AM – 11:30 AM
Q&A PANEL DISCUSSION	Delaware Room	11:30 AM – 12:00 PM
LUNCHEON - Sponsored by Novartis Pharmaceuticals Corporation	The Venue	12:15 PM – 1:15 PM
ACUTE TO CHRONIC PAIN AND ADDICTION - MANAGING PATIENTS ACROSS THE OPIOID TREATMENT SPECTRUM: PART I (PS) - John N. Boll, D.O.	Delaware Room	1:30 PM – 2:30 PM
ACUTE TO CHRONIC PAIN AND ADDICTION - MANAGING PATIENTS ACROSS THE OPIOID TREATMENT SPECTRUM: PART II (PS) - Bradley J. Miller, D.O.	Delaware Room	2:30 PM – 3:30 PM
BREAK – EXHIBITS	Pennsylvania Room	3:30 PM – 4:00 PM
OSTEOPATHIC COMMENT IN PAIN MANAGEMENT - Jennifer A. Lorine, D.O.	Delaware Room	4:00 PM – 4:15 PM
MEDICAL MARIJUANA: REQUIREMENTS AND PROCESSES FOR PRACTICE (PS) - Susan B. Orr, Esq.	Delaware Room	4:15 PM – 5:00 PM
Q&A PANEL DISCUSSION	Delaware Room	5:00 PM – 5:30 PM
COMMON CAUSES OF LOWER EXTREMITY PAIN - Erik G. Polan, D.O.	Delaware Room	5:30 PM – 6:15 PM
AUDIOVISUALS	Juniper & Maple	6:30 PM – 9:30 PM

ual Clinical Assembly
Schedule of Events

FRIDAY, APRIL 28

REGISTRATION	New Jersey Room	6:30 AM – 5:00 PM
EXHIBITS	Pennsylvania Room	6:30 AM – 12:00 PM
BREAKFAST	Pennsylvania Room	6:30 AM – 7:00 AM
COMMON PROBLEMS IN PEDIATRIC GASTROENTEROLOGY - Paul J. Ufberg, D.O.	Delaware Room	7:00 AM – 7:45 AM
PEDIATRIC SLEEP DISORDERS - Anne Marie Morse, D.O.	Delaware Room	7:45 AM – 8:30 AM
ORAL CANCERS IN YOUNG ADULTS - Jacob A. Troutman, D.O.	Delaware Room	8:30 AM – 9:15 AM
BREAK – EXHIBITS	Pennsylvania Room	9:15 AM – 9:45 AM
SUICIDE AND TEENS - Paul W. Kettlewell, Ph.D.	Delaware Room	9:45 AM – 10:30 AM
GENETICS IN PRIMARY CARE - Andrea Seeley, M.D.	Delaware Room	10:30 AM – 11:15 AM
OSTEOPATHIC COMMENT IN PEDIATRICS - Glenn Klucka, D.O.	Delaware Room	11:15 AM – 12:00 PM
ACOFP/POFPS LUNCHEON - Sponsored by Legally Mine, LLC	The Venue	12:15 PM – 1:15 PM
OMM WORKSHOP - Alexander S. Nicholas, D.O., and staff	Parkview Ballroom	1:30 PM – 4:30 PM
DEMENTIA - Michael E. Srulevich, D.O.	Delaware Room	1:30 PM – 2:15 PM
PHYSICIAN WELL-BEING - Scott Glassman, Psy.D.	Delaware Room	2:15 PM – 3:00 PM
INSOMNIA - Bradley Rosenfield, Psy.D.	Delaware Room	3:00 PM – 3:45 PM
POST-TRAUMATIC STRESS DISORDER - Stephanie Felgoise, Ph.D.	Delaware Room	3:45 PM – 4:30 PM
SEXUAL DYSFUNCTION - Darlene M. Gaynor-Krupnick, D.O., and Stephanie Felgoise, Ph.D.	Delaware Room	4:30 PM – 5:15 PM

SATURDAY, APRIL 29

REGISTRATION	New Jersey Room	7:00 AM – 12:00PM
BREAKFAST	Pennsylvania Room	6:30 AM – 7:00 AM
POPULATION MEDICINE WITH AN INTRODUCTION TO MACRA - Dyanne P. Westerberg, D.O.	Delaware Room	7:00 AM – 8:00 AM
IMMUNOLOGY OF LUNG CANCER - Hossein Borghaei, D.O.	Delaware Room	8:00 AM – 9:00 AM
ADVANCE CARE PLANNING AND END-OF-LIFE CARE - Stanley J. Savinese, D.O.	Delaware Room	9:00 AM – 10:00 AM
SOCIAL MEDIA IN HEALTH CARE: WHERE ARE WE NOW AND WHERE ARE WE GOING? - Richard E. Moses, D.O., J.D.	Delaware Room	10:00 AM – 11:00 AM
ADVANCEMENTS AND UPDATES IN HEMATOLOGY AND ONCOLOGY - Pamela Crilley, D.O.	Delaware Room	11:00 AM – 12:00 PM
LUNCHEON - Sponsored by AstraZeneca Pharmaceuticals, LP	Pennsylvania Room	12:00 PM – 1:00 PM
IMPAIRED PHYSICIANS: PATIENT SAFETY, PROVIDER WELFARE AND CLAIMS DEFENSE (PS) - Paula G. Snyder, R.N.	Delaware Room	1:00 PM – 2:00 PM
FLORIDA LAWS AND RULES (PS and FL) - Blank Rome, LLP	Delaware Room	2:00 PM – 3:00 PM
CHILD ABUSE RECOGNITION AND REPORTING (ACT 31) - Frank P. Cervone, Esq., Meghan Johnson, MPH	Delaware Room	3:00 PM – 5:00 PM

Follow POMA on Social Media	
facebook	@POMADOs
twitter	@POMA_DOs
LinkedIn	Pennsylvania Osteopathic Medical Association (POMA)

Pennsylvania Osteopathic Medical Association

109th Annual Clinical Assembly and Scientific Seminar Registration Form
April 26-29, 2017 | Radisson Valley Forge & Valley Forge Event Center, King of Prussia, PA

Mail or Fax completed registration form to:
POMA | 1330 Eisenhower Blvd., STE 100 | Harrisburg PA 17111-2319
fax 717.939.7255

OR

REGISTER ONLINE AT WWW.POMA.ORG

1 REGISTRATION INFORMATION

NAME _____ AOA NUMBER _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____ PHONE (_____) _____

EMAIL _____ COM/GRAD YEAR _____ SPECIALTY _____

2 REGISTRATION TYPE

	before 4/1	4/1 - 4/21	On-Site
PHYSICIAN			
☐ D.O., M.D. Active or Life Member of POMA or Respective State Association	$445	$495	$545
☐ Life Member of POMA or Retired Physician – No CME Awarded - Sponsored by POMA	$0	$0	$0
☐ D.O., M.D. Non-member of POMA or Respective State Association	$820	$870	$920
RESIDENT/STUDENT			
☐ Osteopathic Resident	$50	$50	$50
☐ Osteopathic Student	$0	$0	$0
OTHER			
☐ Allied Health Professionals (P.A., C.R.N.P., C.R.N.A., etc.)	$445	$495	$545
☐ Pratice Manager/Administrator (*registered physician name* _____)	$50	$50	$50

3 OPTIONAL BLS REGISTRATION

REGISTRATION DEADLINE APRIL 1, 2017

Basic Life Support (BLS) for Physicians Course (Wednesday, April 26 9:00 AM - 1:00 PM)
This course provides an opportunity to refresh your skills in foreign body airway obstruction and CPR for victims of all ages (including ventilation with a barrier device and bag-valve-mask) and the use of an automated external defibrillator (AED), all in an American Heart Association (AHA) course led by AHA-certified instructors and state-of-the-art equipment.

☐ **I would like to register for the BLS for Physicians Course** **$75**

BLS for Healthcare Providers course materials will be sent immediately after the registration deadline (pocket mask will be distributed during the course/lecture)
Participants in the BLS course MUST be registered for the POMA Clinical Assembly. Registration deadline is April 1, 2017

4 PAYMENT METHOD

POMA OFFICE USE ONLY Check No. _____ Amount _____

CHOOSE ONE

☐ Check made payable to "POMA" ☐ Visa ☐ Mastercard ☐ American Express ☐ Discover

NAME ON CARD _____ CARD NO. _____ EXP ____ / ____ CVV ____

IF BILLING INFO IS DIFFERENT THAN SECTION 1

ADDRESS _____ CITY _____ ST _____ ZIP _____

REGISTRATION FEE TOTAL $

Registrations will be reviewed for accuracy and completeness by POMA prior to approval.

A $50 processing fee will be deducted on cancellations received before April 1, 2017; a $75 processing fee will be deducted on cancellations between April 1 – April 21, 2017. NO REFUNDS will be given AFTER April 21. A grievance policy is included in the Clinical Assembly program booklet.

Additional banquet tickets will be available for purchase at the registration desk.

No CME credits or attendance confirmation will be granted for osteopathic medical students and residents.

ABOUT THE AUTHORS

Sarah A. Beeson, D.O.

Kathleen A. McDonald, D.O.

Sarah A. Beeson, D.O., M.S.Ed. is the author of *"The Need for a Health Promotion and Disease Prevention Curriculum."* A family medicine physician, Dr. Beeson and her husband, Sean Beeson, D.O., serve patients in the Johnson Memorial Health Greenwood (Ind.) Primary Care Center. A graduate of the University of Pikeville-Kentucky College of Osteopathic Medicine, she received her Master's of Science in medical education from the Lake Erie College of Osteopathic Medicine. She also earned a Bachelor's of Science in biochemistry from Rockhurst University in Kansas City, Missouri. Dr. Beeson completed her residency at Millcreek Community Hospital in Erie, where she served as co-chief resident.

Kathleen A. McDonald, D.O., author of *"Metformin-associated Lactic Acidosis in Acute Kidney Injury,"* is an obstetrics and gynecology resident at St. John Macomb in Warren, Michigan. A graduate of the University of Notre Dame, she received her D.O. degree from A.T. Still University — Kirksville College of Osteopathic Medicine, which included clinical rotations in Lancaster and Lititz, Pennsylvania. Dr. McDonald also spent a year before medical school volunteering with the Redeemer Ministry Corps in Philadelphia. She enjoys running, biking, cooking, reading and playing golf.

Index to Advertisers

Attention Physicians...

***The Journal of the POMA* is seeking professional articles from *YOU*!**

Send manuscripts to:
***Journal* Editor**
1330 Eisenhower Boulevard, Suite 100
Harrisburg, PA 17111-2319
or e-mail *publ@poma.org*.

Medical Update
The Need for a Health Promotion and Disease Prevention Curriculum

by Sarah A. Beeson, D.O.

Abstract

Primary care medicine centers on preventive medicine. Key determinants in preventive medicine involve availability and affordability.[5] In order to ensure appropriate health care promotion and disease prevention (HPDP), physicians must be trained in this. Though physicians can readily access key recommendations via the U.S. Preventive Services Task Force (USPSTF) and American Academy of Family Physicians (AAFP) websites, formal training is often overlooked. The purpose of this study was to investigate resident physician compliance of health promotion and disease prevention. Given that Millcreek Community Hospital (MCH) lacks a formal HPDP curriculum, this study investigated the compliance of HPDP strategies and need for implementation of a formal HPDP course. The study was performed via a survey, which was distributed to approximately 81 MCH residents. Of those residents, only 17 completed the survey. The results, though limited, indicated that though most residents were compliant with HPDP strategies, they did indicate benefiting from a formal HPDP curriculum. Future studies will need to address the necessity of a formal HPDP curriculum for specific residency programs and training years.

Introduction

Primary care physicians are at the forefront of preventive medicine. In the last century — specifically the late 1980s and early 1990s — medicine began focusing more on health promotion and disease prevention, in addition to the previous focus of diagnosis and treatment.[1,2] With the push for patient satisfaction, encouraging healthy lifestyles and staying up-to-date with health guidelines is key.[1] Though patients are aware of preventive measures, many do not adhere to such recommendations.[3]

As physicians, our duty is to treat the entire patient, starting with a preventive approach. Evidence suggests that increasing patient education and utilizing reminders aids in the delivery of health care screening.[4] Some may argue with physicians who do not comply to healthy lifestyle behaviors also do not push for such in their practice. Nevertheless, a study by Seong et al.[1] demonstrated that the characteristics and behaviors of physicians do not affect the incorporation of such lifestyle modifications and disease prevention in clinical practice.

The question remains: What does impact the promotion of health and disease prevention in primary care medicine? Availability and affordability are key components.[5] Moreover, the patient-physician relationship and involvement of the patient in his/her health leads to compliance and better health outcomes.[6]

Though health promotion and preventive medicine recommendations are easily accessed via various online sources, including the U.S. Preventive Services Task Force and the American Academy of Family Physicians websites, resident physicians are often unaware and unsure of the instrumental value and use of such guidelines in clinical practice. A study by Jonas[2] demonstrated that though many military residency programs encourage health promotion, such topics and skills are not specifically incorporated into a curriculum. To address this issue, this study will investigate both resident physician compliance of health promotion and disease prevention and necessity of a formal HPDP curriculum at a local community hospital where a formal HPDP curriculum is not in place.

As such, it was hypothesized that Millcreek Community Hospital residents underutilized HPDP strategies and desire a HPDP curriculum for further training.

Methods

A nonrandomized prospective study was completed after IRB approval. Participants included all MCH residents. Participants completed an anonymous survey that was distributed to each of the resident's mailboxes at MCH with an attached addressed envelope to be returned to Sarah Beeson, D.O., via her mailbox. Please see the supporting attached documentation to view the survey. The survey asked questions regarding the different categories of prevention (primary, secondary, tertiary and quaternary). It also asked questions regarding the knowledge and/or practice of various health screening guidelines as per the USPSTF. Specific demographics, such as age and gender, were not included so as to avoid identifying components. Data analysis was performed using Microsoft Excel.

Results

The research project, involving a knowledge and compliance HPDP questionnaire, was distributed to approximately 81 resident physicians at Millcreek Community Hospital. Of the 81 residents, 17 completed the survey. Data analysis was computed using Microsoft Excel for Mac 2011, Version 14.4.8.

The survey responses with corresponding average percentages appear in Figure 1.

Given that only 17 out of 81 resident physicians completed the survey, the results are

Figure 1 (below)

	1 Strongly disagree	2 Disagree	3 Neither agree nor disagree	4 Agree	5 Strongly agree
1. I know the four categories of prevention.	11.76	17.65	11.76	47.06	11.76
2. I routinely screen my patients according to the appropriate guidelines in clinic.	11.76	5.88	11.76	64.71	5.88
3. I counsel and educate my patients on healthy lifestyles at each visit.	5.88	0.00	11.76	58.82	23.53
4. I discuss tobacco cessation, alcohol limitations, weight management and/or diet and exercise at every patient encounter.	11.76	0.00	17.65	70.59	0.00
5. I readily access current screening recommendations from the U.S. Preventive Services Task Force (USPSTF), the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP) and the American College of Physicians.	17.65	35.29	11.76	29.41	5.88
6. I am comfortable applying the evidence-based guidelines for screening and health promotion to specific patients.	11.76	0.00	17.65	58.82	11.76
7. I know the immunization schedule for adults and children.	11.76	23.53	17.65	35.29	11.76
8. I readily access the immunization schedules for adults and children.	11.76	23.53	17.65	29.41	17.65
9. I explain the immunizations, indications and potential adverse effects to all of my patients, each time they are administered.	11.76	11.76	11.76	52.94	11.76
10. I discuss and offer intervention for the prevention of the progression of chronic disease with my patients.	5.88	5.88	23.53	58.82	5.88
11. I assess basic family and relationship dynamics for health promoting vs. health hampering influences.	5.88	11.76	29.41	35.29	17.65
12. I provide an array of strategies (counseling, therapy, exercise and nutrition prescriptions) in implementing health promotion and disease prevention.	5.88	5.88	23.53	58.82	5.88
13. I have a stable and supportive dynamic with my patients.	5.88	0.00	11.76	64.71	17.65

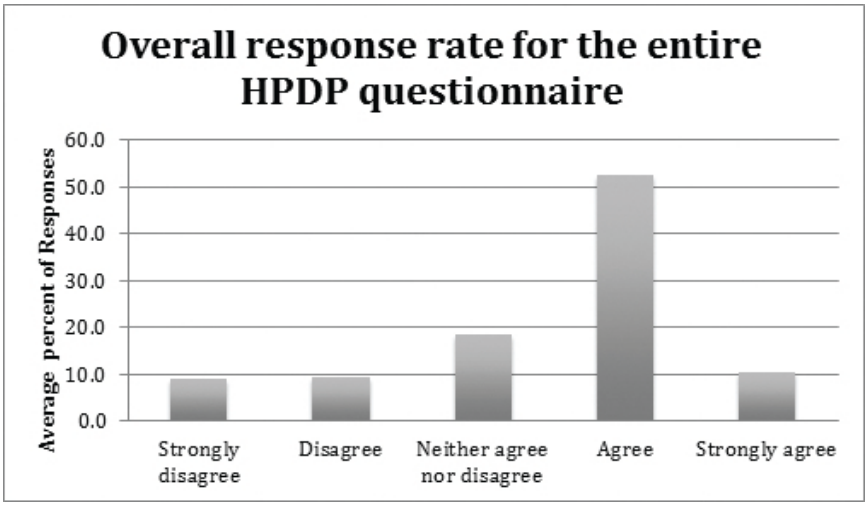
(continued on next page)

14. I routinely read about the latest updates regarding disease prevention.	5.88	11.76	17.65	52.94	11.76
15. I utilize a reminder system for patient follow-up and maintenance.	17.65	11.76	11.76	58.82	0.00
16. I am comfortable discussing health promotion and disease prevention with my patients.	5.88	0.00	11.76	64.71	17.65
17. I model a healthy lifestyle.	0.00	5.88	29.41	52.94	11.76
18. My training prior to this residency program adequately prepared me in health promotion and disease prevention.	11.76	5.88	29.41	41.18	11.76
19. I would benefit from a structured curriculum on health promotion and disease prevention.	5.88	5.88	23.53	58.82	5.88
20. The counseling and patient education attempts provided are effective in the patient population I care for.	5.88	5.88	29.41	58.82	0.00

limited. Nevertheless, the data analysis is summarized as follows. First, the majority of the responses fell in the 'agree' category, with a 53.6 percent response rate as follows (Figure 2).

Additionally, the results of the questionnaire suggest a HPDP curriculum is needed, as 58.82 percent of responders suggested. Interestingly, the highest percentage of resident physicians, that is, 70.59 percent 'agreed' that they discuss tobacco cessation, alcohol limitations, weight management, and/or diet and exercise at every patient encounter. At this point, more data analysis is needed to determine additional relationships as to the trend of respondents. Additional factors to consider in future research include demographics, such as gender, residency program and year of training. Such information would add to the rationale to instill a HPDP curriculum. For now, the data suggests that a HPDP curriculum would benefit said resident physicians.

Figure 2 (below)



Conclusion

The HPDP curriculum survey suggested that MCH residents indicated a need for a formal HPDP curriculum. The studies also showed that resident physicians do address HPDP topics during their patient encounters. The amount of time spent and frequency of discussing HPDP topics was not addressed in this survey. Data was also limited secondary to low completion rate, with a resident response of 21 percent. Moreover, demographics — including sex, residency program, training year — were not addressed. Though including information regarding the residency program would have been beneficial, asking such information with only a 21 percent response rate may result in identifiable issues. Future studies in this field will need to address such issues so as to adequately determine the need for a HPDP curriculum. Moreover, with the physician quality reporting system in place, physicians will be able to access and determine the quality of patient care, which in turn will shed light on various areas needing improvement.

References

1. Seong H, Park E, Cheong Y, Choi E, Kim K, Seo S: Health-promotion and disease-prevention behaviors of primary-care practitioners. *Korean J Family Med* 2014;35:19-27.

2. Jonas WB: Physician health promotion training activities in primary care: a survey of the military residencies. *J Am Board Fam Pract* 1997;10(2):104-110.

3. McAndrews JA, McMullen S, Wilson SL: Four strategies for promoting healthy lifestyles in your practice. *Fam Pract Manag* 2011;18(2):16-20.

4. Chosewood LC: Are your patients getting the preventive services they need? *Fam Pract Manag* 1999;6(1):56-57.

5. Comino EJ, Davies GP, Krastev Y, Hass M, Christl B, Furler J, Raymont A, Harris MF: A systematic review of interventions to enhance access to best practice primary health care for chronic disease management, prevention and episodic care. *BMC Health Serv Res* 2012;12:415.

6. Neuner-Jehl S, Schmid M, Gruninger U: The "health coaching" programme: a new patient-centred and visually supported approach for health behaviour change in primary care. *BMC Fam Pract* 2013;14:100.

7. Bhattarai N, Prevost AT, Wright AJ, Charlton J, Rudisill C, Gullifor MC: Effectiveness of interventions to promote healthy diet in primary care: systematic review and meta-analysis of randomised controlled trials. *BMC Public Health* 2013;13:1203.

8. Corchia C, Mastroiacovo P: Health promotion for child, mothers and families: here's why we should "think about it before conception." *Ital J Pediatr* 2013;39:68.

9. Hesselink AE, Bilo HJG, Jonkers R, Martens M, de Weerdt I, Rutten GEH: A cluster-randomized controlled trial to study the effectiveness of a protocol-based lifestyle program to prevent type 2 diabetes in people with impaired fasting glucose. *BMC Fam Pract* 2013;14:184.

10. Koo D, Thacker SB: The education of physicians: a CDC perspective. *Acad Med* 2008;83(4):399-407.

11. McManus A: Health promotion innovation in primary health care. *Australas Med J* 2013;6(1):15-18.

12. Reynolds JL: Prevention in family practice. *Can Fam Physician* 1983;29:2331-2334.

.

PCOM STUDENT'S VOICE

(continued from page 8)

Bibliography

1. Cates-Carney C: Lifesaving flights can come with life-changing bills. Retrieved from *http://www.npr.org/sections/health-shots/2016/01/18/460848383/lifesaving-flights-can-come-with-life-changing-bills*.

2. Eavis P: Air ambulances offer a lifeline, and then a sky-high bill. Retrieved from *https://www.nytimes.com/2015/05/06/business/rescued-by-an-air-ambulance-but-stunned-at-the-sky-high-bill.html*.

3. Hsia RY, et al: Health care as a 'market good?': appendicitis as a case study. *Arch Intern Med* 2012;172(10):818-819.

4. American Hospital Association: Hospital billing explained. Retrieved from *http://www.aha.org/content/13/hospbill-explain.pdf*.

5. Shih A, et al: Organizing the US health care delivery system for high performance. *The Commonwealth Fund* 2008;xi.

Medical Update
Metformin-associated Lactic Acidosis in Acute Kidney Injury

by Kathleen A. McDonald, D.O.

Abstract

This case examines the presentation, diagnosis and treatment of a 70-year-old female with non-insulin dependent type 2 diabetes who presented with acute onset of confusion, lethargy and general weakness after two days of feeling generally unwell, with decreased oral intake. She was unable to provide a detailed history due to her altered mental status, but labs revealed metabolic gap acidosis, decreased kidney function and elevated lactic acid level in the presence of metformin use, suggesting a diagnosis of metformin-associated lactic acidosis. This was secondary to an acute kidney injury as a result of intravascular dehydration due to a pan-sensitive *E. coli* urinary tract infection. The patient was admitted to the ICU, intubated due to respiratory distress, and treated with continuous renal replacement therapy. After correcting the acidosis, the patient was extubated and her kidney function gradually improved, though it never returned to normal levels. Metformin is contraindicated for patients with chronic conditions associated with systemic hypoxemia, mainly renal dysfunction, but acute disease processes can also put patients at risk for developing metformin-associated lactic acidosis.

Introduction

Type 2 diabetes has reached almost epidemic proportions in the United States. According to the CDC's National Diabetes Statistics Report, 29.1 million Americans are living with the condition. More than 90-95 percent of those patients are diagnosed with type 2 diabetes, where the body cannot properly utilize insulin, and the majority use only oral medications as the primary treatment.[1] Metformin, tradename Glucophage, is a first-line oral medication for the treatment of type 2 diabetes mellitus and one of the most often prescribed due to its ability to reduce subsequent treatment intensification.[2] It has been proven to lower blood glucose levels and reduce complications from diabetes. There has been debate in the medical community over whether the use of metformin can cause a lactic acidosis in patients with significant co-morbidities such as renal dysfunction, liver disease or cardiac failure. However, any acute disease process that causes systemic hypoxemia can put a patient at risk.[3] A diagnosis of metformin-associated lactic acidosis (MALA) is one of exclusion, supported by a high metabolic anion gap, a lactic acid level >5 mmol/L, a serum pH <7.35 and history of metformin use.[3,4] Treatment is continuous renal replacement therapy and supportive measures, as the patient is usually hypoxemic and/or septic.[5,6]

History

S.M. is a 70-year-old female who presented to the Emergency Department with confusion, general weakness and lethargy. She had experienced two days of gradually worsening vomiting and diarrhea with decreased oral intake and nonspecific upper respiratory infection symptoms. The acute onset of weakness, lethargy and confusion prompted her husband to bring her to the ER. She was unable to provide much history per her confusion. She had no prior symptoms in the past. Her husband explained that she is a non-insulin dependent type 2 diabetic and had continued to take her medications despite not feeling well. The remainder of her past medical history and home medications were unknown. She was up to date on her influenza and pneumococcal vaccinations. The patient was known to be a non-smoker. Family history was non-contributory due to age.

Review of Systems

A limited review of systems was documented due to the patient's altered mental status. She was positive for poor oral intake and negative for fever. She was positive for nausea, vomiting and diarrhea, but negative for abdominal pain. The remaining review of systems was unobtainable.

Physical Exam

Initial physical examination revealed a blood pressure of 100/50 mmHg, pulse of 70 beats per minute, respiratory rate of 12, and oxygen saturation 98 percent on room air. She was severely hypothermic at 32.4 degrees Celsius. The patient was very ill appearing and oriented to person, but not time or situation. A neurological exam was nonfocal though the patient was lethargic. Her pupils were equal and sluggishly reactive to light and accommodation. There was no scleral icterus and the conjunctivae were pink. Examination revealed very dry mucous membranes and intact dentition. Her thyroid was normal size and hearing was grossly normal. The cardiac examination was normal with a regular heart rhythm and rate with no murmurs, rubs or gallops. The patient's lungs were clear to auscultation bilaterally with no wheezes, rales or ronchi, but she demonstrated labored breathing with asymmetrical chest movement. Her abdomen was soft, nontender, and nondistended with no visceromegaly. The patient had normal spine alignment, and mild costovertebral angle tenderness was noted bilaterally. Skin was warm and dry with no rashes or suspicious lesions. Movement was noted in all four extremities but her gait was unable to be assessed at the time. An osteopathic exam was not performed due to the acute presentation of the patient.

Differential Diagnosis, Diagnostic Findings and Initial Plan

The differential diagnosis included stroke, sepsis, hypoglycemia, hypothermia, hyponatremia, metabolic acidosis, acute renal failure and toxic metabolic encephalopathy of unclear origin. Due to her acute presentation and initial labs, she was admitted to the Intensive Care Unit soon after arriving to the hospital.

S.M.'s blood glucose level in the Emergency Department was 29 mg/dL, and a bolus of 50 mL Dextrose 50 percent in water was administered. Her glucose then corrected to 186 mg/dL. She was given a bolus of 1 liter 0.9 percent normal saline for fluid resuscitation and it was continued at 125 ml/hr. An infusion of norepinephrine was given to correct her hypotension through the IV line in the patient's right arm, but it infiltrated her tissue and the site could not be used. Therefore, a right femoral central venous catheter was placed. Her blood pressure remained low despite fluids, so epineprhine and norepinephrine drips were initiated. The patient started to experience respiratory distress with oxygen saturation dropping to 70 percent. She was intubated and placed on assist control ventilation.

Initial labs suggested an acute kidney injury based on a blood urea nitrogen level of 90 mg/dL (normal range 8.0-26.0 mg/dL), a creatinine of 8.4 mg/dL (0.4-1.0 mg/dL), and estimated glomerular filtration rate of 5.0. The patient's anion gap was elevated at 41 and, along with an extremely low blood pH of 6.52 (7.35-7.45), a bicarbonate level less than 5 mmol/L (22-32 mmol/L), and a $PaCO_2$ of 14 mmHg (35-45 mmHg), indicated a metabolic gap acidosis. 200 mmols of sodium bicarbonate in 400 mL of sterile water were administered to correct the severe acidemia. A trialysis catheter was placed in anticipation of continuous renal replacement therapy (CRRT) to dialyze the patient. The nephrologist was consulted and requested a lactic acid level measure, which came back at 20 mmol/L, a critically high amount. This nearly fully accounted for the patient's anion gap.

The complete blood count revealed a slightly elevated white blood cell and platelet counts of 13.7 K/μL (3.95-11.35 K/μL) and 408 K/μL (150-400 K/μL), and a normal hemoglobin and hematocrit of 14.2 g/dL and 43.6 percent, respectively. Cultures from blood and urine were obtained to rule-out an infectious cause, and 1 gram of ceftriaxone was given through the patient's IV for a suspected infection of unknown origin. Toxicology labs revealed no indications of overdose for any substance, including aspirin and acetaminophen.

A chest X-ray showed no acute cardiopulmonary process and an EKG revealed sinus rhythm with somewhat hyperacute T-waves. The troponin level was less than 0.02, effectively ruling out any acute cardiac pathology. The patient had a history of hypertension, so an echocardiogram was ordered to evaluate heart function, but showed no significant pathology other than mild mitral stenosis. Left ventricular systolic function was well preserved with an ejection fraction of 60-65 percent.

Final Diagnosis and Management Plan

S.M.'s condition stabilized after initial treatment in the ICU. Her temperature and blood pressure increased to 35.2 degrees Celsius and 107/84 mmHg within 12 hours of admission. The patient responded very well to CRRT and her labs reflected a significant improvement in kidney function, with creatinine stabilizing to

1.3 mg/dL. Her husband brought in the list of her home medications and it was revealed she had been taking metformin 850 mg per oral twice a day for her non-insulin dependent diabetes, lisinopril 40 mg per oral once a day for hypertension, and atorvostatin 20 mg per oral once a day for hypercholesterolemia. The use of metformin raised suspicion for metformin-associated lactic acidosis as a possible cause of the patient's initial presentation.

S.M.'s urine culture was positive for *E. coli* and sensitive to all antibiotics. In conjunction with her non-specific symptoms prior to presentation, and a urinary analysis positive for leukocyte esterase, bacteria and white blood cells, this most likely indicated a urinary tract infection as the inciting event. The ceftriaxone had been changed to vancomycin and piperacillin/tazobactam to cover for both gram-positive and -negative organisms. These were then switched to levofloxacin, as it had the smallest minimum inhibitory concentration.

The patient remained in the ICU for five days and her condition gradually improved. She regained full consciousness and there were no acute neurological deficits noted in the following days. S.M. was weaned off of ventilation to 2 liters of oxygen via nasal cannula and then to room air. She was also taken off vasopressors once her blood pressure returned to a normal range. The patient was eventually transferred to the progressive care unit and then to the main hospital floor. Her creatinine remained elevated throughout her stay in the hospital, ranging from 1.3 to 4.4 mg/dL. This prompted the nephrologist to investigate further renal complications. His evaluation of a urinary analysis two weeks after her admission suggested acute tubular necrosis, though it may have been residual from her prior kidney injury. He did assess that there was no allergic instertitial nephritis or other intrinsic renal complications.

S.M.'s final diagnosis was severe metabolic lactic acidosis secondary to continued metformin use in the setting of dehydration from poor oral intake due to a pan-sensitive urinary tract infection. She also met the criteria for severe sepsis based on her initial presentation of hypothermia and $PaCO_2$ less than 32 mmHg (2 of the 4 SIRS criteria), a source of infection based on the urinary tract infection (sepsis criteria), and lactic acidosis (severe sepsis criteria).

Unfortunately, several issues complicated S.M.'s stay in the hospital. The infiltration of norepinephrine in her right forearm further worsened and a consult was requested with wound care and plastic surgery. The surgeon proceeded with debridement of the skin from the right forearm with a skin graft from the right thigh. She also developed acute anemia, with a hemoglobin level of 6.0 g/dL, on her 20th day in the hospital. She received one unit of packed red blood cells and her hemoglobin corrected to 9.1 g/dL within 24 hours. There was also concern about the management of S.M.'s blood sugars, as they ranged from the high 50s to the 300s at times. She was placed on a sliding scale insulin regimen in addition to long-acting insulin during her hospital admission in order to control her blood glucose levels. At the time of submission, the patient is still in the hospital for further post-operative care and management of her renal injury and anemia

Discussion and Conclusion

Lactic acidosis occurs in a state of hypoxia, when inadequate levels of oxygen prevent mitochondria from completing oxidative phosphorylation to produce ATP. In these states, cellular metabolism switches to anaerobic glycolysis and the excess pyruvate, normally broken down into water and carbon dioxide in the Krebs cycle, is converted into lactate. The lactate is released from cells and accumulates in the bloodstream. Excess hydrogen cations are created from ATP hydrolysis, which drives the glycolysis reaction; this increased concentration cause acidosis. There are several types of lactic acidosis according to the Cohen-Woods classification:[7]

- Type A: Decreased perfusion or oxygenation
- Type B
  - B1: Underlying disease (sometimes causing type A)
  - B2: Medication or intoxication
  - B3: Inborn error of metabolism

Based on S.M.'s case, she most likely had a combination of B1, a urinary tract infection and/or pyelonephritis, and B2, continued metformin use, which contributed to Type A, a hypoxic and hypoperfused septic state.

Metformin, tradename Glucophage, is a biguanide drug that decreases the hepatic gluconeogenesis through the mild inhibition of the mitochondrial respiratory-chain complex 1, providing an anti-hyperglycemic mechanism of action.[8] The drug is renally cleared and has a short half-life of six hours. There is a black box warning on the metformin medication for lactic acidosis, and it is contraindicated in patients with decreased renal clearance, defined as a creatinine >1.5 mg/dL in males

and >1.4 mg/dL in females.[9] The concern for lactic acidosis and metformin stems from an earlier biguanide, phenformin hydochloride. It was withdrawn from the U.S. pharmaceutical market in the late 1970s due to its reported rate of 40 to 64 cases of lactic acidosis per 100,00 patient years.[10] Its mechanism of action differs from metformin by impairing oxidation phosphorylation in the liver, which increases lactate production through anaerobic pathways.[11]

There is debate in the medical community over whether metformin-associated lactic acidosis definitively exists. It is a rare condition with an estimated prevalence of one to five cases per 100,000 patient years, based on initial reports,[12] but there have been no studies that prove metformin directly causes lactic acidosis or that its accumulation correlates with mortality.[13] Mortality from lactic acidosis, which can reach upwards of 50 percent,[14] is rather predicted by the severity of the underlying hypoxia.[15] Metformin should, therefore, be discontinued in a hypoxic state, whether acute or chronic.

In examining the patient's case, she had not been feeling well for some time, most likely due to her urinary tract infection. It wasn't clinically established if she had progressed to pyelonephritis, but the CVA tenderness upon admission to the emergency department, hypothermia, and decreased carbon dioxide levels, suggest as much. This was in addition to her symptoms of nausea, vomiting and diarrhea for up to a week prior to presentation in the hospital. The loss of fluid decreased her intravascular volume and she became dehydrated, effectively causing a prerenal acute kidney injury. Since the patient continued to take her medications, metformin accumulated and, in addition to the lactate, could not be renally cleared. Whether the increased metformin levels contributed to the lactic acidosis is still not understood. It can be hypothesized that the increased load of metformin added to the hypoxic stress of the kidneys in their already hypoperfused state. It was difficult to diagnose the patient's extent of renal injury since a baseline creatinine was not known. In reviewing her case, there was no documentation of communication with her primary care physician to assess her normal lab values. As an aside, the patient's hypothermia possibly contributed to neuroprotection.[16]

The question now is how to approach the non-insulin dependent type 2 diabetic patient who may have risk factors for developing lactic acidosis, but would benefit from taking metformin. It has been suggested that the number of patients taking metformin is too low based on the conservative prescribing practices prevalent today, and that many more could benefit from the medication.[17] Two groups of researchers have filed separate petitions to the FDA in order to loosen the restrictions of prescribing metformin to diabetic patients with mild-to-moderate chronic kidney disease and, instead of serum creatinine levels, to use estimated glomerular filtration rates for risk assessment.[18] One argument is that most of the observational data, as there are no randomized controlled trials, confirms the overall safety profile of metformin in mild-to-moderate CKD patients.[19] As lactic acidosis has already been proven to be a rare event, with or without the presence of metformin, a new set of recommendations has been proposed for the withdrawal of metformin in the *British Medical Journal*:[20]

Suggested revised contraindications and guidelines for withdrawing metformin:

- Stop if serum concentration of creatinine is higher than 150 mmol/l.*
- Withdraw during periods of suspected tissue hypoxia (for example, due to myocardial infarction, sepsis).
- Withdraw for three days after contrast medium containing iodine has been given, and start treatment with metformin only after renal function has been checked.
- Withdraw two days before general anesthesia and reinstate when renal function is stable.
- Any concentration of creatinine that is chosen as a cut-off point for renal failure will be arbitrary in view of individual patients' muscle mass and protein turnover, and caution should, therefore, be used in prescribing metformin for elderly patients. This at least avoids non-specific and unhelpful terms such as renal insufficiency or renal impairment.

Patient education would be paramount if these guidelines were to be implemented. Diabetic patients taking metformin should understand the risks involved and be instructed to cease taking the medication if they are feeling unwell, have increased fluid loss or decreased oral intake. This information may prevent admission to the hospital and the ensuing complications.

References

1. Centers for Disease Control and Prevention. *National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States*, 2014. Atlanta, Georgia, Department of Health and Human Services, 2014.

2. Berkowitz SA, Krumme AA, Avorn J, et al: Initial choice of oral glucose-lowering medication for diabetes mellitus: a patient-centered comparative effectiveness study. *JAMA Intern Med* 2014;174(12):1955-1962.

3. Ncomanzi D, Sicat RM, Sundararajan K: Metformin-associated lactic acidosis presenting as an ischemic gut in a patient who then survived a cardiac arrest: a case report. *J Med Case Rep* 2014;8:159.

4. Misbin RI, Green L, Stadel BV, et al: Lactic acidosis in patients with diabetes treated with metformin. *N Engl J Med* 1998;338:265-266.

5. Alivanis P, Giannikouris I, Paliuras C, Arvanitis A, Volanaki M, Zervos A: Metformin-associated lactic acidosis treated with continuous renal replacement therapy. *Clin Ther* 2006;28(3):396-400.

6. Dichtwald S, Weinbroum AA, Sorkine P, Ekstein MP, Dahan E: Metformin-associated lactic acidosis following acute kidney injury. Efficacious treatment with continuous renal replacement therapy. *Diabet Med* 2012;29(2):245-250.

7. Woods HF, Cohen R: *Clinical and Biochemical Aspects of Lactic Acidosis*. Oxford, Blackwell Scientific, 1976.

8. Viollet B, Guigas B, Sanz Garcia N, Leclerc J, Foretz M, Andreelli F: Cellular and molecular mechanisms of metformin: an overview. *Clin Sci* 2012;122(6):253-270.

9. Metformin (generic) contraindications/cautions. Retrieved January 28, 2016, from *https://online.epocrates.com/drugs/78703/metformin/contradindications-cautions*.

10. Stang M, Wysowski DK, Butler-Jones D: Incidence of lactic acidosis in metformin users. *Diabetes Care* 1999;22(6):925-927.

11. Stumvoll M, Nurjhan N, Perriello G, Dailey G, Gerich JE: Metabolic effects of metformin in non-insulin-dependent diabetes mellitus. *N Engl J Med* 1995;333(9):550-554.

12. Brown JB, Pedula K, Barzilay J, Herson MK, Latare P: Lactic acidosis rates in type 2 diabetes. *Diabetes Care* 1998; 21(10):1659-1663.

13. Salpeter SR, Greyber E, Pasternak GA, Salpeter EE: Risk of fatal and nonfatal lactic acidosis with metformin use in type 2 diabetes mellitus: systematic review and meta-analysis. *Arch Intern Med* 2003;163(21):2594-2602.

14. Blow O, Magliore L, Claridge J, Butler K, Young J: The golden hour and the silver day: detection and correction of occult hypoperfusion within 24 hours improves outcome from major trauma. *J Trauma* 1999;47(5):964-969.

15. Lalau JD, Lacroix C, De Cagny B, Fournier A: Metformin-associated lactic acidosis in diabetic patients with acute renal failure. A critical analysis of its pathogenesis and prognosis. *Nephrol Dial Transplant* 1994;9(S4):126-129.

16. Reeker W, Schneider G, Felgehnaur N, Tempel G, Kochs E: Metformin-induced lactic acidosis. *Dtsch Med Wochenschr* 2000;125(9):249-251.

17. DeFronzo R, Fleming GA, Chen K, Bicsak TA: Metformin-associated lactic acidosis: current perspectives on causes and risk. *Metabolism* 2016;65(2):20-29.

18. Fiore K: Should FDA change metformin's black box warning? Kidney risk may be overstated. MedPage Today. 2015. Retrieved January 29, 2016, from *http://www.medpagetoday.com/endocrinology/diabetes/49431*.

19. Inzucchi SE, Lipska KJ, Mayo H, Bailey CJ, McGuire DK: Metformin in patients with type 2 diabetes and kidney disease: a systematic review. *JAMA* 2014;312(24):2668-2675.

20. Jones GC, Macklin JP, Alexander WD. Contraindications to the use of metformin: evidence suggests that it is time to amend the list. *BMJ* 2003;326(7379):4-5.

OUT OF MY MIND

Samuel J. Garloff, D.O.

Samuel J. Garloff, D.O.

Those who do not remember the past are condemned to repeat it — George Santayana.

Periodically I am informed by my colleagues that psychiatry is approaching obsolescence in the modern era of medicine. Nonsense. The lessons of psychiatry are replete in the literature of mankind. This is especially true to the student of history.

Consider Georg Wilhelm Friedrich Hegel. Hegel was born in 1770 and died in 1831. He was a German philosopher who approached the progress of history in philosophical terms. Many believe his philosophy was brought about by reading Immanuel Kant. Hegel published four main books: *Phenomenology of Mind, Science of Logic*, *Encyclopedia of the Philosophical Sciences* and *Elements of the Philosophy of Right*.

His early background was steeped in religion. In essence, he believed that all human activities are defined by their history and must be understood through that prism. To understand why a person is the way he is, you must study that person in the society they live in and understand the history of that society.

His was an attempt to combine the spiritual and the rational. Subsequently, his followers developed what is known as the Hegelian dialectic. Simply put: thesis, antithesis and synthesis. His works eventually became the cornerstone for Marxist philosophy as after Hegel died, his followers divided into Old Hegelians (conservative, right wing) and Young Hegelians (radical, left-wing). The Old faction was deeply Christian, the Young faction was not. Surely the parallels with modern American society may be seen.

Enter Alexi de Tocqueville, born 1805, died 1859. Tocqueville was a French sociologist and political theorist. In 1831, he came to the United States to study our prison system. In Pennsylvania, he spent a week interviewing all the prisoners in the Eastern State Penitentiary. As he traveled the country east to west and north to south to fulfill his assignment, he became enamored of this nation. Upon his return to France, he published his prison report, and later, *Democracy in America.* Eventually, he published four volumes. The second volume is most relevant in this discussion.

He was impressed that even though America consisted of the rich and the poor, the educated and the uneducated, the philosophy was that anyone could reach their full potential due to the freedoms granted in the Constitution. He was also puzzled by the fact that freedoms existed in a country that allowed slavery and abused indigenous Americans.

He did, however, caution us about the tyranny of the masses. His fear for democracy was simply that acceptance of majority rule would lead to minority opinion and the individual becoming inconsequential and eventually ignored. He concluded that the true essence of American life and philosophy was based in the power of its churches as much or more than the Constitution. He was heartened by the fact that the American experiment was blossoming at the same time the dark side of Hegelian philosophy was growing in Europe.

Congratulations if you have kept reading. Hopefully it can be seen that the troubles of mankind persist today as they did hundreds of years past. We have grown technologically, intellectually and physically. The struggle of democracy versus Marxism/communism are as real today as they were 50 years after the birth of America. The plight of the individual who dares to disagree with the majority is often overlooked, if not condemned outright. Anyone who lived through our recent presidential election cycle cannot deny that de Tocqueville's *Tyranny of the Masses* does not exist.

Psychiatry obsolete? I think not. You and I and every human on the planet deal daily with these opposing forces. We need more people devoted to traditional psychiatry to help us forge into the future.

It ain't all about receptor sites.

 (continued from page 6)

because of the enduring LECOM commitment to provide care where it is most needed.

Ever vigilant to marking innovative trends in education, LECOM added two distance education pathways in 2014. The School of Pharmacy four-year pathway has grown to allow students to take courses online. The pathway offers one of only two online-distance education programs in the nation for pursuing the Doctor of Pharmacy degree. The first online class of the Masters in Health Services Administration has provided the highly sought after opportunity for professionals aspiring to take leadership roles in the administration of hospitals, clinical practices, and in other health care facilities.

Augmenting the noteworthy educational advancements, LECOM has been ever cognizant of its role in community enrichment, service and the promulgation of health for all. With the 2009 opening of the John M. and Silvia Ferretti Medical Fitness and Wellness Center, the college founded a medically-integrated wellness center that not only serves the fitness and medical education needs of LECOM students and employees of LECOM Health, but also provides a facility that offers to the populace of Erie County an opportunity to pursue a better quality of life through prevention and wellness.

In keeping with its stalwart mission of service and its unflagging goal to promote improved health for all, LECOM — in 2014 — became the lead agency for the Safe Kids Erie program, which previously had been administered by the Erie County Department of Health. Safe Kids Erie strives to educate families and to raise awareness of the fact that the vast majority of injuries to children can and should be prevented. LECOM leadership of the program also has created additional opportunities for students at the college to serve the community.

Also in 2014, LECOM incorporated LifeWorks Erie into its family of health and educational services. The affiliation with LifeWorks Erie, which offers programs, services and lifelong learning opportunities for individuals age 50 and older, has complemented and enhanced the ability of the LECOM Institute for Successful Aging to serve the growing elderly population throughout the region.

In 2015, as LECOM wholly recast the very paradigm in comprehensive patient-centered health care, the LECOM Institute for Successful Aging opened the 138-bed LECOM Senior Living Center adjacent to Millcreek Community Hospital. The welcoming and homelike environment, coupled with a skilled nursing facility, is the next generation of innovative, compassionate and comprehensive health care designed specifically for older adults.

As part of the LECOM commitment to wellness for this growing age group, LECOM purchased Parkside Senior Living Communities, comprised of three independent living and personal care apartment complexes, located in Erie, North East and Millcreek.

Life is change; growth is optional. In this area, LECOM has always chosen wisely. Knowing the way in which to grow is just as important as knowing when to do so.

Thus, as the Lake Erie College of Osteopathic Medicine met the new year, 2016 began with multiple LECOM acquisitions, including Corry Memorial Hospital, LECOM at Presque Isle Rehabilitation and Nursing Center, and the Visiting Nurses Association of Erie County. The prodigious undertaking further solidifies LECOM as the seminal provider of a healthful and proactive amalgam of comprehensive services that afford older adults independent decision-making options throughout each part of the continuum of care.

Superb educational programs continue to be added to the LECOM paradigm, further expanding and augmenting the exceptional offerings of a cutting edge leader in medical education. In 2016, the Masters of Science program welcomed its first students to the Bradenton campus.

Now in its 25th year, LECOM has developed an unassailable reputation as a leader in medical education and patient care, with its graduates highly sought after in the fields of medicine, pharmacy and dentistry. LECOM has also set the standard for affordable education in a private medical college setting where graduates achieve outstanding board scores and journey forward to make a difference in the field of health care.

The visionary leaders of medicine who founded LECOM sought to develop the core attributes that define a health care professional: the credo of the calling; the intrinsic purpose of the healer; and the foundation of that which carries a physician to seek the best version of himself or herself — for each defines the future of medicine.

Fraternally,
Silvia M. Ferretti, D.O.

CME Quiz

Name _____

AOA # _____

1. In terms of health promotion and disease prevention, an example of secondary prevention involves:
   a. screening for diabetes.
   b. counseling and educating patients on smoking cessation.
   c. follow-up exam to identify metastatic disease.
   d. nutrition and exercise counseling.

2. The United States Preventive Services Task Force (USPSTF) recommends screening for cervical cancer in women:
   a. ages 21 to 65 years with cytology (Pap smear) every year.
   b. when sexually active, regardless of age.
   c. ages 21 to 65 years with cytology (Pap smear) every three years or, for women ages 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and human papillomavirus (HPV) testing every five years.
   d. Screening for cervical cancer is considered a grade C recommendation as this service is merely offered or provided for selected patients depending on individual circumstances.

3. What is the most accurate indicator of mortality in lactic acidosis?
   a. Lactic acid level >5 mmol/L
   b. Severity of underlying hypoxia
   c. Duration of metformin use
   d. Severity of acidosis

4. According to the Cohen-Woods classification, what causes a Type A lactic acidosis?
   a. Medication or intoxication
   b. Inborn error of metabolism
   c. Underlying disease
   d. Decreased perfusion or oxygenation

To apply for CME credit, *answer the following questions and return the completed page to the POMA Central Office, 1330 Eisenhower Boulevard, Harrisburg, PA 17111-2395. Upon receipt of the quiz, we will forward it to the AOA CME Department. You will receive two Category 2B AOA CME credits. Please include your AOA number.*

Answers to Last Issue's CME Quiz

1. c
2. e
3. d
4. c
5. b
6. a

(Questions appeared in the December 2016 Journal.*)*